A Symposium Sponsored By
The Federal Reserve Bank of Kansas City

MONETARY POLICY ISSUES IN THE 1990s

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THE INTERNATIONAL DIMENSION OF MONETARY POLICY

Foreword

Early in the past decade, the Federal Reserve Bank of Kansas City hosted an economic symposium focusing on "Monetary Policy Issues in the 1980s." That program discussed the complications of monetary policymaking in an environment of deregulation and rapid financial innovation. Recently, accelerating globalization of financial markets and increasing interdependence of the world's economies have made policymaking even more complex.

Given the prospective continuation of these developments, the Bank devoted its 1989 symposium, the thirteenth in a series on major public policy issues, to "Monetary Policy Issues in the 1990s." An outstanding group of scholars and international authorities came together to share their views and consider monetary policy in a new decade.

We appreciate the contributions of all those who took part and made it a notable success. Special thanks go to Gordon H. Sellon, Jr., assistant vice president and economist; and Bryon Higgins, vice president and associate director of research, both in the Bank's Research Department, who helped develop the program.

As we enter the 1990s, it is clear that the formulation and conduct of monetary policy in coming years will require increased cooperation and coordination among policymakers around the globe. We hope these proceedings will add to public understanding and encourage further inquiry into the complex monetary policy issues which lie ahead.

ROGER GUFFEY

President
Federal Reserve Bank of Kansas City

The Contributors

Ralph C. Bryant, Senior Fellow, The Brookings Institution

Mr. Bryant has been a senior fellow in the Economic Studies program of The Brookings Institution since 1976. Prior to joining the staff there, he was associate economist and director of the Division of International Finance at the Board of Governors of the Federal Reserve System. He has served as a consultant to the World Bank, the U.S. Treasury, and the National Science Foundation. Mr. Bryant has also been a professional lecturer in international finance at the Johns Hopkins School of Advanced International Studies. In 1983, he was the first recipient of the Distinguished Fellowship in International Banking and Finance from the Institute of Southeastern Asian Studies in Singapore.

John W. Crow, Governor, The Bank of Canada

Mr. Crow was appointed governor of the Bank of Canada on February 1, 1987. He had been senior deputy governor at the Bank since 1984. Mr. Crow joined the Research Department of the Bank of Canada in 1973. He was appointed adviser to the governor in 1979 and deputy governor in 1981. Previously, Mr. Crow worked with the International Monetary Fund from 1961 to 1973. Mr. Crow is a member of the board of directors of the Federal Business Development Bank and the Canada Deposit Insurance Corporation.

Rudiger Dornbusch, Professor, Massachusetts Institute of Technology

Mr. Dornbusch is the Ford International Professor of Economics at Massachusetts Institute of Technology where he has been a member of the faculty since 1975. He was previously on the faculties at the Universities of Chicago and Rochester. Presently, he is associate editor of the ***Quarterly Journal of Economics*** and ***Journal of International Economics.*** A research associate with the National Bureau of Economic Research, he also serves on the Panel for Economic Activity at The Brookings Institution.

Jeffrey A. Frankel, Professor, University of California-Berkeley

Mr. Frankel is professor of economics at the University of California at Berkeley and a research associate of the National Bureau of Economic Research. At the time of the Symposium, he was Visiting Professor of Public Policy at the Kennedy School of Government at Harvard University. He has had other visiting appointments with the International Monetary Fund, the Institute for International Economics, the Federal Reserve Board, the World Bank, and Yale University. A specialist in international finance and macroeconomics, he served at the President's Council of Economic Advisers in 1983-84 in the area of international economic policy. His research interests include the workings of the foreign exchange market, Japanese financial liberalization, and worldwide financial integration.

Charles Freedman, Deputy Governor, The Bank of Canada

Mr. Freedman was appointed deputy governor of the Bank of Canada in 1988. His principal responsibilities relate to the area of monetary policy design and issues regarding financial institutions. Mr. Freedman joined the Bank of Canada in 1974, serving as research adviser in the Research Department, chief of the Department of Monetary and Financial Analysis, and adviser to the governor. Before joining the Bank of Canada, he spent five years on the faculty of the University of Minnesota, and currently serves as a research affiliate of the National Bureau of Economic Research.

Jacob A. Frenkel, Economic Counselor and Director of Research, International Monetary Fund

Mr. Frenkel is economic counselor and Director of Research at the

International Monetary Fund. He joined the faculty of the University of Chicago in 1973 and since 1982, has been the David Rockefeller Professor of International Economics. Mr. Frenkel is a fellow of the Econometric Society, a research associate of the National Bureau of Economic Research, and a member of the Group of Thirty. A former editor of the ***Journal of Political Economy,*** he currently serves on the board of editors of several economic journals. He was elected a Research Fellow at the Lehrman Institute in New York and a Fellow at the Mortimer and Raymond Sackler Institute of Advanced Studies in Tel Aviv.

Benjamin M. Friedman, Professor, Harvard University

Mr. Friedman is the William Joseph Maier Professor of Political Economy at Harvard University where he teaches macroeconomics and monetary economics and conducts a seminar on monetary and fiscal policy. His most recent book, ***Day of Reckoning: The Consequences of American Economic Policy Under Reagan and After*** (1988), won the George S. Eccles Prize for excellence in economics writing. Mr. Friedman is program director for financial markets and monetary economics at the National Bureau of Economic Research, a director of the Private Export Funding Corporation, a trustee of the Standish Investment Trust, an associate editor of the ***Journal of Monetary Economics,*** and a member of The Brookings Institution's Panel on Economic Activity as well as the Council on Foreign Relations. He joined the Harvard faculty in 1972 after working in investment banking for Morgan Stanley & Co.

Leonhard Gleske, Former Member of the Directorate, Deutsche Bundesbank

Mr. Gleske retired in September, 1989, after having been a member of the board of the Deutsche Bundesbank since 1976. He had been in charge of foreign affairs and international monetary questions and served on the Central Bank Council. He is serving a second term as a member of the board of directors of the Bank for International Settlements. Before joining the Deutsche Bundesbank, Mr. Gleske spent 12 years as president of the Land Central Bank in Bremen. Earlier, he had been director for monetary and financial questions at the Commission of the European Economic Community.

Morris Goldstein, Deputy Director, Research Department, International Monetary Fund

Since joining the staff of the International Monetary Fund in 1970, Mr. Goldstein has filled several senior staff positions. He was named deputy director of the Fund's Research Department in 1987. He has also served as a research fellow at The Brookings Institution, as senior technical adviser at the U.S. Treasury Department, and as a visiting research associate at the London School of Economics. Mr. Goldstein is a former member of the editorial board of IMF *Staff Papers.*

Lyle E. Gramley, Senior Staff Vice President and Chief Economist, Mortgage Bankers Association

Mr. Gramley is the senior staff vice president and chief economist of the Mortgage Bankers Association of America. He joined the Association in 1985. Previously, he was a member of the Board of Governors of the Federal Reserve System. He joined the Federal Reserve in 1955 as a financial economist at the Federal Reserve Bank of Kansas City. In 1962, he joined the faculty of the University of Maryland. Mr. Gramley became a staff economist at the Federal Reserve Board in 1964, and was later named director of the Board's Division of Research and Statistics. In 1977, he became a member of the President's Council of Economic Advisers, where he continued until his appointment to the Federal Reserve Board in 1980.

Alan Greenspan, Chairman, Board of Governors of the Federal Reserve System

Mr. Greenspan began his four-year term as chairman of the Federal Reserve Board in August 1987. Until his appointment as chairman, he had been chairman and president of the New York economic consulting firm of Townsend-Greenspan & Co., Inc. since 1954 except for a three-year appointment (1974-77) as chairman of President Ford's Council of Economic Advisers. He has also chaired the National Commission on Social Security Reform, and served on President Reagan's Economic Policy Advisory Board and Time magazine's Board of Economists. He was also senior adviser to The Brookings Institution's Panel on Economic Activity and consultant to the Congressional Budget Office. In recent years, Mr. Greenspan has served as a director for many major American corporations and leading institutions. His term as a member of the Federal Reserve Board continues through January 1992.

Donald L. Kohn, Director, Division of Monetary Affairs, Board of Governors of the Federal Reserve System

Mr. Kohn was named to his present position in October 1987, after having served 12 years at the Board as an economist in the Government Finance Section, chief of the Capital Markets Section, associate director in the Division of Research and Statistics, and deputy director in the Office of Staff Director for Monetary and Financial Policy. He was a financial economist at the Federal Reserve Bank of Kansas City from 1970 to 1975. In his current post, he has broad responsibility for staff work on monetary policy issues and serves as liaison between the Board of Governors and the Federal Reserve Bank of New York on the day-to-day implementation of monetary policy and developments in financial markets.

Robin Leigh-Pemberton, Governor, The Bank of England

Mr. Leigh-Pemberton is serving his second five-year term as Governor of the Bank of England, having been first appointed to the post in July of 1983. At the time of his first appointment, he was chairman of the National Westminster Bank whose board he had joined in 1972. He has been a member of the National Economic Development Council since.1982 and is a Fellow of the Chartered Institute of Bankers and the Royal Society of Arts. Mr. Leigh-Pemberton has also been an active volunteer in Kent County government and military affairs and on behalf of the University of Kent at Canterbury. He became Lord Lieutenant of Kent in 1982 and continues his family's farming interests there. He was appointed to the Privy Council in 1987.

Ian J. Macfarlane, Head of Research, The Reserve Bank of Australia

Mr. Macfarlane was appointed to his present position in 1988, where he has responsibility for advising on monetary policy and economic developments. Earlier, he spent five years in the Bank's Financial Markets Group, the last two as chief manager. In this area, he had responsibility for domestic open market operations and foreign exchange. He joined the Reserve Bank's Research Department in 1978, after having spent the previous six years in the Economics and Statistics Department of the Organization for Economic Cooperation and Development.

Paul R. Masson, Adviser, Research Department, International Monetary Fund

Before joining the International Monetary Fund in 1984, Mr. Masson worked for the Bank of Canada and the Organization for Economic Cooperation and Development. He is currently a member of the editorial board of IMF ***Staff Papers.***

Robert Solomon, Guest Scholar, The Brookings Institution

Before coming to The Brookings Institution, Mr. Solomon was with the Board of Governors of the Federal Reserve System from 1948 to 1976. While at the Board of Governors, he was involved in both its domestic and international activities, and became adviser to the Board and director of its Division of International Finance. Mr. Solomon also served as senior staff economist at the Council of Economic Advisers in 1963-1964 and from 1972 to 1974, was a vice chairman of the Deputies of the Committee on Reform of the International Monetary System (Committee of Twenty). He is the author of ***The International Monetary System, 1945-1***981 and publisher of ***International Economic Letter.***

Yoshio Suzuki, Vice Chairman, Board of Councillors, Nomura Research Institute, Ltd.

Mr. Suzuki joined the Nomura Research Institute, Ltd., as vice chairman of the board of councillors in June of 1989. He had been with the Bank of Japan for 34 years, most recently as executive director. In previous assignments, he had been chief of the Domestic Division of the Bank's Economic Research Department, deputy director of the Monetary and Economic Studies Department, and director of the Institute for Monetary and Economic Studies. A former visiting lecturer at Tokyo University and Shinshu University, he has received a number of prizes for economic literature. In 1987, he was awarded a Public Finance Fellowship from the Institute of Fiscal and Monetary Policy of the Ministry of Finance.

Alexander K. Swoboda, Professor, Institute for International Studies

Mr. Swoboda is professor of international economics at the Graduate Institute .of International Studies, director of the International Center for Monetary and Banking Studies, and professor of

economics at the University of Geneva. He has also taught at the Graduate School of Business at the University of Chicago and been a visiting professor at the Johns Hopkins School of Advanced International Studies in Bologna, the London School of Economics, and Harvard University. His research focuses on international finance, macroeconomics, international adjustment theory; and the econometrics of the international transmission of inflation and business cycles.

John Williamson, Senior Fellow, Institute for International Economics

Mr. Williamson is a senior fellow with the Institute for International Economics in Washington, **D.C.** Previously, he taught at the Pontificia Universidade Catolica do Rio de Janeiro in Brazil from 1978-1981; the Universities of **Warwick** (1970-1977) and York (1963-1968) in England; and as a visiting professor at the Massachusetts Institute of Technology in 1967 and 1980. He was an economic consultant in the United Kingdom Treasury in 1968-1970, where he worked on a range of international financial issues. He also was an adviser to the International Monetary Fund from 1972-1974, where he worked mainly on questions of international monetary reform related to the work of the Committee of Twenty.

The Moderators

Frederick H. Schultz, Former Vice Chairman, Board of Governors of the Federal Reserve System

Mr. Schultz' record of public service to government and education covers nearly 30 years. His three-year term as vice chairman of the Federal Reserve Board began in 1979. He served eight years as a member of the Florida House of Representatives, and was Speaker during his final term. Mr. Schultz joined the **Barnett** Bank of Jacksonville, Fla., in 1956 and a year later, opened a venture capital office

as a private investor. He was chairman of Florida Wire and Cable Company from 1958-1979 and chairman of Barnett Investment Services, Inc., a subsidiary of Barnett Banks of Florida, from 1973-79. A former Kennedy Fellow at the Harvard University Institute of Politics, he is a member of the advisory committee of the Woodrow Wilson School of Public and International Affairs at Princeton University.

Anthony M. Solomon, Chairman, S. G. Warburg, Inc.

Mr. Solomon was named chairman of S.G. Warburg, Inc. in 1986. Previously, he was president of the Federal Reserve Bank of New York and vice chairman of the Federal Open Market Committee. He was named to those posts in 1980, after having spent three years as undersecretary for monetary affairs at the U.S. Treasury. Earlier, he had been Assistant Secretary of State for economic affairs and worked in both the public and private sectors in Latin America, Bolivia, Mexico, Iran, and London. Currently, he is a director of S.G. Warburg Group plc (London), a director of the Syntex Corporation, adviser to the management board of Banca Cornmerciale Italiana (Milan), and adviser to the Nomura Research Institute of Economics (Tokyo). He also chairs the executive committee for the Institute for International Economics.

Introduction

Donald P. Morgan

Monetary policy operates in a different environment than it did a decade ago. Financial market innovations have eroded the distinctions among monetary assets, making the definition of money increasingly arbitrary. Deregulation of interest rates and banking activity is changing the behavior of the monetary aggregates, as banks pay interest on monetary assets and nonbanks offer monetary-like assets. And globalization of markets has increased the international effects of domestic policy through trade accounts and exchange rates.

The evolution in world financial and goods markets raises a number of questions about monetary policy. What should be the long-run goal of monetary policy? What short-run procedures should monetary policy adopt to achieve this goal? How should monetary policy respond to trade imbalances and volatile exchange rates?

To confront such questions, the Federal Reserve Bank of Kansas City invited distinguished central bankers, academics, and industry representatives to a symposium entitled "Monetary Policy Issues in the 1990s." The symposium was held August 30—September 1, 1989, in Jackson Hole, Wyoming.

Participants generally agreed that the goal of monetary policy in the 1990s, above all else, should be price stability. The challenge to monetary policymakers will be to achieve price stability in the face of rapidly changing financial markets and competing interna-

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tional goals of monetary policy. Most participants agreed that price stability cannot be achieved by targeting monetary growth because the relationship between money and prices will remain unstable in the 1990s. Participants disagreed, however, on whether competing international goals of monetary policy—stable exchange rates and balanced trade—would, or should, compromise the goal of price stability.

This article summarizes the papers and commentary presented at the symposium. The first section discusses the lessons from the 1970s and 1980s that have led monetary policymakers to believe their primary goal should be price stability. The second section examines the operational challenges to price stability arising from the evolution in financial markets. The third section discusses international obstacles to achieving price stability. The final section summarizes the views of four prominent central bankers participating in the symposium.

Price stability: The goal of monetary policy in the 1990s

Historically, central banks have pursued a number of economic goals: price stability, full employment, exchange rate stability, and balanced trade. Defining the proper long-run goal of monetary policy in the 1990s was an important issue at the symposium.

The symposium's first presenter, Charles Freedman, set the stage for this issue. In "Monetary Policy in the 1990s—Lessons and Challenges," Freedman reviewed some important lessons for monetary policy from preceding decades. Freedman argued that high inflation and unemployment in the 1970s, followed by the high cost of disinflation in the 1980s, have convinced central bankers their foremost goal in the 1990s should be price stability.

The principal lesson from the 1970s, according to Freedman, is that monetary policy should not try to stabilize the unemployment rate. He explained the long-run unemployment rate depends on such real factors as labor force mobility and minimum wage laws, rather than on the supply of money. If policymakers increase the money supply in an effort to reduce unemployment, the only long-run effect will be inflation. Policymakers learned this lesson when they expanded the money supply to prevent unemployment from increasing after

the price of oil tripled in the 1970s. The result was stagflation—high unemployment and high inflation.

Turning to the 1980s, Freedman argued that the high cost of disinflation—the recession in 1981 and 1982—taught policymakers to be vigilant against inflation. If policymakers ignore inflation the public will doubt policymakers' commitment to ending inflation. Policymakers in this predicament cannot change the public's expectations merely by announcing that inflation will decline. To overcome inflationary expectations, monetary policy must eventually become severely restrictive, even at the risk of a recession. To avoid this outcome, Freedman advised policymakers to respond quickly to signs of inflation.

Looking ahead to the 1990s, Freedman identified three major challenges for monetary policy. First, the deregulation of interest rates and exchange rates and the greater integration in world financial markets will change the channels of monetary policy. Second, ongoing financial innovation will result in continued instability in the relationship between prices and money. And third, greater international capital mobility may prevent central banks from achieving both price stability and exchange rate stability.

In discussing Freedman's paper, Lyle E. Gramley said it may be politically impossible for monetary authorities to aim only at price stability while ignoring the unemployment rate. He recalled the Bush Administration criticized the Federal Reserve for worrying too much about inflation in 1989, even though the unemployment rate was low at the time. Gramley predicted political pressure to stabilize the economy may increase in the event of disturbances to the vulnerable international or financial sectors. If policymakers are forced to try to stabilize the economy, Gramley advised them to remember that monetary policy has only a temporary effect on real variables, but a lasting effect on prices.

Achieving price stability: Operational challenges

As Freedman observed, rapidly changing financial markets pose an operational challenge to the goal of achieving price stability. Four papers at the symposium addressed this issue. Benjamin Friedman investigated how the monetary transmission mechanism has been changed by deregulation, innovation, and globalization in the 1980s.

Central bank economists from three countries then discussed how monetary operating procedures in the 1990s must adapt to these changes if price stability is to be achieved.

The changing monetary transmission mechanism

In "Changing Effects of Monetary Policy on Real Economic Activity," Benjamin Friedman identified three changes in the U.S. economy in the 1980s that may have altered the behavior of major spending components. First, the elimination of deposit interest-rate ceilings and the emergence of secondary mortgage markets may have weakened the strong effect of monetary policy on the housing industry. Second, rising indebtedness of U.S. corporations and consumers may have made them more sensitive to changes in interest rates. And third, the increased openness of the U.S. economy may have made the exchange rate a more important channel of monetary policy.

Friedman conducted statistical tests of these hypotheses. He found the housing industry has become less susceptible to monetary policy. Business investment in plant and equipment, on the other hand, has become more sensitive to interest rates. Friedman found consumer spending in the 1980s was less affected by changes in interest rates and stock prices than previously. And finally, Friedman found the flow of imports and exports was less sensitive to changes in the dollar's value in the 1980s; he calculated the decline was large enough to decrease the importance of foreign trade as a channel for monetary policy, even accounting for the larger share of U.S. GNP that is traded internationally. In sum, Friedman judged, the ability of monetary policy to affect aggregate spending has not changed, but its relative impact on housing, business investment, consumption, and foreign trade has changed. Policymakers in the 1990s must take these changes into account.

Discussant Ralph Bryant disagreed with some of Friedrnan's conclusions. Bryant questioned Friedman's finding that consumer spending responded more now to changes in interest rates and stock prices. In Bryant's view, not enough data have accumulated since deregulation to measure accurately its effects on consumer spending. Bryant also doubted that trade flows have become less sensitive to financial variables. Even granting that result, Bryant thought the increased share of U.S. GNP constituted by foreign trade would enhance the

importance of trade as a channel for monetary policy.

Bryant did agree with Friedman's conclusions that the housing industry has probably become less affected by monetary policy. He also agreed that business investment has become more sensitive.

In Bryant's view, monetary policy will remain effective in the 1990s, but its effects will be more uncertain. Greater uncertainty will force policymakers to proceed cautiously and to be candid about the possibility of mistakes.

Policy targets and operating procedures

Papers by central bank economists from the United States, Australia, and Japan examined how short-run monetary policy must operate in the 1990s to achieve price stability. The central question was whether price stability could be achieved by targeting the monetary aggregates in the context of financial deregulation, globalization, and innovation.

In "Policy Targets and Operating Procedures in the 1990s," Donald Kohn began with the premise that the only reasonable long-run objective for monetary policy is price stability. He then examined operating procedures that might achieve this objective in the United States.

Kohn first considered intermediate targeting as a short-run operating procedure. Under this procedure, Kohn explained, policymakers try to achieve their ultimate goal by controlling some intermediate variable—the supply of bank credit, for example. He noted that policymakers must abandon a particular target if the short-run relationship between the target and their ultimate goal becomes unstable. For example, bank credit was abandoned as a target in the 1960s after firms began borrowing more in open inarkets and less from banks, thus altering the relationship between bank credit and spending. For much the same reason, Kohn added, monetary targets were deemphasized in the late 1980s. Kohn concluded that the intermediate targeting procedure may be inherently inefficient because it ignores information from other variables. As an alternative to targeting a single variable, Kohn advocated a strategy of small, frequent policy adjustments in response to many different variables. Uncertainty about underlying relationships among financial and economic variables forces policymakers to "cast a wide net" by monitoring several

variables, including interest rates and indicators of real activity. Uncertainty also calls for small, frequent adjustments in policy to avoid making cumulative errors, Kohn argued.

Under this strategy, warned Kohn, policymakers risk losing sight of the long-run goal of reducing inflation. In Kohn's view, the Federal Reserve has avoided this danger by "leaning against the wind" to avoid excess demand that might cause higher inflation. Doing so has enhanced the credibility of the Federal Reserve's commitment to control inflation. In turn, greater credibility has helped reduce inflation by keeping inflation expectations low.

In "Policy Targets and Operating Procedures: The Australian Case," Ian Macfarlane observed that Australia did not reduce its inflation rate in the 1980s as much as many other industrialized countries. He said that reducing inflation further would be the major challenge in the 1990s.

Macfarlane described how monetary policy procedures in Australia had evolved from exchange rate targeting to monetary targeting and then to interest rate targeting: He explained targeting the exchange rate in the 1970s and 1980s constrained the central bank's ability to achieve domestic objectives. For example, whenever the central bank tried to slow the economy by raising interest rates, capital inflows from foreign investors put upward pressure on the exchange rate. Then, to stabilize the exchange rate, the central bank had to sacrifice its domestic objectives. To free monetary policy from this constraint, exchange rate targets were abandoned in 1983.

Macfarlane reported that targeting various monetary aggregates proved to be unreliable in controlling inflation. The narrow aggregates were potentially useful, though, since changes in the narrow aggregates usually preceded changes in spending. But the relationship became unpredictable after interest rates were deregulated in the 1980s. The broader monetary aggregates, on the other hand, bore a lagging relationship to spending, which limited their usefulness as targets. Consequently, the Reserve Bank abandoned monetary targeting in 1985.

Macfarlane explained that the Australian Reserve Bank now operates by adjusting interest rates to achieve price stability. He acknowledged the tendency under this procedure for interest rates themselves to become an objective. The risk with this procedure, he explained, lies in keeping interest rates steady in the face of

accelerating inflation. He felt, however, that the Australian central bank had avoided this risk in recent years. Besides, he could see no better alternative, as exchange rate targets and monetary targets had not performed well in Australia.

In "Policy Targets and Operating Procedures in the 1990s: The Case of Japan," Yoshio Suzuki predicted the Japanese central bank will continue to rely on monetary targeting to maintain price stability. Suzuki reported that the relationship between money and prices in Japan remained relatively stable in the 1980s. He attributed the stability to the gradual pace of interest rate deregulation in Japan, which is not yet complete, and to relatively stable inflation and interest rates in the 1980s.

Suzuki suggested that deregulation would change the channels of monetary policy. Under current deposit and loan interest rate ceilings, a rise in market interest rates leads to a reduction in bank deposits and bank credit. Suzuki predicted this credit availability channel would weaken when deposit ceilings are abolished in the 1990s. A stronger channel may arise from the effect of monetary policy on wealth. He explained that higher interest rates reduce wealth by depressing the stock market and the value of bonds, and the reduction in wealth in turn reduces consumer spending. This wealth effect channel will likely strengthen as Japanese wealth increases in the 1990s.

Achieving price stability: International challenges

Integration of world markets has given international issues greater prominence in policy debates. Two papers examined the possible conflict between the domestic goal of price stability and competing international goals. Jacob A. Frenkel, Morris Goldstein, and Paul R. Masson examined whether price stability could be reconciled with the goal of exchange rate stability. Rudiger Dornbusch argued that policymakers should not be too concerned with price stability in pursuing balanced trade and full employment.

Price stability versus exchange rate stability

In "International Dimensions of Monetary Policy: Coordination Versus Autonomy," Jacob A. Frenkel, Morris Goldstein, and Paul R. Masson examined the tension between central banks' coordinated

pursuit of exchange rate stability and their independent pursuit of domestic price stability.

The authors argued that stabilizing exchange rates is sometimes a legitimate goal of monetary policy. They cited theoretical and empirical evidence that destabilizing speculation can cause excessively volatile exchange rates. Because excess volatility creates needless uncertainty for investors, the authors argued, it would be a mistake for policymakers to ignore exchange rates. On the other hand, since excess volatility is the exceptional case, it would also be a mistake for policymakers to fix exchange rates. As an intermediate solution, the authors proposed that central bankers in larger countries should keep exchange rates within "loose and quiet" target zones.

Will maintaining exchange rate zones compromise the goal of price stability? Not for high-inflation countries, said the authors, since maintaining the exchange rate vis-A-vis a low-inflation country disciplines the central bank of the high-inflation country. However, for larger countries with low inflation rates, enforcing the zones will occasionally require central banks to intervene in exchange markets or to make coordinated adjustments in their domestic policies. In these events, the goal of domestic price stability has to be ignored since monetary policy cannot simultaneously control the domestic and international value of the currency.

Can fiscal policy control the domestic price level when monetary policy is aimed at the exchange rate? The authors offered several reasons why, in their view, fiscal policy is not suited to this purpose. First, fiscal policy is too inflexible to function as a tool of demand management. For evidence, they pointed to persistent and, in their view, inappropriate budget deficits in the United States in the 1980s. Second, too little is known about the effects of fiscal policy on the economy. Third, fiscal policy should be guided by long-run issues, such as economic growth and income distribution, not by the short-run goal of demand management.

Discussant Robert Solomon agreed that excessively volatile exchange rates will occasionally be a major concern for monetary policy in the 1990s. He disagreed, however, that aiming monetary policy at exchange rates requires abandoning the goal of price stability. In his view, fiscal policy could be used to control the price level. While it may be less flexible than monetary policy, fiscal policy may affect the economy faster than monetary policy. He asserted that nearly

a decade of large U.S. budget deficits should not disqualify fiscal policy as a useful policy tool.

Discussant John Williamson agreed with most of the authors' arguments, but disagreed on two points. First, he argued that monetary authorities should announce the exchange target zones publicly. Second, he objected to assigning monetary policy exclusively to controlling inflation or the exchange rate, while assigning fiscal policy solely to balancing the budget. In his view, price stability and exchange rate stability could both be achieved by the appropriate mix of fiscal and monetary policy. He echoed Solomon's point that large U.S. budget deficits should not disqualify fiscal policy as a useful instrument of demand management.

Price stability versus balanced trade

Rudiger Donbusch, in "The Dollar in the 1990s: Competitiveness and the Challenges of New Economic Blocs," argued that U.S. monetary policy cannot be "overconscious" of inflation if the United States is to improve its trade account in the 1990s without suffering a recession.

Dornbusch observed that increased financial integration in the 1980s increased the international spillover of domestic policy. The combination of large U.S. budget deficits and tight monetary policy in the 1980s resulted in higher U.S. interest rates, which attracted foreign capital. The capital inflow moderated the increase in interest rates but increased the value of the dollar. The resulting increase in the trade deficit allowed the United States to run large budget deficits without displacing domestic investment. In Dornbusch's view, there is ample evidence that trade deficits caused by budget deficits are cause for concern.

Next, Dornbusch argued that the trade deficit could remain large unless the exchange value of the dollar declines. The dollar is overvalued, as evidenced by the fact that some U.S. export prices remain above their 1980 levels. The U.S. competitive position appears even worse, he added, in light of the superior quality of some foreign goods compared with U.S. goods. The U.S. competitive position is weakened further, he asserted, because Japanese markets are closed to U.S. exports.

A change in macroeconomic policies is needed to reduce the trade

deficit, Dornbusch reasoned. He stressed that domestic policy must be coordinated toward this end. If monetary policy is eased to lower the dollar without an accompanying reduction in the budget deficit, the economy would overheat and inflation would accelerate. Alternatively, if the budget deficit is reduced without an accompanying ease in monetary policy, a recession could follow. Thus, in the event the budget deficit is reduced, the Federal Reserve should ease monetary policy to lower the value of the dollar in order to increase U.S. exports. The risk is that the Federal Reserve, fearing inflation, would not ease policy as the budget deficit is reduced.

Dornbusch also argued that the emergence of "inward-looking" trading blocs in Europe and Asia threaten the U.S. competitive position and the international role of the dollar. He noted that Europe 1992 has already led some U.S. firms to build plants in Europe to avoid being locked out of that market. He also predicted an Asian trading bloc centered in Japan would emerge in the 1990s as the United States closes its deficit with Japan and Japan seeks new markets. Furthermore, Dornbusch predicted the emergence of a single currency unit in each of these blocs would displace the dollar as a world currency.

Discussant Jeffrey A. Frankel agreed with Dornbusch that the current U.S. budget deficit should be reduced in order to improve the trade balance. He also agreed that the Federal Reserve should accommodate a fiscal contraction by lowering real interest rates and the value of the dollar. Frankel emphasized, however, that inflation would worsen if monetary policy becomes expansionary before the budget deficit is reduced.

Frankel objected to Dornbusch's assertion that European and Asian integration threaten the role of the dollar. He predicted the dollar would remain the preeminent world currency into the next century. A more important trend, in his view, was the increasing share of world output produced in Japan and Europe. To the extent this change reflects slow U.S. productivity growth in the 1980s, it is cause for concern. He noted, however, that integration and economic success among our trading partners would not necessarily be at the expense of the United States.

Discussant Alexander Swoboda warned against focusing too much attention on the exchange rate, lest it be elevated to the undeserved status of a target of monetary policy. In his view, monetary policy

should be assigned to price stability in the long run and stabilizing output in the short run. The U.S. current account deficit should be addressed at its source: large budget deficits. Swoboda also thought Dornbusch overemphasized Japanese-U.S. trade relations, pointing out that opening Japan's markets would benefit all nations, not only the United States. On a separate point, Swoboda observed that while the U.S. dollar is still the predominant world currency, its role is declining vis-à-vis the yen. He predicted a further, albeit slow, decline in the dollar's role in the 1990s.

Central bank overview

The symposium also provided a forum for the opinions of four prominent central bankers. The luncheon address on the first day was delivered by Robin Leigh-Pemberton, the Governor of the Bank of England. The symposium concluded with an overview panel comprising John Crow, Governor of The Bank of Canada; Leonhard Gleske, Member of the Directorate, Deutsche Bundesbank; and Alan Greenspan, Chairman of the Board of Governors of the Federal Reserve System of the United States.

Robin Leigh-Pemberton's address was entitled "Europe 1992: Some Monetary Policy Issues." He noted that integration of Europe in 1992 will enable goods, capital, and labor to move as freely among the nations in the European Community as they do currently throughout the United States. This unity may constrain the autonomy cf member countries in conducting monetary policy, perhaps leading eventually to a common currency and monetary authority. Leigh-Pemberton asserted it is "more important than ever" to understand that the "first and overriding goal" of monetary policy should be price stability.

Leigh-Pemberton discussed the pace at which monetary integration should occur. It is often argued, he noted, that since an integrated Europe will resemble the United States, Europe should adopt a common currency and single monetary authority modeled after the Federal Reserve System. In his view, this argument ignores the fact that European goods and labor markets will likely remain less integrated than U.S. markets for some time. Lacking the adjustment mechanism that integrated markets provide, each European nation may still need an independent monetary authority to accommodate disruptions to its

own economy. For this reason, Leigh-Pemberton warned against allowing monetary integration to race ahead of goods and labor market integration.

Leonhard Gleske addressed two issues in his remarks: the role of monetary targeting in the 1990s and the implications of a tri-polar currency system for monetary policy.

Gleske reaffirmed the majority view that the primary responsibility of a central bank is price stability. Monetary targeting has been useful to the Bundesbank in fulfilling that responsibility, said Gleske, especially when the Bundesbank was attempting to reduce inflation in the early 1980s. More recently, however, German monetary policy has not been guided exclusively by the monetary aggregates; some overshooting of the monetary targets has been tolerated to prevent the deutsche mark from appreciating. In Gleske's opinion, this compromise was justified by the need to protect West Germany's large foreign sector from misaligned exchange rates. Furthermore, because the external sector will likely grow with the integration of Europe, he expects the monetary aggregates to serve as long-run policy guides in the 1990s rather than formal targets.

Gleske speculated that strict monetary targeting might be feasible under a tri-polar currency system. Because each bloc's foreign sector would constitute a smaller share of the bloc's aggregate output, each bloc could better withstand shocks to its exchange rate. Gleske felt, however, that a common monetary authority in Europe is still remote, and a common authority in the Pacific rim may never occur.

John Crow observed in his remarks that central banks are officially charged with many responsiblities. For example, the Bank of Canada Act calls upon the bank to protect "the international value of the currency, and to mitigate by its influence fluctuations in the general level of production, trade, prices and employment." Crow argued that monetary policy is best suited to achieving price stability; therefore, price stability should be the foremost goal of monetary policy.

Crow urged central bankers to resist having too many duties foisted upon them, lest they fail in their primary duty of stabilizing prices. He acknowledged that monetary policy has a comparative advantage over fiscal policy in controlling the exchange rate. Crow reasoned, however, that exchange rate is best stabilized by preserving the domestic value of the currency—that is, by eliminating inflation.

Alan Greenspan predicted central bankers in the 1990s will face more instability in the international financial system due to the accelerating volume of international financial transactions. He explained that most international transactions are not concurrent: a period of "float" separates the commitment and final settlement of a transaction. During such a period, the transaction is essentially a loan. If the borrower defaults, the lender may in turn default on transactions the lender agreed to when still expecting payment from the borrower. Such a chain reaction of defaults could destabilize the international financial system. Greenspan judged that we cannot hope to eliminate such systemic risk. He concluded, however, that because the stability of financial markets ultimately depends on the performance of the world economy, systemic risk is best controlled through the "pursuit of sound economic policies both domestically and, to the extent relevant, on a coordinated international basis."

Conclusion

Participants at The Federal Reserve Bank of Kansas City's 1989 symposium discussed a wide range of issues for monetary policy in the 1990s. One issue, however, forced itself center stage: price stability. Virtually all participants agreed that price stability should be the foremost goal of monetary policy in the 1990s.

With this goal in mind, participants acknowledged a number of obstacles to achieving price stability. Deregulation and innovation in financial markets have changed the transmission of monetary policy in uncertain ways. Just as important, the evolution in financial markets has destabilized the short-run relationship between money and prices, depriving policymakers of a useful tool for short-run policy operation. At the same time, the integration of world markets has forced policymakers to look beyond their borders in deciding policy. International issues, such as volatile exchange rates and trade imbalances, now compete with price stability for policymakers' attention. To achieve price stability in the coming decade, monetary policymakers must overcome these operational and international challenges.

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Monetary Policy in the 1990s: Lessons and Challenges

*Charles Freedman**

Introduction

In recent years there has been considerable discussion of various national and international financial developments ,which, it is argued, have had or will have important implications for the way monetary policy is conducted. The most prominent of these developments can be captured under the rubrics of liberalization and globalization. They include such matters as the abolition of exchange and capital controls, a range of financial innovations brought about by regulatory or market changes that have made monetary aggregates less stable, and the move of some countries toward a fixed exchange rate regime.

In this paper I take both a backward and forward look at the formulation of monetary policy. The next section provides a broad overview of the principal lessons for the conduct of monetary policy that can be drawn from the experiences of the past two decades. The following section traces out some of the likely challenges to monetary policy in the coming decade, in particular the implications of liberalization and globalization. There is, of course, some considerable overlap between past changes and future developments.

One set of broad conclusions is worth highlighting in this introduc-

*The views expressed in this paper are those of the author and do not necessarily reflect those of the Bank of Canada. The author is indebted to a number of his colleagues at the Bank for comments and criticisms of earlier drafts, of this paper. Any remaining errors are, of course, his own responsibility.

tion. For those countries in which monetary policy has in the past operated principally through market mechanisms (that is, changes in interest rates and/or the exchange rate), the 1990s will not differ in any truly fundamental sense from the past two decades as far as the conduct of monetary policy is concerned. Of course, there will be changes. For example, the role of intermediate targets may be different, and the relative importance of interest rates and exchange rates as transmission channels may change. But, basically, the central banks in such countries will likely conduct monetary policy in the 1990s in a relatively similar way to the way they have been conducting policy in the 1980s. In contrast, for those countries which relied upon quantitative controls and credit rationing in the past, changes have been and will be much more fundamental. With the removal of restrictions on markets and on market participants and with the abolition of exchange controls, quantitative credit controls will no longer be feasible. Hence, policy will have to operate through changes in interest rates and exchange rates, as in the first group of countries. A final set of countries will have the most radical changes of all. These are the countries which opt for a fixed exchange rate vis-à-vis a larger partner or as part of a currency bloc. In a world without exchange controls and in which asset substitutability is high, such countries are relinquishing their monetary policy role to their larger partner or to the central bank of the currency area. In return, they receive the long-run inflation rate and credibility of the latter. Thus the relevance of the judgments and conclusions in this paper to a specific country will depend on the institutions that have prevailed in that country as well as the choice it makes with respect to exchange rate regime.

The approach that is taken in this paper to these issues is primarily practical, rather than theoretical, and the focus is upon the major problems that central banks have faced and will be facing. It is not intended to be an exhaustive treatment, but rather a broad-brush survey. The model underlying most of the analysis is what I would call the mainstream central bank model of recent years—best characterized as a structural model with an aggregate demand for goods equation, a money demand equation, and an augmented Phillips curve equation with no tradeoff in the long run but in which wages or prices are responsive to conditions in the labor or goods markets in the short run. Of particular importance is the fact that expecta-

tions in the mainstream model are typically a mix of the backward-looking (that is, adaptive) and forward-looking varieties.[1] In short, the model is basically one in which markets do not continuously clear (that is, there is wage and/or price stickiness in the short run although not in the long run) and in which expectations are, at most, partly rational.[2] I will also follow what I interpret as the mainstream central bank approach to the transmission mechanism, in which monetary policy (in the absence of credit and exchange controls) operates through changes in interest rates and other rates of return, and through changes in the exchange rate when the latter is permitted to move.

A final point by way of introduction. Since much of my own expertise has been in the area of Canadian monetary policy, I will draw heavily on the experiences over the last two decades of the Canadian economy—a quintessential relatively small open economy with very high international asset substitutability, no capital controls, flexible exchange rate, no interest rate ceilings, and no credit rationing. Because of the openness of the Canadian economy and the absence of controls over a long period of time, the Canadian economy may well serve as a useful laboratory for what is likely to happen in those countries whose markets are becoming more liberalized and more global. I also make frequent reference to developments in the U.S. economy over the last two decades, notably in terms of the responses to the abolition of interest rate ceilings, and in relation to the interaction between fiscal and monetary policy.

Lessons from the 1970s and 1980s

In beginning a retrospective of the lessons that can be drawn from the experiences of the past two decades it is perhaps worth recalling very briefly the nature of the policy views that dominated the

1 Models, such as those of Taylor (1980), which incorporate staggered wage contracts and rational expectations can give similar results to models with some backward-looking expectations. Nonetheless, I would characterize the mainstream central bank approach as including an element of backward-looking expectations.

2 In addition to the full rational expectations market-clearing model, I also leave aside the real business cycle theories and new Keynesian approaches to cyclical fluctuations. The real business cycle theories are surveyed in Plosser (1989) and Mankiw (1989), and the new Keynesian approaches are set out in Ball, Mankiw, and Romer (1988), and Greenwald and Stiglitz (1988).

economics profession and central banks in the 1960s. A listing of the goals of policy at this period would make prominent mention of both the level of output and employment and the rate of inflation. It was felt that one could achieve a reasonable outcome for these variables as well as stabilize real incomes by targeting on a real variable such as real output growth or the rate of unemployment. That is, when real output growth fell and the rate of unemployment rose, fiscal and monetary policies would be moved in the direction of expansion, and when the rate of unemployment fell and the rate of inflation rose policies would shift in the direction of contraction.[3] With hindsight it is clear that the attempt to "fine tune" the real economy and to achieve what turned out to be unrealistically low rates of unemployment was overly ambitious and beyond the capacity of central banks and governments.[4] In the event, the combination in the early 1970s of the pressures of worldwide excess aggregate demand and of supply shocks led to a long-lasting inflation situation, unprecedented in the peacetime history of industrialized countries, which is still influencing behavior.

The following list sets out what I consider to be the principal lessons for monetary policy that can be drawn from the experience of the 1970s and 1980s.

(1) Monetary policy should take a longer-term perspective and focus on one or more nominal quantity variables or the nominal exchange rate, and not on real variables or interest rates.

(2) Inflation expectations become entrenched over time and very difficult to eliminate. Hence, in the face of demand pressures, it is important to take timely action to prevent inflation from accelerating or at least to limit the upward movement.

(3) Somewhat less emphasis should be placed on monetary and/or credit aggregates than in the past. They can continue

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3 Indeed, in the most ambitious versions of this approach the authorities were expected to adjust policy in response to projected movements of unemployment and inflation.

4 Furthermore, those who believed in a long-run tradeoff between the unemployment rate and the rate of inflation found their beliefs disproved by the events of the late 1960s and 1970s.

to make a useful contribution to policy but in a world of innovation may not be able to serve as formal intermediate targets.

(4) In an economy that is subject to periodic, significant shocks in its terms of trade, movements in the nominal exchange rate can facilitate adjustments in the economy.

(5) When fiscal policy and monetary policy are working in opposite directions, very large movements in financial variables, such as the nominal and real exchange rate and nominal and real interest rates, may result.

(6) There is no simple way of dealing with unfavorable supply shocks.

Each of these points will now be considered in detail.

(1) Monetary policy should take a longer-term perspective and focus on one or more nominal quantity variables or the nominal exchange rate, and not on real variables or interest rates.

This is, perhaps, the principal lesson to be drawn from the experience of the 1970s. The implications of focusing on real variables can be seen in the events of the period and in the mainstream model. Targeting on, say, the unemployment rate can be very risky since one can never be sure of the magnitude of the nonaccelerating inflation rate of unemployment (NAIRU), and trying to achieve and maintain a level of unemployment which is below the NAIRU will lead to an accelerating rate of inflation. The risks are particularly great when the NAIRU is changing as a result of such factors as changes in minimum wage laws, modifications in the regulations governing unemployment insurance, or demographic shifts.[5]

By focusing on a nominal quantity variable, the authorities can avoid cumulative one-way errors which result in outcomes such as ever-increasing inflation. Excessively rapid growth in demand (whether caused by an internal or external demand shock) causes the nominal variable on which the central bank is focusing to expand at a rate

[5] Rose (1988), Carlson (1988), and Weiner (1986).

greater than desired. In the case of an economy operating under flexible exchange rates, the result will be a rise in interest rates and an appreciation of the domestic currency, both of which will operate to moderate the expansion of nominal spending. Conversely, in a situation with excessively slow growth in spending, there will be a tendency for interest rates to decline and the domestic currency to depreciate, both of which will tend to provide support to spending. In both cases, the transmission mechanism operates from central bank adjustments in its balance sheet through interest rates, exchange rates and their associated effects, to output and prices.

Considerable research over the years has gone into the question of whether the authorities should place most weight on a monetary aggregate or a credit aggregate or nominal spending or the nominal exchange rate.[6] Much of the earlier literature emphasized the monetary aggregates and the debate centered on issues such as the choice between narrow and broad aggregates, the degree of stability of demand for money equations, and reduced-form linkages between money and nominal spending. Recently, somewhat more attention has been paid to the potential role of credit in the conduct of monetary policy[7] and, especially, to the possibility of nominal spending playing the role of intermediate target or focus of policy.[8]

In terms of formal models a strong case can be made for placing most emphasis on nominal spending or, what is more or less equivalent, on a monetary aggregate with low interest rate elasticity and a fairly stable relationship with nominal spending. Indeed, some have urged that the authorities formally target on nominal spending. In addition to ensuring a favorable long-run outcome, nominal spending rules appear to avoid excessive cyclical movements of the economy following demand shocks. However, a number of good, practical reasons have been offered for not going so far as to target on nominal spending.[9] These include concerns about the quality and timeliness of nominal spending data, the relative roles of central banks and governments in taking responsibility for nominal spending, and the

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6 See Longworth and Poloz (1986) and the articles cited therein, as well as Alogoskoufis (1989).

7 B. Friedman (1982), Bernanke and Blinder (1988).

8 Tobin (1980), Gordon (1985a), McCallum (1985).

9 Ando and others (1985). pp. 6-9.

inability of the authorities to achieve such targets with any precision in the short to medium run. In any case, even if the authorities choose not to target on nominal spending for the above or other reasons, it is clear that nominal spending is a variable to which considerable attention should be paid. After all, it is only by getting the growth of nominal spending in the economy down to noninflationary rates that inflation can be eliminated from the economy.

At the other end of the spectrum is targeting on a nominal exchange rate or a basket of nominal exchange rates. This is a viable approach for a small country that is prepared to accept the rate of inflation that is achieved by the large country, or the average rate of inflation of the group of countries, to which it is linking its currency. However, consideration of the type of shock to which a country is likely to be subject is very important in deciding whether to fix the exchange rate or to opt for a floating currency. For example, the periodic shocks in the world prices of raw materials vis-B-vis those of manufactured goods would provide a strong argument for a small raw materials producer not to tie its currency to that of a large manufacturing country. Indeed, one of the adjustment mechanisms for the small raw materials producer is via the movements in the real exchange rate and, therefore, fixing or constraining the nominal exchange rate may hamper adjustment in such circumstances. I will return to these issues in later sections of this paper.

(2) The stubbornness of inflationary expectations and the importance of a timely response to aggregate demand shocks,

One of the more important features of the experiences of the 1970s was the difficulty in bringing down the rate of inflation once the public came to expect that the inflationary process would continue unabated. The lesson to be drawn is the importance of taking timely action to prevent inflation from accelerating, because of the high costs of getting it down after inflationary expectations become entrenched.

The stubbornness of inflationary expectations in the 1970s and 1980s can be interpreted in two quite distinct ways. Those who believe the rational expectations, flexible-price model reach the conclusion that central banks never tried seriously to get the rate of inflation down in the 1970s and that the public was right to expect inflation to persist, given the rates of growth of the monetary aggregates. And

when central banks did finally act in the early 1980s, they tightened up too abruptly so that the unanticipated sharp reduction in money growth led to the most severe recession of the postwar period.

An alternative interpretation of the events of the period follows the mainstream model and places much more emphasis on the backward-looking nature of inflationary expectations. In this view, the public responds much more to actual rates of inflation than to rates of growth of the money supply in establishing its inflation expectations. Some slowing of output growth will typically precede any deceleration of inflation, and the public comes to believe in a lower rate of inflation in the future only when the actual inflation rate is seen to decline.[10] Thus, the lower rate of growth of money is associated with higher interest rates and an appreciated domestic currency, both of which lead to a slowing of spending and to a decline in both the actual and expected rate of inflation."[11]

An intermediate view places a considerable amount of emphasis on the credibility of the central bank.[12] The simplest version of the credibility argument can be posed in two ways. First, we can think of the short-run Phillip'scurve as developing a steeper slope at rates of unemployment above the NAIRU and a flatter slope at rates of unemployment below the NAIRU. That is, the public becomes so convinced that the authorities are going to act to force down the rate of inflation that they respond more than otherwise to signs of slowing in the economy and less than otherwise to signs of strengthening. An alternative and more common way of thinking about the older version of the credibility effect is to have inflation expectations being driven off variables such as the growth of monetary aggregates or pronouncements of the authorities and not just the actual behavior of inflation. Thus, in the Fellner-type view, the authorities may initially have to slow demand growth considerably to set off the process of inflation deceleration. However, once they convince the public

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10 In this connection it is worth noting the argument that the rate of disinflation of the early 1980s in the United States was consistent with the augmented Phillips curves estimated in the second half of the 1970s. See Gordon (1985b) and B. Friedman (1988b).

11 A similar conclusion would be reached in the context of the overlapping multiperiod contract model.

12 Fellner (1979).

that they are serious about their objectives, less slack than otherwise would have been the case is needed to achieve a further deceleration, and the difficulty of achieving a disinflation is considerably less than suggested by the simplest mainstream model (although still more than in the simple rational expectations model).

The earlier literature did not devote much attention to how central banks can achieve credibility. A more recent literature tries, typically in the context of the flexible-price rational expectations model, to explain why inflation has persisted, to examine whether there are ways of precommitting the central bank to noninflationary outcomes, and to analyze the way in which reputation is developed and maintained.[13]

The main insight to be drawn from both the older and newer strands of the literature is the importance of central bank credibility in helping to bring about a decline in the rate of inflation or preventing an increase. For example, the greater the degree of credibility, the more willing is the public to treat expansionary demand shocks as temporary and hence, the easier is the task of the central bank in preventing a rise in the rate of inflation. Similarly, one or a series of upward movements in the price level that are caused by special factors are more likely to be treated as temporary blips in inflation (or more accurately, as changes in the price level rather than in the rate of inflation) and not as harbingers of an upward ratchet in the rate of inflation. They are, therefore, less likely to become entrenched in a wage-price spiral.

There are no simple or magic ways of achieving credibility. Ongoing vigilance and action by the central bank in response to inflationary pressures are necessary to develop and retain such a reputation. Over time, a central bank that is credible will be able to prevent inflation from re-igniting with much less difficulty than one that has not developed the reputation of credibility and hence, central bank credibility serves as a public good for the economy.

(3) *The changing role of monetary and credit aggregates.*

Although at no time did central banks place sole reliance on the

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13 Barro and Gordon (1983), Blackburn and Christensen (1989).

monetary aggregates as the guide to policy, the 1970s saw greater use of them as formal targets than either the previous or subsequent period. In part, this was the result of the extremely difficult inflation problem that dominated the period; in part, it related to the perceived stability of the demand for monetary aggregates, and of reduced-form equations which related the growth of nominal spending to the growth of a monetary aggregate as well as to other variables. On the basis of an enormous amount of empirical work on monetary aggregates, central banks in much of the industrialized world chose during this period to target formally on such measures.

Even during this "golden period" there were signs of problems with the aggregates in a number of countries. In the United States, there was considerable discussion of the case of the "missing money."[14] In Canada, a similar episode in 1976-77 resulted in policy for a time being somewhat easier than had been intended.[15] And in the United Kingdom, the demand for the £M3 equation began to break down in the early 1970s although the leading indicator property of £M3 vis-à-vis inflation made it the favored variable until further problems developed in the late 1970s and the 1980s.[16]

In addition to the broad question of the stability of the money demand or reduced-form equation, which was considered a necessary condition for monetary targeting, other problems also began to be apparent by the end of the 1970s. For those countries which were targeting on a very interest-elastic monetary aggregate, there was a concern that in the face of an expansionary shock a rise in nominal interest rates might be sufficient to hold a narrow monetary aggregate on target and yet might not be sufficient to slow nominal spending."[17] And, a related point, during a period of disinflation focus on an interest-elastic monetary aggregate would result in the so-called re-entry problem. This is a situation in which a falling rate of inflation and falling nominal interest rates lead to a sharp transitory increase in the rate of growth of the nominal aggregate in order to accom-

14 Goldfeld (1976).

15 Thiessen (1983).

16 Goodhart (1986).

17 Thiessen (1983) and Crow (1988).

modate the increased demand for real money balances.[18] The temporary rapid growth in the monetary aggregate over this period would result in credibility problems for the central bank to the extent that it was misunderstood or that there was a concern that the authorities would allow the rapid growth to go on too long.[19] Countries targeting on broader aggregates, which are less interest elastic, would tend to be less affected by these issues than those targeting on narrow aggregates.

The more serious problems of instability in monetary aggregates began in the late 1970s and early 1980s. In the United States, deregulation of interest rates and the introduction of new accounts resulted in an extended period of unstable demand for the narrow aggregates. In Canada, the source of the instability during this period was not related to changes in regulations since interest rates had been largely unregulated since 1967. Rather, the interaction of technology and various market forces, including unprecedentedly high interest rates, led to the introduction and spread of new types of accounts and new techniques of investing idle balances in order to achieve higher rates of return.[20] As a result of such developments, M1 was dropped as a target in Canada in 1982, and in the United States, emphasis shifted to the broader monetary aggregates and, for a time, credit,[21] with M1 playing a much less important role.

The experience in the United States provided a good example of the importance of financial deregulation in destabilizing a particular aggregate, one which had previously been the most stable. The Canadian experience showed that even an economy which had long since deregulated its interest rates would not necessarily be immune to financial innovation, with the potential for deterioration in the stability of some of the aggregates in a world of rapid change. It is the latter lesson that is the more important since it indicates the possibility of continuing instability even after economies have absorbed all the effects of deregulation of interest rates. I return to the implications of this lesson for monetary policy in the 1990s in a subsequent section of this paper.

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18 Freedman (1981), Simpson (1984).

19 M. Friedman (1985).

20 Freedman (1983).

21 The relationship of credit to nominal spending also became unstable later in the 1980s. See B. Friedman (1988b).

(4) In an economy that is subject to periodic significant shocks in its terms of trade, movements in the nominal exchange rate can facilitate adjustments in the economy.

Small countries that are subject to periodic movements in the relative prices of their exports have to cope with adjustment problems following such price changes. For example, there can be significant distributional effects, both industrial and regional. Furthermore, in the case of a terms of trade gain that flows from an export price increase the outcome in the long run must be a real appreciation of the domestic currency. Indeed, the real appreciation is part of the mechanism whereby the gains to producers of the commodity whose price has risen become generalized throughout the economy. However, whether the real appreciation occurs via a nominal appreciation or via a rise in domestic wages and prices, with the nominal exchange rate unchanged, is largely a function of domestic policy. Attempts to hold the nominal exchange rate unchanged in the face of a favorable terms of trade shock that benefits a country could lead to an inflationary outcome.

It can be argued that; faced with a positive terms of trade shock in the early 1970s, monetary policy in Canada should not have attempted to slow or prevent the rise in the value of the Canadian currency. By permitting the rise in real incomes to take place via a rise in nominal incomes rather than through the currency appreciation, the policy response to the terms of trade shock exacerbated the inflationary effects that had been set in train by the earlier worldwide excessive aggregate demand.

Conversely, in the case of a deterioration of the terms of trade arising from a fall in export prices, the country must absorb a real depreciation. Here the choice is between a nominal depreciation and a fall in domestic nominal wages and prices relative to the path they would have taken otherwise. It should be noted, however, that if there is a nominal depreciation of the domestic currency, which is intended to facilitate the required real depreciation of the currency, the authorities must ensure that policy is such that the once-and-for-all price change arising from the nominal depreciation does not turn into a wage-price spiral.

(5) When fiscal policy and monetarypolicy are working in opposite

directions, very large movements in financial variables, such as the nominal and real exchange rate and nominal and real interest rates, may result.

In the earlier literature on the conduct of monetary policy there was little discussion of fiscal policy. However, the behavior of the world economy in the early 1980s in the face of tight monetary policy and loose fiscal policy in the United States (as well as in some other countries) gave rise to a clearer understanding of the effects of fiscal policy and the problems that can arise when fiscal and monetary policy work in opposite directions.

There are several issues regarding fiscal policy to which attention can be drawn. First, the interaction of loose fiscal policy and tight monetary policy can lead to a period of high real interest rates—the classic crowding-out mechanism. Second, loose fiscal policy and tight monetary policy in a major and increasingly open country such as the United States can lead both to high world real interest rates and, at least for a time, to an appreciation of its currency.[22] The higher value of the U.S. dollar in such circumstances is part of a second crowding-out mechanism since it is the U.S. net real trade balance that is thus indirectly reduced by the loose U.S. fiscal policy.[23] For other countries the upward pressure on the U.S. dollar in the first half of the 1980s in the context of a situation in which they were still concerned about their inflation rate resulted in monetary policies being set tighter than they otherwise would have been as these countries tried to offset the downward pressure on their currencies.

A more general point regarding fiscal policy involves the overlapping effects of fiscal and monetary policy on aggregate demand. That is, the expansionary effect on aggregate demand of a budget deficit puts more pressure on monetary policy in the achievement of a given level of overall spending. Moreover, during periods when other elements of demand are pressing against aggregate supply, a tighter fiscal policy can be very helpful in lessening short-run inflationary

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22 See Feldstein (1986). The concomitant tightening of fiscal and monetary policies in other countries also played an important role in these outcomes.

23 There is a massive literature on this subject. See, for example, Helkie and Hooper (1987), and Hooper and Mann (1987).

pressures. Thus, monetary conditions need not be as tight as otherwise if fiscal policy can contribute to easing pressures. Conversely, if easy fiscal policy accentuates pressures on demand from other factors, all the weight of restraining aggregate demand will fall on monetary policy and hence, interest rates and the value of the domestic currency will have to be higher than would otherwise be the case. It may also make it more difficult for the monetary authorities to achieve or retain credibility.

(6) There are no simple ways of dealing with unfavorable supply shocks.

Another of the key issues of the 1970s was the supply shock and its stepchild, stagflation. Although supply shocks can act in both directions, as the oil price declines in the second half of the 1980s have shown us, the difficult challenge to policymakers derives from an unfavorable supply shock. The literature that has developed around this theme has focused on the flexibility of nominal and real wages (including the issue of indexation), the persistence of the shock, the nature of the expectations mechanism at work, and whether the policy response by the authorities is accommodative or nonaccommodative.[24]

It became clear after the first oil shock that there was no way to avoid the real long-run effects of supply shocks. Effectively, in an oil-importing country an oil price increase led to a reduction in real income and, perhaps, the level of potential output. The principal challenge facing policymakers in such countries was how best to deal with the transitional effects along the path to equilibrium so as to minimize any further negative economic consequences of the shock. In the case of an economy with flexible nominal and real wages, this would have been fairly straightforward since real factor returns could adjust rapidly and completely to the oil price shock. That is, if it is widely recognized that real factor incomes in an oil-importing country have to fall as a result of an oil price increase and if this is accepted without any attempt to push up nominal factor incomes in response, there need be no secondary effects in response to the supply shock. However, if, as more commonly was the case, the factors of pro-

[24] See, for example, Gordon (1984) and Bruno and Sachs (1985).

duction attempt to offset the initial decline in their real incomes by demanding higher nominal incomes, the supply side shock can lead to a wage-price spiral, which, in the mainstream model, can only be offset by a temporary period of slack. Thus we have the classic stagflation outcome in which inflation and unemployment are both rising as a consequence of the combination of the oil price shock and the policy response needed to avoid ongoing inflation.

In the context of such a scenario the nature of the policy response is worth considering in more detail. If the authorities tried to maintain an unchanged rate of unemployment in the face of the supply shock in a model where inflationary expectations are based on past rates of inflation, the outcome would be a permanent rise in the rate of inflation. On the other hand, responding to the oil price shock by trying to maintain an unchanged average price level (that is, by forcing down non-oil prices) might require a very considerable and protracted degree of slack in the economy. An intermediate position would involve holding nominal spending constant, thereby permitting an outcome with lower potential and actual real output in the longer run, a temporarily higher rate of unemployment, a once-and-for-all rise in the price level, but no rise in the underlying rate of inflation.

The supply shock also drew attention to the fact that indexation can create difficulties for the adjustment of the economy to real shocks. In the early literature on indexation the focus had mainly been on the role of indexation in response to nominal demand shocks.[25] The basic concern was whether indexation resulted in a faster and stronger response of inflation to positive aggregate demand shocks and, conversely, whether it would aid in the disinflation process by increasing the response of inflation to negative aggregate demand pressures. The newer literature focused much more on whether indexation presented obstacles to the long-run real adjustment of the economy in the face of other types of shocks and what the nature of the difficulties might be.[26]

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25 Examples are M. Friedman (1974) and Giersch (1974).

26 Gray (1976), Fischer (1977).

Challenges of the 1990s

In this section of the paper I examine what seem to be the principal challenges in the 1990s in the design of monetary policy approaches. In the light of the lessons of the 1970s and 1980s, it is likely that the main challenge to large countries and to small countries operating under a flexible exchange rate regime will be the formulation of monetary policy in circumstances in which monetary and credit aggregates are not stable or predictable enough to play a central role as intermediate targets of policy. This is already the case in those countries which have dropped their targets. Even in those countries, which have continued to announce formal targets for one or more aggregates, the role of these aggregates has been downgraded vis-à-vis their position in earlier years. To jump ahead briefly to my conclusions on this issue, I will argue that it is likely that some monetary and credit aggregates will play a role, along with a number of other financial and nonfinancial variables, as information variables, but that they will probably not be able to bear the weight of being a formal intermediate target. Although some might argue that in the absence of formal intermediate targets central banks will return to the policy world of the 1960s with the emphasis on real variables, I will contend that the lessons that we have learned from the past two decades, such as the importance of focusing on nominal quantity variables and the need to take timely action to prevent inflation from accelerating, will be helpful in avoiding a repetition of the errors of earlier years.

Before turning to the question of how central banks in large countries and in small countries under flexible exchange rates might conduct monetary policy in the 1990s, I would like to examine in some detail the importance, both actual and potential, of such developments as globalization, liberalization of markets, and financial innovation. The analysis will be set in the context of a broad-brush overview of approaches to monetary policy and will touch on the implications of these developments for the way in which central banks conduct monetary policy. There are three principal policy conclusions. First, even after deregulation is complete, market processes will likely lead to ongoing financial innovation. Second, with abolition of exchange controls, and with more open domestic and international capital markets, countries that had previously relied upon credit rationing

and quantitative controls can no longer use such techniques as part of the policy process. Third, in the context of a world with open borders and high asset substitutability those countries that opt for fixed exchange rates vis-à-vis a larger country or join a currency bloc will retain little or no policy autonomy. Instead, they will receive the rate of inflation and credibility of the larger country or the currency bloc.

Liberalization and innovation[27]

As suggested earlier, it is useful to distinguish between those developments that derive from the removal of controls or regulations and those elements that relate to market-oriented changes that are not a result of regulatory developments. The reason for emphasizing this distinction is that the former types of changes are clearly specific to those economies in the stage of removing regulations and will disappear as an issue once deregulation is complete. The latter types of changes, however, are likely to persist for a long time and will probably continue to impinge on monetary policymaking over the coming decade. I would also add that, although for analytic purposes I have separated liberalization and globalization, in practice, many of the pressures for innovation and liberalization derive from the global economy, in particular from the pressures on domestic markets and financial institutions arising from the existence of competing international markets and institutions.

One forecast that can be made with considerable confidence is that the process of removing interest rate ceilings and quantitative restrictions on credit flows will be pursued in those countries where it is not yet complete. The likely final outcome of the process is one in which the authorities do not impose any restrictions or ceilings on depositor interest rates and in which no attempt is made to impose credit rationing or quantitative restrictions on lenders.

The pressures toward such an outcome are both domestic and foreign, with the former probably the more important in larger countries and the latter in smaller countries. Among the foreign influences, access to external markets by both lenders and borrowers, most

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27 For a broad general survey of these issues from an international perspective, see Akhtar (1983).

notably the Eurocurrency deposit and loan markets and the Eurobond markets, must certainly head the list. By offering large financial and nonfinancial institutions access to alternative sources and uses of funds (at least where exchange controls do not constrain behavior) they considerably reduce the impact of ceilings and controls. One can also anticipate that smaller participants will increasingly get access to such markets. On the domestic side, such matters as increasing competition in financial markets and new developments in communications and automation are very significant.

In terms of the conduct of monetary policy, the countries most affected by the movement toward liberalization and opening of markets are those that had previously relied upon credit rationing and quantitative controls as a major part of the ,monetary policy mechanism. As it seems less and less feasible to impose credit rationing on lenders and/or borrowers because of their increasing ability to access unregulated domestic and external channels of credit, these countries will have to rely on market-based methods of influencing spending, that is, movements of interest rates and exchange rates. Whether or not they make use of monetary and credit aggregates as intermediate targets, they will face more volatile interest rates and/or exchange rates than in the past. Alternatively, if such countries become part of a large currency bloc, domestic monetary policy will cease to be an issue for them as they accept the policy of the country to whose currency they have tied themselves. I will expand on this point in the next section of the paper.

I now turn to the effects of deregulation and financial innovation on monetary aggregates and on the transmission mechanism, as exemplified by developments in the North American economies. In the United States, it was the ability of financial institutions to develop instruments and mechanisms whereby interest rate ceilings could be avoided that made such constraints increasingly irrelevant. In the context of the high nominal interest rates in the late 1970s, money market mutual funds emerged, enabling depositors to earn rates of interest well above Regulation Q. And the direct impact on residential housing of the disintermediation in near-banks caused by Regulation Q, one of the key channels through which monetary policy worked in the 1960s and 1970s,[28] became less and less significant as near-banks

[28] de Leeuw and Gramlich (1969).

gained increasing access to nonregulated sources of funds and as securitization became more important in housing markets. In the event, the United States eliminated Regulation Q, after recognizing that the interest rate restrictions were having diminishing influence on macroeconomic behavior and were distorting the channels by which lenders and borrowers were brought together, resulting in an inefficient and inequitable outcome.[29]

One of the important results of the removal of interest rate ceilings and the consequent introduction of new types of accounts, most notably interest-bearing transactions accounts, was a shift in demand for money, particularly the narrow measures. Thus, the new NOW accounts attracted funds from both checking and savings deposits. Similar shifts followed the introduction of super-NOW accounts. To some extent, the redefinition of aggregates to include these new accounts was able to internalize the transfers.[30] But to the extent that funds flowed into the new types of accounts from outside the aggregate of which they were part, the internalization was not complete. For example, when funds shifted into NOW accounts from both traditional checking accounts and from savings accounts, the former movement did not affect the newly defined M1 but the latter movement resulted in an upward shift in the aggregate. More important, the nature of the narrow aggregate changed with the introduction and spread of NOW and super-NOW accounts. Whereas previously, the demand for M1 could have been written as a function of income and market interest rates, it was now likely to be a function also of wealth and the own rate of interest on those interest-bearing deposits included in M1. Furthermore, it is not necessarily the case that such own-rates will be related in a stable way to market interest rates. As a result, the narrow monetary aggregate is less likely to behave in stable and predictable fashion in the future in response

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29 I would note in passing that one result of the elimination of the effects of disintermediation on spending is a steeper IS curve at real rates of interest above those that correspond to the nominal ceiling rates imposed by Regulation Q, and hence more volatile real interest rates in response to shocks in nominal spending.

30 The Federal Reserve redefined M1 in 1980.

to changes in income and interest rates.[31]

Under these circumstances it is not surprising that the Federal Reserve has turned away from M1 and focused on broader aggregates, especially M2. However, in terms of stability of demand, these, too, are not ideal. There are potentially the same problems of own-rate adjustments to market rates as have affected the narrow aggregates. And there are other actual and potential problems, such as shifts in securitization, that will continue to affect M3, and, possibly to a lesser extent, M2.

The relationship between own-rates and market rates can significantly affect the behavior of both M1 and M2. There are two polar cases and an intermediate case to be considered. If own-rates always move one-for-one with market rates,[32] and if all or a large proportion of the aggregate bears interest, then the aggregate would become highly inelastic with respect to the general level of interest rates in both the short run and the long run. On the other hand, if own-rates tend to be sticky, then the response of the aggregate to changes in market rates would be high since there would be considerable substitution between the accounts included in the aggregate and instruments outside the aggregate as market interest rates change and as the spread widens or narrows.

The intermediate case in fact reflects what has happened in the United States in recent years. It would appear that own-rates are somewhat sticky in the short run but more flexible in the medium run and behave asymmetrically with respect to increases and decreases in interest rates.[33] In a way, this is the least satisfactory outcome

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31 Some researchers disagree with the conclusion that the introduction of new accounts has made the narrow aggregates less stable. See Rasche (1987), Poole (1988), and Darby, Mascaro and Marlow (1987). The argument is either that M1A (M1 excluding the new accounts) has remained stable or that a simple change in one of the parameters of the M1 equation ensures stability of M1. Others, for example B. Friedman (1988a,b), argue equally strongly that M1 and other aggregates have become highly unstable. In the face of all the changes that have occurred and are likely to occur, continued stability of demand for the aggregates is far from a certain outcome. This does not, however, preclude use of the monetary aggregates, along with other variables, as information variables, as will be suggested below.

32 As long as deposits bear reserve requirements, there will always be a wedge between movements in own-rates and movements in market rates, but this wedge is small for low reserve requirement ratios.

33 Moore, Porter and Small (1988) present a detailed analysis of the determination of deposit rates.

since it leads to rather peculiar behavior of M2 when interest rates change. For example, a rise in market rates would lead initially to a decline in demand for the aggregate as market rates rise relative to deposit rates, eventually to be followed by a period of increasing demand as deposit rates move up relative to market rates. Most important, there is likely to be considerable uncertainty about the response of the aggregate to interest rate movements since the relationship between the deposit rates and market rates is not likely to be especially predictable.[34] A final point worth noting is that, as in all cases of structural change, a fairly long run of data is necessary to test the stability of relationships and to pin down the behavior of financial aggregates following an innovation.

More important in the future than deregulation is the likelihood that innovation will continue even in the absence of removal of controls. The Canadian case provides a good example of the types of developments that are possible. In the context of high and variable nominal interest rates in the late 1970s and early 1980s (resulting in large part from high and variable inflation), the reduction of communications costs', the spread of automation, and aggressive competition in the financial sector, there was a wave of financial innovation. New instruments were introduced which combined the characteristics of transactions accounts and savings accounts. And there was a spread of cash management techniques to middle-sized businesses of the sort that had previously been offered only to large businesses, permitting them to economize on low or zero yielding deposits.[35] M1 was dropped as a target in Canada in 1982 as a result of instability in its behavior which derived from market-led innovation, not deregulation-induced changes.

It is difficult to predict how important these types of changes will be in the future. On the one hand, with the ongoing development

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34 It is of interest to note that in the 1970s Canadian M1 was considerably more interest-elastic than U.S. M1, since competing rates for the non-interest bearing deposits included in M1 moved much more in line with market rates in Canada than in the United States. In the 1980s the greater responsiveness of Canadian deposit rates to market rates has meant that Canadian M2 is less elastic than U.S. M2. The cause of the differences in interest rate movements in the two countries in the 1970s was the absence of interest rate ceilings such as Regulation Q in Canada, while the differences in the 1980s must be attributed to (as yet unexplained) differences in financial institution behavior in the two countries.

35 Freedman (1983).

of technology and the increased competition in the financial services industry, one would expect a continuing flow of new instruments and new techniques. On the other hand, if inflation remains under control, there will not be a recurrence of the high nominal rates of interest of the sort that drove the process in the late 1970s and early 1980s. On balance, I would expect the flow of new innovations to persist and to result in periodic shifts in the demand for narrow money. Furthermore, the dual nature of the new types of accounts (with both checking and savings characteristics) and the lack of long runs of data with which to estimate the effects of a given innovation on the demand for narrow money will remain problems.

Although I have tended to emphasize the narrow aggregate M1 in the discussion thus far, the broader aggregates have been and will be affected as well by financial innovation. In the United States, the spread of mortgage backed securities has reduced the size of financial institution assets and liabilities compared to what otherwise would have been the case, with savings and loan associations in particular selling off mortgages. And to the extent that households hold such securitized instruments in their portfolios in lieu of deposits, M2 will have declined as well. However, one should not overestimate this aspect of innovation since developments may well take place in a rather gradual fashion, making it somewhat easier to monitor. Thus far, securitization has not been as important a factor in other countries as in the United States.?

The interpenetration of various kinds of financial institutions into each other's traditional territory has not had any profound effect on monetary policy but may require a redefinition of various monetary and credit aggregates. Thus, for example, as near-banks offer transactions services to households (as has become common in the United States, Canada and the United Kingdom) narrower definitions of money may have to be enlarged to incorporate appropriate near-bank liabilities.[37] Similarly, in the case of the broader monetary aggregates and credit aggregates, trying to limit definitions to one type of institution becomes less and less sensible as institutions become more alike. Indeed, shifts between different types of institutions (in

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36 **For a comparison between Canada and the United States, see Freedman (1987).**

37 **This has already been done in the United States.**

response, for example, to small changes in institutional interest rates or to marketing expenditures) will show up as shifts in bank-only aggregates but will be internalized in the aggregates that incorporate more types of institutions. Typically offsetting the usefulness of such "wider" aggregates is the problem of getting as timely information from near-banks as from banks. In Canada, thus far, the use of bank-only monetary aggregates has caused relatively little difficulty. Nonetheless, it is probable that the focus over time will have to shift to the "wider" aggregates, which empirically, tend to have better properties.

Much has been made in recent years of other kinds of innovations such as currency and interest rate swaps, options, forward rate agreements, note issuance facilities and Euro-commercial paper.[38] Indeed, at one time there was considerable discussion, exaggerated in my view, of the possibility that direct financing through markets would drive out intermediated financing through institutions. Of course, shifts of borrowing between syndicated bank lending and direct market lending would affect the size of M3. And this would cause difficulties if central banks were targeting on M3 or an equivalent aggregate.

However, for countries that focus on aggregates narrower than M3, it appears to be the case that these new techniques are unlikely to have any profound significance for the operation of monetary policy (with one possible exception to be discussed below). Thus, for example, the ability of financial institutions to use options and futures markets gives them greatly increased scope for matching assets and liabilities but, except in a country that has relied on institutional mismatches to restrain lending, there is, by and large, no great significance from a policy standpoint to such developments.

One possible exception to this generalization relates to the ability of borrowers to use the new instruments to shift from fixed-rate borrowing to floating-rate borrowing. More generally, the shortening of desired maturities by lenders and the drying up of long-term fixed-rate bond markets in the late 1970s and early 1980s, the introduction of various types of floating-rate instruments, and the creation

38 Bank for International Settlements (1986).

and spread of the swap market have considerably increased the use of floating-rate debt in place of fixed-rate debt.

The shift to floating-rate debt may have influenced the responsiveness of spenders to interest rate movements in a variety of ways. First of all, the substitution effect on spending from an interest rate change would be less in a world with greater use of floating-rate instruments than otherwise would have been the case. Put another way, spenders and borrowers would be less sensitive to what are viewed as temporary movements of interest rates in such an environment than in one where they were more dependent on long-term fixed-rate debt.[39]

Second, there is a much more complicated set of income effects in a floating-rate environment. When interest rates rise, all borrowers with floating-rate debt are worse off and all lenders holding floating-rate assets are better off. The responses of such borrowers and lenders to their changed circumstances will depend to a considerable extent on their balance sheet situation.[40] For example, at times of considerable balance sheet pressure (such as the early 1980s, when many borrowers had become overextended), a rise in interest rates could lead to sharp cutbacks in expenditures as interest payments increase sharply.[41] At other times, when borrower balance sheet positions are more comfortable, an equivalent rise in interest rates might have much less effect. The effect of an interest rate change on lender behavior would also be influenced by the balance sheet situation. If much of the floating-rate debt is held by pension funds or by wealthy individuals with a low marginal propensity to consume then an interest rate change would have little direct effect on lender behavior. However, to the extent that such instruments are held by households, or by

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39 If the expectations theory of the term structure of interest rates held perfectly this would not be the case. However, if long-term rates tend to overshoot, as argued by Shiller (1979), then the ability to borrow on a floating-rate basis enables spenders to carry out their plans even when rates are high, without locking themselves into very expensive long-term commitments.

40 In much theorizing about distribution effects, it is assumed as a first approximation that such effects are neutral. See, for example, Patinkin (1965). However, there may be circumstances in which such effects are important, as argued in the text. A particularly important non-neutrality may arise because of the growth in government debt.

41 The strong response of both business and mortgage borrowers in Canada to high interest rates in the early 1980s provides an example of an important balance sheet effect.

banks whose deposit rates move pari passu with market rates, and if there are many liquidity-constrained households directly or indirectly holding such floating-rate assets, there might be a considerable effect on spending of an interest rate change via income movements. Given these various effects, it is an empirical question whether the slope of the IS curve is likely to be more or less steep in a floating-rate environment than in a fixed-rate environment.[42] It is clear, however, that the responsiveness of expenditures to interest rate changes will be more sensitive to the balance sheet situation of lenders and borrowers in the floating-rate environment.

In sum, I would expect innovation to continue to play an important role in financial markets, with the ongoing development of new instruments and new techniques and changes in existing instruments and techniques. Periodic unpredictable shifts in monetary and credit aggregates are, therefore, likely to occur in the future. Similarly, as exemplified by the effect on the IS curve of the shift to floating-rate instruments, there may well be effects on the transmission mechanism of the new instruments and techniques. Nonetheless, both kinds of changes are likely to be evolutionary rather than revolutionary.[43]

Globalization and the role of the exchange *rate*[44]

The terms internationalization and globalization have been used in a variety of ways and can encompass a variety of phenomena. One traditional use of these words involves an increase, to high levels, of asset substitutability. That is, investors and borrowers are willing to shift among markets for very small expected returns. A necessary but not sufficient condition for high asset substitutability is capital mobility, which is defined as the absence of policy restrictions on movements of funds between countries.[45] A more recent use of the

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42 Akhtar (1983), in contrast, argues that the IS curve will be flatter following market liberalization as interest rate changes have a broader influence on the behavior of spenders.

43 It is worth noting that some observers have argued that the spread of debit cards and the move toward a cashless society will have a more profound effect on the financial landscape than I have suggested.

44 Bryant (1987) provides a broad treatment of issues related to globalization.

45 Boothe, Clinton, Coté and Longworth (1985) and Caramazza, Clinton, Cot6 and Longworth (1986).

term internationalization focuses on the establishment by financial institutions of offices in a large number of foreign countries. Although financial intermediaries can carry out international transactions around the world from their home base, they tend to be more internationally oriented when they set up offices outside their home territory. Yet a third and most recent meaning of the term globalization seems to derive from the notion that financial innovations in one country spread quickly to other countries and affect the behavior of their financial markets.[46] Thus markets are linked to an extent and in ways that are without precedent.

The three definitions just set out are not independent of each other. Nor are they unrelated to the ideas of liberalization discussed in the previous section. Many of the factors that were important in explaining innovative behavior, such as the decline in the cost of communications and the spread of automation, are also important in explaining aspects of globalization. And, as mentioned earlier, globalization in itself has been a key element in some kinds of innovation.

I would like to begin this section by focusing on that aspect of globalization which is most important for monetary policy, the increase in the elasticity of substitution of assets across borders. This is not a new development. The classic articles by Mundell on monetary and fiscal policy in a world with perfect substitutability under fixed and flexible exchange rates were written more than 25 years ago.[47] Even then, it could be argued that Canada was a small open economy facing infinitely elastic capital flows. Developments of the last 25 years have moved other economies toward a similar stage of openness. These have included, most importantly, the weakening or abolition of capital controls and exchange restrictions, and the broadening of horizons of both lenders and borrowers beyond domestic financial instruments. In part, the latter development can be attributed to the penetration of international banks into what was the domain of domestic banks; in part, it has resulted from the reduction of transactions and communications costs that have made such alternatives less costly.[48]

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46 This behavior may, itself, be linked to the spread of international banks.

47 Mundell (1963), Fleming (1962), and Frenkel and Razin (1987).

48 Bank for International Settlements (1986).

As suggested earlier, one of the key implications for monetary policy of the opening of borders in some countries was the inability of the authorities to use credit rationing and other forms of quantitative controls on credit. Once major borrowers can evade the controls by borrowing outside the country, attempts to control the macroeconomy by imposing limits on the growth of loans by financial institutions prove ineffective. That is, exchange controls or a very dirigiste set of controls on borrowers are virtually essential to using credit controls as a central part of the monetary policy mechanism. The growth of Euromarkets was most notable in facilitating the access to credit outside the home country but it was certainly not a prerequisite for such a development to take place. Canadian borrowers had long been accessing the U.S. domestic market and, had the United States not imposed controls in the late 1960s, some of the business done by international banks in London would probably have been done in New York (perhaps via international banking facility types of operations).

Thus, asset substitutability has increased in magnitude over the years because of the introduction of new instruments, the removal of restrictions, the reduction of transactions and communications costs, and the spread of international banks. The linking together of markets through the increase in asset substitutability has had important implications for the workings of monetary policy over and beyond restricting the ability of countries to use credit controls, and will be an important factor in the way monetary policy is conducted in future years.

In a small open economy with flexible exchange rates, monetary policy is transmitted via both interest rates and exchange rates. And as economies become more open to foreign financial influences, the greater will be the importance of the exchange rate channel. In the typical closed economy model, the tightening of monetary policy operates to increase interest rates, which, in turn, reduces interest-sensitive expenditures. Typically, the focus is on investment expenditures, residential construction, and consumer durables. In addition, spending on other forms of consumer goods is reduced via the wealth effect, at least in a world where long-term fixed-rate assets predominate.[49]

[49] And in a world with Regulation *Q* types of ceilings there would be disintermediation and credit rationing by financial institutions.

,In the corresponding open economy model with flexible exchange rates, the tightening of monetary policy tends to increase the value of the domestic currency as well as to raise interest rates.[50] The result is to reduce expenditures by foreigners on home goods and to shift expenditures by domestic residents from domestically produced goods to imports.[51] In addition, there is a direct effect on prices of the currency appreciation, particularly in the case of the small open economy where the prices of both exportables and importables respond fairly directly to exchange rate 'changes.[52]

I would thus conclude that, although the mechanism through which monetary policy operates in an open economy under flexible exchange rates differs from that in the traditional textbook closed economy model, that difference, in itself, is not a matter of overwhelming significance.[53] What does seem to have been a source of concern for some observers is the fact that exchange rates have moved for many reasons other than monetary policy developments, and that the trade balance in major countries has swung around strongly at times over the 1980s. These developments have led to pressures for protectionist legislation to be enacted and to arguments for a return to a world with increased fixity of exchange rates.

Over and above monetary policy, major factors in determining exchange rate movements in recent years have included fiscal policy, terms of trade changes, and random or speculative movements. In the case of fiscal policy (and the United States in the 1980s is the clearest example), the external side has acted as a sort of safety valve to lessen the effect on the demand for U.S. goods and services of U.S. fiscal easing. Thus, the appreciation of the U.S. dollar acted to spread the effects of the U.S. demand expansion to the rest of

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50 Dornbusch (1976) and Frankel (1979).

51 In some models the emphasis is on supply responses. Tradables and nontradables then become the important classificatory distinction.

52 In a situation in which all countries are tightening policy simultaneously, exchange rates will tend to remain more or less unchanged and monetary policy will operate primarily through interest rates and the cost of capital.

53 Nonetheless, there are complaints from the traded goods industries when the domestic currency appreciates, just as industries that produce interest-sensitive products complain when interest rates rise. The new literature, which emphasizes economies of scale, startup costs, and so forth in the provision of internationally traded goods, has also expressed concern about the impact of large exchange rate movements (Krugman (1989) and Hams (1989)).

the world.[54] Unfortunately, a side effect of this episode was the increased demand for protectionism in the United States as the affected traded goods industries attributed their situation to unfair foreign competition and not to the U.S. budget deficit.

Significant changes in terms of trade tend to bring about a cushioning movement in the exchange rate. Thus, for example, a rise in the the world prices of raw materials will tend to lead to an appreciation of the currency of a raw materials producer. This has the effect of spreading the real income gains from the rise in raw materials prices throughout the economy. It also tends to relieve some of the aggregate demand pressures that would otherwise have percolated through the economy. At the same time, the exchange rate change will affect the competitiveness of the producers of those exportable goods whose prices have not risen and also the competitiveness of import-competing goods, most notably manufactured goods. Producers of such goods will point to the floating exchange rate as the cause of their problems as opposed to the more basic factor, which is the real effects of the overall rise in raw materials prices.

It is worth noting that in many models of the small open economy under flexible exchange rates the long-run response of the economy to shocks works entirely through the real exchange rate since real interest rates are assumed to converge internationally over time. However, in the short to medium run, both interest rate and exchange rate mechanisms operate, since real interest rates can differ across countries as long as real exchange rates are expected to change.

Thus far I have discussed the exchange rate response to monetary' policy actions, fiscal policy changes[55] and terms of trade changes (as exemplified by a change in the ratio of raw materials prices to the prices of manufactured goods). In all these cases, the resulting exchange rate change acts either to transmit the policy change, as in the case of monetary policy, or to smooth the effect of the shock on the domestic economy. A different kind of shock is that which

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54 Although, in one sense,. the spillover of U.S. demand was welcome in the context of the early 1980s as the world was recovering from recession, the associated pressures on the prices of countries whose currencies were depreciating were a source of concern to these countries.

55 The effects of any domestic demand shock can be treated in much the same way as a fiscal policy change.

causes an exogenous movement in the exchange rate. This can be attributed to randomness, or bubbles, or speculative behavior, or overshoots, or shifts in portfolio preference. Such shocks will have an effect on aggregate demand and prices, as well as on traded goods industries. And in such cases, there will also be demands by these industries that monetary policy be used to avoid the kinds of effects that are causing difficulty.

The issue can be put into a wider context. In the face of movements in exchange rates caused by identifiable or nonidentifiable factors, what should be the response of monetary policy? At one extreme is the view that monetary policy should act to hold the exchange rate unchanged in the face of all shocks. However, as suggested earlier, the exchange rate movement plays a useful cushioning or smoothing role in many circumstances. Attempts to prevent the exchange rate from moving in such situations closes off the safety valve needed to lessen the domestic pressure on demand and on prices arising from the shock. Consider, for example, what would have happened in the United States in the first half of the 1980s had monetary policy been directed to holding the exchange rate unchanged in the face of a very expansionary fiscal policy. Interest rates would have had to be pushed to much lower levels, the monetary aggregates would have grown much more quickly, and there would have been considerable upward pressures on prices in the United States.

In the case of exogenous shocks to the exchange rate arising from portfolio substitution or truly random behavior, one can argue that the impact on aggregate demand of the exchange rate change, particularly if it appears to be long-lasting, should be taken into account in the setting of monetary policy. Thus, for example, if the currency has depreciated exogenously, action should be taken to encourage an upward movement in interest rates. One can think of this policy prescription as a way of achieving a given monetary aggregate target. That is, the depreciation would tend to cause a rise in aggregate expenditures and in prices, thereby putting upward pressure on the monetary aggregate, while the rise in interest rates would put downward pressure on the aggregate, both directly to the extent that money demand is inversely related to the interest rate, and indirectly via slowing the increase in aggregate demand and prices.[56] For those

[56] Duguay (1980), Freedman (1982)

more concerned with nominal spending as a guide to policy, the argument would be that the interest rate increase would offset the pressure on aggregate demand arising from the depreciation, leaving nominal spending more or less unchanged.

In the discussion thus far I have been arguing from the perspective of the advantages to a single economy from having flexible exchange rates, particularly where the shocks to the economy come primarily from terms of trade shifts or aggregate demand shocks rather than from exogenous shocks to the exchange rate itself. There are two other approaches to these issues that require discussion. The first argues for the benefits to the individual small country of tying its currency to a larger partner. The second takes the perspective of the world economy and argues for cooperation/coordination to minimize adverse spillover effects from country shocks.

I begin with the arguments for and against fixed exchange rates from the point of view of a single small country with an open economy. There are two key aspects that I want to focus on. First, a small country that fixes its exchange rate to the currency of a single large country or to a basket of currencies of a number of countries ties its inflation rate to that of its partner or a weighted average of its partners. Second, in the face of real shocks to the terms of trade, adjustment of the real exchange rate must take place through differential price movements rather than through nominal exchange rate changes. I now examine these issues in more detail.

In a world with perfect asset substitutability, no exchange controls and fixed exchange rates, there is virtually no autonomy in monetary policy for the small country.[57] Thus, the country trades off its ability to influence domestic nominal variables in return for the rate of inflation of its larger partner. This decision is more sensible, the greater the confidence a country has in the central bank of the country to which it is tying its currency and the greater the similarity of the shocks faced by the two countries. In the case of the EMS, other countries have been able to import the credibility of the Bundesbank by tying their currencies to the German mark. And, indeed, there has been a convergence of inflation rates over time among those European countries that have associated their currencies with the mark.

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57 Mundell (1963).

Although in the long run a country's inflation rate is tied to that of its partner, in the short run this need not be so in two cases. The first is the case where the country fixes the value of its currency above or below the equilibrium value. If the currency is initially fixed at a rate that is above the equilibrium, the country will have a current account deficit and weak aggregate demand, until its price level moves down to its appropriate relationship with the partner's prices. If it is initially set below the equilibrium level, the country will have trade surpluses, strong aggregate demand, and upward pressure on prices, until its price level moves up to an appropriate relationship with the partner's prices. The second case is that in which a small country faces a domestic aggregate demand shock not faced by its partner. Consider, for example, an expansionary shock. If there were perfect substitutability of goods and services, the shock would manifest itself entirely in a trade deficit. More realistically, if there is imperfect substitutability between domestic and foreign goods, the small country will face a period with high aggregate demand and rising prices relative to its trading partner, with a resulting trade deficit. Eventually, however, the small country must undergo a period of weak demand and lower price inflation than its partner in order to bring its price level back into line with that of its partner. This might be a difficult process, particularly if the partner's economy is at or close to price stability. Of course, a discrete nominal depreciation would be simpler in such a situation but then the country would be back in the world of adjustable pegs, periodic runs on the currency, and much less benefit from the credibility of its partner.

Even more important is the situation where there are sizable external shocks which are specific to the small country and do not affect its potential partner. A common shock of this type is the shift in raw materials prices relative to manufactured goods prices. In such a case, as argued earlier, the movement in the exchange rate can act to moderate aggregate demand pressures, to spread the costs and benefits of the change in product prices throughout the economy, and to move the real exchange rate toward its equilibrium. Of course, even with flexible exchange rates the adjustment is not all that easy. There is always the risk that a currency depreciation in response to a negative terms of trade shock will feed into a wage-price spiral. And flexible exchange rates will sometimes move away from equilibrium, not toward them. Nonetheless, in the case of a country subject to periodic

sizable external shocks which are specific to it and do not affect its potential partner, it is hard to argue that fixed exchange rates will dominate flexible exchange rates.[58]

The arguments for and against cooperation/coordination have been set out elsewhere and need not be repeated in detail here.[59] The points of particular significance of that debate for monetary policy are fourfold. First, the cooperative sharing of information to ensure awareness in various countries of both economic developments and policy initiatives in other countries is clearly useful. It will increase the likelihood that countries take spillovers into account in planning their own policies and that any potential inconsistencies in policy goals (for example, if countries were aiming at inconsistent exchange rates or current accounts) among the countries involved can be avoided. Furthermore, if discussion of the implications of policy changes for the home country and for foreign countries results in improved domestic policies, that, too, is clearly useful. Second, given uncertainty about both projections of economic developments and the true economic model, it is unlikely that a coordinated attempt to fine tune policy in the international arena will be any more successful than fine tuning was on the domestic scene.[60] Third, some proponents of coordination have emphasized the stability of exchange rates as a central part of the exercise.[61] Using monetary policy to stabilize exchange rates as suggested by these authors raises the question of an anchor for the overall system. If there were no such anchor there would be a real risk of a higher world rate of inflation.[62] Fourth, as argued above, exchange rate changes may be beneficial in moving countries toward their new equilibrium in the case of large and long-

58 In this connection, it is worth noting the literature on optimal currency areas where the focus is on such matters as the mobility of labor, the openness of the economy, the nature of shocks, and the flexibility of real wages. See Mundell (1961), McKinnon (1963), Ishiyama (1975), and Tower and Willett (1976).

59 Frenkel, Goldstein and Masson (1988), Feldstein (1988).

60 Frankel and Rockett (1988).

61 Williamson and Miller (1987).

62 Rogoff (1985). See Williamson and Miller (1987) and Frankel (1989) for a discussion of the usefulness of nominal GNP targeting as the nominal anchor in the context of a coordination exercise.

lasting terms of trade shocks. In such circumstances, attempts to stabilize exchange rates could be counterproductive. In contrast, a situation of temporary speculative pressures on the exchange rate provides the best case for using policy (both intervention and monetary policy) to stabilize exchange rates. I would conclude that although there can be benefits in exchanging information and taking account of developments in other countries in the setting of policy, there are also risks requiring careful consideration in moving further to a world of extensive policy coordination.

The conduct of monetary policy in the 1990s

In the previous subsections I have argued that central banks will likely be faced with periodic or continuing uncertainty regarding the stability of the financial aggregates, first as deregulation continues in some countries, and second as technological innovations and reductions in communications costs permit institutions to offer new products and to devise new techniques for doing business. I have also argued that there has been a rise in international asset substitutability in many countries and that this is likely to continue as markets are increasingly linked, in part through the actions of large banks and securities dealers and in part through the broadening of the horizons of both lenders and borrowers. The removal of the remaining exchange and capital controls will increase the likelihood of such an outcome.[63] Finally, those central banks opting for fixed exchange rates in a world with no exchange controls and a high degree of asset substitutability will have little policy autonomy and their policy will, in effect, be that of the large country to which they have tied their currency.[64]

With this as background, one can ask how monetary policy can be conducted by either the central bank of a small country under flex-

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63 Bryant (1987) argues that although the world is moving in the direction of increased asset substitutability, the paradigm of perfect substitutability is not yet applicable to the international economy.

64 Small countries might try to influence the policy of the large country in these circumstances. They might also have some role in the management of a single central bank for a unified currency bloc.

ible exchange rates or the central bank of a large country acting as the center of a group of countries which have tied their currencies to it. In response to such a question I would put forward the following propositions, based in part on the lessons of the 1970s and 1980s.

(1) It is important that the authorities commit themselves to a clear long-term or ultimate goal for a nominal quantity variable or anchor. Price stability is the most appropriate goal. Since price expectations tend to be sticky, it will not be easy to reach the goal of price stability from an inflationary starting point. In this context, establishing credibility will be significant.

(2) There will likely be a continued role in most countries for financial aggregates as a policy guide or information variable, but the role will be less central than their use as an intermediate target in earlier years, given the effects of deregulation and innovation.

(3) Monetary policy is ill-suited for dealing with such issues as current account imbalances and the accumulation of internal and external debt.

Importance of commitment to long-term goal of price stability. In the absence of a monetary aggregate that is likely to perform well as a target, central banks will have to establish and maintain credibility by setting and moving toward goals that they are believed capable of achieving. One potentially helpful way of gaining credibility is for the central bank to announce and move toward a long-run goal of price stability. The achievement of such a goal would be the contribution of monetary policy to improving the performance of the economy.[65] This approach has the added benefit of establishing a long-run target on which the central bank must maintain its focus even when setting policy in the short to medium run. As such, it gives the central bank a "place to stand"[66] in debates about policy

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65 Crow (1988).

66 Bouey (1982).

and ensures that the central bank will bring a long-run perspective to the policy formulation process. As the central bank achieves a gradual disinflation, its credibility will be enhanced and further progress will be facilitated.

In spite of its appropriateness as a long-run goal of policy, it is likely that there will be criticism of the focus on price stability. There will be those who argue that the central bank should aim at maintaining a constant, fully anticipated rate of inflation at whatever the current rate of inflation happens to be. Others will argue that price stability is an inappropriate goal because it is too difficult to reduce the rate of inflation given the stickiness of price expectations, or because such a policy will have too much of an impact on less favored regions of the country.[67] The proponents of a policy of price stability can point to the fact that, given its tools, it is natural for a central bank to try to achieve a nominal quantity goal, that price stability is a sensible long-run target in an economy that relies on money and on the price system since the economy will perform best under such circumstances, and that it would not be possible to achieve a constant fully-anticipated non-zero rate of inflation.

A ***role for financial aggregates in a world of financial innovation.*** Even if it were agreed that price stability is an appropriate long-run policy goal, the central bank would still prefer to have an intermediate target to help it conduct policy over the medium term. Here, unfortunately, a degree of eclecticism or judgment is likely to be required over the next few years. I am skeptical that the monetary aggregates will be able to bear the weight of being a formal intermediate target for policy under the situation of continuing financial innovation that is likely to persist over the next few years. This does not mean that every country will drop the use of financial aggregates as announced targets. It does mean, however, that even if they do have such an intermediate target it will not be as central to policymaking as in the past and that it will be only one of a number of (mainly nominal) variables on which central banks will focus attention over the medium term.

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67 **Lucas (1989).**

In my view, it is most useful to think of financial aggregates, both money and credit, as playing the role of policy guides rather than formal targets over the next few years. The distinction between these two concepts—policy guide and formal target—is one of degree rather than of kind.[68] For a central bank to use an aggregate as a target variable, it should be able and willing to achieve the announced target growth rate for the chosen aggregate on most occasions. If it did not do so, there would be a loss of confidence in the chosen aggregate and, perhaps, a loss of credibility by the central bank.

What would be the conditions under which an aggregate could be used as a formal target in a world where the goal of monetary policy is, first, to reduce the rate of inflation over time and, second, to maintain price stability once it is achieved? First, there would have to be a stable relationship between the chosen monetary aggregate and a goal variable, either nominal spending or prices. Second, if the chosen aggregate diverged from the target growth path, the central bank would have to be able and willing to act in such a way as to return it to that path over a time period that is not overly long. Third, along the disinflationary path, it would be helpful if, over time, the target path for the chosen aggregate had a monotonically declining growth rate. I examine each of these elements in turn.

The question of the stability of a relationship is one of judgment. Is the relationship perceived to be sufficiently stable so that one could be reasonably confident that the target range would not have to be readjusted frequently because of shocks to the monetary aggregate, whether caused by the normal disturbances to the relationship or by financial innovations? Clearly, if one had to readjust the target range too frequently, the target would soon lose value in assisting the authorities to conduct policy or in assisting the public to evaluate policy and to formulate expectations of future developments.

Typically, the view that an aggregate has a sufficiently stable relationship to spending to serve as formal target would be based on the good performance of either demand for money equations or reduced-form equations. As I argued earlier, in many countries the judgment has been that such equations have not performed well enough in recent

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68 The next few paragraphs draw heavily on Freedman (1989). For a broad and comprehensive discussion of issues of intermediate targets and information variables *see* B. Friedman (1988c).

years or will likely not perform well enough in coming years to satisfy the strong requirements of being a target.

The second characteristic of a target as opposed to policy guide is the capacity and willingness of the authorities to engineer a relatively quick return to the target path following a divergence caused, say, by excessively rapid growth in spending. Analysis of the properties of the broader aggregates that are the likely candidates for intermediate targets suggests that if one targeted on them and wished to return them to a target path following a surge in their growth rates it could well make sense for the return to be rather gradual.

There are two (related) reasons for this conclusion. First, it might not be feasible for the central bank to achieve control over these aggregates over a very short period of time without excessive swings in interest rates. Second, and related to this point, the effect of interest rate changes on the broader aggregates occurs over a one- to two-year horizon more through indirect effects, that is, via induced effects on aggregate demand, and less through the direct effects of the interest rate movements on desired holdings of deposits. This is in contrast with the experience with narrow aggregates where, over the one- to two-year horizon, the direct effects of the interest rate change tend to be greater than the indirect effects via output and price changes. The appropriate way to respond to a spending-induced acceleration of the aggregates is to tighten the stance of monetary policy sufficiently so that the combination of the direct effects of the interest rate rise and the indirect effects of the nominal spending decline (caused by whatever combination of higher interest rates and ,stronger exchange rate emerges from the tightening of policy) brings the monetary aggregate back to its desired path. Given the lag between the interest rate change and the response of nominal spending, this implies a somewhat longer period in which broader aggregates could diverge from their target ranges than would be the case with a narrow aggregate.

The third helpful characteristic for a formal target that was mentioned earlier was a monotonically declining path over the period of disinflation. This, too, would not necessarily be the outcome of using a monetary aggregate as a target. The principal reason is that such an aggregate may be somewhat interest-elastic. This again raises the re-entry issue, that is, the temporary increase in the growth rate of interest-elastic monetary aggregates as nominal interest rates

decline during the disinflationary process, albeit in weaker form for the broader aggregates than is the case for narrow aggregates.

Indeed, model simulations of various disinflationary paths indicate that preferred scenarios which incorporate reasonably smooth paths of the goal variables do not typically imply monotonically declining growth paths for monetary aggregates. Conversely, smoothly declining growth paths for monetary aggregates usually imply very cyclical behavior for spending, output and inflation.

For a financial aggregate to serve as one of a number of policy guides is less demanding than to function as a formal intermediate target. Rather than a stable and tight-fitting demand function, one requires of an aggregate only that it be able to contribute information as to the growth of nominal spending or output or prices.[69] That is, one focuses on the information content of various aggregates, both money and credit, in terms of their ability to predict future movements of nominal spending as well as future movements of output and prices.[70] In this astructural approach to the data, one searches for empirical regularities on both a contemporaneous and leading basis between the aggregates and "goal" variables. The objective is to see whether the aggregates can be helpful in warning of excessively rapid increases in nominal spending or prices or sudden declines in nominal spending.

More broadly, one can consider policy as operating in the following way. The underlying goal of monetary policy is price stability. On the path to that goal; one looks at everything, for example, the growth of nominal spending and of the financial aggregates, the behavior of wages and prices, and the demand pressures on the economy relative to its production capacity. The role of the monetary aggregates in this context is twofold. First, they provide important information (in addition to that available from other data) on spending and inflation in the economy. Second, the monetary aggregates act as a kind of checkoff item in terms of the thrust of monetary policy actions, that is, something that has to be considered frequently and

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69 The aggregate can be a leading indicator either because it actually moves in advance of the goal variable or because it moves contemporaneously with the goal variable but is known in advance.

70 For the Canadian experience, see Hostland, Poloz, and Storer (1988), Milton (1988) and Muller (1989). For a pessimistic view regarding the U.S. situation see B. Friedman (1988a).

carefully in the course of deciding on the stance of policy. Of course, at times a response to excessively rapid or slow monetary growth may not be necessary since the reason for the changed growth of the aggregate could be an identified special factor. But, at times, the aggregates may be signalling that the growth of aggregate demand is faster or slower than had been anticipated and that some policy response is needed.

The events of 1987 and 1988 in Canada provide a useful illustration of the contribution that monetary aggregates can make to policy. In both years it became apparent that spending growth was much faster than had earlier been anticipated. As a result of the very strong spending growth, the stance of policy was progressively tightened through much of the period.[71] One of the key pieces of information buttressing the decision to tighten policy was, initially, the acceleration in the growth of M2 and the wider measure M2+ and, then, the persistence of the rapid growth of these aggregates. Thus, developments in M2 and M2+ provided an important "early warning signal" of changes in nominal spending. I hasten to add that such signals are cross-checked against a variety of other sources of information, both in the financial and nonfinancial sphere. And the developments of the aggregates themselves require careful interpretation to take account of known special factors influencing growth.

It has been argued that "looking at everything" is a recipe for poor policymaking, that it does not give the central bank sufficiently firm intermediate guidelines to withstand the pressures of the short run and that it is likely to bring us back to the unsatisfactory situation of the later 1960s and 1970s with the risk of recurrence of unacceptable rates of inflation. I would argue that there are (or should be) significant differences between the 1960s and the 1990s, of which the most important is the ability to learn from the lessons of the 1970s and 1980s. First, the variables on which central banks now focus are largely nominal quantity variables, perhaps not as a target, but nonetheless, as important inputs to policy. The risks of targeting solely on a real variable such as unemployment, or output relative to potential, or output growth are now well known. And by continuing

71 Following the stock market crash of October 1987 there was a relatively short period in which monetary conditions eased.

to pay considerable attention to financial aggregates which have some leading indicator properties, as well as to nominal spending and wages and prices,[72] one can hope to avoid cumulative upward pressure on price inflation of the sort that can break out if one targets on a real variable.

Another lesson one hopes has been learned is the importance of timeliness. One must act quickly to scotch upward pressures on the rate of inflation, not wait for the data to show an acceleration, because of the risk that the inflation will become entrenched. Here, too, the emphasis on leading indicators and even nominal spending is helpful. Thus an acceleration or continued high growth in those financial aggregates that provide leading information regarding spending and price developments should be taken seriously in the absence of knowledge about unusual behavior of such aggregates. Indeed, one should keep an eye on all variables that are known to contain information about inflationary developments. If all, or almost all, of them are pointing in-the same direction, it is a clear signal that monetary conditions need to remain tight or to be tightened. On the other hand, when information is mixed, it is harder to decide and one has to move with more caution. The behavior of central banks in the **1987-88** period suggests that the lesson of timely response has also been absorbed.

Monetary policy is ill-suited for dealing with current account imbalances and the accumulation of internal and external debt. One issue that gets raised periodically is the extent to which central banks should take account of such matters as domestic and international debt burdens and trade imbalances in setting policy. In the context of the approach taken in this paper, I would argue that the accumulation of the stock of liabilities that is the basis for the expressed concerns can potentially affect policy in two ways. First, if the buildup of liabilities were to bring about a crisis in a particular financial market that was likely to spill over and affect other markets, central banks would act as the ultimate suppliers of liquidity in order to prevent market contagions. This is the type of action that was taken in October **1987** in the wake of the stock market plunge. Second, as argued

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72 Even though wages are known to be lagging indicators.

earlier, the effect on spending of a given change in interest rates and exchange rates can, at times, be significantly influenced by the balance sheet position of households and corporations. Hence, the achievement of a given spending path or a given path for a monetary aggregate may be associated with quite different movements of interest rates and exchange rates, depending on the balance sheet positions of spending units.[73]

As for the possibility of using monetary policy to achieve better outcomes in the current account of the balance of payments, I would argue that such a policy would be inappropriate. First of all, it is crucial that policy be directed to its primary goal, the achievement over time of price stability. Second, during the period in which monetary policy is acting to bring down the rate of price inflation, the domestic currency may well appreciate temporarily and hence the current account balance may well "deteriorate" for a period of time. Third, the current account is influenced to an important extent by fiscal policy and by shocks to savings and investment behavior in both the domestic and foreign economies. Monetary policy cannot and should not be asked to try to counteract the implications for the current account of changes in fiscal policies.

In conclusion, I would summarize the framework for monetary policy sketched out in this part of the paper as one which has price stability as the ultimate target, a variety of variables (including, prominently, the monetary aggregates) as guides to policy but perhaps not as formal intermediate targets, and policy operating through interest rates and exchange rates as channels. I expect that some variant of this type of framework will be used in the 1990s by countries that do not opt for a fixed exchange rate regime.

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[73] In terms of the simple IS-LM model, what we are saying is that a change in the slope of the IS curve will lead to a different path of interest rates in the face of shocks, for given money or nominal spending guidelines.

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Commentary on 'Monetary Policy in the 1990s: Lessons and Challenges'

Lyle E. Gramley

Charles Freedman's paper, "Monetary Policy in the 1990s: Lessons and Challenges," is at once lucid, interesting and informative. That is no small accomplishment. I find myself in broad agreement with most of what Mr. Freedman says about the challenges for monetary policy in the decade ahead. The best use of my time can perhaps be made, therefore, by focusing largely on one subject: how well will the monetary authorities in a country like the United States succeed in accomplishing their objectives in the environment described by Mr. Freedman? I am not terribly optimistic, because the road ahead may turn out to be a virtual mine field.

Let me begin by considering what it is the monetary authorities should seek to accomplish. Freedman argues that monetary policy ought to take a longer perspective, seek to control the growth of a quantity like nominal GNP, avoid focusing on real variables or interest rates, and aim principally at achieving price stability. "Fine tuning" is to be avoided. That sounds like very sensible guidance, given the lessons of the 1970s. But does that mean essentially ignoring the earlier role that monetary policy tried to play as a short-run economic stabilizer? Central bankers might like to do that, but I doubt that the political process will permit it.

Consider the flak shot off at the Federal Reserve by the Bush administration in recent weeks. The Fed managed to nip in the bud a flowering inflation in 1988 and turn the corner to an easier monetary policy early enough in 1989 to avoid a recession—or so it seems to me. That is a remarkably good performance. But it's not good enough

for the administration. Moreover, the criticism of the Fed for focusing too strongly on bringing down inflation, and not enough on sustaining adequate growth, comes from the political party that appointed all of the sitting members of the Board. Meanwhile, two members of Congress from the other political party have introduced a bill designed to bring the Fed under tighter control by making the Secretary of the Treasury a member of the FOMC, reducing, to a degree, the Fed's historic budgetary independence, and requiring the Fed to publish immediately its policy directive. Developments such as these are not new, of course, but they suggest that the politicians may not have learned the same lessons of the 1970s that central bankers did.

In short, the next decade is not likely to feature a course of monetary policy in the United States that aims serenely at long-run price stability, while ignoring the economy's short-term proclivities to grow at an inappropriate speed. If that judgment is correct, what do we make of Freedman's suggestion that the monetary authorities should avoid focusing on real variables and instead, focus on one or more nominal variables?

First, selection of the appropriate long-run growth rate of nominal GNP, which would probably be the best choice of a nominal quantity variable for the United States, cannot be accomplished without knowledge of the economy's real long-run growth potential. That is not too demanding a requirement. Fairly robust estimates of potential GNP growth can be made without too much difficulty, since abrupt changes in long-run growth rates of the labor force and productivity are relatively infrequent.

Second, and more important, the choice of an appropriate growth rate of nominal GNP for the next year or two requires at least crude estimates of the full employment unemployment rate, where the economy is in relation to it, how fast the gap will be closed with any actual growth rate of real GNP, and the probable breakdown of nominal GNP growth between its real and price components. The monetary authorities can't avoid focusing a lot of attention on real variables, nor should they seek to do so. What they need to remember, as they focus on real variables, is that the effects of monetary policy on real variables are largely transitory, while the effects on prices are lasting.

While the political pressures on the monetary authorities to achieve

economic nirvana are as formidable as ever, the economic and financial environment that Mr. Freedman describes seems likely to make it increasingly more difficult to achieve the ultimate objectives of monetary policy for several reasons.

First, the automatic stabilizing properties of the financial system leave much to be desired. As Mr. Freedman indicates in his discussion of the monetary aggregates as intermediate targets, the short-run elasticity of money demand with respect to market interest rates is quite high. A recent Federal Reserve study, for example, estimates the short-run elasticity of demand for M2 with respect to the Federal funds rate to be −0.14, roughly twice as high as the long-run elasticity.[1] The short-run elasticity of demand for M1 with respect to market rates is much higher still.[2] Prior to deregulation of interest rates on deposits, it was often assumed that market-determined deposit rates would reduce the elasticity of money demand with regard to market interest rates, and thus help to stabilize money velocity. That has not happened, at least not in the short run. Indeed, for M1, the short-run elasticity of demand appears to be much higher since NOW accounts have become part of M1. As a consequence, short-run growth rates of the monetary aggregates have to be managed aggressively if shocks coming from shifts in aggregate demand are to be cushioned. Perhaps there never was a good time to put monetary policy on automatic pilot by adopting a constant money growth rate rule. But now is clearly not the time to go in that direction.

Second, I suspect that aggregate demand shocks are likely to become larger and more difficult to manage, if not more frequent. The international sector is a prime candidate for more serious shocks. Trade plays a far more important role in the U.S. economy than it once did, so that shocks originating from abroad have more potent effects through the trade route. Shocks coming through the exchange rate route are perhaps even more worrisome, and as Freedman indicates,

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1 David H. Small and Richard D. Porter, "Understanding the Behavior of M2 and V2," *Federal Resewe Bulletin,* April *1989.*

2 George R. Moore, Richard D. Porter, and David H. Small, "Modeling the Disaggregated Demands for M2 and M1 in the 1980s: The U.S. Experience", in *Financial Sectors in Open Economies: Empirical Analysis and Policy Issues.* Washington: Board of Governors of the Federal Reserve System (forthcoming). Paper originally presented at a Conference on Monetary Aggregates and Financial Sector Behavior in Interdependent Economies, sponsored by the Board of Governors in May 1988.

the process of globalization has not yet run its course. Another potential candidate for generating damaging shocks is the financial sector, as Henry Kaufman keeps telling us. Price volatility has increased, equity cushions of many nonfinancial businesses are razor thin (as are those of a number of depository institutions), and developing countries in Latin America and elsewhere still confront crushing debt burdens. Shocks may originate in financial markets; alternatively, as Ben Friedman argues, shocks to aggregate demand may be magnified there by cascading defaults in the private sector when interest rates rise or when the economy heads into recession.

But why worry about aggregate demand shocks when we have just been through a decade in which there were some blockbuster shocks to aggregate demand in the United States that didn't cause particularly untoward short-run consequences? The reason is that the shocks of the 1980s were, fortuitously, rather well-timed. A gargantuan fiscal stimulus package was introduced in the United States early in the 1980s, when growth of the U.S. and other industrial economies was floundering. In mid-1984, as the danger of renewed inflation in the United States was increasing, the effects of the dollar's rise over the previous three and one-half years dramatically slowed growth of the U.S. economy. And when the impact of the dollar's decline from early 1985 onward began to increase demands for U.S. exports in late 1986, the stimulus to aggregate demand came at a welcome stage of the business cycle. During the next decade, we may not be so lucky.

Third, I would speculate that, over time, aggregate demand may become increasingly less responsive to fluctuations in interest rates. Indeed, I suspect that process is already under way. Mr. Freedman recognizes this possibility. He notes that floating rate debt—a byproduct of the violent fluctuations of interest rates in the late 1970s and early 1980s—has probably reduced the substitution effects of interest rate changes on spending. That seems to be the case in the housing markets during the past several years, as changes in the mix of adjustable and fixed-rate mortgage loans soften the impact of changing market interest rates on sales and starts. Income effects, Freedman argues, may go the other way, however, and how it all comes out is an empirical issue. Clearly, he is right; we don't know the final outcome yet.

The point I would make is that Darwinism may work in economics as well as in ecological environments. Violent fluctuations in interest

rates, such as those experienced in the late 1970s and early 1980s, may engender innovational changes—such as floating rate debt and interest rate swaps—that permit economic units to survive. The burden of interest rate risk gradually is shifted to those economic units best able to manage it, units whose day-to-day business activity is least disrupted by interest rate variability.

I would not suggest carrying this line of thought to its logical limit, arguing that monetary policy might be unable to affect the temporal course of aggregate demand. Rather, I would argue that if monetary policy works to a larger degree through balance sheet effects, or cash flow effects, or exchange rate effects, and less through the more traditional route of impacts on credit-financed spending, then we will know less about the magnitude and timing of the economy's response to monetary policy than we used to know, or thought we did. This would not be a problem if the sole objective of monetary policy were to achieve long-run price stability; it is a problem if the objectives are more ambitious, and extend to short-run economic stabilization.

Mr. Freedman warns us, moreover, that we cannot realistically hope that the narrower monetary aggregates will bail us out of difficulty by reemerging as usable formal targets of monetary policy to guide the monetary authorities through the mine fields. Continuation of unstable demand for money is one reason. Innovations are likely to persist, he argues, and patterns of deposit rate adjustment will be difficult to predict. I agree. But Freedman also contends that formal monetary targeting would probably be impossible under current circumstances even if money demand were stable, because of the high short-run elasticity of demand for money with respect to market interest rates. This is an extremely interesting point and, I believe, a valid one.

To see why this is the case, imagine Alan Greenspan going to the House Banking Committee next February to deliver the Humphrey-Hawkins testimony, with the following story. The economy's growth, he says, has slowed somewhat, so that real interest rates need to come down a bit to sustain a reasonable rate of economic expansion. Since inflation is abating, nominal interest rates will have to fall somewhat more than real rates. To achieve these modest objectives, he says, the Fed's target range for M2 has been raised from 3 to 7 percent in 1989 to 9 to 13 percent in 1990. This small and prudent step, he tells the committee, is fully consistent with the Federal Reserve's

long-run objective of restoring price stability. And he implies that, in the following year or two, the M2 range will be lowered enough to maintain the long-run growth rate of money consistent with stable prices.

Clearly, the FOMC would be unlikely to adopt such widely differing growth rates of money even if that constituted a correct and sensible course of monetary policy. More important, the monetary authorities probably won't act that way either. That is to say, the FOMC won't set out ***ex ante*** to change the growth rate of money markedly, even though the course of policy it adopts may lead to that result ***ex post***. A cautious central banker will probably be reluctant to manage money growth aggressively if even he believes his own forecasts and his staffs estimates of the interest elasticity of money demand. One reason is that if the course of policy chosen turns out to be inappropriate, everyone knows about it. Another reason is that sharp increases in money growth may upset participants in financial markets, who then worry that the monetary policy has become an engine of inflation, while sharp declines in money growth upset the Congress and the administration, who always worry about impending recession.

A high degree of shod-term variability of monetary velocity, together with considerable uncertainty about the magnitude and timing of the economy's response to interest rate changes, are severely damaging to the ability of monetary policy to work effectively as a short-run economic stabilizer. These are conditions that invite gradualism. Counteracting aggregate demand shocks will tend to be done in small steps—say, 25 basis points per month in the federal funds rate, to take a random example. Such a course of action worked in **1988** and early **1989;** it may not work so well under less favorable circumstances. And what the monetary authorities will be using as an intermediate policy target as they probe cautiously toward higher or lower money growth rates very likely will be short-term interest rates. Interest rates are likely to come in the back door, despite Mr. Freedman's warnings about the dangers of paying too much attention to them. We have not yet heard the end of policy mistakes that stem from too much focus on interest rates by the monetary authorities.

This is not a particularly happy state of affairs, but there is no present way out of the box. Moving to the use of broader monetary and

credit aggregates as policy targets really won't do, as Mr. Freedman notes, because they seem to respond to monetary policy about as sluggishly as nominal GNP. Perhaps use of commodity prices, exchange rates, or the slope of the yield curve as formal monetary targets will fill the gap vacated by the monetary aggregates. I doubt it, however, and I suspect Mr. Freedman does too, since he doesn't mention the issue.

On the way to achieving their ultimate goals, Freedman argues, the monetary authorities have to look at everything. He recognizes that this may be a recipe for poor policymaking, but he hopes that the monetary authorities will learn from their past mistakes. I hope so, too. And I hope the political process will permit the exercise of good judgment in the conduct of monetary policy. If not, the monetary authorities and our respective economies may be in for some rocky times.

2
Changing Effects of Monetary Policy on Real Economic Activity

*Benjamin M. Friedman**

A series of developments in the U.S. economic environment in the 1980s has resulted in major changes in prevalent thinking about how monetary policy affects economic activity. One important part of this change simply reflects the heightened awareness, following the experience of disinflation early in the decade, that monetary policy is not neutral—that is, that actions taken by the central bank can and do influence real economic outcomes. Indeed, in the wake of the early 1980s disinflation, the more traditional view that monetary policy affects inflation by and only by influencing real economic activity seems much closer to the mark than the polar opposite view, which became increasingly popular in the 1970s, that monetary policy determines prices without affecting real economic activity at all.

Another aspect of the change in thinking about monetary policy that has taken place in recent years reflects the loss of confidence in the conventional monetary aggregates as a satisfactory measure of the effect of monetary policy on either real economic activity or prices. Standard relationships between the M's and either real or nominal income have largely broken down, and the correlation between money growth and price inflation, calculated in the way advocated by Milton Friedman (that is, using two-year moving

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averages to smooth out erratic movements, and a two-year lag between the money growth and the supposedly resulting inflation), is actually negative for sample periods including the 1980s.[1]

Because both of these changes mitigate in favor of a renewed emphasis on earlier, more "structural" ways of thinking about monetary policy, having a solid quantitative understanding of how monetary policy actions affect economic activity has assumed heightened importance. Here, too, however, the current state of empirical knowledge is less than satisfactory. One reason, of course, is the well-known tendency of empirical models based on different theoretical specifications to deliver differing quantitative estimates. Perhaps more importantly, several specific changes in the relevant economic environment have, at least potentially, rendered earlier quantitative representations of the monetary policy process seriously inadequate. Given the background of existing knowledge about how monetary policy affects economic activity, three such changes are—again, at least potentially—of particular importance.

First, the elimination of Regulation Q interest ceilings has weakened the Federal Reserve System's ability to arrest deposit growth at savings institutions merely by raising short-term market interest rates. In the meantime, the development of the secondary mortgage market has weakened the link between the growth of thrift deposits and the supply of mortgage lending. Both changes have presumably limited the Federal Reserve's ability to influence the pace of home building solely by changes in short-term nominal interest rates that do not necessarily correspond to movements in interest rates and asset prices more generally.

Second, the increased openness of the U.S. economy, with exports and especially imports rising as a share of aggregate output and spending, has increased the direct importance of dollar exchange rates for real economic activity. At the same time, exchange rates themselves have become much more volatile. Similarly, the greater integration of U.S. and world financial markets—including tighter linkages reflecting reduced costs of international investment and arbitrage, as well as the growing presence of foreign investors in U.S. asset markets as a cumulative result of the chronic U.S. trade imbalance in the

[1] For quartarly data spanning 1970:1-1988:4, for example, the simple correlation between M1 growth and the change in the GNP deflator is −.33.

1980s—has raised the possibility that movements of short-term interest rates, or other instruments subject to close Federal Reserve control, may not be sufficient to influence long-term asset prices and yields in the way required to achieve any given set of monetary policy objectives.

Third, the increasing indebtedness of borrowers throughout the U.S. economy, especially including corporate businesses, probably means that the economy's financial structure has become more fragile in the face of adverse shocks. At current levels of indebtedness, a general decline in business profits would leave many companies without adequate cash flow to service their obligations, and would thereby create the prospect of a widespread default that could further compound the slowdown in real economic activity that initially caused it. As a result, the real economy may have become not insufficiently sensitive to financial influences for purposes of carrying out monetary policy but, at least on the down side, excessively sensitive.

The object of this paper is to assess some of the major changes that have taken place in recent years in the ability of monetary policy to influence real economic activity, in part or as a whole: To what extent is housing now insulated from movements of short-term interest rates? How correct is the conventional wisdom that fundamental economic forces like real interest rate effects on investment and wealth effects on consumption, rather than credit rationing and other forms of sand in the economy's gears (to use James Tobin's phrase), now constitute the heart of the monetary policy process?[2] Apart from the relative growth of imports and exports per se, have exchange rates really become more important in how monetary policy works?

Clearly no one paper can provide satisfactory answers to questions like these, but the several forms of empirical evidence summarized here are suggestive in potentially interesting ways. The first section indicates the broad dimensions of the three major economic developments of recent years mentioned above, including changes in the financing of residential construction, changes in U.S. international economic relations, and changes in patterns of business indebtedness. The second section shows that these (and presumably other) changes in the economy's structure have resulted in major changes in the kind

2 See for example; Tobin (1984).

of simple aggregate-level reduced-form relationships that, in the past, have often provided the basis for quantitative discussion of monetary policy. The third section reports the results of a more sharply focused examination of some of the potentially important changes that have taken place, based on more carefully constructed equations describing the behavior of home building, business investment, consumer spending, and foreign trade. The final section briefly summarizes the paper's major conclusions.

Some recent developments in the U.S. economy

Table 1 summarizes, for each of the major business recessions that have occurred in the United States since World War II, the extent to which different kinds of spending have systematically accounted for different shares of the decline in overall economic activity. For each recession, the table's upper panel reports the peak-to-trough decline in total output, measured in billions of 1982 dollars. It also reports the corresponding increase or decline in each of several familiar categories of spending, measured from peak to trough of each respective spending component in case of a decline, and from the overall cycle peak to cycle trough in case of an increase—so that the component declines indicated for each episode usually add up to substantially more than the corresponding decline for total output.

As is well known, cutbacks in inventory accumulation have typically been the greatest single element accounting for U.S. recessions in this sense. Among the major components of final demand, residential construction has played the leading role ever since the beginning of the 1960s, followed by business fixed investment and consumer spending on durables, in that order. Consumption of nondurables and services has continued to rise in real terms throughout each recession, while net exports has exhibited little regular relationship to recessionary episodes in the domestic economy. Reductions in government purchases were especially important in the recessions that accompanied the end of the wars in Korea and Vietnam, but not otherwise.

This simple-minded breakdown provides a useful overview, but even as such, it is seriously deficient in a variety of ways. The most obvious of these is that any given component of economic activity may be a major part of the typical recession story, even if it never

Table 1
Composition of U.S. Business Recessions, 1953-1982

GNP Peak	GNP Through	GNP	Inven. Accum.	Final Demand	Res. Constr.	Bus. Fixed Inv.	Dur. Cons.	Nondur. Cons.	Net Exports	Govt. Purch.
Decline Measured in Constant 1982 Dollars										
1953:2	1954:2	−43.7	−18.4	−29.2	−3.5	−4.6	−2.8	−2.6	5.5	−55.3
1957:3	1958:1	−55.4	−23.2	−32.9	−7.6	−24.4	−9.3	−4.3	−21.6	−0.9
1960:1	1960:4	−17.5	−40.6	−1.9	−13.0	−6.1	−8.7	−3.0	12.0	−4.1
1969:3	1970:2	−26.7	−23.4	−7.5	−17.3	−9.5	−5.3	30.1	−7.4	−31.3
1973:4	1975:1	−120.1	−86.6	−63.8	−70.2	−47.9	−32.2	−15.2	39.8	−8.1
1980:1	1980:2	−76.4	−53.4	−74.6	−50.5	−27.3	−39.0	−12.6	15.1	7.3
1981:3	1982:3	−110.1	−59.7	−69.9	−42.1	−50.4	−18.3	−2.9	−62.4	−6.2
Change in Annual Percentage Growth Rate										
1953:2	1954:2	−11.1	—	−9.1	1.2	−11.2	−2.7	−2.7	—	−28.8
1957:3	1958:1	−10.4	—	−7.2	−5.6	−21.7	−14.5	−4.2	—	2.1
1960:1	1960:4	−6.7	—	−2.1	−29.3	−6.6	−6.7	−2.5	—	2.8
1969:3	1970:2	−6.0	—	−4.7	−19.1	−11.1	−8.1	−1.0	—	−9.0
1973:4	1975:1	−7.5	—	−4.8	−36.9	−16.1	−15.2	−2.4	—	2.2
1980:1	1980:2	−13.2	—	−12.8	−70.1	−29.6	−43.4	−6.2	—	4.3
1981:3	1982:3	−6.1	—	−3.9	−17.0	−17.4	−9.5	−0.2	—	1.3

declines in absolute terms, merely by undergoing a sharp slowdown in its rate of expansion. The lower panel of Table 1 addresses this possibility by reporting, for each category of spending considered above (except inventory accumulation and net exports), the difference between the average real growth rate during the recession and the average real growth rate during the previous expansion. Viewing the data in this way changes the picture in some ways—for example, a slowdown in nondurable consumption, which typically accounts for some three-fifths of aggregate demand, is part of each recession—but the more prominent role of investment-type spending, including especially home building, is readily apparent from this perspective as well.

Changes in the financing of residential construction

A quarter century ago—specifically, in 1964, to pick a typical nonrecession year midway between presidential elections—the average home buyer in the United States put 28 percent of the purchase price down and borrowed the remaining 72 percent.[3] Of the $17 billion lent that year in the form of one-to-four family home mortgages (net of repayments), savings and loan associations accounted for $8.1 billion, mutual savings banks for $3 billion, and commercial banks for $2.3 billion. Hence these three kinds of consumer deposit-oriented intermediaries accounted for nearly 80 percent of the final absorption of all home mortgage lending. Furthermore, in 1964, the share of these institutions' liabilities that consisted of ordinary deposits and deposit-type instruments was 93 percent at savings and loan associations, 98 percent at mutual savings banks, and 95 percent at commercial banks.[4] Federal legislation had precluded interest payments on demand deposits altogether since the 1930s, and had also imposed interest ceilings on commercial banks' time and saving deposits under the Federal Reserve System's Regulation Q. The Interest Rate Control Act of 1966 imposed analogous ceilings (administered by the Federal Home Loan Bank Board, in consultation with the Federal Reserve Board) on similar instruments issued by thrift institutions.

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3 Data on down-payment ratios are from the Federal Home Loan Bank Board.

4 Data on both lending and liabilities are from the Board of Governors of the Federal Reserve System, Flow of Funds Accounts.

As a result, while the market for home mortgages depended heavily on financial intermediaries whose ability to lend depended in turn on their ability to attract deposits, by 1966 the Federal Reserve had available a ready device with which to affect these institutions' deposit flows—the relationship between short-term market interest rates and Regulation Q ceilings. For example, in 1969 the prevailing ceilings at thrift institutions were 5 percent a year on passbook saving accounts and 5¼ percent on saving certificates. When Treasury bill rates rose to an average 6.68 percent a year for 1969 (from 4.32 percent on average in 1967, and 5.34 percent on average in 1968), thrift institutions' total deposit inflow fell to less than half the 1967 level, and the pace of home building slowed as well. Similarly, in 1974 market interest rates averaged 7.89 percent a year for Treasury bills and 10.81 percent for commercial paper, compared to ceiling rates of 5¼ percent for passbook accounts and 6½ percent for certificates. Thrift institutions' 1974 deposit inflows were less than half of the 1972 level, and again home building slowed sharply.

In 1986—to pick another nonrecession year midway between presidential elections—the average home buyer in the United States put down 26 percent of the purchase price and financed the remaining 74 percent, a slightly greater loan-to-value ratio than in 1964. But of $219 billion in net lending that year for one-to-four family mortgages, commercial banks accounted for $20 billion, credit unions for $7 billion, mutual savings banks for $6 billion and savings and loans for just $500 million—in sum, just 15 percent of the total. Secondary mortgage pools sponsored by the Federal National Mortgage Association (FNMA), the Government National Mortgage Association (GNMA), the Federal Home Loan Mortgage Corporation (FHLMC), and the Farmer's Home Administration (FHA) absorbed (net of repayments) $168 billion of home mortgages in 1986, or nearly 77 percent of the entire market volume. Thrift institutions and commercial banks continued to originate new mortgage loans, but in aggregate they sold almost as many loans to these pools as they retained in their own portfolios. While 1986 was a somewhat extreme year in this regard, mortgage pools accounted for fully 52 percent of all net lending for home mortgages during 1980-88, compared to 12 percent for banks and 21 percent for the three kinds of thrift institutions combined.

Just within this two-decade period, therefore, the development and

rapid growth of the secdndary mortgage market shifted the majority of net mortgage lending in the United States away from deposit-based intermediaries to specialized pools that package mortgages and sell bond-type obligations against them into the open market. FNMA had begun its lending operstions in 1955, but, as the comparison to a quarter century ago illustrates, the enormous growth of the secondary mortgage market is more recent.[5] Congress separated GNMA from FNMA in 1968 and founded FHLMC in 1971, and private issuers of collateralized mortgage obligations (CMOs) did not begin activity until 1982. By the late 1980s this secondary market had effectively severed the traditional link between the volume of net mortgage lending done and the net addition of mortgages to the balance sheets of deposit-based intermediaries.

Moreover, by the late 1980s the Regulation Q ceilings that had earlier enabled the Federal Reserve to interrupt these intermediaries' deposit flows and hence to curtail the net volume of new assets they could book, had disappeared anyway. Although the Federal Reserve began the elimination of these ceilings on its own in June 1970, by suspending the ceiling on interest paid on most large bank certificates of deposit, Congress mandated the widespread elimination of interest ceilings in the Depository Institutions Deregulation and Monetary Control Act of 1980. This legislation phased the ceilings out by successive steps beginning in 1981 and ending in 1985. The old Regulation Q is therefore gone, and (apart from the continuing legislative prohibition of explicit interest on corporate demand deposits) nothing has taken its place.

The development of the secondary mortgage market and the elimination of Regulation Q certainly do not render residential construction activity immune to the effects of 'monetary policy. But they do mean that the kind of directly visible impact that used to ensue when short-term market interest rates rose above the prevailing deposit ceilings, as in 1969 or 1974, will not recur. In the aftermath of these

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5 **A large part of the motivation for the development of these new lenders, of course, was to shelter the housing industry from just the effects that Regulation Q brought at times of high market interest rates. Before the mortgage pools became such a major factor in this regard, the government relied on a different solution to this problem, using the Federal Home Loan Bank System to issue securities in the open market and channel the proceeds to savings and loan institutions via direct advances. Largely between** FHLBS **and FNMA, federal support accounted for 45 percent of total net extensions of one-to-four family mortgages in 1969 and 52 percent in 1974.**

changes, the effect of monetary policy on home building no doubt depends, to a much greater extent than in the past, on fluctuations in both real and nominal mortgage interest rates.

Fluctuations in the relevant real interest rate presumably influence home buying and home building decisions in the familiar way that is standard in most theories of investment-type spending. Fluctuations in nominal mortgage rates per se can also have important effects, since for any given size of loan it is the nominal rate that determines the size of the monthly payment, which in turn affects the willingness of liquidity-constrained home buyers (that is, almost all home buyers) to take on the commitment, as well as their ability to qualify in the eyes of potential lenders. In addition, with a large part of mortgage lending now done on an adjustable rate basis—between one-third and two-thirds of the total in a typical year—the influence of movements in both real and nominal interest rates may be either greater or smaller than when all mortgages bore fixed interest rates. In short, monetary policy presumably can still affect home building, but in different ways than in the past.

Changes in the openness of the economy

The Federal Reserve System has traditionally given a prominent place to international economic and financial considerations in its public accounts of the motivation underlying the conduct of U.S. monetary policy. Pressures on the dollar value of foreign currencies under the Bretton Woods system, fluctuations in currency values during the subsequent period of floating exchange rates, and the balance of international trade have all been standard items of concern in this context. Even so, there has always been suspicion that these expressions of concern were merely that—in other words, a belief that while the Federal Reserve paid ample lip service to international considerations, in fact it took little account of them in actual monetary policy decisions.

A quarter century ago—again, 1964 to be precise—exports of goods and services constituted 6.5 percent of total real output in the United States, while imports equaled 6.2 percent. By 1988, exports and imports had risen to 12.6 percent and 15.1 percent of total real output, respectively. With the foreign sector approximately twice as large as before, relative to the size of the economy, the opportunity for

monetary policy to affect aggregate economic activity by discouraging exports and encouraging imports, or vice versa, had clearly increased. (By comparison, residential construction and business fixed investment, the two spending components traditionally emphasized in this context, respectively accounted for 5.8 percent and 8.9 percent of total real output in 1964, and 4.8 percent and 12.2 percent in 1988).

In addition to the fact that exports and imports have grown secularly relative to overall economic activity—and perhaps more important, from a monetary policy perspective—the gap between the two has become both larger and more volatile in recent years. From 1950 through 1970, the U.S. merchandise trade balance fluctuated in a fairly narrow range, with maximum $6.8 billion (1 percent of total nominal income) in 1960 and minimum $600 million (less than 0.1 percent of nominal income) in 1969. Trade deficits first began to appear in the early 1970s, especially after the OPEC cartel quadrupled crude petroleum prices in 1973, although even as late as 1976 the largest recorded deficit was still only $9.5 billion, or 0.5 percent of nominal income. During 1977-82 the trade deficit stabilized at $25-35 billion a year, or roughly 1 percent of nominal income, despite another doubling of oil prices in 1979. But under the combination of extraordinarily expansionary fiscal policy and anti-inflationary monetary policy that prevailed thereafter, the trade deficit rose dramatically to $169 billion, or 3.5 percent of nominal income, in 1987. Wholly apart from the implications for aggregate economic activity of a swing of this magnitude in the economy's foreign sector, the collapse of U.S. competitiveness that this implosion of the trade balance reflected rapidly became a national problem serious enough to figure importantly in macroeconomic policymaking.

Part of the reason why the U.S. trade balance became so unstable, of course—and, correspondingly, part of the reason for supposing that monetary policy either could or should do something about it—was the change from fixed to flexible exchange rates. In 1964 the Bretton Woods system was still firmly in place. The United States fixed the price of gold, at $35 an ounce, but otherwise played no explicit role in setting currency values. Other countries mostly fixed the price of their own currencies in terms of the dollar, with relatively infrequent changes. This system weakened in 1968, with the increase in the official gold price to $42.50 an ounce and effective restric-

tions on U.S. willingness to sell gold even at that price, but it remained in place until the United States unilaterally terminated it in 1971. Since then, exchange rates have fluctuated with more or less freedom, according to a shifting balance of market forces and official intervention that is sometimes coordinated and sometimes not.

The dollar has, in fact, fluctuated substantially since 1971. The dollar's maximum trade-weighted average value against 10 major foreign currencies (in February 1985) was almost twice its minimum value during this period (in July 1980). At times, major changes have occurred quite rapidly. For example, after the February 1985 peak, the dollar fell by 44 percent by December 1987. Moreover, theories of purchasing power parity notwithstanding, these have mostly been real changes, not merely the reflection of different countries' differing rates of price inflation. Given the familiar dependence of imports and exports on real exchange rates, together with the dollar's evident relationship to interest rates—or at least to the differential between interest rates on dollar assets and on assets denominated in other currencies—the combination of a larger foreign sector in the U.S. economy and flexible exchange rates has clearly opened new avenues for monetary policy to affect economic activity. At the same time, given the far greater volatility of exchange rates, participants in international trade may be less likely than in the past to view exchange rate changes as permanent, rather than as mere transitory blips, and therefore may be less likely to change their business relationships in response to whatever exchange rate fluctuations do occur.[6]

The increasing openness of the U.S. economy has created complications as well as opportunities for monetary policy in areas other than just the sensitivity of trade flows to exchange rates. One direct result of the United States' chronic inability to meet foreign competition in goods markets both at home and abroad in the 1980s is a greatly enhanced role of foreign capital and foreign lenders in U.S financial markets. The enormous U.S. trade deficit since 1982 has necessarily brought huge U.S. capital imports. As a result, the United States' net international investment position peaked at $141 billion in 1981, and it has declined at an accelerating rate since then. By 1985 the United States had entirely dissipated the positive net inter-

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6 For an argument along these lines, see Baldwin and Krugman (1989).

national investment position built up since 1914, when the country first became a net creditor. By yearend 1988, the U.S net international investment position was *minus* $533 billion.[7]

Because U.S. investors have continued to acquire modest amounts of foreign assets throughout this period, the growth in foreign ownership of financial assets issued and traded in U.S. markets is even greater than the erosion of the net international investment position suggests. For example, as of yearend 1980, private foreign investors held $19 billion in U.S. Government securities, or only 1.9 percent of the total amount outstanding. By yearend 1988, private foreign holdings had risen to $121 billion, or 3.7 percent of the amount outstanding. Including central banks and other official institutions, foreign holdings of U.S. Government securities rose from $139 billion in 1980 to $384 billion in 1988. Nor is the government securities market the only one to be so affected. Foreign holdings of corporate bonds issued in the United States, for example. rose from $22 billion, or 4.4 percent of the total amount outstanding, in 1980 to $180 billion, or 13.5 percent of the market, in 1988. And because foreign holdings in these markets are dominated by large institutional investors to an even greater extent than is the case among U.S. holdings, the percentages of trading volumes accounted for by foreign orders are typically even greater.

These large increases in foreign participation in U.S. financial markets complicate monetary policymaking in several ways. Merely changing the composition of asset holdings, away from one group of investors toward another, changes the market average portfolio behavior when the two groups of investors exhibit different asset preferences—as foreign investors and U.S investors on average clearly do.[8] More worrisome, in conjunction with flexible exchange rates, the increase in foreign participation raises the possibility that familiar cause and effect relationships may no longer obtain. For example, throughout the post World War II period, a typical (though not invariable) market reaction to an increase in short-term interest rates has been an increase in long-term interest rates. But if higher U.S.

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7 See Scholl (1989).

8 See Friedman (1986a) for a discussion of how foreign investors' portfolio preferences differ from those of U.S. investors on average, and the implications that follow from these differences.

short-term interest rates make dollar assets as a whole more attractive relative to assets denominated in other currencies, and if participants in the foreign exchange market also account for a large share of the trading in the dollar bond market, the effect of the stronger dollar may overwhelm the effect of higher short-term rates, so that bond yields decline rather than rise. Analogous examples, involving markets for other assets, are plentiful.

These new complications for monetary policy are hardly the most worrisome aspect of the remarkable transformation of the United States from the world's leading creditor to its largest borrower. From a broader perspective, the increasing dependence on countries whose central banks prop up the dollar and support auctions of U.S. Treasury bonds, the wholesale acquisition of the nation's productive assets and real property by foreign investors, and the inevitable erosion of U.S. influence in world financial, commercial and other affairs are the issues that genuinely matter.[9] But monetary policy is important as well, and to the extent that these changes have made the conduct of a successful monetary policy more difficult, that, too, is a proper object of concern.

Changes in business indebtedness[10]

A quarter century ago—that is, at yearend 1964—U.S. corporations in nonfinancial lines of business owed $201 billion in debt borrowed from the credit markets, an amount equal to 30.4 percent of total U.S. nominal income at the time. By yearend 1988, nonfinancial business corporations owed $1.9 trillion in credit market debt, equivalent to 37.5 percent of nominal income. Substantially all of this increase has taken place in the 1980s, as a consequence of the extraordinary wave of mergers, acquisitions, leveraged buyouts and stock repurchases that has seized corporate America during this period. During 1984-88 alone, the amount of their equity that U.S. nonfinancial business corporations paid down through such transactions exceeded the amount of new equity that they issued by $444 billion.

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9 I have discussed these matters at some length in Friedman (1988a).

10 This section draws on Friedman (1986b, 1988b).

Corporate businesses are hardly alone in having borrowed in record volume recently. Since 1980 all major sectors of the U.S. economy except farms have increased their outstanding indebtedness at a pace significantly faster than the economy's overall growth. The huge budget deficits that became the hallmark of U.S. fiscal policy under the Reagan administration led to the first sustained peacetime increase in the federal government's debt, compared to gross national product, since the founding of the Republic. State and local governments have also increased their combined indebtedness, relative to gross national product, although their borrowing has clearly slowed since 1985 (presumably because of new tax legislation). Households—mostly individuals, but also including personal trusts and nonprofit organizations—have likewise borrowed record amounts.

The resulting across-the-board rise of debt relative to income has marked a sharp departure from prior patterns of U.S. financial behavior. From the end of World War II until the 1980s, the outstanding debt of all U.S. obligors other than financial intermediaries fluctuated relative to total nominal income within a narrow range, with no evident trend either up or down. The overall debt-to-income ratio was especially stable from the end of the Korean War until the 1980s, averaging $136 of debt for every $100 of total income during 1953-80. At yearend 1980, the total debt outstanding amounted to $137 for every $100 of total income. By yearend 1988, however, the corresponding level was $181, greater than any prior U.S. debt level recorded in this century except for 1932-35 (when many recorded debts had defaulted de facto anyway).

Private-sector borrowers, including both individuals and businesses, have accounted for two-thirds of this increase. Not surprisingly, this phenomenon has generated widespread concern. In particular, discussion at a variety of levels has questioned whether a cascade of defaults by private-sector borrowers, initially touched off by some external shock—a collapse of oil prices, for example, or a sharp rise in interest rates needed to defend the dollar—might threaten the nation's financial system, or perhaps even the nonfinancial economy. Such concerns are clearly relevant for monetary policy.

While both households and businesses have borrowed in record volume during the 1980s, households have also built up record asset levels, including not just equities and other assets exhibiting high price volatility, but also liquid assets and other stable-price debt instru-

ments. As a result, aggregate-level household net worth has shown no significant deterioration compared to national income since 1980 (and that remains true after the October 1987 stock market crash). By contrast, during the 1980s U.S. nonfinancial businesses have increasingly borrowed not to invest, in either tangible or financial assets, but simply to pay down their own or other businesses' equity. As a result, the aggregate net worth of both the corporate sector and the noncorporate business sector has declined substantially compared to national income.

As would be expected under such circumstances, interest coverage has deteriorated along with balance sheets. Since 1980 it has consistently taken more than 50 cents of every dollar of pre-tax earnings, and more than 30 cents of every dollar of pre-tax cash flow, just to pay corporations' interest bills—far more than in earlier periods. More troubling still, the corporate sector's problem in this regard has not gotten better as the economic expansion has advanced. Continuing large-scale borrowing has about offset the effect of continuing economic expansion in boosting earnings, as well as the effect of declining interest rates, so that corporations' interest coverage has remained poor throughout the decade to date. It is not surprising, therefore, that the current business expansion has been the only one since World War II (the only one ever?) to be accompanied by a rising, rather than falling, rate of business bankruptcies and debt defaults.

There is no lack of ready explanations for businesses' eagerness to take on debt. The U.S. tax code favors reliance on debt, by allowing borrowers to deduct interest payments but not dividends from taxable income while nonetheless treating interest and dividends alike in the taxation of income earned by recipients. This discrimination is all the greater in that borrowers can deduct the full (nominal) interest that they pay, including not just that part corresponding to the "real" interest rate but also the part that compensates the lender for the erosion of principal value due to inflation. Legal and regulatory restrictions on ownership of equities by many kinds of financial intermediaries create an additional incentive to fashion instruments (like "junk" bonds) that have risk and return properties similar to equities but nonetheless constitute debt in the eyes of the relevant authorities. Larger underwriting spreads for equity than for debt offerings further increase the incentive to rely on debt when firms raise new capital. The greater speed at which firms can typically issue new debt than

new equity is also a factor in contexts like unsolicited takeovers, in which timing can be all-important.

What is puzzling, however, is why business reliance on debt has accelerated so much in the 1980s. Each of these features of the U.S. financial system favoring debt financing has been present for a long time, and some should be less potent now than they were in the past. The lowering of tax rates in the 1980s, for example, should have reduced the incentive to borrow. Given the continuing non-neutrality of the tax code, so should the slowing of inflation. At least for the present, therefore, the most honest answer to the question of why all this has happened in the 1980s is that nobody really knows.

But regardless of just what motives lie behind it, the massive increase in business indebtedness has raised concerns that it will make the U.S. economy excessively fragile in the face of downward shocks. The chief danger posed by an overextended debt structure in this context is that the failure of some borrowers to meet their obligations will lead to cash flow inadequacies for their creditors—who may, in turn, also be borrowers, and so on—and that both borrowers and creditors facing insufficient cash flows will then be forced to curtail their spending. Similarly, forced disposal of assets by debtors and others facing insufficient cash flows will lead to declines in asset prices that erode the ability of other asset owners to realize the expected value of their holdings if sale becomes necessary, and will therefore threaten the solvency (in a balance sheet sense) of still others. The most likely implications for the nonfinancial economy would be reductions in employment and in a variety of dimensions of business spending, no doubt prominently including investment in new plant and equipment. Indeed, it is likely that deteriorating interest coverage has also rendered the average company's capital spending more sensitive than in the past to tight financial markets generally.

At the same time, the ability of debtors to service their obligations is clearly not independent of what is happening in the economy. For most borrowers, both the size of cash flows and the value of the marketable assets that they could liquidate in the event of an insufficiency depend to a great extent on general business conditions. Business downturns typically shrink the earnings of many firms, slow the growth of earnings for most others, and in many cases also reduce the market values of assets. Hence problems of debtors' distress are most likely to become widespread in the context of just the kind of

economic difficulty that they tend to aggravate.

The most important implication for monetary policy is probably that, in the event of a business downturn, the U.S. economy would be likely to exhibit less resilience, and correspondingly more proclivity to contractionary dynamics, because of the greater potential for financial instability.[11] Hence the real costs of a recession—costs in terms of forgone output, incomes, jobs, capital formation, and so on—are likely to be greater than would be the case without the higher level of business indebtedness. Given the ever present risk that the economy may suffer an adverse shock from some entirely independent source, the higher level of business indebtedness therefore makes it all the more important for the Federal Reserve to arrest promptly any resulting contractionary tendencies.

But higher business indebtedness also matters for monetary policy in a more complicated, and more important, way because of the key role historically played by tight money in resisting price inflation. If the potential cost of recession is now greater because of higher business indebtedness, it is greater whether the recession's source is an external shock or an anti-inflationary monetary policy. To put the point in simple shorthand, the borrowing that U.S. corporations (and other businesses) have done in the 1980s has shifted the short- and intermediate-run tradeoffs confronting monetary policy, both in the sense of changing the most likely set of outcomes following from any given course of Federal Reserve action, and in the sense of changing the attendant risks.

Evidence of change from reduced-form relationships

In light of the three changes in the structure of the U.S. economy described above, not to mention others besides, it would be surprising if simple summary relationships between real economic activity and various measures of financial conditions had remained unchanged throughout the past quarter century. In fact, they have not. As is well known, standard reduced-form equations relating either nominal income or real output to money, credit, or interest rates have largely

[11] See Bernanke and Campbell (1988) for an analysis based on individual company data that reinforces the argument made here on the basis of aggregate data.

broken down in the 1980s.[12] For example, the familiar "St. Louis" equation relating the growth of nominal income to the lagged growth of the M1 money stock and the lagged growth of high-employment federal expenditures exhibited $\bar{R}^2$ of .32 for the 1960:2-1979:3 period. For 1970:3-1986:4, the $\bar{R}^2$ was .02.

Table 2 gives an overview of the extent to which simple reduced-form equations say different things about recent years than about earlier time periods. The table summarizes the respective real output equations from a series of vector autoregressions of the form

$$(1)\ \Delta X_t = a + \sum_{i=O}^{4} b_i \Delta X_{t-i} + \sum_{i=0}^{4} c_i \Delta P_{t-i} + \sum_{i=O}^{4} d_i \Delta G_{t-i} + \sum_{i=O}^{4} e_i Z_{t-i}$$

where X is real gross national product, P is the corresponding implicit price deflator, G is real high-employment federal expenditures—all measured in logarithms—and Z is, in turn, one of a list of financial variables that could plausibly represent the influence of monetary policy. The table shows results for 16 different choices for Z, including the growth rates of the monetary base, the M1 and M2 money stocks, and total domestic nonfinancial debt outstanding; nominal interest rates on commercial paper and corporate bonds; the difference between the commercial paper rate and the rate of change of the consumer price index; the difference between the corporate bond rate and a one-year average of consumer price inflation; the change in each of these nominal and "real" interest rates; the difference between the corporate bond rate and the commercial paper rate; the difference between the commercial paper rate and the Treasury bill rate; and the change in each of these spreads.[13]

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12 See Friedman and Kuttner (1989) for details.

13 The timing used in constructing the real interest rates is as follows: For the short-term rate, the nominal rate is the average of daily observations throughout the quarter, computed as the average of reported monthly averages. The price change subtracted from the short-term rate is the annualized percentage change from the prior quarter to the present quarter, based in each case on averages of monthly observations. For the long-term rate, the nominal rate is the average of daily observations during the last month of the quarter. The price change subtracted from the long-term rate is the average annualized percentage change for the current and the preceding three quarters, based in each case on the last monthly observation in each quarter.

The table shows separate results for two halves of the sample period spanning the current availability of data corresponding to the Federal Reserve System's current definitions of the monetary aggregates. For each equation, within each separate sample, the table reports the F-statistic for the test of the null hypothesis that the e_i coefficients in equation 1 are uniformly zero. It also reports the $\bar{R}^2$ value for the entire equation.

Table 2
Summary Statistics for Financial Variables in Real Output Equations

Financial Variable	1960:2-1975:4		1976:1-1988:4	
	F	$\bar{R}^2$	F	$\bar{R}^2$
A Monetary Base	1.60	.17	2.25*	.16
A Money (M1)	1.52	.17	.87	.04
A Money (M2)	.42	.09	.14	—
A Credit	3.04**	.25	1.21	.10
Short Rate	3.64**	.28	3.00**	.21
Long Rate	2.05	.20	.50	.00
Real Short Rate	.25	.07	1.26	.08
Real Long Rate	3.15**	.26	.25	—
A Short Rate	2.35*	.22	2.58*	.18
A Long Rate	2.98**	.25	.48	—
A Real Short Rate	.31	.08	1.66	.11
A Real Long Rate	3.38**	.27	.32	—
Long-Short Spread	1.56	.17	2.04	.14
Default Premium	5.86***	.37	1.53	.10
A Long-Short Spread	2.18*	.21	.67	.02
A Default Premium	5.27***	.35	1.20	.07

*significant at .10 level
**significant at .05 level
***significant at .01 level

There is little useful similarity between the results shown for these two sample periods. The short-term interest rate level and its change stand out as the only financial variables among the 16 examined for which there is evidence of a relationship to real economic activity that is statistically significant, even at the .10 level, in both samples. Variables like the growth of credit, nominal and real long-term interest rates, the long-short rate spread, and the default premium on commercial paper all showed a significant relationship in the earlier sample but not the later.[14] The monetary base is (weakly) significant in the later sample, but not the earlier. Money growth and real short-term interest rates show a significant relationship in neither sample.

Further, even those few relationships that are statistically significant in both samples are hardly identical across time in an economic sense. For example, the financial variable showing the strongest relation to movements of real economic activity in the later sample is the level of the nominal short-term interest rate, and this relationship is also significant in the earlier sample. For the earlier sample, the estimated values of coefficients e_i for this variable in equation 1 are, successively, $-.0029$, $-.0013$, $.0004$ and $-.0007$ (sum $-.0045$). The corresponding estimated values for the later sample are $.0003$, $-.0042$, $.0033$ and $-.0004$ (sum $-.0010$). Although the relevant F-test does not warrant rejecting the null hypothesis that these two sets of coefficients are identical, the failure to meet the .05 significance level in this case simply reflects the imprecision with which the individual coefficients are measured in the first place. The change in estimated values between the earlier and later samples is easily large enough to make an important difference—for forecasting, or for planning monetary policy—depending on which ones are relevant.

These results, and others like them reported by numerous researchers, warrant little confidence in the ability of monetary policy to affect real economic activity in any dependable way by merely relying on simple aggregate reduced-form relationships. There is ample evidence of change between a quarter century ago and more recent

[14] The F-statistic for the nominal long-term rate in the earlier sample barely fails to meet the critical value for significance at the .10 level. The same is true for the default premium in the later sample.

experience—including not just statistically significant changes of small magnitude in relationships that are precisely measured, but changes on a scale to matter importantly in a macroeconomic context.

Changes in the sensitivity of four components of spending

Even simple reduced-form relationships for aggregate income and output like those summarized in the preceding section, indicate that the sensitivity of real economic activity to monetary policy has changed in potentially important ways. But a more focused, and more detailed, approach is necessary to flesh out the nature of those changes in a sufficiently substantive way to provide information of potential use for the conduct of monetary policy. In light of the changes in the U.S. economy reviewed in the opening section, four distinct aspects of economic activity represent plausible places to look for such changes: home building, business capital spending, consumer spending, and foreign trade.[15]

Deriving from first principles a detailed representation of each of these four components of aggregate spending would be a task well beyond the scope of any one paper. The approach adopted here is instead to exploit the extensive research embodied in the Federal Reserve Board MPS model.[16] For each component of spending, the general question to be addressed is then whether the relevant empirical relationships have changed in recent years in ways that have either heightened or dulled the sensitivity of real economic activity to aspects of financial conditions that are subject at least to influence, if not outright control, by monetary policy.

The answers yielded by this kind of single-equation approach are clearly only partial in nature. They necessarily omit the entire range of repercussions that act in a general equilibrium setting to reinforce the real effects of monetary policy, because one agent's spending decision determines another's product demand or income flow, and

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15 A fifth possibility is business inventory accumulation, but the empirical literature has generated little consensus on the nature of financial influences on inventory investment. Irvine (1981) and Akhtar (1983) reported significant effects of interest rates on inventory behavior, but many other researchers (see, for example, the many references cited in those two papers) failed to do so.

16 The version used here is described in detail in Brayton and Mauskopf (1985).

because many agents' asset demands collectively determine asset prices and goods prices, and hence alter their own and other agents' wealth. They also necessarily omit the whole range of repercussions that act to dampen the real effects of monetary policy, because many agents' spending and portfolio behavior collectively determines interest rates and inflation rates, and hence the financing costs that they and other agents face. Even so, the limited exercise of establishing what changes have occurred in the first-round effects of monetary policy actions is informative too. After all, if there were no first-round effects there would be no repercussions either.

Beyond the question of partial versus general equilibrium analysis, the findings from any empirical exercise along these lines are also necessarily limited by the use of the specific model that underlies it. Nonrobustness of quantitative estimates with respect to model specification has long been a familiar phenomenon in empirical economics, certainly including the investigation of relationships bearing on monetary policy. Nevertheless, any such analysis requires some well-specified model as a base, and in light of its long history of use in just this context, the FRB-MPS model is probably as appropriate a vehicle as any for this purpose. Especially for policy purposes, the right response to concerns about robustness with respect to model specification is presumably to carry out parallel empirical analyses based on alternative models, not to eschew empirical investigation in the first place.[17] While such a comparative approach clearly lies beyond the scope of this paper, it is appropriate to view the findings reported here as one element—given the historical role played by the FRB-MPS model, a particularly interesting element—in such a broader endeavor.

Residential investment

The most immediate question to ask about home building is to what extent the elimination of deposit interest ceilings and the development of the secondary mortgage market have made residential construction less sensitive to monetary policy by precluding restrictions

17 See, for example, McCallum (1988) for an investigation that explicitly addresses the robustness issue in this way.

on mortgage lending like those that occurred in tight money episodes in the 1960s and 1970s, when market interest rates rose sharply above the then permissible deposit rates. Was the resulting credit rationing all there was to the effect of tight money on housing? Or is housing also sensitive to mortgage interest rates? If so, how far do mortgage rates have to rise to depress housing as much as an episode of credit rationing? And has the sensitivity of home building to changes in mortgage rates become greater or smaller in recent years?

The FRB-MPS model's treatment of residential construction activity combines a relatively straightforward model of investment, based on the real after-tax cost of capital, with a completely separate model for episodes of credit rationing. The complete equation is

$$(2)\ IH_t = (1-DCR_t)\left\{(1-DPO_t)\left[a + \sum_{i=0}^{3} b_i\, RH_{t-i} + c\ CON_t + d\ \Delta UE_t + e\ KH_{t-1}\right] + f\ DPO_t \cdot IH_{t-1}\right\} + DCR_t\left\{\sum_{i=0}^{4} g_i\, SLD_{t-i} + h\ UE_t + k\ IH_t^*\right\}$$

where IH is the natural logarithm of per capita real expenditures on housing; DCR is a dummy variable indicating whether a "credit rationing" episode is in progress (value 1 if so, 0 if not); DPO is a dummy variable indicating the phase-out of a credit rationing episode (non-zero value if an episode had occurred within the prior four quarters, 0 if not); RH is the logarithm of the real after-tax cost of capital for housing investment; CON is the recent average per capita consumer spending; UE is the unemployment rate; KH is the existing stock of residential capital; SLD is the per annum real growth rate of deposits at savings and loan institutions; IH* is the value of IH in the most recent period prior to the onset of credit rationing; and lower case letters (a, b, . . . , k) indicate coefficients to be estimated.[18]

[18] Appendix A gives the exact definition of each variable used here and in the other equations presented in this section. As the appendix indicates, some variables are in logarithmic form.

Apart from episodes of credit rationing, the direct influence of monetary policy on home building lies in the real after-tax cost of capital, defined here by

$$(3)\quad RH = \log\frac{PH}{PC}\left\{(I-TP)(RM+TPR) + 2.4 - 6\dot{PR}\right\}$$

where PH and PC are the implicit price deflators for residential construction and consumption, respectively; TP is the average effective tax rate on personal income, including federal, state and local taxes; RM is the mortgage interest rate; TPR is the average property tax rate; and $\dot{PR}$ is the recent average rate of change of the rental component of the consumer price index. For a given relative price of housing, given tax rates, and given inflation, a change in the mortgage interest rate directly affects the cost of capital in equation 3, which in turn affects home building via the b_i coefficients in equation 2. This effect is strong empirically, with each estimated b_i value but the last (which is small) individually negative as is to be expected, and the sum negative with t-statistic -4.5, for the equation estimated over the 1964:3-1988:4 sample.[19]

By contrast, during episodes of credit rationing what matters is not the cost of capital but the growth of deposits at thrift institutions, which is presumably slower than normal because of the interaction of market interest rates and deposit rate ceilings. Indeed, during the three historical periods identified in the model as credit rationing episodes (1966:3-4, 1969:3-1970:3, and 1974:1-1975:1) real deposit growth averaged -0.26 percent a year versus 5.76 percent a year on average during the remaining quarters of the post-Accord period. Within the credit rationing regime, faster or slower deposit growth matters for housing activity, although here the empirical evidence is much weaker. Again for the equation estimated over the 1964:1-1988:4 sample, each estimated g_i value but the last (which

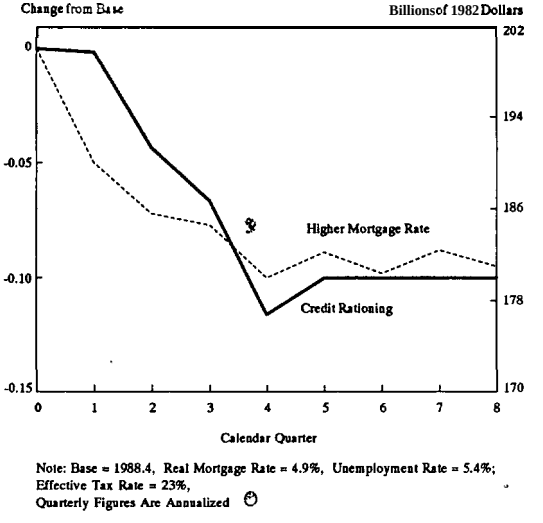
[19] Appendix B gives the complete estimation results for all equations described in this section. The sample period in most cases reflects that shown in Brayton and Mauskopf (1985), extended to incorporate subsequently available data.

is small) is individually positive, but the t-statistic for the sum is merely 0.8.[20]

Chart 1 indicates the relative strength of these two channels of monetary policy influence by showing the results of using the estimated equation 2 to simulate the effects of two separate experiments. The solid line shows the effect on home building of a sustained increase of 1 percent (that is, one percentage point) in the mortgage interest rate, beginning in quarter 1. The dashed line shows the effect of a sustained episode of credit rationing involving a 6 percent (six percentage points) decrease in the annual growth of real savings deposits. In both simulations all values other than the mortgage rate and the deposit growth rate are normalized to the actual values that prevailed in 1988:4 and held fixed at those values throughout. In the absence of either the mortgage rate increase or

Chart 1

Residential Investment: Responses to 100 Basis Point Rise In Mortgage Rate and Imposition of Credit Rationing



Note: Base = 1988.4, Real Mortgage Rate = 4.9%, Unemployment Rate = 5.4%; Effective Tax Rate = 23%, Quarterly Figures Are Annualized

[20] Brayton and Mauskopf reported a t-statistic of 2.2 for the equation estimated over 1960:1-1982:4. Indeed, in the 1964:3-1988:4 sample there is little evidence to warrant separate treatment of credit rationing episodes at all. The $\bar{R}^2$ value for the equation as written in equation 2 is .9311. For the simple form with DCR and DPO always set equal to zero, the corresponding $\bar{R}^2$ is .9230.

the credit rationing, therefore, home building would simply remain constant at the 1988:4 base level.[21]

The 1 percent increase in mortgage interest rates depresses housing fairly rapidly, with substantially all of the effect occurring within four quarters. The full effect is to depress the level of spending by approximately 9 percent (left scale), or roughly $19 billion in constant 1982 dollars, based on the 1988:4 level (right scale).[22] The imposition of credit rationing acts more slowly but has approximately the same effect after four quarters. Apart from differences in timing, therefore, these results imply that, given the relatively high level of real interest rates prevailing in 1988:4, it takes an increase of approximately 1 percent in mortgage interest rates to have an effect on home building comparable to that of a 1960s-1970s credit rationing episode.[23]

What about the possibility that home buyers have become more interest sensitive in recent years, so that monetary policy can still depress housing without large increases in mortgage rates despite the inability to create conditions of credit rationing as in the past? These relationships provide only modest evidence to support such a claim. For the 1964:3-1988:4 sample, the estimated sum of the b_i coefficients in equation 2 is −1.095 (t-statistic −4.5). For the 1964:3-1976:4 and 1977:1-1988:4 samples taken separately—that is, dividing the full sample approximately in half—the corresponding sums are −.954 (t-statistic −1.1) and −1.320 (t-statistic −3.9), respectively.[24] Moreover, even this modest difference is difficult to

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21 The simulation does, however, allow for incremental effects via changes in the stock of residential capital. As is clear from equation 2 as written, the deposit growth rate does not matter in the absence of credit rationing, The credit rationing simulation uses a base value of 4.45 percent (the 1988 average) for DSL in quarter 0 and before, and −1.55 percent from quarter 1 on.

22 For purposes of comparison, here and below, aggregate gross national product in 1988:4 was $4,033.4 billion in 1982 dollars.

23 Because one of the variables held fixed in the simulations is the rate of increase in the CPI rental index, the mortgage rate increase under study here is explicitly an increase in the *real* interest rate on mortgage loans. The base real interest rate matters in this simulation because the equation is in logarithmic form.

24 The finding of no significant (economically or statistically) change in the interest sensitivity of housing investment corresponds to the conclusion reached by Akhtar and Harris (1987) on the basis of a much simpler model.

interpret, because of changes in the coefficient on the lagged stock of residential capital (e). The effect of real interest rates on housing may be either large or small, depending on one's point of view, but there is no firm basis here for concluding that in recent years it has been larger or smaller than it was earlier.

Business fixed investment

Business capital spending typically exhibits less cyclical volatility than does housing, at least on a percentage basis. But because capital spending bulks much larger in overall economic activity, the dollar decline in capital spending has exceeded the dollar decline in housing in four of the seven post-Accord recessions.[25]

A standard approach to modeling business investment behavior, which the **FRB-MPS** model also follows, treats spending on structures and spending on equipment separately. Spending on equipment is by far the larger of the .two, usually almost three-fourths of the total. Moreover, a typical finding in, the empirical literature that distinguishes between these two components of business investment is that spending on equipment exhibits economically important and statistically significant sensitivity to changes in the relevant cost of capital—caused by changes in tax rates, changes in financial markets, and so on—while spending on structures does not.[26]

The **FRB-MPS** model's treatment of business equipment spending follows the standard neoclassical investment model according to which the capital stock adjusts over time to an optimal value determined by the level of output and the optimal capital-output ratio, which in turn depends on the cost of capital. The specific relationship is

$$(4)\ IE_t = \sum_{i=0}^{16} a_i\,[XB_{t-i}\ V_{t-i-1}] + \sum_{i=1}^{16} b_i\,[XB_{t-i}\ V_{t-i}] + \sum_{i=1}^{16} c_i\,[XB_{t-i-1}\ V_{t-i}]$$

25 See again Table 1.

26 See, for example, Bischoff (1971b). Experimentation based on an analog to equation 4 below similarly failed to reveal any significant sensitivity for investment in structures.

where IE is real expenditures on producers' durable equipment; XB is gross business output; V is the equilibrium ratio of equipment to output; and the a_i, b_i, and c_i are coefficients to'be estimated.[27] The equilibrium equipment-output ratio is given by the cost ratio

$$(5)\ V = \frac{PXB}{RRE}$$

where PXB is the implicit price deflator corresponding to XB and RRE is the per-unit after-tax rental rate for producers' equipment, determined as

$$(6)\ RRE = PE \frac{[1-K-TC \cdot Z]}{1-TC} (DE + RFE)$$

where PE is the implicit price deflator corresponding to IE, K is the percentage investment tax credit (if any), TC is the federal corporate income tax rate, Z is the present value of the depreciation allowance for equipment, and DE is the relevant depreciation rate. Finally, RFE, the real financial cost of capital for equipment, is determined as

$$(7)\ RFE = DR \left\{ (1-TC)\ RCB - \dot{PX} \right\} + (1-DR) \frac{ERN}{PRI}$$

where DR is the ratio of debt to total capitalization for nonfinancial corporations, RCB is the corporate bond rate, $\dot{PX}$ is the recent average inflation rate for gross domestic product, and ERN/PRI is the earnings-to-price ratio for the Standard & Poor's 500.[28]

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27 The equation also includes seasonal dummy variables. See, for example, Bischoff (1971a) and the references cited there.

28 A key feature of this model that has importantly influenced the literature of empirical findings based on it is the assumption, here embedded in the form of equations 6 and 7, that changes in the cost of capital due to tax factors and changes in the cost of capital due to market rates of return on debt and equity exert isomorphic effects on investment. See Jorgenson (1963) for a discussion of the basic theoretical conceptions underlying the model. Especially for sample periods during which there was little actual change in measured debt and equity returns, the inferred effects of hypothetical changes primarily reflect actual effects of changes in the tax factors.

Given equations 4—7, monetary policy directly affects business fixed investment in two ways. Changes in the corporate bond rate alter the financial cost of capital and thereby affect the rental rate, hence the equilibrium equipment-output ratio and, over time, actual expenditures on new equipment. In addition, to the extent that monetary policy influences the stock market, the resulting change in the effective yield on equity (for given earnings) acts in the same way as a change in the corporate bond rate. (In a general equilibrium context, of course, there are also secondary effects due to changes in output, goods prices and earnings, but the focus of attention here is on the immediate, direct effects of monetary policy.)

Unraveling the separate effect of the a_i, b_i and c_i coefficients that together determine the time response of equipment investment to changes in output and in the optimal equipment-output ratio is both complex and unilluminating. More to the point is that the total effect is unambiguously positive and statistically significant. For the 1958:2-1988:4 sample, the combined sum of the a_i, b_i and c_i coefficients is positive, with t-statistic 2.5. For given values of output, goods prices, and the relevant tax parameters, therefore, an increase in the (real) corporate bond rate depresses spending on new equipment, as does a decline in stock prices.

For purposes of analyzing the immediate effects of monetary policy on business investment spending, simply taking as given any specific change in the corporate bond rate is straight forward. By contrast, some additional apparatus is necessary to represent the part of the effect on investment that takes place through changes in stock prices, and hence (for given earnings) in the earnings-to-price ratio. The auxiliary equation used for this purpose here is

$$(8)\ PRIL_t = d + e\,t + \sum_{i=0}^{6} f_i\, RCP_{t-i} + \sum_{i=0}^{6} g_i\, (RCP - \dot{CPI})_{t-i}$$

where PRIL is the logarithm of the market value of corporate equity; t is a linear time trend; RCP is the commercial paper rate; CPI is the rate of increase of the consumer price index; and d, e, the f_i and the g_i are coefficients to be estimated. The results of estimating equation 8 for the 1956:1-1988:4 sample indicate that increases in short-term interest rates depress stock prices regardless of whether or not

they are accompanied by inflation. The estimated sum of the f_i coefficients is $-.0675$, with t-statistic -3.8, so that a 1 percent (that is, one percentage point) increase in the commercial paper rate lowers stock prices by nearly 7 percent (that is, to a level equal to .93 times the previous level). By contrast, the estimated sum of the g_i coefficients is indistinguishable from zero.[29]

In contrast to the results for housing investment, estimating equation 4 for different sample periods does indicate a substantial change over time in the behavior of business equipment investment. In particular, in recent years firms' investment behavior has apparently become more sensitive to variations in output and in the various determinants of the optimal equipment-output ratio. Chart 2 illustrates this change by plotting the results of two simulations that differ only in the sample used to estimate equation 4.[30] In both cases the experiment analyzed is an increase of 1 percent (as before, one percentage point) in both the corporate bond rate and the commercial paper rate beginning in quarter 1. The higher corporate bond rate directly raises the debt component of the cost of capital in equation 7, while the higher commercial paper rate raises the equity component by lowering stock prices as in equation 8. Throughout both simulations all variables other than the two interest rates and the level of stock prices are normalized to their historical 1988:4 values, and these three variables are set equal to their 1988:4 values for all quarters prior to and including quarter 0. In the absence of the interest rate increases, therefore, equipment investment would simply be constant throughout at its 1988:4 level. In addition, both simulations rely on a single set of coefficient values in equation 8, so that the difference shown is strictly due to differences in the estimated coefficients in equation 4.[31]

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29 The estimated value is .0012, with t-statistic 0.0.

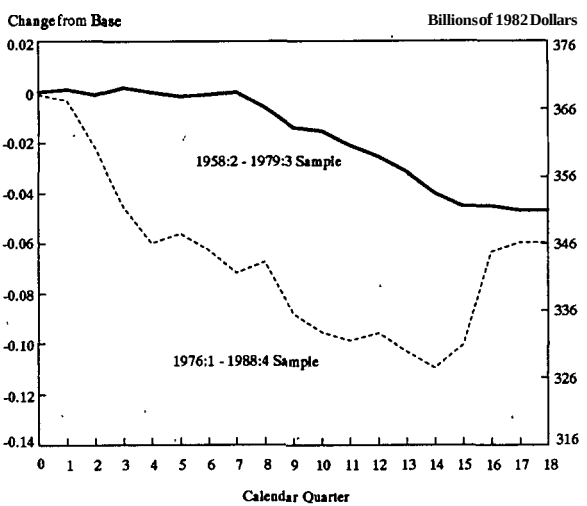
30 Choice of 1979:3 for the end of the first sub-sample corresponds to a familiar benchmark used in discussions of how monetary policy has changed, based on the Federal Reserve's introduction of new monetary policy procedures in October 1979. Choice of 1976:1 (rather than 1979:4) as the beginning of the second sub-sample merely reflects the need for additional observations to facilitate suitable estimation of so many parameters.

31 Using identical coefficient estimates for equation 8 in both simulations is consistent with the emphasis in this paper on changes more directly bearing on nonfinancial economic activity, rather than changes among financial variables per se. In a more general context, however, there is no reason not to allow the coefficients in equation 8 to change along with those in equation 4.

For equation 4 estimated using the 1958:1-1979:3 sample (the solid line), the decline in equipment spending that results from a 1 percent increase in both short- and long-term interest rates is modest in extent and gradual to take place. Little change occurs for the first six quarters, and the ultimate effect (which, by assumption, is complete after 18 quarters) is to depress equipment spending by 4.7 percent of its base level, or by $17 billion in 1982 dollars based on the 1988:4 value.[32] For equation 4 estimated using the 1976:1-1988:4 sample (the dashed line), the corresponding effect is somewhat greater. The ultimate result is to depress equipment spending by 6 percent, or $22 billion in 1982 dollars based on the 1988:4 value. Even more so than this difference in magnitude of the ultimate effect, however, the timing is very different. In the simulation based on the later sample, equipment spending falls approximately to the new (par-

Chart 2

Investment In Producers' Equipment: Response to 100 Basis Point Increase In Corporate Bond and Commercial Paper Rates



Note: Base = 1988:4; Earnings/Price = 8.5%; Corporate Bond Rate = 10%; Debt/Capitalization = 67%;
Quarterly Figures Are Annualized

32 The gradualness of the change is typical of results found using data from before the 1980s. *See,* for example, Clark (1979).

tial) equilibrium level within a year, after which the interim decline overshoots the equilibrium by roughly a factor of two, before ultimately recovering.[33]

The finding that business investment in new equipment is now more sensitive to monetary policy actions, especially in the short run, than it was in prior decades no doubt reflects a complex interaction among several different effects which will require substantial further research to sort out.[34] For example, changes in the tax code legislated in the 1980s result in a greater share of the pre-tax interest burden of debt passing through to the borrowing corporation on an after-tax basis, and thereby presumably make firms more sensitive to interest rate changes.[35] At the same time, the increasing sensitivity of business capital spending to financial conditions is certainly consistent with the implications of the more heavily leveraged position of the corporate sector in recent years, as reviewed in the first section, including in particular the historically large share of earnings required in the 1980s for interest payments. Given the deterioration of interest coverage, first in the 1970s and then even more so after 1980, it is hardly surprising that the typical firm now cuts back its investment spending more promptly when market interest rates rise.[36]

Consumer spending

Whether financial factors affect consumer behavior—and, if so,

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33 The FRB-MPS model results reported by Brayton and Mauskopf (for the 1961:1-1979:4 sample) constrained the a_i, b_i and c_i coefficients to lie along respective thirddegree polynomials. The results underlying Chart 2, reported in Appendix B, imposed no such constraint, hence permitting the irregular pattern shown in the chart.

34 This result, too, roughly accords with the finding of Akhtar and Harris (1987), despite their use of a much simpler model. In their results, however, it is also the long-run effect that differs.

35 The effective tax rate series used here is analogous to series (1) in Auerbach and Hines (1988), disaggregated to reflect equipment investment only, and updated through 1988. I am grateful to them for providing their unpublished series, as well as for helpful discussions.

36 Bosworth (1989) suggested several other reasons for expecting instability in relationships involving equipment investment, including unusually great changes in the relative price of equipment—at least as calculated by the Commerce Department for purposes of these data (see Bailey and Gordon [1988])—and the changing composition of equipment spending, in both cases with computers playing the central role. Yet another consideration along these lines is the changing (first rising, then declining) importance of investment for purposes of pollution control; see, most recently, Rutledge and Stergioulas (1988).

how—is a long debated issue. Early Keynesian consumption functions related spending solely to income levels, as did early versions of the "permanent income" hypothesis.[37] By contrast, from the outset, the closely related "life cycle" hypothesis emphasized the role of consumers' wealth and hence, at least implicitly, the importance of changes in asset prices. Yet a different line of inquiry has sought, without much success, to document effects on consumer spending due to interest rates directly.[38]

To a large extent, the experience of the 1980s has apparently belied the importance of financial influences on consumer behavior along either of these two lines. Despite record high real after-tax interest rates in the 1980s--due to a combination of high pre-tax interest rates, reduced inflation (given the non-neutrality of the tax code), and lower tax rates—personal saving fell to record lows as a share of income. And although purchases of consumer durables did slow briefly after the October 1987 stock market crash, the decline was both milder and shorter-lived than most traditional life cycle models would have predicted in light of the severity of the crash.

The FRB-MPS model's treatment of consumption combines a Keynesian approach based on income flows and a life cycle approach based on wealth levels, as is presumably appropriate when a large part of the consuming population faces liquidity constraints.[39] It further disaggregates both income and asset totals in ways intended to capture differences in behavior among different groups of income recipients, as well as differences in the liquidity properties of different assets. The specific relationship is

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37 Friedman (1957) used a three-year moving average of past income to proxy perceived permanent income.

38 See, for example, Boskin (1978) and Howrey and Hymans (1978).

39 For evidence on the importance of liquidity constraints in this context, see Hayashi (1982), Hall and Mishkin (1982) and Zeldes (1989).

$$(9)\ C_t = a + \sum_{i=0}^{6} b_i\,(1-TP_t)\,YL_{t-i} + \sum_{i=0}^{6} c_i\,(1-TP_t)\,YP_{t-i} + \sum_{i=0}^{6} d_i\,YT_{t-i} + \sum_{i=0}^{6} e_i\,EQ_{t-i} + \sum_{i=0}^{6} f_i\,OFW_{t-i} + \sum_{i=0}^{6} g_i\,TAN_{t-i}$$

where C is consumer expenditures, **YL** is labor income, **YP** is property income, YT is income from transfer payments, EQ is household holdings of equities, OFW is the remainder of household financial wealth (financial assets minus liabilities), and TAN is household holdings of tangible assets—all measured in real per capita magnitudes; TP is again the average tax rate on personal income; and the a, b_i, . . . , g_i are coefficients to be estimated.[40]

Estimating equation 9 for the 1955:4-1988:4 sample delivers results that are both economically sensible and, for the most part, statistically significant. The marginal propensity to consume out of each of the three different forms of income is positive, and it differs among them in ways that correspond to conventional expectations. The estimated values of the respective coefficient sums are .61 for labor income (t-statistic 7.2), .21 for property income (t-statistic 0.7). and .75 for transfer payments (t-statistic 3.9). The marginal propensity to consume out of each different form of wealth is also positive, although in this case it is not clear what prior expectations one would have about the differences among them. The estimated values of the respective coefficient sums are ,022 for equity (t-statistic 1.6)—that is, a 2.2 cent change in spending for every $1 change in the value of equity holdings—. 168 for other financial wealth (t-statistic 4.0), and .077 for tangible assets (t-statistic 2.8).

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40 As in much of the related literature, the FRB-MPS model distinguishes consumption of nondurable goods and services (including the implicit services provided by durables) from expenditures to purchase new durable goods. Indeed, much of the empirical literature addressing financial effects on consumer spending focuses primarily, or even exclusively, on durable goods purchases; see, most recently, Akhtar and Hams (1987). By contrast, the equation estimated here simply treats C as total consumption expenditures in the NIPA accounts. This choice reflects the result of initial experimentation with both aggregate and disaggregated equations.

Given equation 9, the direct effects of monetary policy on consumer spending follow immediately from the effect of interest rates on property income (of which almost one-half has been interest income since 1970, and more than one-half in the 1980s) and on asset prices. In light of the substantial literature associated with the theoretical possibility of a nonzero interest elasticity of saving, however, it is also worth asking whether there is evidence to support the claim that interest rates affect consumption directly, in addition to their effects via property income and asset prices. The answer is that there is not—at least not in the context of a mixed Keynesian-life cycle consumption function like equation 9. Re-estimating equation 9 with the addition of a distributed lag on the commercial paper rate, or on the commercial paper rate minus the rate of increase of the consumer price index, results in estimated coefficients for these variables that are both small and statistically insignificant.[41] (In addition, monetary policy presumably affects consumer spending in other ways, most obviously by reducing labor income. But the focus here is on direct effects rather than repercussions from other aspects of economic activity.)

Investigating the effect of monetary policy on consuption via equation 9 therefore requires a representation of the link between interest rates and asset values, and also between interest rates and property income. The four auxiliary equations used for this purpose are each of the form

$$(10)\ EQ_t = h + k\,t + \sum_{i=0}^{6} m_i\, RCP_{t-i} + \sum_{i=0}^{6} n_i\, (RCP - \dot{CPI})_{t-i}$$

where the right-hand side variables are as in equation 8. Table 3 summarizes the respective estimated effects of nominal and real interest rates in these four equations. For equities and other financial wealth, changes in short-term interest rates again affect real asset values (negatively) regardless of whether or not they are accompanied by inflation. As is to be expected, the reverse is true for tangible assets. There what matters (negatively) is real interest rates. Finally, the results for property income are also about as one would expect.

41 For the nominal short-term rate, the estimated coefficient sum is −13.2, with t-statistic −1.3. For the real short-term rate, the estimated sum is −2.3, with t-statistic −0.3.

Changes in short-term real interest rates affect property income positively, although the effect is not statistically significant. Joint changes in nominal short-term market rates and inflation affect property income negatively—presumably because so much of household wealth is in instruments, like saving and checking deposits, bearing interest rates that adjust sluggishly if at all.

Table 3
Summary of Estimated Interest Rate Effects on Asset Prices and Property Income

Equation	RCP		RCP-CPI	
EQ	−430.5	(−3.6)	26.3	(0.2)
OFW	−116.3	(−4.5)	30.5	(1.1)
TAN	−49.7	(−1.2)	−129.7	(−3.0)
TP	−19.3	(−2.6)	8.3	(1.1)

Note: Values shown are estimated sums of coefficients (t-statistics in parentheses). Sample period is 1955:1-1988:4

Chart 3 shows the results of using equation 9 and the four equations like equation 10—one each for EQ, OFW, TAN and YP—to simulate the effect on consumption of monetary policy, represented once again by a 1 percent (that is, one percentage point) rise in the commercial paper rate beginning in quarter 1. Apart from the interest rate, the three wealth components, and property income, all other variables are normalized throughout to their historic 1988:4 values. As usual, the variables that change in the simulation are fixed at their 1988:4 values for all quarters prior to quarter 1.

As in the case of business capital spending, the effect of monetary policy apparently differs in recent years from what it was in the past. The two lines in Chart 3 show results for simulations that are identical except for the sample used to estimate equation 9.[42] For coeffi-

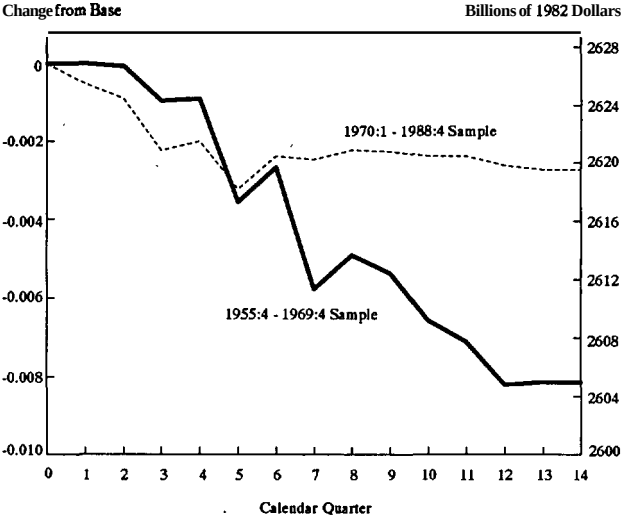
42 The choice of the two sub-samples reflected an approximate halving of the sample period, together with a (slight) preference for conforming to popular discussions that often draw distinctions by decades. The same coefficient values for the four auxiliary equations 10, estimated for the full 1955:1-1988:4 sample, are used in both simulations; see again, footnote 31.

cient values based on the 1955:4-1969:4 sample (the solid line), a 1 percent increase in short-term interest rates ultimately lowers consumer spending by 0.8 percent. While this percentage change may appear small, the effect is still highly meaningful in terms of the ability of monetary policy to affect economic activity because consumption bulks so large in aggregate spending. Based on the 1988:4 level, the resulting decline in consumer spending is equivalent to $21 billion in 1982 dollars—a greater amount than in any of the simulations shown in Charts 1 and 2.

For coefficient values based on the 1970:1-1988:4 sample, the ultimate effect of tight money on consumption is much smaller. A 1 percent rise in short-term interest rates depresses spending by only 0.3 percent, or $7 billion in 1982 dollars. In contrast to the long time required for the effect to become complete in the simulation based on the earlier sample, however, here the effect is substantially complete within one year. Indeed, during the first year after the rise in interest rates, the effect on consumer spending is greater in the results

Chart 3

Personal Consumption Expenditures: Response to 100 Basis Point Rise In Commercial Paper Rate



Note: Base Quarter = 1988:4
Quarterly Figures Are Annualized

based on the more recent sample.[43] To the extent that episodes of tight money typically last not much more than a year, if that long, these results therefore suggest that the ability of monetary policy to affect real economic ability by slowing consumer spending is approximately unchanged.[44]

Foreign trade

Finally, the larger share of both exports and imports in the aggregate U.S. economy in recent years raises the prospect of an enhanced opportunity for monetary policy to affect real economic activity through the impact of interest rate changes on dollar exchange rates. Despite uncertainty about the magnitudes of the relevant income and price elasticities, there is substantial agreement that export demand depends on the level of economic activity abroad while import demand depends on income levels in the United States, and that both exports and imports depend on the relevant terms of trade. The FRB-MPS model specifies these relationships as

$$(11)\ EX_t = a + \sum_{i=0}^{4} b_i\, WIP_{t-i} + \sum_{i=0}^{6} c_i\, TTEX_{t-i}$$

$$(12)\ IM = d + \sum_{i=0}^{4} e_i\, X_{t-i} + \sum_{i=0}^{6} f_i\, TTIM_{t-i}$$

where EX and IM are real non-agricultural exports and real non-petroleum imports, respectively; WIP is industrial production out-

43 In contrast to the results shown in Chart 3, Akhter and Harris (1987) concluded that the "long-run" interest sensitivity of consumer spending has increased in recent years. Wholly apart from their focus on purchases of durables only, versus aggregate consumption expenditures here, the explanation may lie in the different dynamics of their simpler equation. In particular, the finding here that consumer spending is somewhat *more* sensitive in the first year may—given the equations' different dynamic structures—be the appropriate counterpart of Akhtar and Harris' result.

44 As the coefficient values reported in Appendix B suggest, the principal source of the difference is the change in the sensitivity of consuption to the three asset values, including especially equities. A further reason for not emphasizing the differences between the two sets of results is that, while the coefficient sum for the three assets is plausible enough in both samples—.15 in the earlier sample, .29 in the later—some of the individual asset sums are not plausible, and the same is true for property income.

side the United States; X is U.S. gross national product; and TTEX and TTIM are the U.S. terms of trade with other countries, weighted by the volume share of each country in U.S. export trade and U.S. import trade, respectively—all in logarithms; and a, . . . , f_i are coefficients to be estimated.

Estimating equations 11 and 12 delivers results broadly in line with standard notions about how activity levels and real exchange rates affect international trade. For the 1968:1-1987:4 sample, the sum of the estimated coefficients on foreign industrial production in equation 11 is 1.81, with t-statistic 15.8. The corresponding sum for U.S. gross national product in equation 12 is 2.56, with t-statistic 43.7. The coefficient sums for the terms of trade variables are −.347, with t-statistic −2.9, in equation 11—that is, an improvement in the U.S. terms of trade, corresponding to a deterioration in other countries' terms of trade with the United States, reduces demand for U.S exports—and .739, with t-statistic 11.5, in equation 12.[45]

Since the terms of trade variables in equation 11 and equation 12 are simply weighted exchange rates, adjusted by relative prices, the familiar connection between interest rates and exchange rates immediately implies an effect of monetary policy on the terms of trade, and hence on both exports and imports. Following equations 8 and 10 above, the auxiliary equations used here to represent this link are both of the form

$$(13)\ TTEX_t = g + h\,t + \sum_{i=0}^{6} k_i\, RCP_{t-i} + \sum_{i=0}^{6} m_i\, (RCP - (\dot{CPI})_{t-i}$$

where the right-hand-side variables are again as before. In sharp contrast to the effects of short-term interest rates on asset values, the evidence strongly indicates that exchange rates depend on real rather than nominal interest rates. For the 1968:1-1987:4 sample, the estimated coefficient sum for the real interest rate in the export-weighted terms of trade equation is .0560, with t-statistic 20.0, while the estimated sum for the nominal rate is −.0055, with t-statistic −1.5. The corresponding sums for the import-weighted terms of trade

45 Empirical estimates of the elasticities of exports and imports with respect to the terms of trade have varied widely in the literature; see the survey of such results in Helliwell and Padmore (1985).

are ,0565 (t-statistic 19.8) for the real rate and −.0004 (t-statistic −0.1) for the nominal rate.

Charts 4 and 5 show the results of simulating the effects of monetary policy on U.S. foreign trade, based on the usual 1 percent increase in the commercial paper rate. The terms of trade equations underlying these simulations are, in each case, estimated for the 1968:1-1987:4 sample.[46] Each figure shows different results based on the export and import equations estimated first for 1968:1-1979:4 and then for 1980:1-1987:4.[47]

Both exports and imports exhibit less sensitivity to fluctuations in the terms of trade—and therefore less sensitivity to interest rates, and hence to monetary policy—in the more recent sample. In the earlier sample, the 1 percent increase in interest rates causes the dollar to appreciate by enough to depress U.S. exports by 5.2 percent, and to boost U.S. imports by 4.8 percent, resulting in a net subtraction from U.S. economic activity equivalent to $36 billion in 1982 dollars based on historic 1988:4 values. The corresponding percentage effects on exports and imports in the later sample are −4.2 percent and 2.1 percent, respectively, resulting in a $21 billion real net subtraction from total activity at 1988:4 values.

Given the increased volatility of exchange rates, it is not surprising that the responsiveness of both exports and imports to fluctuations in the terms of trade has moved in the direction that offsets at least part of the larger role of foreign trade in the U.S. economy.[48] What is interesting about the results summarized in Charts 4 and 5 is the finding that, especially in the case of imports, the smaller (in absolute value) responsiveness is more than sufficient to offset the larger foreign trade share, therefore resulting in a smaller overall effect on aggregate economic activity. To be sure, having more exports and more imports relative to aggregate U.S. output and spend-

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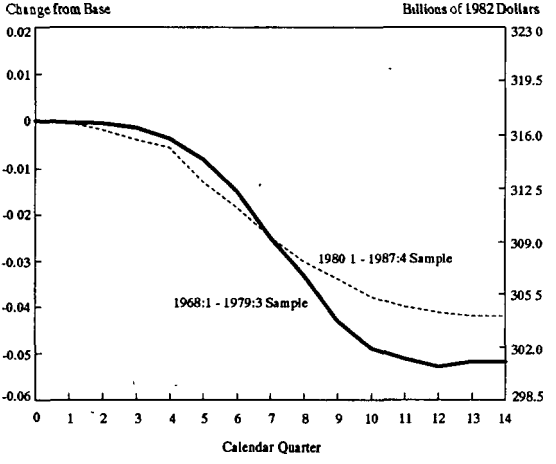
46 To guard against the possibility that the use of data from 1968-72 (that is, before the floating exchange rate regime) might have affected the estimates for the terms of trade equations, both equations of form in equation 13 were also estimated using the 1973:1-1987:4 sample. The results were essentially unchanged. See again footnote 31 on the logic of not dividing the sample used to estimate equation 13 in parallel with the sub-samples used for equation 11 and equation 12.

47 Breaking the sample after 1979:4 reflects the increased volatility of exchange rates in the 1980s.

48 See again Helliwell and Padmore (1985).

Chart 4

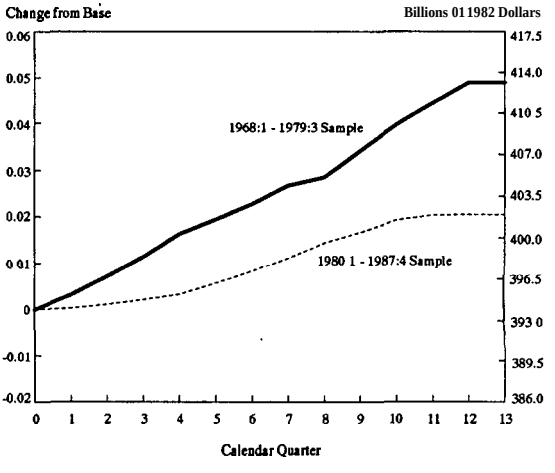
Non-Agricultural Exports: Response to 100 Basis Point Rise In Commercial Paper Rate



Note: Base = 1988:4,
Quarterly Figures Are Annualized

Chart 5

Non-Petroleum Imports: Response to 100 Basis Point Rise In Commercial Paper Rate



Note: Base = 1988:4;
Quarterly Figures Are Annualized

ing provides a larger base through which exchange rates can affect real activity. But with exports and imports less sensitive to dollar values, interest rates and exchange rates now have to move not less but more in order to achieve the same real effects.

Conclusions and caveats

Major changes have taken place in the U.S. economy within the past quarter century. Three of these changes have implications that, at least potentially, are especially important for the ability of monetary policy to affect real economic activity. First, the elimination of Regulation Q interest ceilings and the development of the secondary mortgage market have deprived monetary policy of the ability to slow economic activity, via a decline in home building, merely by increases in short-term interest rates not accompanied by increases in asset yields and declines in asset values more generally. Second, the greater openness of the U.S. economy, including both goods markets and financial markets, has broadened the potential base of effects on economic activity due to changes in dollar exchange rates but has also complicated other key linkages in the monetary policy process. Third, the rapidly increasing indebtedness of private borrowers, including especially nonfinancial business corporations, has made the economy's financial structure more fragile and hence has increased the risks associated with business recessions.

As is becoming increasingly widely known, these changes—and presumably others as well—have in turn led to major changes in standard reduced-form relationships of the kind that often stand behind quantitative analysis of monetary policy at either formal or informal levels. Relationships between aggregate economic activity and financial variables that could plausibly represent the influence of monetary policy show little useful stability over the past quarter century. Many variables that earlier exhibited statistically significant relationships to real output no longer do so, and in some cases the opposite is true. Even for variables that were significantly related to output earlier and continue to be so, the quantitative relationships have changed in ways that are not just statistically significant but economically important. The principal implication of all this for the conduct of monetary policy is that, whatever may have been true in the past, familiar simple relationships of this kind do not provide a sound basis for policymaking at this time.

Examination of relationships between monetary policy and economic activity at a more detailed, disaggregated level indicates a variety of potentially relevant changes within the past quarter century, most of them at least broadly consistent with the changes that have taken place in the underlying economic environment. The elimination of major episodes of credit rationing in the mortgage market has clearly rendered housing less sensitive to restrictive monetary policy; Moreover, there is no solid evidence of change in the sensitivity of home building to mortgage interest rates. Business fixed investment has apparently become more sensitive to financial market conditions, at least in the short run, as is to be expected from the much higher leverage now carried by the typical nonfinancial firm. By contrast, consumer spending has apparently become less sensitive to interest rate increases and stock price declines, at least in situations that persist for lengthy periods of time. Although foreign trade has clearly grown relative to aggregate U.S. economic activity, both exports and imports exhibit less sensitivity to exchange rate changes (perhaps because exchange rates have become more volatile), and hence presumably less sensitivity to monetary policy actions, than in earlier years.

Especially in light of the conditions that have confronted U.S. monetary policy since simpler relations connecting income growth or price inflation to money growth broke down, the practical role of empirical findings like these is to enable policymakers to do more—presumably to do better—than following mechanical rules like changing the federal funds rate by one-fourth of a percentage point and then waiting to see what happens next before making another change. The potential shortcomings of such interest rate formulae—due in part to lags in the effect of policy actions on the economy, in part to the insufficiently clear distinction in practice between real and nominal interest rates, and in part to the tendency to confuse interest rates as a means of influencing the economy with interest rate control as an end in itself—are certainly well known from the experience of the 1950s and 1960s.[49] Part of the contribution of empirical relationships like those developed in this paper is therefore

[49] See Friedman (1988c). The classic review of these issues in their historical context is by Brunner and Meltzer (1964).

to help guide policy in an environment in which simple relationships based on money growth have disappeared and mechanical rules based on interest rates expose policy decisions to traps like those that have had such severe consequences in the not so distant past.

At the same time, substantial caution is appropriate before going on to apply in practice any specific set of results like those developed here. One reason, already emphasized above, is the need to take account of repercussion effects that could—in some cases, presumably would—substantively alter the empirical inferences drawn here on the basis of single-equation relationships alone. Some analytical framework more compatible with the general equilibrium of a highly complex economy, in which different aspects of economic behavior are fundamentally intertwined, is necessary. A second reason, also emphasized above, is that even within the limited context of partial equilibrium analyses, such inferences are not necessarily robust with respect to the specification of the underlying conceptual relationships. Hence comparative empirical investigation of different specifications, not just the ones drawn here from the FRB-MPS model, would be especially helpful.

And third, even if all of the findings reported here were robust with respect to model specification as well as to distinctions between partial and general equilibrium, the changes in the economy studied here are hardly the last that will occur. Changes in the economic environment that matter for macroeconomic behavior—not just in the sense of statistical significance without economic importance, but changes with effects that are central to how monetary policy works—have happened repeatedly in the past, and no doubt will continue to do so.

Taken together, the specific changes reported in this paper probably leave the Federal Reserve System neither more nor less able to influence real economic activity than it used to be. But they also mean that the influence of monetary policy works in different ways, which present different opportunities as well as different risks. Sound policymaking means taking account of those differences, not obscuring them behind aggregate-level relationships or mechanical rules that no longer fit the economy's actual experience.

Appendix A
Glossary of Symbols Used in the Section "Changes in the Sensitivity of Four Components of Spending"

C	Personal consumption expenditures, per capita, 1982 dollars ***NZPA*** (equation 9).
CON	Log of eight-quarter, equally-weighted, moving average of expenditures on consumption of services and nondurable goods, 1982 dollars ***NZPA*** (equation 2).
CPI	Annualized rate of change in consumer price index, on average over current and immediate prior period ***BLS*** (equations 8, 10a-d, 13a-b).
DR	Ratio of debt to total capitalization ***FRS*** (equation 7).
DE	Rate of depreciation for durable equipment, *.16 **BM*** (equation 6).
DCR	Binary variable indicating credit rationed regime ***BM*** (equation 2).
DPO	Credit rationing phase-out parameter ***BM*** (equation 2).
ERN/PRI	Earnings-to-price ratio, Standard and Poor 500 (S&P) (equation 7).
EQ	Per capita value of corporate equities on balance sheet of household sector ***FRS,*** deflated using implicit deflator on consumption expenditures ***NZPA*** (equations 9, 10a).
EX	Log of nonagricultural exports, 1982 dollars ***NZPA*** (equation 11).
IH	Log of per capita expenditures on residential investment, 1982 dollars ***NZPA*** (equation 2).
IH*	Value of IH in most recent period prior to the imposition of credit rationing (equation 2).
IE	Expenditures on purchases of producers' durable equipment, 1982 dollars ***NZPA*** (equation 4).
IM	Log of nonpetroleum imports, 1982 dollars ***NIPA*** (equation 12).
K	Rate of investment tax credit, implicit in Auerbach and Hines (1988), (equation 6).
KH	Per capita residential wealth component of all sectors at current cost ***FRS,*** deflated using implicit deflator on residential investment expenditures ***NZPA*** (equation 2).

OFW	Per capita sum of deposits and credit market instruments, minus total liabilities, on household sector balance sheet ***FRS,*** deflated using implicit deflator on consumption expenditures ***NZPA*** (equations 9, 10b).
PE	Deflator corresponding to IE, ***NIPA*** (equation 6).
PRIL	Log of the market value of corporate equities minus mutual fund shares ***FRS*** (equation 8).
PX	Equally-weighted average of past four quarters rate of inflation on gross domestic product, ***NZPA*** (equation 7).
RCB	Corporate bond yield ***FRS*** (equation 7).
RCP	Interest rate, six-month commercial paper ***FRS*** (equations 8, 10a-d, 13a-b).
RFE	Real financial cost of capital (equations, 6, 7).
RRE	Rental rate for producers' equipment (equations 5, 6).
RH	Log of real after-tax cost of capital for residential investment (equations 2, 3).
SLD	Annual rate of growth of deposits at saving institutions ***FRS,*** deflated using implicit price deflator for residential investment ***NZPA*** (equation 2).
TAN	Per capita sum of tangible wealth components on household sector balance sheet ***FRS,*** deflated using implicit price deflator for consumption expenditures ***NZPA*** (equations 9, 10c).
t	Time index.
TC	Statutory corporate tax rate, implicit in Auerbach and Hines (1988); (equations 6, 7).
TP	Average personal income tax rate, constructed by dividing personal tax and nontax payments by personal income less interest paid by consumers to business and transfers from government ***NIPA*** (equations 3, 9).
TPR	Average property tax rate, interpolated to fill in years not reported ACIR (equation 3).
TTEX	Log of export-weighted terms of trade for the United States, constructed by author using CPIs, nominal bilateral exchange rates, and bilateral trade flows, between the United States and other G-7 countries plus Mexico *IMF* (equations 11, 13a).
TTIM	Log of import-weighted terms of trade for the United States, constructed by author using CPIs, nominal

bilateral exchange rates, and bilateral trade flows, between the United States and other G-7 countries plus Mexico *IMF* (equations 12, 13b).

UE Civilian unemployment rate *BLS* (equation 2).

V Reciprocal of the relative rental cost of capital for producers' equipment (equations 4, 5).

WIP Log of weighted index of world industrial production, constructed by author using industrial production indexes weighted by bilateral U.S. export flows to G-7 countries plus Mexico *IMF* (equation 11).

X Gross national product, 1982 dollars NIPA (equation 12).

XB Gross domestic business product, 1982 dollars NZPA (equation 4).

YL Per capita income from wage and salary disbursements plus other wage income, 1982 dollars *NIPA* (equation 9).

YT Per capita income from transfer payments, 1982 dollars NZPA (equation 9).

YP Per capita property income: sum of interest income, rental income, and proprietors' income, 1982 dollars NZPA (equations 9, 10d).

Z Present value of depreciation allowances under current tax codes, implicit in Auerbach and Hines (1988) assuming 4 percent discount rate (equation 6).

Key to sources:

ACIR Advisory Commission on Intergovernmental Relations.

BLS Bureau of Labor Statistics.

BM Brayton and Mauskopf (1985), see references.

FRS Federal Reserve System, Board of Governors.

IMF International Monetary Fund, International Financial Statistics.

NZPA National Income and Product Accounts, Bureau of Economic Analysis.

S&P Standard & Poor's.

Appendix B
Equations Used in Simulations Reported in the Section on "Changes in the Sensitivity of Four Components of Spending"

Residential Investment:

$$(2)\ IH_t = (1-DCR_t)\left\{(1-DPO_t)[a + \sum_{i=0}^{4} b_i\, RH_{t-i} + c\, CON_t + d\, \Delta UE_t + e\, KH_{t-i}] + f\, DPO_t \bullet IH_{t-i}\right\} + DCR_t\,[\sum_{i=0}^{4} g_i\, \dot{SLD}_{t-i} + h\, UE_t + k\, IH_t^*]$$

Sample: 1964:3 - 1988:4

$a = -5.12$	$b_0 = -0.3862$	$c = 2.072$	$d = -0.0422$	$e = -0.6227$	$f = -0.9979$
(-2.1)	$b_1 = -0.4144$	(3.7)	(-1.6)	(-1.3)	(66.6)
	$b_2 = -0.1379$				
	$b_3 = -0.1846$				
	$b_4 = -0.0286$				
	$\Sigma b = -1.0946$				
	(-4.5)				

$g_0 = 0.000264$	$h = -0.05104$	$k = 1.017$
$g_1 = 0.006959$	(-2.8)	(36.5)
$g_2 = 0.003786$		
$g_3 = 0.008142$		
$g_4 = -0.002634$		
$\Sigma g = 0.016517$		
(0.8)		

$DCR_t = 1$ in the following periods:

1966:3 - 1966:4
1969:3 - 1970:3
1974:1 - 1975:1

$$DPO_t = \max [0.8\, DCR_{t-1}, 0.6\, DCR_{t-2}, 0.4\, DCR_{t-3}, 0.2\, DCR_{t-4}]$$

$\bar{R}^2 = 0.931$ SE = 0.0475 DW = 1.72 $\varrho = 0.89$

Investment in Producers' Equipment:

$$(4)\ IE_t = \sum_{i=0}^{16} a_i [XB_{t-i}V_{t-i-1}] + \sum_{i=1}^{16} b_i [XB_{t-i}V_{t-i}] + \sum_{i=1}^{16} c_i [XB_{t-i-1}V_{t-i}]$$

Sample: 1958:2 - 1979:3

$a_{1'} = 0.0248$		
$a_1 = 0.0808$	$b_1 = -0.0574$	$c_1 = -0.0321$
$a_2 = -0.0376$	$b_2 = 0.0089$	$c_2 = -0.0881$
$a_3 = -0.2983$	$b_3 = 0.3887$	$c_3 = -0.3536$
$a_4 = -0.4623$	$b_4 = 0.8205$	$c_4 = -0.5204$
$a_5 = -0.4238$	$b_5 = 0.9454$	$c_5 = -0.4823$
$a_6 = -0.2815$	$b_6 = 0.7570$	$c_6 = -0.3339$
$a_7 = -0.4287$	$b_7 = 0.7614$	$c_7 = -0.4808$
$a_8 = -0.1623$	$b_8 = 0.6396$	$c_8 = -0.2061$
$a_9 = -0.2465$	$b_9 = 0.4613$	$c_9 = -0.2946$
$a_{10} = -0.5560$	$b_{10} = 0.8383$	$c_{10} = -0.5925$
$a_{11} = -0.4389$	$b_{11} = 1.0116$	$c_{11} = -0.4524$
$a_{12} = -0.3331$	$b_{12} = 0.7939$	$c_{12} = -0.3533$
$a_{13} = -0.0237$	$b_{13} = 0.3679$	$c_{13} = -0.0320$
$a_{14} = 0.2593$	$b_{14} = -0.2225$	$c_{14} = 0.2509$
$a_{15} = 0.1980$	$b_{15} = -0.4526$	$c_{15} = 0.1954$
$a_{16} = 0.0007$	$b_{16} = -0.2050$	$c_{16} = 0.0050$

$\Sigma a + \Sigma b + \Sigma c = 0.0212$
(20.9)

$\bar{R}^2 = 0.997$ SE = 2.78 DW = 1.60 $\varrho = 0.99$

Sample: 1976:1 - 1988:4

$a_{1'} = 0.0117$		
$a_1 = 0.0044$	$b_1 = 0.0550$	$c_1 = -0.0651$
$a_2 = 1.0274$	$b_2 = -0.8742$	$c_2 = 0.8828$
$a_3 = 1.9397$	$b_3 = -2.8328$	$c_3 = 1.8193$
$a_4 = 0.8432$	$b_4 = -2.7318$	$c_4 = 0.7974$
$a_5 = -0.2653$	$b_5 = -0.5080$	$c_5 = -0.3432$
$a_6 = 0.1429$	$b_6 = 0.2665$	$c_6 = 0.0020$
$a_7 = -0.5476$	$b_7 = 0.5227$	$c_7 = -0.6614$
$a_8 = -1.0879$	$b_8 = 1.6613$	$c_8 = -1.1184$
$a_9 = -0.1736$	$b_9 = 1.2786$	$c_9 = -0.1742$
$a_{10} = -0.4547$	$b_{10} = 0.6092$	$c_{10} = -0.4334$
$a_{11} = -0.4548$	$b_{11} = 0.8394$	$c_{11} = -0.3851$

a_{12} = 0.2746	b_{12} = 0.1142	c_{12} = 0.3356
a_{13} = 0.4598	b_{13} = −0.7530	c_{13} = 0.4848
a_{14} = 1.0006	b_{14} = −1.4305	c_{14} = 0.9722
a_{15} = 1.0433	b_{15} = −2.0788	c_{15} = 1.0712
a_{16} = 0.0051	b_{16} = −1.1127	c_{16} = 0.0426

$\Sigma a + \Sigma b + \Sigma c = 0.0215$
(5.9)

$\bar{R}^2 = 0.956$ SE = 9.86 DW = 1.89 $\varrho = 0.89$

$$(8)\ PRIL_t = d + e\,t + \sum_{i=0}^{6} f_i\, RCP_{t-i} + \sum_{i=0}^{6} g_i\, (RCP - \dot{CPI})_{t-i}$$

Sample: 1956:2 - 1988:4

d = 14.35	e = 0.024	f_0 = −0.0216	g_0 = −0.00014
(50.3)	(2.14)	f_1 = −0.0184	g_1 = −0.00309
		f_2 = −0.0087	g_2 = −0.00022
		f_3 = −0.0106	g_3 = 0.00308
		f_4 = −0.0040	g_4 = −0.00065
		f_5 = −0.0083	g_5 = 0.00246
		f_6 = 0.0040	g_6 = −0.00021
		Σf = −0.0675	Σg = 0.00123
		(3.8)	(0.1)

$\bar{R}^2 = 0.903$ SE = 0.0802 DW = 2.00 $\varrho = 0.93$

Consumption Expenditures

$$(9)\ C_t = a + \sum_{i=0}^{6} a_i\,(1-TP_{t-i})YL_{t-i} + \sum_{i=0}^{6} c_i\,(1-TP_{t-i})YP_{t-i} + \sum_{i=0}^{6} d_i\, YT_{t-i} + \sum_{i=0}^{6} e_i\, EQ_{t-i} + \sum_{i=0}^{6} f_i\, OFW_{t-i} + \sum_{i=0}^{6} g_i\, TAN_{t-i}$$

Sample: 1955:4 - 1969:4

$a = 281.8$	$b_0 = 0.2807$	$c_0 = -0.2861$	$d_0 = 0.4096$
(0.3)	$b_1 = 0.0756$	$c_1 = -0.2929$	$d_1 = 0.4807$
	$b_2 = -0.1613$	$c_2 = -0.2065$	$d_2 = -0.2236$
	$b_3 = -0.0127$	$c_3 = 0.6097$	$d_3 = -0.2327$
	$b_4 = 0.2616$	$c_4 = 0.4466$	$d_4 = 0.7444$
	$b_5 = -0.2829$	$c_5 = 0.7057$	$d_5 = 0.1044$
	$b_6 = 0.2174$	$c_6 = -0.0283$	$d_6 = 0.2991$
	$\Sigma b = 0.3783$	$\Sigma c = 0.9480$	$\Sigma d = 1.5818$
	(0.6)	(1.4)	(5.5)
$e_0 = 0.01770$	$f_0 = -0.0313$	$g_0 = -0.0405$	
$e_1 = 0.00950$	$f_1 = 0.0226$	$g_1 = -0.0645$	
$e_2 = 0.00573$	$f_2 = 0.1246$	$g_2 = -0.0097$	
$e_3 = -0.00030$	$f_3 = -0.1551$	$g_3 = -0.2005$	
$e_4 = 0.02055$	$f_4 = 0.1569$	$g_4 = 0.0520$	
$e_5 = -0.02232$	$f_5 = 0.2481$	$g_5 = -0.1106$	
$e_6 = 0.03255$	$f_6 = 0.0008$	$g_6 = 0.0926$	
$\Sigma e = 0.06340$	$\Sigma f = 0.3665$	$\Sigma g = -0.2812$	
(2.4)	(1.9)	(−1.6)	
$\bar{R}^2 = 0.999$	SE = 20.00	DW = 1.79	$\varrho = 0.09$

Sample: 1970:2 - 1988:4

$a = 650.8$	$b_0 = 0.4497$	$c_0 = 0.1351$	$d_0 = -0.1770$
(0.6)	$b_1 = 0.3929$	$c_1 = 0.4648$	$d_1 = -0.2487$
	$b_2 = 0.0321$	$c_2 = -0.3323$	$d_2 = 0.1863$
	$b_3 = 0.2271$	$c_3 = -0.0622$	$d_3 = -0.3993$
	$b_4 = -0.2624$	$c_4 = 0.2450$	$d_4 = 0.2694$
	$b_5 = 0.0823$	$c_5 = -0.3859$	$d_5 = 0.0568$
	$b_6 = -0.2097$	$c_6 = 0.6547$	$d_6 = 0.1418$
	$\Sigma b = 0.7121$	$\Sigma c = 0.7192$	$\Sigma d = -0.1707$
	(2.1)	(2.6)	(−0.2)
$e_0 = 0.02607$	$f_0 = 0.0206$	$g_0 = 0.05409$	
$e_1 = -0.00455$	$f_1 = 0.1188$	$g_1 = -0.01808$	
$e_2 = 0.02787$	$f_2 = -0.0002$	$g_2 = 0.03256$	
$e_3 = -0.03497$	$f_3 = 0.0732$	$g_3 = -0.00007$	
$e_4 = 0.02703$	$f_4 = -0.0335$	$g_4 = 0.01651$	
$e_5 = -0.01190$	$f_5 = -0.0998$	$g_5 = -0.00373$	
$e_6 = -0.02126$	$f_6 = 0.1364$	$g_6 = -0.00617$	
$\Sigma e = 0.00830$	$\Sigma f = 0.2155$	$\Sigma g = 0.07510$	
(0.3)	(2.2)	(2.0)	
$\bar{R}^2 = 0.997$	SE = 51.03	DW = 1.86	$\varrho = 0.38$

$$(10a)\ EQ_t = h + k\,t + \sum_{i=0}^{6} m_i\, RCP_{t-i} + \sum_{i=0}^{6} n_i\, (RCP - \dot{CPI})_{t-i}$$

Sample: 1955:4 - 1988:4

$h = 9570$	$k = 21.87$	$m_0 = -129.50$	$n_0 = 6.67$
(5.1)	(0.3)	$m_1 = -98.30$	$n_1 = -11.64$
		$m_2 = -74.24$	$n_2 = -3.89$
		$m_3 = -79.42$	$n_3 = 28.09$
		$m_4 = -26.61$	$n_4 = -2.09$
		$m_5 = -46.22$	$n_5 = 16.75$
		$m_6 = 23.81$	$n_6 = -7.54$
		$\Sigma m = -430.46$	$\Sigma n = 26.34$
		(−3.6)	(0.2)

$\bar{R}^2 = 0.909$ SE = 537.4 DW = 1.98 $\varrho = 0.93$

$$(10b)\ OFW_t = h + k\,t + \sum_{i=0}^{6} m_i\, RCP_{t-i} + \sum_{i=0}^{6} n_i\, (RCP - \dot{CPI})_{t-i}$$

Sample: 1955:4 - 1988:4

$h = -13033$	$k = 632.2$	$m_0 = -37.97$	$n_0 = -0.87$
(−0.2)	(0.7)	$m_1 = -27.07$	$n_1 = 3.84$
		$m_2 = -18.75$	$n_2 = 0.13$
		$m_3 = -17.57$	$n_3 = 12.67$
		$m_4 = -3.35$	$n_4 = 6.00$
		$m_5 = -16.04$	$n_5 = 7.73$
		$m_6 = 4.44$	$n_6 = 1.00$
		$\Sigma m = -116.32$	$\Sigma n = 30.50$
		(−4.5)	(1.2)

$\bar{R}^2 = 0.998$ SE = 109.2 DW = 2.17 $\varrho = 0.99$

$$(10c)\ TAN_t = h + k\,t + \sum_{i=0}^{6} m_i\, (RCP_{t-i}) + \sum_{i=0}^{6} n_i\, (RCP - \dot{CPI})_{t-i}$$

Sample: 1955:4 - 1988:4

h = 3786	k = 327.1	m_0 = −23.93	n_0 = −0.52
(3.5)	(7.7)	m_1 = 76.99	n_1 = −38.07
		m_2 = −46.77	n_2 = −21.80
		m_3 = 16.39	n_3 = −21.30
		m_4 = −30.46	n_4 = −15.60
		m_5 = −64.20	n_5 = −21.27
		m_6 = 22.25	n_6 = −11.19
		Σm = −49.72	Σn = −129.75
		(−1.2)	(−3.0)
$\bar{R}^2$ = 0.996	SE = 177.3	DW = 1.91	ϱ = 0.96

$$(10d)\ YP_t = h + k\,t + \sum_{i=0}^{6} m_i\,(RCP_{t-i}) + \sum_{i=0}^{6} n_i\,(RCP - \dot{CPI})_{t-i}$$

Sample: 1955:4 - 1988:4

h = 1312	k = 44.45	m_0 = 0.051	n_0 = 1.674
(2.0)	(8.8)	m_1 = 9.646	n_1 = 3.534
		m_2 = −8.355	n_2 = −0.304
		m_3 = 0.901	n_3 = 1.098
		m_4 = −9.568	n_4 = 2.656
		m_5 = −4.972	n_5 = −1.030
		m_6 = −6.994	n_6 = 0.701
		Σm = −19.291	Σn = 8.330
		(−2.6)	(1.1)
$\bar{R}^2$ = 0.991	SE = 33.38	DW = 1.82	ϱ = 0.93

Non-Agricultural Exports

$$(11)\ EX_t = a + \sum_{i=0}^{4} b_i\,WIP_{t-i} + \sum_{i=0}^{6} c_i\,TTEX_{t-i}$$

Sample: 1968:1 - 1979:3

a = 4.075	b_0 = 0.2469	c_0 = −0.0903
(2.5)	b_1 = 0.2061	c_1 = 0.1197
	b_2 = 0.0134	c_2 = −0.3435
	b_3 = 0.4076	c_3 = −0.1353
	b_4 = 0.1814	c_4 = −0.1394
		c_5 = −0.4188
		c_6 = 0.1500

$\Sigma b = 1.0554$ (5.9) $\Sigma c = -0.8576$ (−4.3)

$\bar{R}^2 = 0.958$ SE = 0.0465 DW = 2.06 $\varrho = 0.20$

Sample: 1980:1 - 1987:4

$a = 3586$ (0.0)

$b_0 = 0.8996$
$b_1 = 0.5490$
$b_2 = -0.4791$
$b_3 = -0.0171$
$b_4 = -0.0281$

$c_0 = -0.1582$
$c_1 = -0.1184$
$c_2 = -0.0078$
$c_3 = -0.2388$
$c_4 = -0.0114$
$c_5 = -0.0419$
$c_6 = -0.1169$

$\Sigma b = 0.9242$ (2.3) $\Sigma c = -0.6935$ (−4.3)

$\bar{R}^2 = 0.978$ SE = 0.0167 DW = 1.18 $\varrho = 1.00$

Non-Petroleum Imports

$$(12)\ IM_t = d + \sum_{i=0}^{4} e_i X_{t-i} + \sum_{i=0}^{6} f_i TTIM_{t-i}$$

Sample: 1968:1 - 1979:3

$d = -19.75$ (−6.0)

$e_0 = 1.006$
$e_1 = 2.468$
$e_2 = -0.106$
$e_3 = -1.534$
$e_4 = 0.783$

$f_0 = 0.2322$
$f_1 = 0.3820$
$f_2 = -0.2432$
$f_3 = 0.0063$
$f_4 = -0.0030$
$f_5 = -0.1290$
$f_6 = 0.6215$

$\Sigma e = 2.617$ (8.7) $\Sigma f = 0.8668$ (4.0)

$\bar{R}^2 = 0.901$ SE = 0.0529 DW = 2.04 $\varrho = 0.24$

Sample: 1980:1 - 1987:4

$d = -23.07$ (−6.1)

$e_0 = 1.844$
$e_1 = 0.780$
$e_2 = 0.060$
$e_3 = 1.214$

$f_0 = 0.0430$
$f_1 = 0.0162$
$f_2 = 0.1128$
$f_3 = -0.1414$

$e_4 = -0.590$ $f_4 = 0.1926$
$f_5 = 0.1235$
$f_6 = 0.0189$

$\Sigma e = 3.307$ (8.6) $\Sigma f = 0.3655$ (1.7)

$\bar{R}^2 = 0.995$ SE = 0.0200 DW = 2.01 $\varrho = 0.84$

Terms of Trade

$$\text{(13a) TTEX, } = g + h\,t + \sum_{i=0}^{6} k_i\, RCP_{t-i} + \sum_{i=O}^{6} m_i\, (RCP - \dot{CPI})_{t-i}$$

Sample: 1968:1 - 1987:4

$g = 4.568$ (80.4) $h = -.007509$ (−2.2)

$k_0 = 0.002795$ $m_0 = 0.002562$
$k_1 = -0.007959$ $m_1 = 0.006754$
$k_2 = 0.006422$ $m_2 = 0.008004$
$k_3 = -0.006524$ $m_3 = 0.010384$
$k_4 = -0.000187$ $m_4 = 0.010391$
$k_5 = 0.008503$ $m_5 = 0.008378$
$k_6 = -0.005017$ $m_6 = 0.006920$

$\Sigma k = 0.001593$ (−0.2) $\Sigma m = 0.053393$ (8.3)

$\bar{R}^2 = 0.935$ SE =0.0373 DW = 1.78 $\varrho = 0.75$

$$\text{(13b) TTIM, } = g + h\,t + \sum_{i=0}^{6} k_i\, RCP_{t-i} + \sum_{i=O}^{6} m_i\, (RCP - \dot{CPI})_{t-i}$$

Sample: 1968:1 - 1987:4

$g = 4.583$ (88.9) $h = -0.01390$ (−4.4)

$k_0 = 0.002284$ $m_0 = 0.002764$
$k_1 = -0.007864$ $m_1 = 0.006846$
$k_2 = 0.006816$ $m_2 = 0.008313$
$k_3 = -0.006042$ $m_3 = 0.011233$
$k_4 = 0.001411$ $m_4 = 0.011060$
$k_5 = 0.009943$ $m_5 = 0.008993$
$k_6 = -0.004159$ $m_6 = 0.007101$

$\Sigma k = 0.002388$ (0.4) $\Sigma m = 0.056310$ (9.3)

$\bar{R}^2 = 0.932$ SE = 0.0388 DW = 1.74 $\varrho = 0.71$

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Commentary on 'Changing Effects of Monetary Policy on Real Economic Activity'

Ralph C. Bryant

Many controversial issues traditionally rear their heads when the focus of attention is the conduct of monetary policy. At past conferences with titles and subjects similar to ours today, participants have vigorously debated the old chestnuts: the pros and cons of different operating regimes (the issues of "instrument choice"); the pros and cons of different types of "intermediate-target strategies," including, of course, the appropriate role, if any, for monetary-aggregate targets in the conduct of policy; the appropriate amount of "activism" in varying the instruments of policy (all the various dimensions of the rules versus discretion debate about the conduct of policy); issues about the information that central banks should (or should not) publicly announce about their policies which, in turn, leads to consideration of the public's expectations about the conduct of policy; interactions between monetary policy decisions and fiscal policy decisions; and, not least important, the constraints and opportunities facing an individual nation's monetary authority because of world economic interdependence, and how the individual nation's authority should cope with them.

The important topic about the conduct of monetary policy that has typically been ignored is the state of empirically useful knowledge about how the macroeconomy actually functions, and, in particular, how monetary policy actions are transmitted to the real economy. Too seldom have conference participants focused on the accuracy and reliability of the empirical "models" of the economy available to policymakers. Nor has it been popular to examine whether such

models have been adequately adapted to institutional and structural innovations in the economy.

Happily, this paper by Ben Friedman directly tackles the important empirical topic that usually gets short shrift. It is a pleasure to join Friedman in directing attention to these issues.

The paper is thoughtful and its judgments are balanced, as is typical of Ben Friedman's writing. I do have some questions, and reservations, about particular details. And I tend to be a bit more agnostic about the status of our empirical knowledge than Friedman appears to be in this paper. Nonetheless, Ben proposes generalizations that, on the whole, seem to me plausible. I have had to work fairly hard to do the traditional job of a discussant, namely, to find things to criticize and dispute.

Initial parts of the analysis

The first section of the paper identifies three economic developments of recent years that have presumptively altered the structure of the U.S. economy (or, in any event, the way economists tend to model that structure). The overview presented is informative, and there are only a few nuances where I am even tempted to disagree. I, therefore, pass immediately to the section of the paper that discusses "Evidence from Reduced-Form Relationships."

Friedman believes that recent institutional and regulatory changes in the economy's structure have called into doubt, even more than before, the usefulness for monetary policy of aggregate-level relationships based merely on reduced-form equations or simple intermediate-target relationships. I share this view about the diminished reliability of such relationships as guides for estimating the impacts of monetary policy. And such relationships were never robust in any case.

On many earlier occasions of this type, both Friedman and I have stressed that monetary policy cannot be safely based on simple reduced-form relationships, or on simple intermediate-target relationships.[1] Perhaps there are only a few individuals at this conference

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1 Friedman's many contributions to the debate include Friedman (1975, 1977, 1983, and 1988). For my views, see Bryant (1980, 1983).

who will want to take exception to Friedman's conclusions on this point.

I can imagine that someone who is persuaded otherwise will not find the sparse additional evidence in Friedman's paper fully persuasive. But I scarcely want to take up the cudgels in disagreement with Friedman here. In the last year or so, I have even fondly come to hope that views on many of these old controversial issues have been converging to an unexciting but sensible middle ground.

Because I believe the conclusions stressed in the second section are sound, and by now may even be noncontroversial, I will not linger on the old battlefields. Instead, I go directly to the more interesting and meaty part of Friedman's paper.

Changes in the sensitivity to monetary policy of spending components

As a preface to my comments on the third section of the paper, I first need to summarize the analytical procedures that are followed. Friedman focuses on the effects of financial variables on four main components of real spending. He thinks of these effects as the "first-round" consequences of monetary policy (but acknowledges this focus as just partial rather than a full general-equilibrium treatment). He chooses econometric equations from the 1985-vintage MPS model (of the Federal Reserve Board staff) as a representative characterization of the real spending relationships, and then re-estimates those spending equations, sometimes with minor alterations from the original. When re-estimating, he splits his full sample of data, which begins either in the 1950s or 1960s, into two subsamples; and he then observes how the resulting coefficient estimates differ between the two subsarnples. Friedman also estimates what might be termed "auxiliary" equations in order to be able to simulate the effects of monetary policy actions per se on the right-hand-side financial variables in his spending equations. He does not split the full Sample into two subsamples when estimating these auxiliary equations.

Implicit in Friedman's procedures is a traditional "two-step" approach to thinking about the effects of monetary policy. In step 1, the monetary policy action influences financial sector variables. In step 2, the financial variables then influence real-sector spending decisions.

Finally, Friedman uses his different coefficient estimates from the two subsample equations for real spending relationships, combined with the simulations of right-hand-side variables obtained from his auxiliary equations, to suggest how the effects of monetary policy may differ between the "before" and "after" subsamples. Hence the charts on which attention is focused in his section III.

Several questions can be raised about these econometric and analytical procedures. These technical problems need to be identified here, because they bear directly on the trustworthiness of the section-III conclusions.

In general, Friedman's procedures would be appropriate if the split of his full sample corresponded to the timing of the primary changes in the institutional and regulatory structure of the economy, and if the change in coefficients between the subsamples were a reliable indication of how the actual behavioral relationships have changed. But are these conditions met? I worry that they are not, at least not sufficiently.

One possible difficulty arises right away with the choice of subsample periods. In the paper distributed for the conference, Ben does not indicate why he chose to split the full sample of data as he did. In fact, he selected different splits for the four components of real spending.[2]

These differing choices for where to break the full sample are puzzling to me. I do not find the choices self-evidently compelling as likely dates for changes in behavior for the individual spending components; nor do I understand why the varying choices mesh with the overall analytical purpose of the paper. Take the example of business fixed investment. The years 1976, 1977, 1978, and most of 1979 are included in both subsamples. Why is that overlap included for business fixed investment but not the other components of spending? Or consider aggregate consumer spending, for which the split between subsamples is put at the end of 1969. By the MPS model's identification of credit-rationing periods, which Friedman accepts for his

[2] For residential investment, the two subsamples are 1964-Q1 to 1976-Q4 and-1977-Q1 to 1988-Q4. For business fixed investment, the subsamples are 1958-Q2 to 1979-Q3 and 1976-Q1 to 1988-Q4. For aggregate consumer spending the subsamples are 1955-Q4 to 1969-Q4 and 1970-Q2 to 1988-Q4, while the subsamples for nonagricultural exports and non-oil imports are 1968-Q1 to 1979-Q3 and 1980-Q1 to 1987-Q4.

analysis of home building, the later subsample for consumer spending includes one and one-half out of the three episodes of credit rationing actually observed during the whole sample. It is unclear to me why the subsamples for expenditures on housing and expenditures on consumption should be defined so differently.

It would seem a cleaner procedure to split the whole sample of data at the same point for all the components of spending. If the resulting estimates for the individual spending equations fail to look stable or convincing when that common split is chosen, then that outcome could well be an indication that the equations, themselves, are not satisfactory on other grounds (for any subsamples) and that the procedure of splitting the sample to look at changes in the coefficients is not a robust procedure. At a minimum, it would be helpful for Ben to make explicit the underlying rationale for his choices and for their consistency with his overall analytical objective.

Another possible source of difficulty stems from Friedman's decision not to split the full sample into subsamples for his auxiliary equations. If asked where behavior might most likely have changed in the economy, might we not say that it has changed within the financial sector (where financial innovations and other types of institutional and regulatory changes have been so great) much more than in the real sector? There might have even been a case for splitting the full sample for the auxiliary equations and not for the spending equations; but again, at a minimum, the underlying rationale should be spelled out.[3]

Regardless of the sample or subsamples over which they are estimated, I suspect that the auxiliary equations are somewhat shaky. I conjecture, in other words, that these equations are not accurate (semi-reduced-form) representations of the effects of monetary policy actions on endogenous interest rates. In contrast to the MPS specifications for the spending equations, such auxiliary equations have not received the same amount of careful study and evaluation.

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[3] At one level of rationalization, I can sympathize with not splitting the sample for auxiliary equations: Friedman wants to focus on changes in the effects of financial variables on real spending alone, holding other things unchanged. But this procedure for the auxiliary equations—in effect, estimating a whole-sample equation that is a mixture of effects before and after the institutional and regulatory changes—could lead to misleading inferences about the spending equations if there have been even bigger changes in the auxiliary equations themselves, which offset or reinforce the effects in the spending equations.

As a further comment on the analytical procedures used in this third section of the paper, a mention of current disputes in econometric methodology seems appropriate. In particular, try to imagine what an econometrician schooled in the style of David Hendry (or Edward Leamer?) might say if commenting on these procedures. Such a critic might well take major objection. He would probably observe that we must try to get at "deeper" parameters describing the private sector's macroeconomic behavior in response to financial variables, where such deeper parameters have not changed. Then, he would say, we should try to obtain more direct estimates of the consequences of the institutional and regulatory changes we believe to be important. The essence of this Hendry-style criticism is that conventional procedures for trying to get at the effects of institutional and regulatory changes—such as those used here by Friedman—are often not robust enough to justify the conclusions based on them. Many types of equation misspecification could lead to the nonconstancy of parameters observed across Friedman's subsamples. Some of those misspecifications could be examined through diagnostic tests. In the absence of such tests, one could incorrectly attribute the quantitative changes of the estimated parameters across subsamples to "institutional" or "regulatory" or "structural" changes.

I am no econometric theorist, and certainly cannot credibly articulate the nuanced views of a David Hendry. Nor do I wish to push this line of thought too far. The equations in the MPS model are thoughtful efforts to capture the effects of macroeconomic behavior; and they embody a long history of research. I think Friedman has appropriately chosen, them as a focus of attention. Nonetheless, the MPS equations as re-estimated by Friedman are not immune to some of the Hendry-style criticisms. The criticisms may be relevant especially because Friedman's estimates might be substantially different for varying definitions of the subsamples.

I turn now to the substance of the conclusions. By the way, there are two other recent studies that have addressed essentially the same empirical issues. Friedman does not mention them, but they are relevant here. They are analyses by M.A. Akhtar and Ethan Harris (1987) done at the Federal Reserve Bank of New York and by Barry Bosworth (1989) in the most recent issue of the *Brookings Papers on Economic Activity.*

Friedman's conclusions about the changing effects of financial

variables on real spending relationships can be summarized qualitatively in terms of four propositions:

(1) Home building is less sensitive to restrictive monetary policy today than in former decades, because of the diminution or elimination of credit-rationing effects.

(2) Business fixed investment has become more sensitive to financial market conditions.

(3) In contrast, consumer spending may now be less sensitive to interest rate increases and stock price declines.

(4) The key elements of exports and imports, despite having grown relative to aggregate U.S. economic activity, exhibit less sensitivity to exchange rate changes, and hence presumably to monetary policy actions; than in earlier years.

How much can we trust these conclusions? My own tentative judgment is that two of the generalizations, those about home building and business fixed investment, are broadly valid.

For home building, there seems little doubt that credit-rationing effects in the mortgage market and the related non-interest-rate effects of monetary policy on housing spending are less significant now than several decades ago. Friedman, Bosworth, and Akhtar and Harris all agree on this qualitative conclusion, as do a number of other analysts who have commented on the issue.

The reduced sensitivity of home building to monetary policy actions has probably been offset, at least in part, by increases in the interest sensitivity of other private investment expenditures, particularly expenditures on new plant and equipment. Here, too, there seems to be fairly widespread agreement among those that have tried to look at the question empirically. For example, Akhtar and Harris reach a similar qualitative conclusion. (Bosworth is somewhat more agnostic, worrying that the accounting treatment of computer investment and computer prices clouds the interpretation of recent data.)

I am more agnostic and skeptical, however, about Friedman's generalizations for the other components of spending. The conclusion that consumption spending has become less sensitive to interest

rate increases and stock price declines is not clearly shared by the other recent studies. Akhtar and Harris believe they found an increase in the sensitivity of consumer durables to interest rates since the mid-1970s. Bosworth again takes a fairly agnostic view, finding it difficult to identify a robust correlation between consumption spending and interest rates for any time period.

I personally tend toward the view that, for consumption spending and even for business fixed investment, we simply do not yet have enough useful new data to pin down the consequences of the big institutional and regulatory changes we have experienced in recent years. Those changes probably significantly altered the effects of monetary policy on domestic expenditures. But we have not had a major enough episode of monetary restraint since the time the changes have been fully in force to be confident of that conclusion; 1979-81 was the last such episode, and not all of the changes were fully in force by then.

I am particularly skeptical about Friedman's conclusions for the export and import components of real GNP. Contrary to Ben's finding about the sensitivity of U.S. foreign trade to financial variables, my own view is that the behavioral effects of exchange rate changes on spending are no less powerful than before. Bosworth's research suggested to him that such effects may not have changed much over time. Akhtar and Harris, though not presenting direct evidence, conjectured that such effects may have increased. Research in the International Division at the Federal Reserve Board—by Catherine Mann, Ellen Meade, Peter Hooper and William Helkie—leads to agnostic and mixed conclusions, but not to the view that the sensitivity of trade volumes to exchange rate changes has diminished over time.[4]

Some evidence exists that the sensitivity of trade prices, particularly the implicit deflator for U.S. imports, to exchange rates may have been unstable in the 1980s.[5] Such results, however, like those for investment expenditures, may be inordinately and misleadingly influenced by the NIPA treatment of computer prices. Recent work by Meade (1989) and Hooper-Mann (1989a, 1989b) that uses fixed-

[4] See, for example, Helkie and Hooper (1988, 1989), Hooper and Mann (1989a, 1989b), and Meade (1989).

[5] *See,* for example, Richard Baldwin (1988) and Hooper and Mann (1989b).

weight import-price deflators and that studies the business equipment (computer) component of trade separately from other manufacturinggoods does not seem to show evidence of significant structural change in the 1980s.

Taking into account the variety of recent research on trade-volume and trade-price equations, I thus doubt that the behavioral sensitivity of trade to financial variables has lessened in the 1980s. Given the quantitatively larger ,importanceof the external sector to the U.S. economy, the overall effects of monetary policy working through the external sector have probably become significantly more important than several decades ago. .The sensitivity to interest rate changes of the nominal current account balance as a whole, moreover, is rising over time as the United States goes more deeply into an international net debtor situation.

The bottom line from surveying the available evidence for all the components of spending, it seems to me, is that there has probably been little if any net decline in the power of Federal Reserve monetary policy to influence the U.S. real economy. Friedman, himself, does not seem to want to argue that there has been a net decline either. My differences of judgment with Friedman pertain to details about compositional effects, not about the larger issue.

Uncertainty about policy effects

If the means of the effects from Federal Reserve.policy actions have not changed much, the variances may have changed appreciably. It seems likely that the transmission effects of monetary policy are at least as uncertain as they once were—probably even more uncertain. This enhanced uncertainty does make the conduct of monetary policy more difficult than it used to be. The importance for policymaking of this uncertainty, and its implications for further research, prompt me to extend my comments beyond the boundaries that Friedman has imposed on himself in the paper.

Consider the research issues first. Can we get acceptable answers to what we want to know about the effects of monetary policy by application of "partial-model" techniques such as those used in this paper? Probably not, I would say. The traditional two-step, partial-equilibrium procedure, implying a uni-directional causation for first-round effects running from financial variables to real spending, may

not be adequate. Instead, we probably need to go to full-model simulations, and careful attempts within the full models to represent how the institutional and regulatory changes have occurred. (Friedman mentions this problem, but gives it less emphasis than I would.)

Nor is it likely to be sufficient to carry out the research in the context of a full model of the **U.S.** economy alone. In principle, we should use empirical models that analyze the **U.S.** economy as part of an increasingly integrated global economy. What, in principle, is required is an empirical measure of changes in the autonomy of **U.S.** monetary policy, measured as a change in the ability of a given dose of Federal Reserve monetary policy to influence **U.S.** domestic variables relative to foreign variables (Bryant, 1980, chaps. 11-13). Such a measure in principle requires estimates of final-form multipliers from a full model of the world economy.

But how difficult this is! Analysts must reliably be able to identify changes in full-model final-form multipliers over time. But how could analysts conceivably do that without going back to key "structural" coefficients and how they may have changed over time? That task, in turn, requires dealing appropriately with Hendry-style econometric issues of parameter nonconstancy in the context of very large global models.

We should not underplay the significant uncertainties that exist about the effects of monetary policy, in particular once an effort is made to take international repercussions and feedbacks into account. To give a rough indication of this uncertainty, I have included here a chart that shows the full-model effects of a standardized **U.S.** monetary policy action on **U.S.** real GNP, as simulated by a variety of different multicountry empirical models. The underlying model simulations come from a series of collaborative research projects on macroeconomic interdependence in the world economy sponsored in recent years by the Brookings Institution. This chart visually illustrates the diversity in simulated results across different models.[6]

The curves in the chart represent deviations of **U.S.** real GNP from a "baseline" simulation caused by a simulated expansionary action

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[6] **The research projects are described, the participating models are identified, and the main empirical conclusions are reviewed in Bryant, Helliwell, and Hooper (1989); the data plotted in the chart are presented in Table A-3 of the unabridged version of that paper. See also the two volumes of Bryant, Henderson, Holtham and others (1988).**

by the Federal Reserve. The data for the specific simulations from the individual models are shown with small dots in the background. In addition, the chart shows two averages (which differ little in this particular case) and two intervals, defined by plus and minus one standard deviation, roughly calibrating the variability in the models' responses.[7]

As the widths of the intervals in the chart indicate, there are very sizable differences across the models, both about the magnitude and the timing of the simulated effects. Some of this model diversity may reflect different approaches in trying to capture recent institutional and regulatory changes. But the diversity can also be traced to even more fundamental differences among modeling groups in the specification and estimation of their models.[8]

It would not be right, I believe, to infer from the sobering evidence about disagreement among existing models that model uncertainty is very much greater today than in the past. At least with respect to the international dimensions—the macroeconomic interactions among national economies—we are less poorly off with empirical knowledge today than we were several decades ago. Nevertheless, notwithstanding the progress in research achieved during recent years, the economics profession has miles and miles to go before it will

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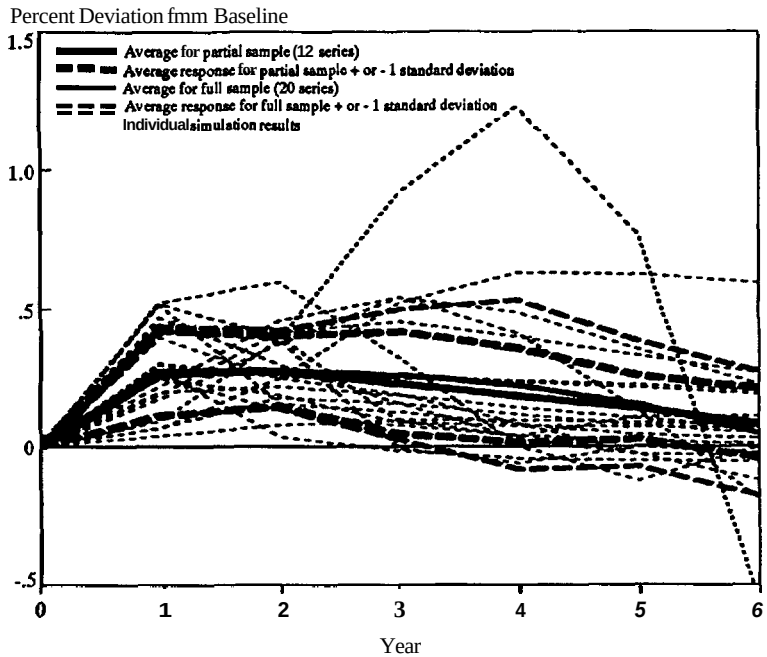
7 The baseline (sometimes referred to as "control") simulation is a benchmark set of commonly defined paths for important macroeconomic variables appearing in a model. A policy ("shock") simulation is prepared by changing an exogenous variable by a specified amount from its baseline path and using the model to calculate the alterations in the paths of endogenous variables caused by the policy action. The monetary action illustrated in the chart is defined as the raising of a key U.S. monetary aggregate (M1 or M2) above its baseline path by 1 percent throughout the six years of the simulation period. The average curve in the chart shown with a heavy solid line refers to a partial sample of results (from 12 time series of model simulations), while the average with a less prominent solid line pertains to a more complete set of model results (19 time series). As a measure of the variability of the models' responses, the chart also shows with dashed lines the interval defined by plus and minus one standard deviation around the mean. The interval around the 12-series mean is shown with the heavy dashed lines, the 19-series interval less prominently.

8 The model simulations included in the chart were generated by models with both rational, forward-looking (RFL) and adaptive, backward-looking (ABL) treatments of expectations. Although interesting and in some cases apparently significant, the differences between models with RFL and ABL expectations are often less dramatic than one might at first expect (especially given the emphasis on this topic in the theoretical literature). Nor do such differences seem to account for the bulk of the variation in results across models. Other types of structural differences among the models seem to dominate the treatment of expectations as the cause of divergent results. For discussion, see Bryant, Henderson, Holtham and others (1988, chap. 3) and Bryant, Helliwell, and Hooper (1989).

Chart 1

Effects on U.S. Real GNP of U.S. Monetary Expansion



Note: Increase of money stock above baseline by 1 percent, maintained throughout the six years of simulation period.

be possible to place much narrower confidence intervals around the quantitative estimates of the effects of policy actions. This uncomfortable state of affairs still exists for own-country effects in the United States, as is apparent from the chart.[9] Ranges of uncertainty for

9 In the empirical models of the U.S. economy that have not been especially concerned with the international aspects, there remains a very substantial divergence of views about the effects of Federal Reserve monetary policy. See Klein and Burmeister (1976) and Christ (1975) for comparison of U.S.-focused models as of the 1970s. Adams and Klein (1989) report comparisons from recently conducted simulations.

estimates of the cross-border spillover effects (effects of U.S. policies on foreign economies and the effects of foreign policies on the U.S. economy) tend to be even larger than those for own-country effects.

Taking uncertainty into account in policy formulation

I want to conclude with an upbeat observation on how the Federal Reserve seems to be doing in coping with analytical uncertainty about the behavior of the economy and about the transmission of monetary policy to the economy.

Is there major reason to be critical of the Federal Reserve System because somehow it is not sufficiently taking into account the increased uncertainty associated with institutional and regulatory changes, with the increasing openness of U.S. goods markets, and with the increasing cross-border integration of national financial markets? Should the Federal Reserve be proceeding more cautiously, defined in some way or another?[10]

I cannot, myself, see any grounds for serious criticism. The Federal Reserve System staff continues to re-evaluate existing research and to carry out new research, thereby trying to get as good a fix as possible on changes in the impacts of policy. Both in terms of quality and quantity, that staff research plays a leading role in professional research as a whole.

Moreover, Federal Reserve policy itself appears to give substantial weight to the existing uncertainties. As an illustration, I was struck by the last paragraph of Chairman Greenspan's testimony in this summer's Humphrey-Hawkins hearings. The testimony candidly acknowledged the possibility of a "mistake" due to errors in forecasting the evolution of the economy and the effects on the economy of monetary policy. But it also emphasized that the Federal Reserve will try to steer cautiously between the twin dangers of inflation and recession: "an efficient policy is one that doesn't lose

[10] In this context, the general public (though not the participants in this conference) may need to be reminded that there is not any way that the Federal Reserve can somehow set the dials on its instruments merely at "zero," thereby eliminating the effects of policy on the economy. Nor, of course, is there any presumption that some simple rule could minimize uncertainty about the effects of monetary policy on the economy.

its bearings, that homes in on price stability over time, but that copes with and makes allowances for any unforeseen weakness in economic activity.''

That type of cautious discretionary policy, backed up by constant research monitoring of empirical knowledge about the behavior of the **U.S.** and world economy and about the transmission effects of monetary policy actions, seems to me the best attainable approach the Federal Reserve could pursue. My serious criticisms of **U.S.** macroeconomic policy have to be directed, not at the Federal Reserve, but at the President and the Congress for their incautious, short-sighted—indeed, outrageous—conduct of **U.**S. fiscal policy.

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3
Policy Targets and Operating Procedures in 'the 1990s

Donald L. Kohn*

A presentation entitled ''Policy Targets and Operating Procedures in the 1990s'' could cover many topics. What this paper will not deal with is the ultimate targets of monetary policy. I take that target to be price stability. Along with others at the Federal Reserve, I believe that the price level is the only variable that over the long run is under the control of the central bank. Moreover, for a variety of reasons having to do with economic inefficiencies and with the unsustainability of other inflation goals, stability is the only sensible objective for the price level. Nor do I undertake the difficult task of laying out a path of interim objectives to get from the .currentstate of moderate inflation to price stability.

Rather, I want to focus on the narrower issue of how to keep policy on a path that leads to the achievement of the objectives the monetary authorities have set for themselves, how the process of adjusting policy to this end has evolved over the last decade or so, and what that evolution may mean for the success ,of policy in the 1990s.

An examination of policy targets and operating procedures inevitably entails consideration of the role of various intermediate targets and indicators. But I begin by examining the need for explicit intermediate indicators between central bank actions and their results

****I would like to thank David Lindsey and Thomas Simpson for their helpful comments and discussions. The views expressed are my own and do not necessarily reflect the dews of the Federal Reserve Board or any other members of its staff***

for the price level. Then I will discuss the reasons for the changing status of money and credit measures in guiding policy adjustments, and the implications of relying, instead, on various signals from financial markets and the economy. I will conclude by treating the closely related issues of how the central bank reacts to new information and how it ensures consistency between its short-run policy actions and its long-run objectives.

Why intermediate indicators?

To some observers, debates about what central banks should be looking at to guide policy decisions are superfluous. The ultimate objective is stable prices, and these observers have advocated keying policy directly to new readings of broad measures of inflation. In their view, either the monetary base or the federal funds rate should be adjusted in direct response to information that the price level is deviating from a preset objective.

Suggestions of this sort have proliferated in recent years. They are motivated in some cases by frustration with alternative intermediate targets previously thought to be useful in accomplishing the same objective. In particular, this camp has attracted some former monetarists, who are now a little less certain of the relationship between money supply measures and spending or inflation. This greater uncertainty has resulted from the changes in markets for deposits and other financial assets wrought by innovation and deregulation in the 1980s. (The implications of these changes for the implementation of monetary policy in coming years is discussed below.)

Some academic advocates of adjusting the monetary base or the funds rate in response to the price level are reasoning from theories in which monetary policy affects the path of output only in trivial ways so that there is no reason not to pursue price stability directly. For policy to feed through reasonably directly into prices, prices and wages must adapt quickly to changing conditions in goods, labor, and financial markets. In the United States, at least, such flexibility very likely has increased in recent years. Deregulation of various industries, the shift away from an industrial base characterized by relatively few large firms and large unions toward a service-based economy, and the greater international integration of markets for

goods and services probably have heightened effective competition and hence the responsiveness of wages and prices to various influences.

But the perfectly flexible classical economy still seems some way off. For whatever reasons—long contracts, slowly changing expectations—the adjustments the central bank makes to the reserve base and to very short interest rates still affect real interest and exchange rates and, in turn, economic activity. We have seen this influence at work in recent years, when the more rapid expansion of 1987 and 1988 and the slowdown in 1989 have seemed traceable at least partly to the monetary policies that preceded them.

The lags between policy actions and price consequences appear to remain long and complex, with implications for the path of output. A single-track policy.response tied to inflation data alone probably will produce sizable swings in the economy. As a consequence, objectives for inflation are likely to have some side constraints having to do with real output. These side constraints may dictate policy reactions to incoming information on the course of the economy as well as on prices, leading to adjustments to the desired path for inflation.

If the linkages among policy, the economy, and prices were well enough understood, reasonably stable over time, and mostly free from noise, they might be captured by a reliable empirical model or perhaps by judgmental forecasts. Then the job of implementing policy might still be straightforward: Policy adjustments, though perhaps not adhering to transparent rules of thumb, could be calibrated from the model or judgmental forecast, taking into account the inflation objectives and output constraints of the authorities.

Inherently, all policy depends, at least implicitly, on projections that permit policymakers to assess the implications of a course of action. A reliance on intermediate indicators arises out of skepticism about forecasting exercises and out of a desire to identify and minimize deviations from objectives. Intermediate indicators are used partly in an attempt to shortcut or cross-check the projection process and possibly to discipline policy, through prompting adjustments before cumulative imbalances require more costly corrections. These indicators may even be elevated to targets if they are considered sufficiently reliable. As long as forecasts are subject to substantial error and real output paths are important, monetary policymakers are likely

to rely on indicators or targets intermediate between policy actions and price-level effects.

It is in this area of intermediate indicators that policy implementation has undergone its greatest change in recent decades—an evolution that is likely to continue into the 1990s. Some indicators, such as interest rates and exchange rates, are elements in the transmission process, figuring directly in spending and saving decisions. To the extent the transmission of policy has changed, so too have the appropriate settings and weights for these types of indicators. Indicators in another class—including the money and credit aggregates—may have little independent standing as variables with direct influence on spending and production; they may, instead, be the surface manifestations of complex interactions among savers, spenders, and intermediaries. Changes in those interactions may call into question the reliability of the relationships between the indicators and ultimate policy objectives.

Money and credit aggregates

In the United States we have seen changes both in the monetary aggregate that is the preferred target or indicator and in the weight that is placed on money and credit measures in the conduct of policy. These shifts have reflected important underlying developments in financial markets: changes in the characteristics of existing financial instruments, the creation of new instruments, and the blurring of distinctions among financial instruments generally. Among the factors behind these developments have been the removal of regulations that enforced the distinctions among instruments and advances in technology that have reduced the transaction costs of issuing and buying a variety of financial claims. These forces not only have been at work on the financial instruments issued in a given country, but also have affected the relation of financial claims in one country to those in another.

The effects of these forces on previously distinct categories of assets are illustrated by a variety of developments in the seventies and eighties: Deregulation has blurred the distinction between deposits used for transactions and those used as a store of wealth; securitization has made loans much more like securities; in the wake of deregulation and brokering, retail deposits and managed liabilities

at depositories no longer are separate and distinct from one another; the junk bond market has blurred debt and equity; computers have permitted easy substitution between deposits and mutual funds; and the removal of controls on international capital movements has meant that investors can treat assets denominated in home currency and those denominated in foreign currency more interchangeably.

Moreover, as government regulation has become less confining, the decisions of suppliers of certain assets have become more important in determining the outstanding quantity of those assets. In the retail deposit markets, for example, decisions of depository institutions about the interest rates at which these instruments are offered affect the willingness of the public to hold them at given levels of income and market interest rates. Moreover, deposit-pricing strategies appear to have changed as institutions have adapted to deregulation, introducing substantial uncertainty, in the short run at least, into the relationship between the quantity of money and movements in market rates and income. And both supply and demand for individual financial assets can be quite sensitive to small changes in their own rates, relative to those on alternative assets, given the multiplicity of close substitutes. Internationally, the ability of capital to flow freely across borders has broadened the choices of borrowers and lenders. As a consequence spending on the goods and services produced by a particular country likely has become less dependent on the volume of claims originated or held in that country.

In these circumstances, the boundaries around specific collections of financial instruments have become increasingly arbitrary, and monetary or credit aggregates, however carefully delineated, are less likely to be stably related to spending or income. This certainly is the case for short-run relationships; and it may also pertain, if to a lesser extent, over the longer periods that are relevant to the business cycle.

The experience of the United States illustrates the erosion of the distinctions among various types of claims, and points up the implications of that erosion for the utility of traditional aggregations of these claims as policy indicators. In the 1960s, policymakers monitored bank credit closely, but this aggregate was deemphasized when open market paper became a closer substitute for bank loans as a source of funds for businesses. In the 1980s, M1 was dropped as a target when deregulation blurred the line between it and M2,

producing greater interest sensitivity in its components and more variability in its velocity. At the same time, the target range for M2 was widened as the supply behavior of banks and thrift institutions seemed to impart a substantial short-run interest elasticity to that aggregate as well. Moreover, substitution of debt for equity is one of the factors disturbing the established relation of the debt aggregate to income.

Deregulation and the proliferation of new, highly substitutable claims also have reduced the effect of credit rationing as a channel for monetary policy. Deposit intermediaries now can maintain access to funds for lending, and both borrowers and lenders need depend less on particular types of claims or intermediaries.

At present, with the restructuring of the savings and loan industry, these hypotheses about the diminishing value of certain financial variables and reduced credit-rationing effects are undergoing an intriguing empirical test. The solutions to the problems of savings and loans are likely to entail fewer and smaller institutions, in what has been the country's key mortgage intermediary. Other mortgage lenders will have to fill the void left by this reduction in the industry's size. On the deposit side, restructuring will almost certainly restrain the expansion of M3, and perhaps M2 as well, depending on how successful the regulators are in beating down deposit offering rates and thereby raising the opportunity cost of holding M2.

Expectations about the effects of this restructuring offer an instructive contrast to the dislocations brought on by earlier episodes, when this industry shrank through disintermediation induced by Regulation Q. Although specific real estate markets may be affected in the current situation, confidence in the capital markets to rechannel funds appears to have allayed concerns about major overall effects on the housing market and on the macro economy. Spreads between mortgage interest rates and other rates have widened only a a bit, a development that suggests that the demands of other investors for mortgage instruments are elastic and that nonprice credit rationing is unlikely. Any damping of M2 and M3 in this process would reflect a shift in the level of velocity, and would not be a precursor of lower spending.

Although short-run variations in money and credit may be of limited value in keying policy adjustments in most circumstances, in certain situations they may portend a serious disturbance in financial and

goods markets, especially when interpreted together with interest rate developments. For example, the Federal Reserve kept especially careful track of the monetary aggregates in the wake of the stock market collapse in October 1987 to ascertain whether there were unusual demands for money and, if so, whether they might connote flight from other financial assets or from spending. In light of the current situation in the thrift industry, unexpected movements in credit flows or in deposits will also be examined carefully.

Over longer periods, the net result of market adaptations to supply and demand conditions for financial assets may well be a stable ratio of desired holdings of money to wealth or income. Such stability is all the more likely now that incentives to innovate around regulatory constraints have been removed, a removal that has enhanced the value of persistent movements in money supply as policy signals. In this regard, the recently published study relating M2 and prices—the so-called P* model—was encouraging. The study suggested that a reasonably robust long-run relationship between money and prices has persisted despite the changes in M2 in the 1980s. Since, as the cliché has it, the long run is a collection of short runs, even short-run variations in an aggregate may yield some information on the long-run thrust of policy, though one may be skeptical of the short-run inflation forecasts produced by a model as simplified as P*. Translating between the short and the long runs is unlikely to be simple, however, in part because of the short-run interest elasticity imparted by the supply behavior of depositories. For example, 2½ to 3 percent growth in M2 may be the steady state associated with price stability, but, in light of the complex interactions among money, interest rates, and spending, gradual reductions may be far from the best way to achieve this objective. Overall, money and credit aggregates probably will continue to play an important role in policy in the 1990s; but that role is more likely to be the supporting one of the late 1980s, keyed to sustained, appreciable deviations from long-term objectives, than the romantic lead of the late 1970s and early 1980s, when relatively small month-to-month movements were allowed to influence reserve markets.

Interest and exchange rates and economic and price data

As attention to the monetary aggregates has lessened, policy imple-

mentation has had to rely more on inferences from the price axis in the financial markets and signals directly from the economy and from prices. The difficulties with attention to interest rate levels as intermediate indicators of the effect of policy and the course of the economy are well known. They include differentiating nominal from real rates and distinguishing the effects on rates of shifting demands for money and credit in response to developments in the economy from those caused by bank actions. Particular levels of nominal interest rates can be consistent with either accelerating or decelerating inflation, depending on the relationship of the real rate to its equilibrium level. In the past, when short-term objectives for interest rates as the proximate targets for policy were combined with attention to the most recent economic data, which respond to policy actions only with a delay, too often the results were a policy that tended to lag developments, moving initially both too little and too late and ultimately overstaying.

That danger remains, though it is one policymakers are aware of. It may be reduced to an extent by the recent emphasis on a variety of financial market variables, such as yield curves and exchange rates, that incorporate market expectations about future levels of real interest rates and inflation. In particular, these variables are likely to send clear signals if policy is perceived to be deflationary or inflationary because it is seen as keeping real interest rates substantially above or below equilibrium levels. In this regard they help to address one of the serious deficiencies of emphasis on nominal rate levels.

Developments in financial markets may have enhanced the usefulness of such indicators in recent years. The internationalization of financial flows and the increasing interdependence of national economies would of themselves naturally lend the exchange rate greater prominence in policy deliberations. But beyond this, the proliferation of financial instruments and the greater use of futures and options markets for risk shifting probably have reduced the influence of sector-specific supply and demand conditions on interest and exchange rates and have increased the response of asset prices to underlying fundamentals, including price expectations. These changes have taken place as economic analysis has placed greater emphasis on the influence of forward-looking expectations on economic decisions. As a consequence, policymakers have become increasingly sensitized to the importance of information that may be embedded

in interest and exchange rate relations.

Several caveats are in order. First, like nominal interest rates, yield curves and exchange rates reflect many influences besides judgments about the course of the economy and prices. For example, a yield curve that is downward-sloping, especially at the shorter maturities, may simply embody an expectation that the Federal Reserve is about to ease, not necessarily that such an easing will be stabilizing to the economy. And yield curves still may respond to changes in relative supplies of various kinds of paper as well as to shifting perceptions of liquidity risk. Likewise, the exchange rate is subject to developments abroad, as well as to short-run changes in expectations or perceptions that may have little to do with longer-run economic forces. More generally, many asset markets appear to exhibit more volatility than can be explained by changes in fundamental determinants of asset prices. Under these circumstances, adjusting monetary policy in response to short-run variations in individual interest rates or in their relative levels or in foreign exchange rates may in the end destabilize, rather than stabilize, the economy.

But the most serious deficiency of these indicators is that they provide little, if any, guidance for achieving specific inflation objectives. At best, the exchange rate would anchor the home inflation rate over time to those of major trading partners and competitors. Adjusting policy in accord with the market's interest rate expectations —that is, operating to flatten the yield curve—would tend only to lock in the expected rate of inflation built into that curve.

In theory, policymakers could achieve their inflation objectives by designing a course for the economy that would bring about the desired pressures on resources and on the rate of change of prices. In practice, doing that would require an accurate estimate of the economy's potential, a thorough understanding of the transmission and inflation processes, and reliable forecasts of the response of the economy to monetary policy and other forces. Such a policy would necessarily involve tolerating movements in exchange rates and changes in the slope of the yield curve in the transition period as output was adjusted relative to potential. In general, a central bank must take account of the real economic effects of its actions; but it is in both economic and political trouble when specific goals for the economy become the enduring focus of its attention. Among other things, the focus on the real economy in the context of an active discretionary policy

probably accentuates the well-known temptation to cheat on the side of a little more output.

In this sense, the monetarists are right: Policy reaction and implementation need something to keep these temptations at bay. Unfortunately, the monetary aggregates no longer seem to fulfill that requirement except in a long-term context, in which they may indeed check the worst mistakes and excesses. Moreover, as I indicated at the outset, simple reaction rules linked to broad price measures also seem to fall short in the face of uncertainties about lags and side constraints on output.

Commodity prices have been offered to fill this gap. Because they are unconstrained by long-term contracts, commodity prices are said to react more quickly to fundamental developments, short-circuiting some of the lags, and therefore the cyclical uncertainties, inherent in broad price measures. While commodity prices, too, contain valuable information for the policymaker, whether they belong at the center of policy implementation remains to be proven. There are the familiar issues of accounting for supply shocks, choosing the market basket, and assessing the reliability of such prices as forecasters of the aggregate price level. In addition, establishing a target level for the commodity basket is a problem. As the British discovered in the 1920s, this is not a trivial exercise—and it is the level that needs to be tied down. Movements in commodity prices cannot be interpreted without reference to an equilibrium level. Rising prices might suggest an easy policy if they were occurring above equilibrium. But they might suggest that policy was tight if commodity prices had been driven below their equilibrium level by that policy; in that case, increases in commodity prices would be needed to equalize returns with the high real rates on financial assets. Ultimately, one suspects, commodity prices will take their place in that eclectic mix of indicators that have keyed policy recently and that are likely to continue to do so in the 1990s.

Policy reactions and long-run objectives

As the 1990s open, then, policymakers are reacting to information from a wide variety of sources, making frequent adjustments of the stance of policy in reserve markets when the evidence sug-

gests that the existing posture is inconsistent with their longer-run objectives. No one indicator, nor any one small set of indicators, dominates this policy-adjustment process. Indeed, the whole intermediate indicator/target paradigm may not be very useful. Realistically, policy cannot afford to lose any information about the complex relationships in the economy. Signals from financial and foreign exchange markets, and from the domestic economy and foreign economies, all need to be filtered for clues about where the economy and the price level are headed relative to the objectives for policy. Casting the net wide is especially important when the underlying relationships among financial and economic variables seem to be evolving in ways that are not easy to predict.

It seems likely that operations by the monetary authority will continue to involve frequent policy adjustments in response to new information. Such adjustments need not connote unsteadiness of purpose, or an excessively activist hand on the wheel, or an attempt to "fine tune" the economy in the sense of trying to achieve an outcome with unrealistic precision. Instead, they may be rational responses to changing indications about economic trends contained in the new data, which prompt small but frequent adjustments in instrument variables to keep the economy and prices on a track consistent with ultimate objectives.

This type of operating system does involve difficulties, among which is filtering signal from noise. Given the difficulties of interpreting new data and the possibility of later revisions, unnecessary policy adjustments likely will be made. As long as policy remains flexible and mistakes are quickly recognized and corrected, unnecessary adjustments should remain a minor problem. Deviations from the optimal policy path that are kept small and short-lived will have little effect on the ultimate outcome.

The greater danger of a policy that relies on frequent adjustments of nominal interest rates to incoming data is insufficient attention to long-run policy objectives. I have already noted the tendency in the past for policy that involves this type of procedure to react too little and too late. But that tendency has not always been symmetrical. Emphasis on the level of nominal interest rates in connection with information on the real economy has at times tended to impart an inflationary bias to policy. Given the lag between policy and the price level, such a focus in the context of an active discretionary policy

may lead to attempts to achieve higher output levels than are consistent with stable prices.

In that regard, recent experience is mildly encouraging. Though inflation remains well above the long-term objective of price stability, it has accelerated only a little even as the U.S. economy has enjoyed an unprecedented peacetime expansion. Many factors account for this performance, including good fortune and greater flexibility in price and wage setting.

But monetary policy may also have played a role. Leaning fairly hard against the wind and being willing to shift policy promptly when the wind shifts appear to have forestalled the buildup of excesses and imbalances, so that the economy has remained in the neighborhood of its potential and inflation has stayed within a fairly narrow range. And to the extent that this outcome has reinforced the credibility of the Federal Reserve's anti-inflation policy, it may, by restraining inflation expectations, by itself have contributed to price performance that has been better than expected. The factors underlying this behavior by the Federal Reserve include a number of the elements previously discussed, no one of which seems adequate to the task of exerting longer-term discipline within the current policy regime.

First is some attention to movements in price indexes, despite the inherently backward-looking nature of these indexes. The monetary authority has clearly stated its intention to achieve price stability and has emphasized the importance it places on this objective. Although it has neither set a timetable nor established an automatic disciplining device, it has created for itself the burden of explaining sustained deviations from intentions. Such deviations would raise questions about its true intentions that would put an authority concerned about its reputation on the defensive.

The second factor underlying Federal Reserve policy that imposes discipline is the heightened sensitivity of expectations-driven variables, including yield curves, exchange rates, and commodity prices. At a minimum, these variables help the policymaker judge when market participants consider that conditions are ripe for significant movements in inflation rates. Thus, from these indicators policymakers may be able to infer the credibility that the markets accord their anti-inflation objectives.

The last such factor is the continued attention to the monetary aggregates. Although they may not be good guides to short-run policy,

the aggregates appear to maintain their longer-run relationships to spending and inflation. Sustained very rapid or very slow growth in the aggregates has continued to play a role in keying policy adjustments.

Taken together, these factors have tended to limit the distance and the duration of deviations of monetary policy from actions consistent with, at the least, its not straying far from its long-run objective. They have imposed some discipline on the task of adjusting reserve conditions and nominal short-term interest rates.

As the 1990s begin, the challenge to policy is to strengthen the elements that supply long-run discipline, without sacrificing the flexibility to adapt policy to changing conditions and to consider the consequences of policy actions for output and employment. Sufficient attention to reputation, to market expectations of inflation, and to trend money growth should help to ensure progress toward price stability in coming years. We should make certain that in 10 years, were we to consider monetary policy in the new century, we would be able to report that the decade of the 1990s, like the 1980s, ended with inflation lower than when it began.

4
Policy Targets and Operating Procedures: The Australian Case

Ian J. Macfarlane

In Australia, we find it hard to believe that the implementation of monetary policy could change as much over the next decade as it has over the last. That, perhaps, shows our lack of imagination, but it also recognizes that the 1980s was an exceptional period of change compared with the three postwar decades that preceded it. In Australia, the financial system changed from one which was heavily regulated in the 1970s to one which is now largely deregulated. Unless there is a return to regulation (which cannot, of course, be ruled out), there is not much farther that we can travel in the direction of deregulation. The challenges for monetary policy in the 1990s are, therefore, more likely to come from a different direction, namely, from innovation rather than deregulation.

The body of this paper will explain how the operating procedures for monetary policy in Australia evolved, and how we see them evolving over the next decade. The first section traces the development of the system over the past decade, while the second describes, from an international perspective, how it operates at present. The third section discusses the question of operating objectives, while the fourth describes the link between instruments, intermediate objectives, and ultimate aims. The fifth section outlines what we think will be the major challenges to our present system over the coming decade.

The evolution of the present system

For most of the 1970s, the Australian financial system was still

heavily regulated. The government set both the exchange rate and the interest rate on government debt, and there were interest rate ceilings on most types of bank deposits and on some forms of lending. Monetary policy was conducted by either raising a reserve asset ratio on banks or by increasing the interest rates on the primary issue of government securities to make them more attractive than bank deposits. Open market operations were limited in scope and were not the main means of implementing monetary policy. The fulcrum of the system was not the cost or availability of cash, but the banks' need to obtain government securities to meet a minimum asset ratio.

With banks' capacity to compete for deposits limited by the interest rate ceilings, a tightening of monetary policy, for example, would soon result in a loss of deposits and a need to run down stocks of excess assets (government securities). Although regulations were progressively liberalized throughout the 1970s, the effects of interest rate ceilings were quite pervasive even at the end of the decade, and banks acted essentially as asset managers. One effect of this was that monetary policy actions quickly flowed through into changes in the most widely-used measure of money supply—M3, which covers all deposits of banks.

The major shortcoming of such a system was that financial institutions grew up outside the regulated (banking) sector. These institutions tended to thrive and gain market share at the expense of banks. Thus, although the authorities' control over the regulated sector remained strong, its influence over the wider financial market and, hence, the economy overall, was being progressively eroded. The crucial policy change that was needed to restore the capacity of monetary policy to influence the whole of the financial system was to eliminate the ceilings on bank interest rates.

The removal of interest rate ceilings

Although the first steps toward removing interest rate ceilings had been taken as early as 1973, it was not until 1980 that all ceilings on deposits were abolished. This was the major watershed, which led banks to move away from their old habits as asset managers and adopt a more orthodox liability management approach. A couple of ceilings remained on types of lending (for owner-occupied housing, and to small businesses) but these had gone by 1986 and their effects

were never as important as the ceilings on deposits.

With banks now free to increase interest rates in order to maintain or raise deposits, pressure was immediately transferred to two other rigidities in the financial system; namely, the means of issuing government debt, and the exchange rate regime.

The tender system for selling government debt

In common with most other countries, Australia did not have a strict separation of monetary management from debt management. With the government running big budget deficits during most of the 1970s, there was a large debt selling task. This was done under arrangements whereby the government set the interest rate on its own paper and then hoped that the public would buy enough debt to finance the deficit. Often this proved not to be the case, and reluctance by the government to set high enough interest rates meant that the Reserve Bank had to mop up by selling securities from its own portfolio. The effect of these arrangements, therefore, was to blur the line between debt management and monetary management, and to impart a downward bias to the general level of interest rates.

By 1982, arrangements had been completed so that all Commonwealth Government debt was effectively sold by tender. The size of the budget deficit determined the debt selling task which was accomplished at regular predetermined intervals throughout the year. There was no temptation to adopt a U.K.-type over-funding arrangement.

Floating of the exchange rate

There was still one loophole that remained. When monetary policy was tightened, and domestic interest rates rose, the quasi-fixed exchange rate usually meant that capital inflow would rise. Open market sales of securities to tighten domestic conditions soon resulted in Reserve Bank purchases of foreign exchange and the need for further open market sales. This, of course, had an inhibiting effect on the willingness of the authorities to use open market operations to achieve monetary policy ends; they knew that there was a high probability that their efforts would be thwarted by foreign capital movements.

In December 1983, the exchange rate was floated and the remaining exchange controls on capital inflow dismantled (the Exchange Control Department of the Reserve Bank was abolished). With this move, and the earlier abolition of interest rate ceilings plus the introduction of a tender system for selling government securities, the textbook preconditions were in place for the orthodox implementation of monetary policy by open market operations.

The present system of open market operations

This is not the place to give a full account of the Australian system of open market operations; like other countries which use open market operations, it has its own complicated set of institutional arrangements.[1] What I will do, instead, is to give a sketch of the essential features of the system as seen from a U.S. perspective. In the process, I hope I will establish that it operates in a way which is not very different from the U.S. or Canadian system, but quite different from the United Kingdom or the old pre-repo German system. Incidentally, there are at least three very good "snapshots" of the Australian system done by U.S. monetary economists over the last two decades.[2]

The essence of the system is that the Reserve Bank can influence the quantity and price of the funds that are available to banks to settle their positions with the central bank. The above condition is, of course, necessary for any system of monetary control to be effective. What distinguishes open market operations from other methods is that this influence is exerted by trading in the market rather than by administrative change to a controlled interest rate or asset ratio. The characteristics of the Australian system that make it similar to the U.S. system are as follows:

There is a separation between debt management and monetary management which means that the primary issue of government securities is equal to the budget deficit. A corollary is that

1 See Macfarlane and Battelino (1988).

2 See Dewald (1967), Poole (1981), and Dotsy (1987).

monetary policy is entirely implemented by the Reserve Bank's open market operations.

There is only one means of same-day settlement between the banks and the central bank. In Australian terminology, it is referred to as "exchange settlement funds" or simply "cash" and is analogous to Fed funds in the United States. Banks maintain a buffer stock of these funds, and can only augment them by a limited range of transactions with the central bank. The interest rate on these funds is referred to as the "cash rate" and is analogous to the U.S. Fed funds rate. It plays an important role in the implementation of monetary policy and is closely watched by the market to detect changes in policy. A change in this rate, which is expected to be sustained, quickly feeds through into all short-term private and government security yields and to the rates charged by financial intermediaries.

There is a reasonable amount of day-to-day variability in the cash rate, and one or two days' pressure would not necessarily mean that the Reserve Bank was wishing to change monetary policy. The Reserve Bank does not have to stand in the market at the end of the day and clear it at a predetermined rate, as does the Bank of England. It is much more analogous to the Fed in this respect. The average daily variability in the Australian cash rate is similar to that of the Fed funds rate.[3]

Open market operations are conducted mainly by buying and selling short-term government securities outright or under repurchase agreement. The market for government securities is deep, turnover is high, and Reserve Bank transactions are only a small part of the total market.

The Reserve Bank of Australia conducts its operations with a group of government security dealers. However, unlike the United States, these dealers do not include banks. They are analogous to the London discount houses (and, to a lesser extent,

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3 *See Dotsy, op. cit.*

the Canadian investment dealers). These dealers are also the repository for the banks' exchange settlement funds. Thus, the banks' buffer stock of cash is not held on the books of the Reserve Bank.

On the other hand, there are some differences between arrangements in Australia and the United States:

The Reserve Bank of Australia does not use a reserve ratio to create a demand for bank reserves. Rather, it relies on banks' demand for reserves for settlement purposes. (A reserve ratio does exist, but like the United Kingdom and Canada, it is designed to serve purposes other than as a fulcrum for monetary policy.) Banks maintain exchange settlement funds at a level adequate for their immediate future needs. Open market sales or purchases enable the Reserve Bank to change the size of these funds, and hence, banks will increase or decrease their bidding in the money market as they seek to restore their preferred position.

Banks can never let their position at the Reserve Bank go into debit (there is no provision for borrowing reserves or for allowing the reserves to be met on average over a maintenance period). The severity of this requirement is modified by the fact that there is room for banks and authorized dealers to play the float between same-day and next-day value transactions. This effectively gives banks a rolling two-day maintenance period.

A final difference concerns the way central bank lending acts as a safety valve to the system. In the United States, the discount facility involves lending to the banks at a rate below the Fed funds rate. In Australia, the main safety valve involves the Reserve Bank lending to the authorized dealers, but at a penalty rate. (There is also a facility under which Treasury notes can be rediscounted at the Reserve Bank, also at a penalty.)

Operating objectives

The search for a quantitative objective

With all the preconditions for open market operations in place by

December 1983, the first question to arise was what operational objective to pursue. At the time, we had a money supply target as our intermediate objective. It seemed natural, therefore, to assume that the appropriate thing to do was to pursue some quantity—such as the monetary base, or bank reserves—as an operational objective, on a week-to-week basis.

We came to the conclusion, however, that this sort of strategy was not feasible, for the following reasons:

> The "money multiplier" relationship between the base and the money stock M3 was not reliable. While it seemed stable when looked at in level form over long periods, there was too much variability in the relationship from one quarter to the next, or even one year to the next.
>
> In the final analysis, it would be virtually impossible to deny reserves to the system, even if banks had expanded their balance sheets more rapidly than we desired. All we could do was make the price of the reserves high enough to make further overexpansion of balance sheets unprofitable. With this, we were in agreement with the view most bluntly put by the Bundesbank[4]
>
> In Australia, there were other structural difficulties with this approach. An important one was that the banks' excess reserves are not held on the books of the Reserve Bank but are held with the authorized dealers in the short-term money market. This meant that control over central bank domestic liabilities—difficult at the best of times—did not guarantee control over banks' balance sheets.

I should add here that we saw no particular problem with the money base as an alternative ***intermediate*** monetary objective. We simply saw it as unfeasible as an ***operational*** objective.

Some argued that if we were prepared to be very tough on supply, banks would learn to keep much higher levels of excess reserves (in effect, go back to being asset managers), and so it would be possible

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[4] See Deutsche Bundesbank Special Series, No. 7 (1982).

to control the growth of money base much more closely in the short run. This would have been a rather drastic step, however, as it would have involved changing the structure and behavior of the financial system in order that the central bank could exploit a relationship which had yet to prove its own stability.

As it turned out, this discussion about quantitative operating objectives was largely terminated in January 1985, when monetary targeting was abandoned. It was hard to put forward an argument for exploiting the money multiplier relationship where money supply, itself, was thought to be unstable with respect to the ultimate aims of policy.

An interest rate as an operating objective

That left us with, effectively, an interest rate—the "cash rate"—as the operating objective toward which our instrument—market operations—is directed. It is the gauge we use in the very short term of the direct impact of our market operations.

The open market desk keeps daily forecasts of how much the banks have to settle with the Reserve Bank, and how much, on average, their holdings of cash are likely to be. These forecasts would imply a series of sales and purchases by the Reserve Bank in order to keep the money market at approximately its present degree of tightness (as indicated by the average level of cash rates). If the Reserve Bank wishes to tighten its monetary policy stance, it will deal so as to raise cash rates; that is, it would sell a little more, or buy a little less, than the amounts indicated by the neutral path. It is thus able to achieve an interest rate objective on average without ever having to set an administered interest rate.

We have found control over these rates is sufficiently close that it is hardly necessary, for most practical purposes, to distinguish strictly between open market operations as the instrument and cash rates as the operational objective. For all intents and purposes, the cash rate is our instrument, even though we do not resort to announcing a fixed rate publicly.

Leaving aside the question of no longer having a formal intermediate objective, which is dealt with later, are there any major weaknesses with the system outlined above? Obviously there are criticisms that can be made, but I will only cover them briefly because they closely

parallel those made of the U.S. system before 1979, and to a lesser extent, since 1982. Basically, they center on the fact that it is an interest rate, rather than a quantity, that is at the center of daily operations.

The main argument is that in such a system there will be a bias toward not changing interest rates, or toward keeping them low. That is, the instrument of monetary policy will be confused with and, in fact, will become, its objective. In particular, as we know, keeping interest rates steady in the face of a rise in inflationary expectations carries great danger.

There is always a risk of this perhaps, but I do not think we have been guilty of it in recent years. There is certainly much more quarter-to-quarter variation in interest rates now than in the 1970s, and the rates are quite high in Australia—both by world standards and our own history. Any sensible adjustment for inflation puts them very high in real terms as well. Failure to allow interest rates to move is not a criticism that has been made of our actions over the last six years. If anything, there have been complaints that monetary policy has been used too heavily to compensate for the weaknesses of other policies.

A second criticism is that a quantitative operating rule can impart a degree of automaticity which cannot be achieved if interest rates have to be moved on a discretionary basis. We would concede that this is true, but we have not been able to find a quantitative rule that will work in practice. In addition, that sort of automatic response is the optimal arrangement only under certain circumstances; under other circumstances (for example, with a demand for money shock), a stable interest rate rule is better.

Instrument, intermediate objective, ultimate aim

The next logical question is: should there be an intermediate objective? In our monetary targeting phase (1976-1985), we tended to see monetary policy as operating within the standard framework—instrument to intermediate objective to ultimate aim. No one can dispute the need for an instrument, or for the ultimate aim of monetary policy to be made clear. The one part of the trilogy that is not self-evident is the need for an intermediate objective, or what the intermediate objective should be. It is the part that we have come

to doubt, and ultimately to discard. We do not rule out the possibility, however, that we could, in time, reinstate one.

The role of an intermediate objective

The two standard candidates for an intermediate objective in the economics literature are the exchange rate or the money supply. As explained earlier, we moved away from an exchange rate objective in 1983, and have seen no possibility of moving back since. An exchange rate objective should be simple; for example, fix your rate to that of a large country that has a satisfactory macroeconomic performance and an economy which is subject to the same sort of external shocks as your own. This, I assume, is why European countries have been comfortable with the EMS. Our problem is that, while there is no shortage of large countries with satisfactory macroeconomic performances, none is subject to the sort of external economic shocks that we are. In fact, they tend to be subject to the opposite sort of shock. For this reason, we have accepted our fate as an "independent floater."

That leaves the money stock as the intermediate objective (if it is publicly announced, it becomes a monetary target, the merits of which I will not go into in this paper).

There are two main reasons why money supply might be regarded as a useful intermediate objective:

Money, somehow defined, is the important link in the transmission mechanism. It can be exogenously determined (by the central bank), and will, in turn, determine the outcome for the ultimate objective.

Even if not exogenous, there is a stable demand for it as a function of interest rates, prices, and real income or wealth. Directing policies toward achieving some particular path for money operates by affecting output and prices (through the demand for money, not its supply). Since money is a nominal quantity, achieving an objective for it should (providing all the functional relationships remain stable) "tie down" the price level. An additional aspect is that the money stock may, even though endogenously determined, provide information about the course of the variables that are important as ultimate aims, especially if money leads activity or prices.

On the first of these, I have to say that we doubt that the conven-

tional definitions of money are exogenous. Empirically, it is hard to test for exogeneity. The strongest evidence that money leads income seems to be for the United States, and even there the empirical results have been subject to increasing debate in recent years as the level of statistical rigor has increased.

For Australia, there is very little evidence that either of the two main measures of money—M3 or broad money—cause, or even lead, nominal income. About the only evidence is that if M1 is graphed against spending, it does seem to lead. If short-term interest rates are put on the same graph, they will lead, too. (More sophisticated tests, however, cast doubts on even these regularities.) Since M1 is interest sensitive, we are inclined to put our faith in a "transmission mechanism" that sees interest rates affecting M1 quickly, and activity with a lag.

On the second point, we have found considerable instability in most of our demand for money functions in the deregulatory phase. This was particularly true of banking aggregates where there has been clear evidence of reintermediation and major shifts between deposit and non-deposit liabilities as a result of changes to regulations. The aggregates where this was least of a problem were the broad ones, and they clearly lagged the movements in nominal income. One interpretation of this is that the relationship between intermediation and nominal income may still be stable, but monetary aggregates have become an unreliable indicator of the total pace of intermediation.

We still see some value in the informational content provided by monetary aggregates, as long as they are carefully interpreted. We have spent a lot of time analyzing the effects of particular changes in regulation of particular aggregates, and we also have to bear in mind the coincident or lagging relationships that most exhibit with nominal income.

As a result, we do not have a formal intermediate objective. This means that monetary policy is effectively run by varying an instrument (interest rates) with a view to achieving some ultimate objective. The two questions that then immediately arise are: what is the ultimate objective; and, is it theoretically possible to achieve it with variations in the instrument?

Achieving an ultimate objective

We have no desire to dispute the widely-held proposition that the

ultimate objective of monetary policy should be a nominal variable, such as the rate of inflation or the rate of growth of nominal income. This does not, however, preclude other factors from having a role to play; the speed with which a country chooses to bring its rate of inflation into line with its aims may be influenced by considerations such as employment and financial solvency.

Given that the ultimate aim is a nominal variable, is it necessary to have an intermediate objective that is also a nominal variable, such as money supply? It has often been claimed, for example, that if interest rates were used as a target, it would lead to price level indeterminacy. This is almost certainly correct, but not very relevant. The more interesting question concerns a situation where interest rates are used as the instrument with the aim of achieving some nominal ultimate target. In our view, as long as there is a preparedness to vary the instrument, there is no reason why the ultimate target could not be achieved.[5] In fact, in such a world, the use of a monetary aggregate as an intermediate target would be counterproductive if the money demand function was unstable.

A system which operates directly from instrument to ultimate objective still has to contend with the fact that there is a long interval between the movement in an instrument and the resulting change in the ultimate objective. For this reason, actual inflation is not a good guide for monetary policy; leading indicators of inflation are much more useful. The main leading indicator is the strength of domestic demand. Monetary policy should aim to keep domestic demand growth at a rate that is consistent with future restrained inflation. Indicators of inflationary expectations are also very important. As a result, the degree of inversity of the yield curve should be a good indicator of the tightness of monetary policy. In this scheme of things, indicators of future inflation have become a quasi-intermediate objective. This does not rule out some monetary aggregates themselves being used as indicators of future inflation, but they would have to take their place alongside the other indicators.

Each country, I suspect, has had to come up with its own approach; some would weight monetary aggregates highly and others would tend to place more emphasis on other indicators. The presence or

5 See Friedman (1988) and Edey (1989).

not of a formal monetary target is often not a good guide to how countries behave. We have had recent experience of the United States tightening monetary policy at a time when M2 was below its target range, while in Japan we saw money supply above its target range, but the Japanese monetary authorities made no move to tighten. I cannot help but think that the fact that inflation was rising in the United States at the time, while it was stable in Japan, weighed as heavily on the minds of policymakers as did the movement in their monetary aggregates.

Challenges for the future

At the broadest level, we would probably see the major challenge being to get inflation down. Although Australia's inflation performance in the 1980s has been better than it was in the 1970s, the slowdown in our inflation rate was not as marked as in other OECD countries. We did not have as decisive a break with the inflationary 1970s as we would have liked. However, the aim of this paper is to talk about the procedures rather than aims of monetary policy, so I will not explore this point further. The subject in question is the narrower one of operating procedures and intermediate objectives.

Operating procedures

Which market? Like the United States, we have a strong preference for conducting our open market operations in government securities or in repurchase agreements on government securities. It has served us well, and the market is deep and of uniform credit risk. The stock on issue has also been quite large, which contributes to turnover and market depth.

The source of supply of new securities is the budget deficit. For all of the 1970s and early 1980s, the budget was in deficit, sometimes substantially so. Like central bankers in other countries, we often used to decry the size and stubbornness of the deficit. There has now been a remarkable turnaround in the Australian Government's accounts. The budget has been in surplus for the last three fiscal years (including the present one), and could easily remain in surplus for a number of years to come.

The stock of government securities has consequently run down,

both because of the surplus and because of the Reserve Bank's need to buy government securities to accommodate the trend growth of the money base. This has had an inhibiting effect on the government securities market, particularly the bond market. With the level of government securities falling by 25 percent and new issues of bonds having almost ceased (in earlier years, there were issues to replace maturities), turnover is declining. We have tended to keep up the supply of short-term paper and let the reduction occur at the longer-term end in order not to interfere with our open market operations. We have to accept that there is a risk, however, that the market may lose the depth necessary for us to conduct market operations.

I do not wish to give the impression that this is an insuperable problem, or that the reform of the government's fiscal position was anything other than a very good thing, entirely in keeping with the economy's medium-term needs. However, it leaves us, as the central bank, with the need to think through our open market procedures. In principle, we can trade in any market and still have the desired effect on banks' holdings of cash and, hence, on overnight interest rates. The most obvious candidates are short-term bank-accepted bills, or the short-term debt of state authorities. Another alternative is to make greater use of foreign currency swaps, which we already use as an auxiliary instrument for smoothing large flows.

As is apparent from these deliberations, we still see great value in implementing our monetary policy by trading in a market. If we did not, we could simply solve the problem by forcing the banks to have to borrow from us and adjusting the interest rate at which we accommodate their needs.

With whom should we deal? As explained earlier, our open market operations are conducted with a group of independent specialists in trading short-term government securities. There is a prohibition on banks owning these dealers, and we have always felt it important that there be a group of specialists whose job it was to make a market in government securities. At the time the system was set up, there were very few banks, and they had no incentive to serve the wider market in government securities.

As time has gone on and deregulation has proceeded, many of the lines of demarcation in financial markets have dissolved; there are now approximately three times as many banks as there were formerly,

many with an interest in these markets. As in the United Kingdom and Canada, the role of the authorized dealers in the short-term money market has come into question. We have already had to make changes to address the fact that, by the nature of the industry, they have had to accept quite large interest rate risk on the base of relatively modest capitalizations. We feel more comfortable with the position now, but many people would argue for a wider range of institutions to be permitted to deal with the Reserve Bank. Of course, if budget surpluses continue and we choose to deal in different instruments, the case for a different group of counterparties becomes stronger.

Banks' need for cash. *I* keep being reminded by academic colleagues that innovation may make the conduct of market operations more difficult if there ceases to be a stable demand function for banks' holdings of excess reserves. This argument, based on that put forward by Fama (1980), has recently been proposed in Australia by Harper (1988). It looks forward to the time when the public no longer wishes to hold currency and when there is no reserve requirement on banks to hold a proportion of their deposits at the central bank. In such a situation, the central bank would no longer have control over the supply of an asset which was needed by the commercial banks.

I can see the logic behind this position but doubt that it will come into play within the next decade. Despite confident predictions that the public will not wish to hold currency; their trend demand has not altered very much over the last decade. We, like the Canadians, do not see a strong need for reserve ratios on banks; however, if all else failed, a low ratio would maintain the capacity for monetary control and have negligible distortionary effects.

Intermediate targets

If we reach a point where deregulation has run its course, that is, there is no further deregulation nor is there a reinstatement of regulations, then it may be possible to find a stable demand for money function again.

I can remember when it used to be said that if regulations were removed, or at least greatly reduced, it would not matter which monetary aggregate was looked at, the behavior would be similar.

We have certainly reduced our regulation enormously, and there has been no tendency for the behavior of the various financial aggregates to converge. In fact, they are more disparate than they were a decade ago. It is true that their behavior is still reflecting changes to regulation even though the absolute amount of regulation is greatly reduced. It is possible that when changes stop occurring, the various aggregates will become more alike and that their relationship with nominal demand or inflation will become more stable.

Unfortunately, that still seems to be a fair way off. An additional problem is that it will take some time to recognize the nature of the relationship even after stability has returned. Also, changes to regulations are not the only source of disturbance to money demand. Presumably innovation per se, not just innovation to get round regulations, can also influence results. For example, there is evidence that the growth of automatic teller machines has increased the demand for currency.

There are, however, some grounds for expecting stability to return. As deregulation has proceeded, the share of total financing undertaken by banks has increased. More recently, we have seen banks doing a higher proportion of their lending "on balance sheet" and funded by normal domestic deposits. It may be that, in a deregulated system, the lowest cost source of funds is that provided by bank deposits. As a result, money supply—that is, the balance sheet liabilities of banks—may return to a position where it is a reasonably stable proportion of total financial intermediation.

There is also that other great intermediate target—the exchange rate. We would find it very hard to conceive of the world's changing enough to make this a realistic option for Australia. As said before, we would have to find someone else to peg to, and it is unlikely that our economy or other economies will change sufficiently for us to find a suitable partner. We think we will remain, of necessity, an economy with a floating exchange rate and a "quasi-independent" monetary policy. For this reason, despite our smaller size, our monetary policy has more in common with the United States, Japan and the United Kingdom, than with the other European economies or Canada which may resemble us more closely in other respects.

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Policy Targets and Operating Procedures in the 1990s: The Case of Japan

Yoshio Suzuki

Introduction

The framework in which Japan's monetary policy will be implemented in the 1990s will be different from that in the 1980s at least in three respects. First, the financial restructuring proceeding today, accompanied by financial innovation, deregulation, and reregulation, will have advanced further. Second, the financial globalization with the result of increasing external impacts on the domestic financial variables will have developed further. Third, the role of the yen as an international currency and the role of the Japanese financial system as an international financial center will have increased.

So, discussions on Japan's monetary policy management in the 1990s should include the following three perspectives. First is the question of how financial restructuring, accompanied by the completion of interest rate deregulation and further progress in securitization, will change transmission channels of policy effects and monetary policy procedures. In my view, the interest rate effects and wealth effects will become more important in the 1990s, while effects through credit availability will decline.

Second is how the Bank of Japan will respond to increasing external impacts on interest rates, asset prices, and other transmission variables under circumstances where the world's three major international financial centers (the United States, Japan, and Europe, especially the London market) will integrate further and interest rate arbitrage among them, through foreign exchange markets, will

become even more active than at present.

Third is relations with the international monetary system. Despite further progress in financial globalization, a tri-polar currency system with the currency areas of North America, integrated Europe and Japan will prevail in the 1990s. Among the tri-polar currency areas, the floating exchange rate system will continue. Therefore, the question of how to harmonize autonomy in monetary policy in each area and international cooperation between the United States, Japan, and integrated Europe centering on West Germany will continue to be a major issue.

The impact of financial restructuring

Transmission channels of policy effects: present and future

As is the case for other major industrial countries, the starting point of transmission channels in Japan is the impacts of policy measures upon money market rates. The Bank of Japan manages call rates and bill discount rates, which are overnight or a few weeks' interbank money rates, through its daily market operations and credit rationing at the Bank's discount window. It also intervenes to the open money market of one- to six-month terms through market operations of short-term government securities and commercial papers (CP) and government bond repurchasing dealings.

Policy effects are transmitted to nominal aggregate demand from money market rates, which are subject to the impact of the Bank of Japan's policy measures, through the following four channels. I will describe them by using an example in which interest rates rise.

First, the increase in the interbank money rates brought about by operations of the Bank of Japan reduces the marginal profitability of additional loans to customers and increases the profitability of portfolio investments on short-term money market assets for deposit banks. Consequently, deposit banks reduce loans and increase net lendings in the interbank money markets. In this case, the supply of funds in the interbank market will increase, but this will be offset by the Bank of Japan's selling operations. This change in portfolio management follows from the fact that the loan rates of deposit banks are less flexible than the interbank rates because they are significantly influenced by interest rates on their liabilities, which are, in turn,

based more or less on regulated deposit rates, and by the consideration of long-term customer relationships. Moreover, the effect of an increase in interbank rates on the amount of loans of deposit banks through this channel is supplemented by the so-called "window guidance" (a type of moral suasion by the Bank of Japan), which is intended to limit the quarterly increases in the total loan volume of individual deposit banks.

Second, increases in the interbank money rates and the open money market rates raise yields on medium- and long-term government bonds through arbitrage, causing individuals and nonfinancial firms to make portfolio adjustments away from deposits with regulated interest rates to open market instruments and government bonds for which yields have risen. Deposit banks thus suffer from outflows of funds in deposits with regulated interest rates (that is, financial disintermediation).

As a result, credit supply from deposit banks will be curbed. In this case, the supply of funds to the open market will increase. However, the Bank of Japan's selling operations will absorb funds in the open market; besides, small and medium-sized companies and individuals, which are not able to issue bonds or commercial papers, cannot raise funds in the market.

Third, increases in various interest rates resulting from rises in money market rates reduce the expenditures of the private nonfinancial sector by raising the cost of obtaining loans or issuing bonds and CPs, and also by raising the opportunity cost of liquidating their financial assets.

Fourth, the expenditures of the private nonfinancial sector are curbed by negative wealth effects as increases in various interest rates reduce the value of such assets as bonds, equities, and land.

Among these four channels, the first and the second affect credit availability based on the rigidity of deposit and lending rates. Japan is presently in the final stage of deposit rate deregulation. In the 1990s, all deposit rates will fluctuate in line with money market rates. Today, lending rates are determined by weighted average of interest rates paid on funds raised by deposit banks such as deposit rates and money market rates. In the 1990s, when deposit rates will fluctuate flexibly along with money market rates, lending rates will also move fairly flexibly. As a result, the first and the second transmission channels will have to weaken.

Besides, in the 1990s, the means of fund raising by Japanese companies, at home and abroad, including small and medium-sized ones will diversify and personal financial assets as compared to their incomes will further accumulate. Therefore, if the credit availability of domestic deposit banks is restrained through the first and second channels, Japanese companies will be able to raise funds easily through domestic and overseas financial markets, as well as through overseas financial institutions. Individuals, too, will be able to obtain funds more easily than before by liquidating part of their financial assets.

For these reasons, these transmission channels will no longer be important in the 1990s.

By contrast, the third and fourth channels will probably become more important in the 1990s, because not only market rates but all interest rates including lending and deposit rates will fluctuate flexibly through increased arbitrages with interbank rates and open market rates under the control of the Bank of Japan. Since the asset-to-income ratio in the private sector is expected to rise in the 1990s, the wealth effects of a change in the asset price on private expenditure will also be strengthened.

Procedure of monetary policy

With the change in the relative importance of the transmission channels of the policy effects, the way to implement financial policies will change in some respects in the 1990s.

First of all, daily market operations influencing market rates will become more important, compared with changes in the official discount rate and implementation of "window guidance." This is because deposit and loan rates will be based on money market rates, not on the official discount rate. A change in the official discount rate will no longer serve to lead deposit and loan rates, but will merely follow interbank rates. It will come to have a symbolic meaning of officially admitting the level of interbank rates. By the same token, "window guidance" by the central bank will no longer be effective as a means of regulating total bank credit because various fund raising means other than domestic bank borrowing (such as issuing CPs and bonds at home and abroad and borrowing from overseas banks) will have to be available for the nonbank private sector.

From such a perspective, the Bank of Japan conducted a reform

of the interbank market and made some changes in the market operation procedure last November. While there had been a large volume of transactions in bills of more than one month, transactions in funds of less than one month had been mainly conducted not in the bill market, but in the call market. Therefore, the Bank of Japan had to carry out operations in bills with two- or three-month maturities. However, one of the disadvantages of this was that the Bank of Japan had to reveal to market participants its views concerning interest rates two or three months ahead whenever it carried out bill operations. This is unnecessarily binding to the Bank of Japan, itself, and, if changed, unnecessarily disturbing to the markets. The primary purpose of market operations should be the adjustment of demand and supply of short-term money on a daily basis. It is better for the Bank of Japan not to indicate its views on future interest rates. Therefore, the Bank switched from two- or three-month bills to one- or two-week bills in its market operations and, as a result, dealings of bills with two- to three-week maturities have become active, while in the call market, overnight dealings have become the main form.

On the other hand, with respect to noncollateralized call market dealings, terms had been restricted to less than one month because Japan had traditionally adopted collateral requirements for most interbank transactions. However, noncollateralized call market transactions had expanded out of the country in the offshore market; they were eventually permitted in the domestic market in 1985, with regulations on terms of less than one month. Since then, such transactions have greatly increased, and Japanese banks have become fully accustomed to them. Consequently, in November 1988, restrictions on terms for domestic call market transactions without collateral were completely abolished.

As byproducts of the money market reform and the new operation procedure, more brisk interest arbitrage is observed among interbank and open market rates as well as among domestic and offshore markets, and short-term funds have been recirculated back to interbank markets from open markets and to domestic markets from offshore markets. The expansion of the domestic interbank market is an encouraging sign for the effectiveness of the new bills operation.

In addition to financial deregulation and the new operation procedure, the determination of the short-term prime rate, which used to be de facto linked to the official discount rate, has recently become

based on market rates, and leading banks have already announced their own prime rates. In Japanese city banks, the proportion of funds with market determined rates, such as MMCs, CDs and large-denomination time deposits, has already hit 70 percent. I expect that the transmission of monetary policy effects from the new market operations through flexibly changing interest rates in all markets (that is, the third and fourth channels) is now being strengthened.

Let me turn next to the role of the money stock as an intermediate target. In Japan, M2+CD is regarded as most important and this will continue during the 1990s. With decreased importance of the first and the second transmission channels of policy effects through credit availability, the character of money as leading indicator of nominal expenditures and prices would likely dwindle. But it is unlikely to disappear, though its time lag becomes short. This is because asset transactions will become active at the fourth transmission channel, resulting in an increase in the demand for money, and later on, nominal expenditures will rise through wealth effects arising from the asset price increase.

When the third transmission channel is looked at in the light of James Tobin's general equilibrium approach to asset selection, it is very likely that an increase in money demand and a decline in interest rates will lead an increase in nominal expenditures.

In the 1990s, the money demand function will likely regain its stability in many countries since diversification of financial assets, resulting from financial deregulation and financial innovation, will pass the peak. In Japan, the money demand function has so far been relatively stable. This is partly because the schedule of financial deregulation has been gradual and predictable rather than abrupt, and partly because the rates of inflation and interests have been fairly stable rather than volatile, and their changes have been anticipated to a large extent. Recently, the Institute for Monetary and Economic Studies of the Bank of Japan has obtained the following findings from a survey on money demand in Japan during the 21-year period from the first quarter of 1968 to that of 1989 using the function of the error correction model (ECM) type (dependent variable: M2+CD; on a quarterly basis).

The function obtained by the survey covering the whole of the above-mentioned period has proved to be far more explicative than the conventional-type functions. And in the function estimated for

the period up to 1985, the forecast made by extrapolation for the subsequent three years, 1986 through 1988, has proved to be quite satisfactory. The statistical verification conducted in parallel has revealed that no structural change arose in the ECM-type money demand function within the period under review, and that the function has been fairly stable since the mid-1970s.[1] This is another reason for expecting survival of the money stock as an intermediate target in the 1990s.

Influences of financial globalization

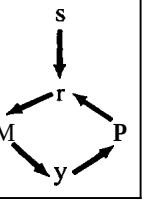
In the 1990s, integration of the three international financial centers—the U.S. financial markets in dollar terms, Japan's domestic market in yen terms and its offshore market in dollar terms, and the Euromarket centering on London—will further progress, and interest arbitrage in these markets through exchange rates of the U.S. dollar, the yen and the German mark (or the currency of a unified Europe) will become more active than now. Hence, market rates, the importance of which as operating variables of monetary policy is expected to increase, will become not only subject to influences of domestic monetary policy measures but more sensitive to external financial shocks than they are presently. In Japan, when viewing a causality in the sense of Granger by means of a VAR model, there is a unidirectional causality from exchange rates to market rates, and there exists no reverse causality. We estimate a VAR model of five variables, including exchange rate(s), the money market rate (r), the money stock (M), real GNP (y), and the GNP deflator (P). In an open macroeconomy with floating exchange rates, it is usually assumed that causality runs from r to s, and then from s to y through changes in exports and imports. However, our results for the estimated VAR model, which are presented in Table 1, show no causality from r to s or from s to y, but they do show a reverse causality from s to r. It should be added that the causal relationships among r, M, P, and y are from r to M, from M to P, from M to y, and from P to

[1] Tomoo Yoshida, "On the Stability of Money Demand Function in Japan: Estimation Results Using Error Correction Model," The Bank of Japan, *Monetary and Economic Studies* (forthcoming).

y. The causalities from r to M and further, from M to P and Y, correspond to the four transmission channels already described. The causality from P to y suggests the so-called deflationary effect of inflation, implying that an increase in M might have two results that largely offset each other: an increase in y and the deflationary effect of inflation. As a result, the effect of an increase in M on y is uncertain in the long run and the long-run Phillips curve may be nearly vertical.

Table 1

F statistics based on five-variable VAR Model for r, M, y, P, and s

Dep. \ Ind.	r	M	Y	P	s	Causality
r	117.146**	0.409	0.277	2.741*	6.204**	
M	5.801**	26.495**	0.946	0.555	0.911	
Y	0.277	5.589*	3.637*	5.915**	0.080	
P	0.745	6.048**	1.957	25.346**	0.802	
s	0.150	0.207	0.122	0.315	4.185*	

r: weighted average of call and bill rates; M: money stock (M+CDs);

y: real GNP; P: GNP deflator; s: exchange rate.

Notes: 1. Period: from the 2nd quarter of 1973 to the 2nd quarter of 1988.
2. All variables are percentage increases over the previous quarter.
3. Lag length of the estimated VAR model is selected by the minimum AIC.
4. **(*) indicates that F-value is significant at 1(10)%.

How should we interpret the causality from s to r in an open macroeconomy model of Japan? First, since the start of the floating exchange rate system, the yen-dollar exchange rate has moved exogenously rather than endogenously for the Japanese economy. The first and second oil shocks caused depreciation of the yen; the high U.S. real interest rates in the first half of the 1980s brought some appreciation of the dollar, but this trend has been reversed much

more by the international policy coordination among leading industrial countries since the Plaza Accord of September 1985. The Bank of Japan has reacted to the yen's depreciation (or appreciation) by raising (or reducing) short-term interest rates. In other words, the estimated causality from s to r indicates the reaction function of the Bank of Japan to the exogenous movements in foreign exchange markets.

Second, the Bank of Japan recognizes the effect of interest rate policy upon exchange rates and has sometimes manipulated short-term interest rates in order to rectify the misalignment of exchange rates, as it did, for example, with the sharp rises of market rates in mid-1982 and in 1985 after Plaza Accord until the end of the year. However, the effect of this type of active interest rate policy on the exchange rate objectives has been overwhelmed, on the average, by that of defensive interest rate policy generated by the Bank of Japan's reaction function.

The remaining question is why no relationship exists between s and y. Although the yen's appreciation (or depreciation) has brought about either decreased (or increased) current account surpluses or increased (or decreased) deficits, there have been offsetting changes in domestic demand since 1975, as can be seen in Chart 1. We understand that the falls (or rises) in short-term interest rates have contributed to the increases (or decreases) in domestic demand. In other words, we have experienced a kind of reswitching between external and domestic demand, and the economy has always followed the stable growth path since 1975 except for two periods: the worldwide recession following the second oil crisis in about 1982 and the high-yen recession in 1986. This has been possible in Japan because real wages in the Japanese economy are almost as flexible as in the Classical School textbook model and because the money growth rate has been stable since 1975, so that the economy has been on the stable equilibrium growth path, except for those two periods, accompanied by the real crowding-out between external and domestic demands.[2]

In the 1990s, though falls (or rises) in overseas interest rates will cause appreciation (or depreciation) of the yen, which will, in turn,

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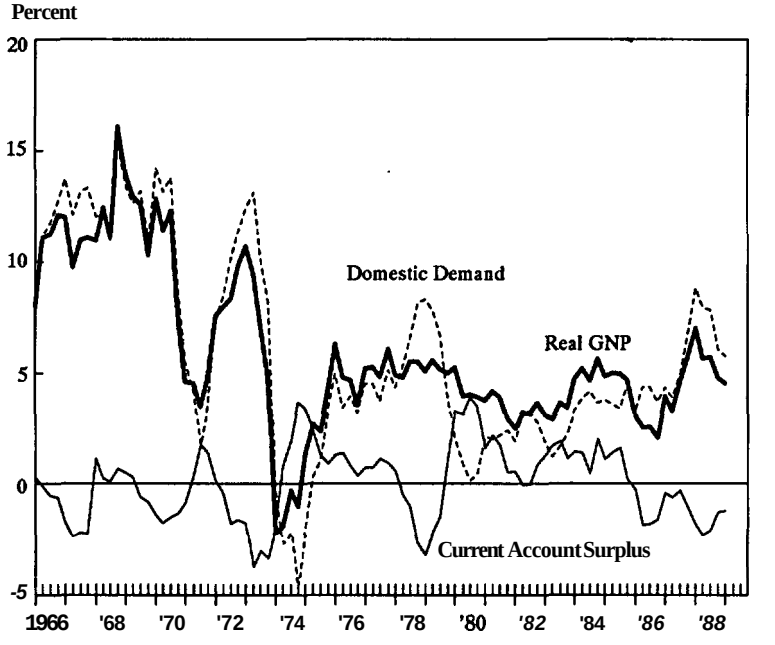
2 Yoshio Suzuki, *Japan's Economic Performance and International Role,* Chapter *1,* "Price Stability and Stable Growth under the Floating Exchange Rate System" (University of Tokyo Press, 1989).

Chart 1

Growth Rate of Real GNP and Contribution of the Two Components to it, as Year-to-Year Changes



Note: Both domestic demand and current account surplus are adjusted to exclude effects of the import of gold bullion to mint coins in commemoration of the Emperor's 60-year reign.

induce falls (or rises) in interest rates with the result of switching from external to domestic demand (or vice versa), the Bank of Japan will implement its policy in order to control market rates and money stock on such a level that it could maintain domestic price stability by stabilizing the total of external and domestic demands.

The international currency system and its implication for monetary policy targets

Is Japan's monetary policy in the 1990s, which will aim at domestic

price stability as a final goal, consistent with the international monetary arrangement?

In my view, a tri-polar currency system in the following sense will have prevailed by the mid-1990s. In Europe, EMS will have succeeded in creating a unified currency. In North America, the United States and Canada will continue to have a U.S. dollar zone. In Asia and the Pacific area, the yen's role as an international currency will have increased, but the U.S. dollar will still be widely used. So, no country yet will conduct its monetary policy in order to stabilize the exchange rate of its currency vis-à-vis the yen.

In this sense, an international yen area will not have taken shape. The yen area will still be limited to Japan. Nevertheless, since the Japanese economy will have grown further and its dependence upon international trade in terms of the ratio to GNP will be larger than that of the United States, Japan's weight in international trade and capital transactions will be so important that the yen area could be called the third largest currency area, even if it is limited to Japan.

The common challenge of the world in the 1990s is, with the U.S. dollar, the unified European currency, and the yen as international currencies, how to make the domestic stability in each currency area compatible with the stability of exchange rates while maintaining free trade and free capital movements in the world under the floating exchange rate system.

In my view, judging from the bottoming-out of the U.S. dollar's value last year and its rebound this year, and steady contraction of the ratio of the U.S. current account deficit to GNP, a medium-term adjustment of the exchange rate misalignment since the Plaza Accord has already finished. If each pivotal country in these three currency' areas—the United States, Japan, and West Germany for now—carries out the policy outlined below, and if the following policy cooperation is realized among the G-5 or G-7 including these three countries, neither medium-term misalignment of exchange rates nor intolerable current account imbalances would occur among these currency areas.

First, on the domestic front, tri-polar countries should manage a rule-oriented, predictable macroeconomic policy. Such a policy consists of a monetary policy which emphasizes money growth as the intermediate target and gives top priority to domestic price stability as the final goal, and a fiscal policy which continues fiscal consolida-

tion (steady contraction of budget deficits aiming at a balanced budget). Besides, in the case of Japan, it should step up the structural shift to a domestic demand-led economy.

On the side of international policy cooperation, it is necessary, first of all, to have common international understanding as to the means of policy coordination. While joint intervention in the exchange markets is a means of preventing excessive short-term fluctuations of exchange rates stemming from psychological factors, it is not a means of controlling the level of exchange rates. Advisable measures to influence the level of foreign exchange rates are described below.

Monetary policy coordination can influence foreign exchange rates in the short term through manipulation of interest rate differentials. However, its scope should be limited because it should be assigned primarily to domestic economic stability. If the central countries in the three polar currency areas pursue stability of exchange rates at the expense of domestic economic stability, the tri-polar currency system will be shaken altogether as confidence in domestic economic stability declines.

A medium-tern misalignment of exchange rates should be avoided by fiscal policy coordination and measures affecting the economic structure. As these measures are deeply intertwined with domestic politics, the realization of such coordination has to take a long time. While coordination of monetary policies is sometimes necessary as a measure to play for time, the basic means for avoiding the medium-term misalignment of exchange rates should be fiscal policy coordination and economic structural policies.

Second, in order to prevent the three currency spheres from forming protectionist economic blocs, policy coordination among the United States, Europe, and Japan should be enhanced. Major acid tests in the near future will be the relationship of the EC with non-EC countries stemming from the European integration by 1992 and negotiations between the United States and Japan, and other related countries, over the Super 301 of the U.S. Omnibus Trade Act of 1988.

Third, the relationship between Japan and its neighboring countries might be tightened. Although we use the term, "the tri-polar monetary system," the yen will be used mainly in Japan; However, it is only a matter of time before Japan replaces the United States as the largest trading partner of other Asian and Oceanic countries, as the United States and Japan adjust their current account imbalances;

At the same time, there has been a structural increase in Japan's imports of industrial products from other Asian countries triggered by the enormous appreciation .of the yen.

As a result, intraregional trade in Asia and Oceania would sharply exceed trade with the United States and this region would form the third trading area next to Europe and North America. With these developments, yen-denominated loans from Japan will increase further and the yen will be used more frequently in international goods and capital transactions in this region. However, it is unlikely that Asia and Oceania will form a currency area as closely tied as in Europe, since the countries in this region are at diverse stages of industrialization and their cultural and historical traditions are different. Nevertheless, if Japan's neighbors choose that option, Japan should be prepared to offer the yen and its financial market as international public goods for them, and to become an anchor for the stability of neighboring economies who could then stabilize their own currencies' exchange rates vis-à-vis the yen.

6
Europe 1992: Some Monetary Policy Issues

Robin Leigh-Pemberton

Some dates do rather more than identify a point in time. They come to stand for a combination of historic developments that would otherwise defy simple description. The year, 1992, is just such a date: it symbolizes the determination of the European Community to weld itself into a single market, without internal barriers.

I want to say a few words today about what this means for central bankers, but I shall also range more widely as the 1992 project has been accompanied by an important debate on the possibility of economic and monetary union in Europe. This debate has already been fairly emotive, partly because it is colored by different views on the desirability of ultimate political union and partly because it raises issues concerning economic sovereignty, not least of which is whether we would have to give up our individual currencies and monetary policies. I shall try to avoid the more emotive aspects this afternoon. Rather, I want to use the opportunity of being here in Jackson Hole to consider what lessons the United States can offer Europe in the field of monetary arrangements.

Monetary policy in a European marketplace

Let me begin with some observations about the broad economic and financial background to the 1992 project, as it is essential that

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This paper was presented as the symposium's luncheon address.

the institutions and instruments of monetary policy be designed to work with the grain of market realities and not against it.

As I am sure you are all aware, far-reaching changes are under way in the legal and regulatory framework of financial markets in Europe. By the end of 1992, financial institutions incorporated in one member state will be able to conduct business throughout the community. Capital movements, already largely free, will by then be entirely so. And the way should be open for free competition among financial institutions from both inside and outside the community. Despite some initial fears, it is, I hope, now clear that in the field of financial services, we will have almost the opposite of what has been caricatured as "Fortress Europe;" we will have "Market Place Europe." The scale of the changes will be so great that in an American context it would almost be as if nationwide interstate banking and the repeal of the Glass-Steagall Act were to be effected at the same time.

Meanwhile, goods markets will become even more integrated, and the remaining professional and administrative barriers to labor mobility will be eliminated. Goods, capital, and labor will be able to move as freely between the member states of the European Community as they can around the United States, although it will, of course; take time before that freedom is fully exploited.

Finally, there will be a significant development in the monetary field because, within a few years, the currencies of all member countries will participate in the Exchange Rate Mechanism of the European Monetary System.

As a result of all these developments, Europe will increasingly have to be seen as a single economic and financial area. This will have important implications for the autonomy with which individual European countries can conduct monetary policy and also, taken together with the globalization of markets and the integration of the world economy, for Europe's financial relations with the United States and Japan.

Goals of monetary policy

It is perhaps, therefore, more important than ever that we should be clear about our monetary policy objectives. The first and overriding goal must, of course, be the establishment and maintenance

of price stability. This is one of the greatest services that finance can render industry—or at any rate, instability is certainly the greatest disservice. History also suggests that the credibility of the authorities' commitment to price stability is a valuable resource that is easier to squander than to reacquire.

A second objective is exchange rate stability, which I put second because, to my mind, it has to be seen as following from a collective achievement of the first objective, and not as a goal that is independently attainable. Our immediate aim is to achieve and sustain exchange rate stability within Europe. On a global scale, international cooperation in the management of exchange rates between the three major economic groupings—Europe, North America, and Japan—has made significant advances in recent years, though we are still a long way short of anything that could be described as exchange rate stability. In pursuing this objective, the monetary policies of the three blocs must be consistent and, more particularly, aimed at internal price stability.

A third objective is to ensure the stability of financial systems. It has been recognized since at least the nineteenth century that the macroeconomic goals of price and exchange rate stability can be undermined if the financial system is unstable. For this reason, all central banks have developed ways of channelling liquidity to the banking system in periods of pressure and the arrangements for the prudential supervision of individual firms have been progressively strengthened.

I imagine most of us could agree, at least in broad terms, on these goals. The more difficult question is how we can achieve them in the changing economic and institutional circumstances of the 1990s.

The road to monetary union

We have all learned that economic interdependence limits the extent to which a single country, particularly a small or medium-sized country, can pursue an independent monetary policy. In Europe, this has led to increased coordination of monetary policy decisions and recently, to calls for moves to eventual economic and monetary union, which some see as an inevitable and logical conclusion of current trends. There is far less consensus, however, on the form such a union should take or on how rapidly it would be reasonable to pursue it.

As you probably know, the Delors Committee saw monetary union as ultimately comprising a single Europewide currency with a single monetary policymaking authority, which it called the European System of Central Banks. In addition, it envisaged that the arrangements for monetary policy would be supported by mechanisms for coordination in the fields of fiscal and regional policy.

The institutional structure would have some similarities with your own in the United States, in that the overall policy stance would be determined collectively—as it is by the Federal Reserve Board and the Federal Open Market Committee—while policy implementation (and, more particularly, market intervention) would remain in the hands of the national central banks. Consideration would, however, have to be given to how any new institutional structure would be made politically accountable—a question not addressed specifically in the Delors Report.

Wisely, in my opinion, the committee refrained from expressing views on the timetable within which monetary union should be approached and the new institutions should be established. Nor, significantly, did it make any claim that the model it described was the ***only possible*** model.

Limitations of the U.S. model

It is at this point that a comparison with the United States can be instructive. It is sometimes suggested that when internal barriers to goods and factor mobility have been removed, Europe will be "just like the United States" and could then benefit from monetary arrangements on the Federal Reserve model. Put in other terms, the advocates of rapid progress toward monetary union suggest that, once the 1992 program is fully implemented, Europe will be an "optimum currency area" needing a single currency and monetary authority. This neglects some important practical differences between Europe and the United States, however. In at least four respects, Europe is much farther away than the United States from being an optimum currency area.

In the first place, the degree of integration in goods markets is significantly lower in Europe. Despite the tremendous growth of trade in recent years, the four largest European countries export only about 10 percent of their GNP to partner countries in Europe. This is signifi-

cant, but still probably falls somewhat short of the comparable figure for regions of the United States.

Second, labor mobility is—and is likely to remain—much lower than in the United States. The European Community is probably even more culturally diverse than the United States, and while, in my view, this has many benefits, it does obviously limit labor mobility. In consequence, labor is less ready to move from place to place in response to developments requiring economic adjustments, and other adjustment mechanisms have to bear more of the burden.

A third difference lies in the lack of fiscal instruments to cushion the costs of adjustment to economic disturbances. In the United States, income tax and national social security provisions act to some extent as automatic mechanisms for transferring resources from richer to poorer regions, and from those with high to those with low employment. No such automatic fiscal mechanisms exist at the community level in Europe.

The fourth difference lies in the disparate relative sizes of the central and regional governments in the United States as against Europe. In the United States, federal government spending represents some 25 percent of GDP and is 20 times as great as California's state expenditure. In Europe, by contrast, the community's budget represents only just over one percent of community GDP and is only one-tenth of the expenditure of West Germany.

What do these differences mean for the process of economic and monetary union in Europe? In the first place, they suggest to me a need for gradualism and pragmatism. Consider the role of goods and factor mobility. This is essential to the success of a common monetary area, since it provides the means by which disturbances in demand or prices in individual regions are spread throughout the union. In other words, it is a safety valve against the intensification of localized inflationary or deflationary pressures. Europe, as I said, is gradually becoming more integrated and the degree of goods and factor mobility is increasing, but there are serious economic and political risks in allowing the process of monetary union to run ahead of integration in the underlying markets for goods, labor, and capital.

For the same reasons, the business cycles in the European economies cannot be expected always to be precisely in phase, so that the monetary policy needed in one part of Europe will, for the foreseeable future, not necessarily be the same as that needed

elsewhere. (This is, of course, true in the United States also, and indeed was one reason for the choice of a federal structure for the central bank—but the original goal of regional autonomy in monetary policy has proved unattainable in a union with a single currency.)

Coping with regional differences

If Europe is not yet an optimum currency area, we need to consider how community monetary arrangements might take account of prospective regional differences in economic conditions. I think three broad options can be identified. The first would be to allow interest rates to continue to diverge to some extent as cyclical conditions vary. Some such flexibility is, in fact, provided by the existence of fluctuation bands around central exchange rates within the present Exchange Rate Mechanism and the possibility of realignments.

A second way of coping with different national or regional policy requirements would be through an intensification of policy coordination. Our collective objective must be to pursue policies which are consistent with communitywide price stability, taking full account of the interdependence of individual national economies.

A third option would be to make use of other policy instruments. I am afraid the Delors Report has been much misunderstood on this matter. Two of the mechanisms it suggested—fiscal policy coordination and regional transfers—have been widely criticized. Another mechanism, competition policy, has been given much less attention than I believe it deserves. Allow me to elaborate briefly on these points.

In the Delors Committee, we saw fiscal policy as having importance for monetary management for several reasons. First, the fiscal stance of individual member states has implications for capital market pressures, and therefore, interest rates, throughout the community. Second, an inappropriate fiscal/monetary policy mix can make it harder for countries to reconcile the objectives of internal and external stability. Third, excessive fiscal deficits can lead to unsustainable borrowing and a loss of creditworthiness by the borrowing country. I believe these are important and legitimate concerns, particularly given that the individual member states, and not the central community bodies, carry the main fiscal responsibility. However, neither I—nor, I think, my colleagues on the committee—saw a need for

specific and detailed budgetary rules. We were simply expressing a rather straightforward proposition: namely, that the mix of monetary and fiscal policy is as important in a monetary union as in an individual country and that limits, which might be quite wide, should be put' on the size of individual deficits.

Let me turn now to regional policy. I am not a believer in government intervention as a means of overcoming regional disparities in incomes or employment for the simple reason that I do not think it can deliver durable results. But I am enough of a realist to recognize that greater economic integration will not necessarily benefit all regions equally. Within a country like the United States, the effects of regional differences in economic welfare can be partly offset by the kind of transfers that arise from the national income tax and welfare system, and ultimately, through inward or outward migration. Such offsets are, as I noted earlier, less readily available in Europe and it seems to me legitimate to ask what mechanisms should exist in their place. Indeed, I believe it is incumbent on those who would like to accelerate the pace of monetary union to explain how regional disparities could be solved satisfactorily in economic terms and acceptably in political terms.

The third element stressed in the Delors Report—and the one which has received too little attention—was competition policy. Europe still has its fair share of rigidities; therefore, 1 believe reforms that strengthen the role and efficiency of markets can be seen as not only desirable in their own right, but part and parcel of a move toward greater economic integration. If rigidities in the functioning of markets can be reduced or removed, natural adjustment mechanisms will be more effective and exchange rate adjustment will become less important.

My remarks this afternoon have ranged quite widely over some of the issues that will be presented by the 1990s. As central banks, we have long recognized that our freedom to conduct an independent monetary policy is constrained by the economic and financial links that bind our countries together. These constraints have typically been greater for small countries than for large ones, although in Europe we now realize that even countries that are large in a European context may have limited freedom to formulate policies independently.

Growing economic and financial integration in Europe in part

reflects similar trends taking place on a global scale. The monetary arrangements devised for Europe should, therefore, be compatible with increasing cooperation between the major regions of the industrial and, indeed, the developing world. It will be of key importance for the world economy in the 1990s that the three major economic blocs coordinate their efforts toward price stability, an effectively functioning international payments system, and an open trading regime. I believe that the 1992 process will make Europe a stronger partner in all these endeavors.

7
International Dimensions of Monetary Policy: Coordination Versus Autonomy

*Jacob A. Frenkel, Morris Goldstein, Paul R. Masson**

Introduction

If each of the major industrial countries independently conducted its monetary policy in a stable, noninflationary way, would exchange market stability emerge as a byproduct? What sacrifice to the ultimate goals of monetary policy would be associated with the coordinated pursuit of greater exchange rate stability? How much flexibility of fiscal policy is necessary to avoid over-burdening monetary policy? What assistance can be obtained from sterilized official exchange market intervention, and will such intervention be effective if it is concerted? Will removal of capital controls where they still remain, as well as the more general global integration of capital markets, restrict unduly the room for maneuver of monetary authorities? Would a moderate increase in nominal wage-price flexibility be sufficient to deal with typical real economic shocks that might impinge on wider currency areas? Is there a need for an explicit nominal anchor under managed floating and if so, what form should it take?

None of these are new questions. Yet events of the past five years have underscored their continuing relevance. During this period monetary authorities of major industrial countries have been faced with the multifaceted task of: (1) containing inflationary pressures

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at a time of high rates of capacity utilization; (2) promoting a configuration of domestic demand and output growth that would reduce large current account imbalances among the three major countries; (3) lending support—via both exchange market intervention and coordinated adjustments in interest rates—to *G-7* pronouncements on the appropriate pattern of exchange rates; and (4) preventing the synchronized equity market crash of October 1987 from generating either widespread financial market failures or a slide into global recession. Moreover, this tall order has been placed against a backdrop in which the relationship between monetary aggregates and income has become less predictable,[1] fiscal policy has evolved according to its own, slower biological clock,[2] and the debt problem of developing countries has made for an increased sensitivity to the level of world interest rates. Last but not least, monetary authorities in European Community (EC) countries have been engaged in preparations for the single European market in goods and financial services in 1992, and in discussions regarding monetary union.[3]

The "international" dimension of monetary policy is thus easy to motivate. This paper discusses key aspects of the international coordination of monetary policy, with particular emphasis on the role that exchange rate considerations should play in the larger industrial countries. The next section seeks to clarify the concepts of coordination and autonomy; then we consider the objectives of the monetary authorities, and follow that by explaining why we regard benign neglect, coordination around rigidly fixed exchange rates, and restrictions on international capital flows all as flawed corner solutions. Then we assess the search for additional policy instruments, including sterilized official intervention, fiscal policy, and structural policies (aimed at greater wage-price flexibility). In the subsequent section, we turn to what we regard as more promising policy strategies, at least for the long term. Key elements of such strategies include focusing monetary policy on price stability (or another domestic nominal magnitude) in the largest economies; using monetary, fiscal and structural policies to correct "bad" external imbalances at their source;

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1 Rasche (1987).

2 Tanzi (1988) provides a discussion of the lags associated with implementing fiscal policy adjustments in the major industrial countries.

3 Delors (1989).

and specifying exchange rate commitments that are looser and quieter[4] across currency areas than within them. That section also contains a discussion of the role of the International Monetary Fund in the coordination process. Finally, we briefly survey existing model evidence on competing policy options and provide some additional simulations using a global macroeconomic model (MULTIMOD).

Coordination and autonomy: clarifying basic concepts

The late Henry Wallich (1984, p. 85) defined coordination as "... a significant modification of national policies in recognition of international economic interdependence." Such a concept of coordination encompasses—but also goes beyond—the adoption of a common data base and the exchange of information regarding recent developments and policy intentions. Some writers prefer to reserve the term "coordination" for agreements among countries to adjust policies in light of shared objectives and/or to implement policies jointly; less ambitious forms of interaction are often then labelled as economic "cooperation."[5] By analogy, policy autonomy implies greater independence by each country in pursuit of its objectives. Almost whatever the definition chosen, international policy coordination has been stronger in the four years beginning with the Plaza Agreement of September 1985 than during the first dozen or so years of managed floating (1973-85).

In our view, neither coordination nor autonomy ought to be regarded as objectives in themselves; instead, they are better seen as facilitating mechanisms for obtaining better policy performance. Coordination is basically a mechanism for internalizing the externalities that arise when policy actions of some countries, particularly the larger ones, create quantitatively significant spillover effects for other countries.[6] Autonomy, in contrast, relies on independent decentralized policy decisions at the national level to achieve policy objectives.

From this perspective, it follows that coordination and autonomy are both capable of producing good and bad outcomes depending on

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4 That is, not disclosed. See Frenkel and Goldstein (1986).

5 Dini (1988), Horne and Masson (1988), Tietmeyer (1988).

6 Frenkel, Goldstein, and Masson (1988a, 1988b).

how such mechanisms are applied in practice. Postwar experience highlights the point.[7] During most of its first two decades of operation, the Bretton Woods system of coordination acted as a force for stability in the world economy.[8] Under the "implicit contract," the United States as the center of the system accepted the obligation to conduct its macroeconomic policies in a prudent, stable way; it was also passive about its exchange rate as a solution to the "N-1 problem." As a consequence of their exchange rate obligations, other countries gave up independence in their monetary policies; in exchange, they received implicit assurance that they would be importing price stability. The move to floating rates in early 1973 was, in good measure, a response to the breakdown of that implicit coordination contract. Specifically, Germany and Switzerland saw floating and more autonomy as a way to break out of the vicious circle of disequilibrium exchange rates, heavy exchange market intervention, and massive capital inflows—and thereby regain control of their money supplies.[9] But autonomy gained is by no means always autonomy wisely used. Summarizing the 1973-84 experience of the industrial countries with managed floating, G-10 Deputies concluded that "... the (present) system has not adequately promoted sound and consistent policies."[10]

The coordination/autonomy debate is logically distinct from the other longstanding policy debate on rules versus discretion. We say this because it is possible to envisage both coordination and autonomy as being implemented under either a rules or discretion format. Kenen

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7 The theoretical literature likewise offers cases where coordination can generate good and bad outcomes. Whereas any single country acting alone may be reluctant to expand when faced with a global deflationary shock for fear of unduly worsening its external balance, coordinated expansion can loosen the external constraint and can permit each country to get closer to internal balance. On the other hand, if inflation-prone authorities are restrained by the concern that unilateral monetary expansion will bring on a devaluation, a coordinated expansion will weaken discipline by removing that threat; see Rogoff (1985).

8 Solomon (1982).

9 Emminger (1977, p.4) has stated: "For countries like Germany and Switzerland, the main--or even only—reason why they went over to floating in the spring of 1973 was the necessity to regain control over their own money supply." Suzuki (1989, p. 2) has recently offered a similar view: "... after the adoption of the floating rate system, the Bank of Japan was able to control money supply more effectively and, as a consequence, the growth rate of real GNP and the rate of inflation became more stable."

10 This 1985 G-10 Deputies Report is reproduced in Crockett and Goldstein (1987).

(1987), for one, has argued for a rules-based approach to policy coordination along the lines of Bretton Woods because it economizes on the scarce resource of willingness-to-coordinate. On the other side, there is the formidable difficulty of identifying coordination rules that are robust to changes in the operating environment.[11] For example, by placing all exchange rate changes under international supervision, the Bretton Woods rules of the game achieved their purpose of minimizing competitive exchange depreciations (a la 1930s); but these same rules became a liability in the late 1960s and early 1970s when the need arose for greater exchange rate flexibility. The dialogue in the domestic monetary policy context has had similar overtones, with adherents of rules stressing the long-term advantages of predictable policies and of constraints on unknowing or expansionist policy authorities, and with champions of discretion citing the need for flexibility to deal with both short-term disturbances and longer-term structural changes.[12] Thus far, practice on both the international and domestic fronts has come closer to the discretion pole. Successive G-7 coordination agreements have featured country-specific policy commitments and concerted official views on the pattern of exchange rates but have not specified a new set of rules for the system. By the same token, monetary authorities in several major industrial countries have continued to announce and to pay attention to monetary aggregates but have moved closer to an "eclectic" approach.

Objectives of monetary policy

The goals or objectives of monetary policy are often stated as price stability, full employment, and sustainable economic growth. Such a listing, however, obscures an important shift in priorities and in approach to policymaking as between the 1980s and the two previous decades. As documented by Polak (1988), control of inflation has been elevated above avoiding more-than-frictional unemployment, and real output targeting has given way to targeting nominal

11 Goldstein (1984).

12 Changes in velocity have heightened interest in "adaptable" rules or guidelines that use longer-term trends in velocity, as well as potential rather than actual output; see Hallman and others (1989).

Table 1
Balance of Payments on Current Account, 1980-88[1]

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Balance on current account									
(In billions of U.S. dollars)									
United States	1.53	8.16	−6.99	−44.29	−104.19	−112.69	−133.25	−143.70	−126.55
Japan	−10.75	4.77	6.85	20.80	35.00	49.17	85.85	87.02	79.63
Germany, Fed. Rep. of	−13.85	−3.57	5.12	5.31	9.85	16.55	39.38	45.24	48.61
(In percent of GNP)									
United States	0.06	0.27	−0.22	−1.30	−2.76	−2.81	−3.14	−3.17	−2.60
Japan	−1.01	0.41	0.63	1.76	2.78	3.67	4.34	3.63	2.78
Germany, Fed. Rep. of	−1.69	−0.52	0.78	0.81	1.58	2.62	4.38	4.02	4.02

Source: ***World Economic Outlook***

1 Including official transfers.

variables.[13] While controversy exists on which intermediate target (for example, the monetary aggregates, nominal domestic demand, interest rates, the exchange rate, various price indexes, or some combination) will produce the best result under a variety of disturbances, the bottom line is that price stability is now widely regarded as the principal priority for monetary policy.[14] Suffice to say that given the experience of the late 1960s and the 1970s, we regard this reorientation of monetary policy as entirely warranted.

The issue of what monetary policy should do about current account and exchange rate developments[15] has, of course, been the subject of increased concern in light of the huge imbalances recorded since 1984 by the United States, Germany, and Japan, and of the large swings—and sometimes, "misalignment"—of the U.S. dollar throughout the decade;[16] see Table 1 and Chart 1, respectively. Here, a more differentiated approach is called for.

We reject *both* the "all current account imbalances should be eliminated" view and the "current accounts don't matter" view. Nonzero current account positions arise from a variety of sources, some of which are "good" and require no policy intervention, and some of which are "bad" and do require intervention. This distinction can best be illustrated by recalling the identity that expresses the current account as equal to the sum of the saving-investment balances of both the public and private sectors. In this context, it is not difficult to

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13 While authorities often continue to provide price and quantity components of nominal GNP, these are typically regarded as "assumptions" or forecasts rather than "targets."

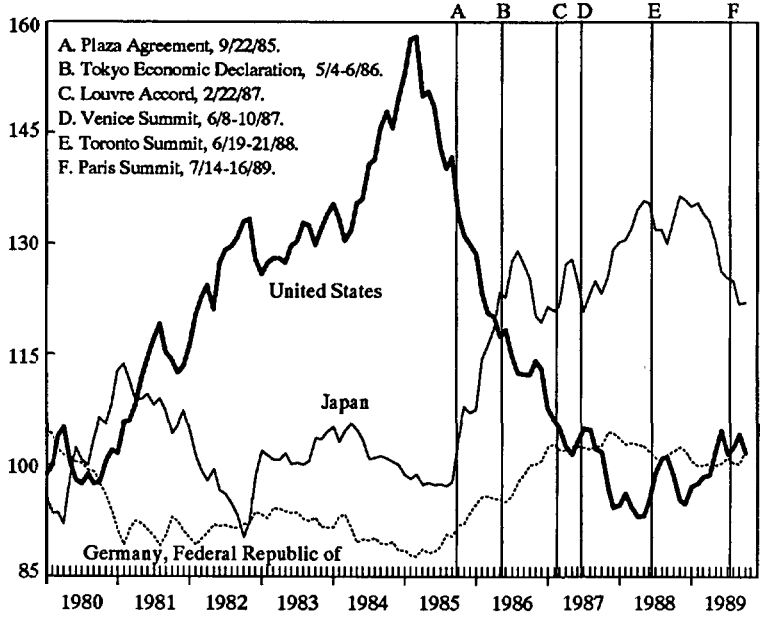
14 One attractive interpretation of such an ordering of priorities is that price stability is a necessary (albeit not sufficient) condition for the achievement of other objectives. Greenspan (1987), for example, has argued that " . . . the mandate for economic policy in the United States and elsewhere should be to maintain the maximum growth in real income and output that is feasible over the long run. A necessary condition for accomplishing that important objective is a stable price level, the responsibility for which has traditionally been assigned, in large part, to the central bank . . ."

15 Current accounts and exchange rates are best viewed as intermediate targets in the sense that departures from targets can imply unfavorable feedback effects on the ultimate objectives of monetary policy (price stability, economic growth, and so forth).

16 By "misalignment" we mean a departure of the real exchange rate from its equilibrium value. Williamson (1985) has estimated that as of the end of 1984, the dollar was overvalued by 39 percent and the yen undervalued by 19 percent.

Chart 1

Real Effective Exchange Rates, 1980 - 1989*
(1980 = 100)



* Real effective exchange rates based on normalized unit labor costs in manufacturing.

envisage several kinds of benign imbalances.[17] One is an imbalance that arises from reversible, intercountry differences in the age distribution of the population. Such demographic differences can be expected to yield different life-cycle-induced private savings patterns which, if not paralleled by differing domestic investment opportunities, will find their reflection in current account imbalances. Yet there is no presumption that these underlying private saving decisions are suboptimal. Consumption-smoothing of a temporary terms-of-trade shock, and private investment booms that make investment in one country more productive than elsewhere, are other examples of good imbalances. In such cases, international capital markets are playing

17 Dornbusch (1988) provides a more complete catalogue and analysis of alternative types of "good" and "bad" imbalances. The same logic separating "good" from "bad" imbalances can be used, as in Frenkel (1985), to assess the relative merits of fixed and flexible exchange rate regimes.

their intended function of optimally allocating saving. Contrast this with the situation where the government is borrowing abroad primarily to finance a consumption spree and where, therefore, an ***unsustainable*** net liability position is being established.[18] When it comes time to pay the piper, there will need to be adjustments—probably sharp ones—to absorption and to relative prices that are likely to be costly to the country and to its trading partners.[19] Here, the current account imbalance obviously "matters" and there is a strong case for removing the imbalance at the ***source*** by reducing government borrowing and/or spending.[20] Other examples of "bad" imbalances are those arising from tax considerations that distort pretax real rates of return, or from "market failures" of various sorts (including ones where the present generation in its saving decisions takes too little account of the interests of future generations, or where private saving and investment decisions are made on the basis of market prices that do not reflect "fundamentals").

A strong implication is that one needs to know the ***origin*** of a current account imbalance before one can decide both *if* it needs correction, and if so, ***how*** to correct it. This, in turn, points up the limitations of simple "assignment rules" that specify how monetary and fiscal policy should be assigned to internal and external balance[21]—be it on the basis of the size of respective impact multipliers from econometric or theoretical models,[22] or on the basis of the relative flexibility of the instruments. Since these assignment rules cannot distinguish the source of the disturbance to the current account, they

18 We abstract here from the issue of "Ricardian equivalence." If such equivalence holds, then the government's saving-investment imbalance will have no inter-temporal effects; in that case, the current account imbalance would still be "benign."

19 The kind of adjustments necessary, and their growth and inflation implications, are often referred to as the "hard landing" scenario; see Marris (1987). See also Lamfalussy (1987).

20 Another relevant factor, more political than economic, is that large and persistent current account imbalances—whatever their source—may incite protectionist pressures.

21 A shortcoming of all such simple assignment rules is that they assume no coordination between monetary and fiscal authorities within a country. Once such coordination is admitted, monetary and fiscal policies can together pursue internal and external balance.

22 The principle that a policy instrument should be assigned to the policy target on which it has the greatest effect is from Mundell (1960). Boughton (1988) and Genberg and Swoboda (1987) have used it to argue that, under floating rates, fiscal policy should be assigned to external balance and monetary policy to internal balance. This is the reverse of the more traditional assignment, as defended in Williamson and Miller (1987). Using a Mundell-type model, Frenkel (1986) shows that the appropriate assignment depends on the degree of capital mobility.

run the risk of barking up the wrong tree.[23] Suppose, for example, that there is a shock that increases the rate of return to investment and that, subsequently, the country runs a current account deficit.[24] Suppose further that monetary policy is assigned to maintaining current account balance. In that situation, tighter monetary policy could inappropriately choke off a sustainable investment-led increase in economic growth.[25] Take another example, this time where household saving is too high because of the existence of a favorable tax incentive, and where fiscal policy is assigned to external balance. In this situation, the policy response to a current account surplus may be an increase in government expenditures that entirely misses the root cause of the problem. There will, of course, be situations where either it is difficult to identify the source of the imbalance, or where the imbalance cannot be corrected at the source. One then enters the slippery world of the second best where a choice has to be made either to leave the imbalance alone or to make compensating adjustments at other than the source of the problem. Such situations are best handled on a case-by-case basis.

Lest there be any misunderstanding, we do *not* see benign influences as dominant in the large existing current account imbalances for the three largest industrial countries. In particular, while there are demographic and other structural factors involved, we regard the U.S. current account deficit as a "bad" deficit that should be reduced substantially, primarily through fiscal consolidation. We simply note that despite large net capital inflows, U.S. investment as a ratio to GNP is at a historically low level;[26] that even at this low investment ratio, investment still exceeds U.S. national saving by roughly 3 percent of GNP; and that this fall in national saving reflects both larger government deficits and lower private saving.[27]

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23 The problem is analogous to that encountered in trying to choose between interest rate and money-aggregate targeting, or between fixed and flexible exchange rates, on the basis of the dominant source of disturbances; see, for example, Poole (1970), Frenkel and Aizenman (1982), and Aizenman and Frenkel (1985).

24 The investment shock could, for example, take the form of a discovery of a natural resource, or technological advances that increase the productivity of capital in that country.

25 Implicit here is the assumption that the country is earning a rate of return that exceeds the rate of interest paid on borrowed funds.

26 See IMF (1989), Supplementary Note 2.

27 See Bosworth (1989) and Feldstein (1989b).

So much for current accounts. We turn next to the role that exchange rate stability should play in the design of monetary policy—an issue that will be occupying us for much of the remainder of this paper. At this point, it is enough to make two distinctions.

One is between countries with and without strong *anti-inflationary* credibility. For the former group, there can be a good justification for pegging to the currency of a country with an established reputation for price stability as a means of disciplining both the authorities and the private sector. If credibility can be so established, it will induce changes in the structure of the economy, including in the elasticity of capital flows and in the wage-price determination process.[28]

In this situation, exchange stability is not in conflict with the objective of price stability; in fact, it becomes the ***means*** by which the low-credibility country establishes a nominal anchor to achieve price stability. Credibility for such a "hard currency" policy is not likely to be achieved costlessly or instantaneously. For example, if a change in the real exchange rate is needed, it must be achieved by a reduction of costs and prices in the low credibility country. Where there are labor market rigidities, this will involve output losses and higher unemployment. Yet the credibility of the authorities and of the exchange rate commitment depends on convincing the private sector that the authorities are willing to bear those costs. Still, when all is said and done, the costs of disinflation could well be lower than with alternative strategies.[29]

A classic illustration of this monetary policy strategy is provided by the EMS experience of the early 1980s. Since disinflation was then the top priority in virtually all EMS countries and since Germany had the best reputation for price stability, there was a commonality of interests in trying to converge to the German inflation rate. Monetary policy in Germany thus served as the anchor of the system. While to date there have been 11 realignments (since the beginning of the EMS in 1979), none of them has resulted in a revaluation relative to the deutsche mark, thus leaving Germany's reputa-

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28 See Kremers (1989).

29 In this connection, the relevant comparison is not just the difference in inflation behavior since 1979 between, say EMS and non-EMS countries (for example, see Collins [1987]), but also what have been the *costs* of disinflation in countries with and without a hard currency policy (for example, see Giavazzi and Giovannini [1988b]).

tion as an exporter of credibility intact; also these realignments have usually not provided full compensation for past inflation differentials —so that the resulting real appreciation for higher inflation countries acts as disincentive to inflation.

As Poehl (1987, p. 8) has put it succinctly, '' . . . credibility is the capital stock of any central bank.'' When a central bank doesn't have it, there can be advantages in tying its hands. Paradoxically, what looks like less autonomy in monetary policy can, in reality, be more. This is also relevant to discussions about a European central bank. If to convince the markets of the credibility of a hard currency policy, weaker-currency countries have to follow every interest rate change of the stronger-currency country, the former may actually increase their effective degree of autonomy within a central institution where they have some influence on the stance of a common monetary policy.

The second distinction worth emphasizing is between well-behaved and misbehaved *foreign* exchange markets. Here, the focus shifts from using exchange rate objectives to discipline policies to using them to discipline markets.

Recall that early advocates of floating exchange rates assumed that speculation would be stabilizing. Faith in that proposition has been weakened somewhat by the development of models of profitable destabilizing speculation,[30] by studies showing that most activity in foreign exchange markets represents interbank trading at short maturities,[31] and most of all, by episodes of exchange rate movements that seem to be unrelated—or even counter—to ''fundamentals.''[32]

The failure of stabilizing speculation to live up to its advance billing makes it imprudent to adopt a strict ''hands off' approach to foreign exchange markets—particularly since the real exchange rate is such a key relative price for resource allocation in advanced market economies. At the same time, we think it has yet to be demonstrated that speculative excesses and serious misalignments are the rule rather than the exception, or that improved macroeconomic policy perfor-

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30 **The literature on rational "speculative bubbles" and on "noise trading" is relevant; see Blanchard (1979) and Frankel and Froot (1987).**

31 **See Dornbusch and Frankel (1987).**

32 **Solomon (1988) singles out the late 1984 to February 1985 and early 1989 periods as ones where the U.S. dollar was moving counter to fundamentals.**

mance would not favorably influence speculative behavior in these markets—without going all the way to continuous management of the exchange rate via monetary policy and publicly announced exchange rate targets.[33] To draw an analogy, it is one thing when handling flammable materials to exercise caution and to have a well-maintained sprinkler system in place to deal with accidents. It is another to have the water spraying down 24 hours a day.

False corner solutions

Even if monetary authorities in the larger industrial countries were in perfect agreement about their objectives, they would still need to address ***how*** these objectives should be pursued. In this section, we analyze three alternative policy strategies and explain why we regard each of them as undesirable.

The first one is ***independent pursuit of (monetary) policy*** objectives, with benign neglect of the international repercussions of national policy decisions. There would presumably still be international cooperation via " . . . exchanging information about current and future policy decisions," but little beyond that.[34] The underlying premise, like the working of the invisible hand under pure competition, is that a global optimum is best reached by independent, decentralized policy decisions. Our disenchantment with this strategy is based on four arguments.

First, this policy strategy pays too little attention to potential "beggar-thy-neighbor" practices. Unlike the atomistic agents of the competitive model, larger countries can exercise appreciable influence over prices, especially the real exchange rate.[35] As such, one cannot rule out manipulation of prices to their own advantage and at the expense of others.[36] Under floating rates, a mix of tight monetary

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33 For an evaluation of the overall performance of foreign exchange markets in the post-Bretton Woods period, see Frenkel and Mussa (1980) and Frenkel (1981).

34 Feldstein (1987).

35 Cooper (1985, 1987), Fischer (1987).

36 Tobin (1987, p. 68) expresses a similar sentiment: " . . . but in its (coordination) absence, I suspect nationalistic solutions will be sought—trade barriers, capital controls, and dual exchange rates. War among nations with these weapons is likely to be mutually destructive. Eventually, they, too, would evoke agitation for international coordination."

and loose fiscal policy will produce an appreciated currency which enhances a country's own disinflation efforts—but at the expense of disinflation efforts of partner countries. Coordination is a way of discouraging such beggar-thy-neighbor practices.

Second, this option gives insufficient weight to a reasonable degree of (real) exchange rate stability as a public ***good*** that can be undersupplied if some large suppliers act in a decentralized way. One does not have to be an advocate of fixed rates to concede that decentralized policy decisions which induce large and unpredictable changes in real exchange rates create international external diseconomies for other policy authorities, as well as for private economic agents. Firms, for example, may hedge against such uncertainty by investing abroad across currency zones even if it means sacrificing cost and scale advantages associated with exporting from what would otherwise be the lowest cost location.[37] It is for this reason that even some supporters of largely decentralized policymaking see a need for some concession to coordination. Corden (1986, p. 431), for instance, concludes that, "... each country benefits the other by maintaining relatively stable policies which will minimize real exchange rate changes in either direction. Coordination consists:essentially of a reciprocal agreement to modify policies that generate real exchange rate instability."

Third, the benign neglect approach underestimates the contribution that coordination can make to achieving a country's ***own*** objectives—either by providing it with a counterweight to pressure from domestic pressure groups, or by restraining through peer pressure misguided policy actions of partner countries. On the latter count, we agree with Williamson's (1988, p. 4) assessment that "... prudence demands that a country retain the right to opt out ... if the rest of the world is going off course. But it is better still to be part of a functioning system which gives some assurance that the rest of the world will ***not*** veer off course."

Finally, the benign neglect approach overestimates, we think, the effective degree of autonomy that exists in today's interdependent global economy. Not only have simple ratios of imports or exports to GNP increased from levels of the 1960s but capital markets have

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37 Cooper (1988)

also become more integrated. Openness by itself places constraints on the conduct of monetary policy regardless of the exchange rate regime chosen.[38] The exchange rate regime influences the form that these constraints take.[39] Under fixed exchange rates and high international mobility of capital, authorities lose control over the money supply, that is, over the ***instruments*** of monetary policy. Flexible exchange rates permit control over the money supply but also imply more rapid adjustment of exchange rates and prices to money supply changes, as well as a sensitivity of current exchange rates to expectations of future policy action; this constrains the ability to influence some targets of monetary policy (for example, the level of real output).[40]

Nothing we have said contradicts the contribution that "putting one's own house in order" can make to greater exchange market stability. We question not whether this is a necessary condition—but rather whether it is a ***sufficient*** condition. Similarly, we do not see coordination as preventing countries from pursuing policies that "are in their own best interest" or as substituting for them; we instead argue that this "best interest" should take account of the spillover effects of domestic policy choices. To be sure, there are obstacles to coordination, ranging from intercountry differences of view about how the world works, to treatment of certain policy instruments as objectives in themselves. Some of these obstacles are also present in the domestic context, while others can, we think, be reduced over time.[41]

A second policy strategy could be ***coordination around a set of fixed*** (or adjustable) ***exchange rates,*** that is, bringing back Bretton Woods or expanding the EMS. Again, we do not see this strategy as fitting the bill—at least not for the larger industrial countries with good anti-inflationary credibility.

To begin with, such a fixed (nominal) rate strategy is unlikely to

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38 Duisenberg (1988, p. 40) offers an even stronger verdict: " . . . it is an illusion to think that, in the absence of an exchange rate objective, domestic policies would be free from constraints. In fact, the choice is to accept the policy constraints beforehand or to face the more damaging consequences when they are ultimately enforced by the market."

39 Frenkel and Mussa (1981).

40 Frenkel (1983) and Feldstein (1989a).

41 These obstacles to coordination are discussed more fully in Frenkel, Goldstein and Masson (1988a).

produce enough flexibility in real exchange rates to accommodate typical changes in real economic conditions, including permanent changes in the terms of trade, secular intercountry differences in rates of productivity growth, and long-term shifts in saving and investment propensities.[42] In theory, the required adjustment in real exchange rates could come just as well from adjustments in nominal wages and prices with fixed nominal exchange rates. But in practice the "stickiness" of nominal wages and prices makes it more realistic to get most of the job done by allowing the nominal exchange rate to adjust.[43]

Second, our ability to identify the equilibrium real exchange rate is subject to wide margins of error. In our paper presented at last year's Jackson Hole symposium,[44] we outlined the limitations of traditional approaches to estimating equilibrium rates (ranging from purchasing-power-parity to the underlying-balance approach). This argues for eschewing narrow exchange rate bands and for challenging the market only when differences between official estimates of the equilibrium rate and the market rate are "large."

A third difficulty is that exchange rate targets are better for disciplining errant monetary policies than errant fiscal policies—yet the latter have often been the real culprits in recent adjustment problems. In fact, exchange rate targets can even send the wrong signal for fiscal adjustment;[45] for example, when fiscal expansion prompts the currency to appreciate toward the top of the band, it sends a signal for looser monetary policy, thereby inappropriately "monetizing" the deficit.[46]

A fourth shortcoming, hinted at earlier, is that rigid exchange rate targets would divert monetary policy too often from its primary

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42 If exchange rates are fixed in nominal terms, they would also need to be adjusted periodically to compensate for inflation differentials.

43 Frenkel and Mussa (1980).

44 Frenkel and Goldstein (1988b).

45 Frenkel and Goldstein (1988a).

46 See Frenkel and Goldstein (1986). It is no coincidence that second generation target zone proposals (for example, Williamson and Miller [1987]) contain a fiscal policy rule, whereas first generation proposals spoke only of monetary policy. Note also that the Delors Report (1989) sees the need for binding cross-country rules that impose upper limits on budget deficits of individual countries and preclude access to direct central bank credit—and this in *addition* to closer monetary coordination and greater fixity of exchange rates.

responsibility of promoting internal balance. There will, of course, be periods when internal and external considerations point monetary policy in the same direction.[47] But when the two conflict, the internal target should almost always take precedence. As Schlesinger (1988, p. 32) has argued:

> '' . . . nor can it in the future become the central banks' main function, regardless of the prevailing circumstances, to try to implement fixed targets for exchange rate movements . . . Central banks' most important function . . . resides in the fact that they collectively bear the ultimate responsibility for the 'global . rate of inflation' and that each individual major central bank is responsible for the stability of the purchasing power of its own currency.''

We can see no close substitutes for monetary policy in carrying out this crucial domestic stabilization task.

Last but not least, the credibility of exchange rate targets hinges directly on the ***commitment*** of policy authorities to achieve them.[48] In this sense, it is questionable whether a firm anchor for exchange rate expectations can be established on the cheap. This commitment to exchange rate targets is not likely to be uniform across countries since some will have more at stake in maintaining stability than others. Specifically, incentives are apt to be greater for small, open economies than for large, more closed ones; for country groups that have strong bilateral trade patterns; and for country groups where exchange rate stability is part and parcel of larger integration objectives. In this connection, Giavazzi and Giovannini (1988b) note that because of the large share of intra-EC trade in total trade, EC countries have a stronger incentive to limit fluctuations of intra-EC exchange rates

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47 Suzuki (1989) identifies the September 1985 to December 1986 period as one where there was no serious inconsistency between domestic objectives of Japanese monetary policy and international considerations; from the beginning of 1987, however, he does see a conflict.

48 Mussa (1986, p. 203) puts it well: "This commitment does not necessarily entail specific rules for monetary and fiscal policy . . . but rather, a general commitment to do whatever is necessary (within limits) to sustain official parities."

than of exchange rates vis-à-vis non-EC currencies;[49] moreover, they point to the importance of stability of intra-EC exchange rates for the survival of the common agricultural policy.

Yet a third policy strategy would be to throw "sand in the wheels" of the international capital markets, by accepting restrictions or transactions taxes on *capital flows*. In brief, this strategy is based on the assessment that such restrictions would be less costly to the real side of the economy than either subordinating macroeconomic policies to exchange rate targets, or accepting the kinds of exchange rate fluctuations associated with greater policy autonomy.[50] Since we have expressed our lack of enthusiasm for such "sand-in-the-wheels" proposals on other occasions,[51] we simply note here four serious objections.

First, to be effective, these proposals require universal implementation.[52] Yet there is always an incentive for some country to capture more of the world's business by not imposing the tax. If only the geographic location of speculation changes—and not its volume or nature—little will be accomplished.

Second, too little is known about asset price behavior in markets with different levels of transactions taxes to be confident that it will penalize only bad speculators and socially unproductive capital flows—without affecting good ones.[53] For example, are asset price volatility and misalignments systematically lower in say, real estate markets (with high transactions costs) than in financial markets (with lower ones)? Are "bubbles" less prevalent in fine art and wine markets (again where transactions costs are relatively high) than in stock markets? If restrictions or taxes are not successful at separating productive from unproductive flows, we would be sacrificing some of the benefits of liberalization, including increased returns to savers,

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49 While some smaller EC countries have openness ratios of 60-70 percent—and while even Germany, France, Italy, and the United Kingdom have ratios of 25-30 percent—the share of imports in GNP for the EC as a whole (in 1987) is only about 12 percent; the analogous figures for the United States and Japan are 10 and 11 percent, respectively. See Giavazzi and Giovannini (1988b).

50 Tobin (1980).

51 Frenkel and Goldstein (1988b).

52 Another consideration is resources spent by speculators in finding a way around the regulations.

53 Mussa (1989).

a lower cost of capital to firms, and better hedging instruments against a variety of risks.

Third, we worry that restrictions on capital flows—even if they affected bad flows more than good ones—could weaken support for "outward looking" policies more generally and possibly spread to other areas, including the foreign trade sector.

Fourth, once sand has been thrown in the wheels, it may be difficult to get out, as rent-seeking groups coalesce around the restrictions.

Searching for additional policy instruments

When an economist hears of one policy instrument being asked to serve two masters, his (Tinbergenesque) instinct is to look for another instrument. In this section, we briefly appraise prospects for assisting monetary policy through foreign exchange market intervention, fiscal policy, and structural policies.

The appeal of ***exchange market intervention*** is that, if effective, it would allow authorities to influence the exchange rate while monetary policy was taking care of internal balance. The relevant concept in this context is sterilized intervention, that is, intervention which is not allowed to affect the monetary base (and thus amounts to an exchange of domestic for foreign bonds).

Sterilized intervention is posited to affect exchange rates through two channels. One is via portfolio effects. Specifically, by altering the relative outside supplies of (imperfectly substitutable) assets denominated in domestic and foreign currency, intervention changes the risk characteristics of the market portfolio and induces changes in exchange rates.[54] The second channel is the signalling effect. The line of argument here is that exchange rates reflect expectations of future macroeconomic policies, that monetary authorities have inside information on future monetary policy, and that they can credibly signal future monetary policy via intervention.[55] Intervention is said to be a good signalling device because authorities are "putting their money where their mouth is," because (if sterilized) signals can be given without affecting the real economy, and because intervention

[54] Branson and Henderson (1985).

[55] Mussa (1981) and Dominguez (1989).

can be deployed rapidly and around the clock.[56] This signalling effect is sometimes also argued to be more powerful when intervention is "concerted" (that is, undertaken by several countries simultaneously) because it eliminates the risk of authorities operating at cross-purposes.

The last official study on the subject, namely, the Jurgensen Report (1983), did not offer much encouragement; it concluded that sterilized intervention was a relatively weak instrument of exchange rate policy, with limited effectiveness beyond the short run. Some have argued, however, that the post Plaza Agreement experience merits a reappraisal of that verdict. Even if the contribution of intervention plus jawboning to the depreciation of the dollar from September 1985 to February 1987 is regarded as little more than "kicking the ball down the hill," they see the subsequent relative stability of key exchange rates as prima facie evidence of intervention's efficacy.[57]

Obstfeld (1988) has recently completed an examination of the effectiveness of intervention over the 1985-87 period. His main conclusions can be summarized as follows. First, the dominant policy determinants of broad exchange rate movements of recent years have been monetary and fiscal actions, not sterilized intervention. Second, except possibly in 1987, the scale of intervention has been too small (relative to huge outstanding asset stocks) to have significant portfolio effects. Third, the signals sent by intervention have been effective only when they have been backed up by the prompt adjustment of monetary policies, or when other events (for example, unexpected trade balance developments) have coincidentally altered market sentiment. Finally, the most convincing intervention operations have been "concerted" ones. This last conclusion is also consistent with the results of the only existing empirical study that had access to daily intervention data for the 1985-87 period. Specifically, Dorninguez (1989) found that concerted intervention had a larger and longer-term influence on exchange rate expectations than did unilateral intervention.

From all this we conclude that while sterilized intervention may be helpful at times in calming disorderly foreign exchange markets or in signalling authorities' views about the appropriateness of market

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56 Obstfeld (1988).

57 Williamson (1989).

exchange rates, it is not likely by itself to be powerful enough to extricate an overburdened monetary policy from two-hat policy dilemmas. Within these limitations, one can probably maximize "the bang for a buck" by implementing intervention in a concerted, coordinated way.

Another popular candidate for the second policy instrument is *fiscal* policy. In some coordination schemes, it is assigned to maintaining internal balance (say, nominal domestic demand),[58] while in others, it is paired with external targets (the current account).[59] In defining an appropriate role for fiscal policy, consideration needs to be given to the following factors.

First, it is a fact of life that fiscal policy is significantly *less flexible* than monetary policy in virtually all major industrial countries. Contrast, for example, the frequency in the United States of meetings of the Federal Open Market Committee with the frequency of budget submissions to Congress. This means that under current institutional arrangements, it is not realistic to envisage fiscal policy as playing a short-term stabilization role—be it on either the domestic or external side.

Second, we think fiscal policy should be framed primarily within a medium-term perspective. An appropriate fiscal policy should be guided by considerations of long-term efficiency, resource allocation, income distribution, and economic growth—rather than by short-term considerations of demand management and fine tuning. The emphasis should be on establishing the right incentives for working, saving, and investing—with monetary policy carrying the bulk of the domestic stabilization load. The delays and difficulties associated with correcting the large U.S. federal budget deficit undercut the case for greater flexibility of fiscal policy. Instead, they make the case for greater medium-term fiscal discipline. Too often in the past have industrial countries accepted " . . . a permanent increase in the debt-to-GDP ratio in order to achieve short-term objectives . . . ;"[60] see Table 2. The priority should be to ensure that the aggregate stance of fiscal policy is subject to a long-run constraint that precludes

58 Williamson and Miller (1987).

59 Genberg and Swoboda (1987) and Boughton (1988).

60 Bruce and Purvis (1988, p. 29).

Table 2
Major Industrial Countries: Debt Outstanding at Central and General Government Levels, 1978-88[1]

(In percent of GNP/GDP)[2]

	1978	1982	1986	1987	1988[3]
Central government					
Gross Debt					
Canada	30	34	48	49	—
United States	35	38	52	54	55
Japan	31	47	59	61	59
France	15	17	24	24	26
Germany, Fed. Rep. of	14	19	21	22	22
Italy	57	63	86	90	94
United Kingdom	44	48	51	50	45
Net debt					
Canada	12	20	37	38	—
United States	22	25	37	38	38
Japan	3	12	14	10	8
France[4]	−1	0	11	13	14
Germany, Fed. Rep. of	—	—	—	—	—
Italy	35	48	72	77	81
United Kingdom	9	18	15	16	13
General government					
Gross debt					
Canada	59	64	82	82	—
United States	47	48	65	66	67
Japan	42	61	73	76	74
France	26	31	36	37	37
Germany, Fed. Rep. of	29	38	41	42	43
Italy	62	66	88	93	96
United Kingdom	58	58	56	54	49

Table 2 — Continued

	1978	1982	1986	1987	1988[3]
Net debt					
Canada	12	17	37	38	—
United States	29	31	41	42	43
Japan	11	23	26	22	19
France[4]	—	4	12	13	14
Germany, Fed. Rep. of	7	19	19	20	21
Italy	47	51	77	81	85
United Kingdom	25	29	25	26	22

Source: Fund staff estimates based on the following national publications: United States: Board of Governors of the Federal Reserve System. ***Flow of Funds Accounts, Financial Assets and Liabilities. Year-End, 1964-1987,*** and ***Federal Reserve' Bulletin*** (various issues); Japan: Economic Planning Agency, Government of Japan, ***Annual Report on National Accounts*** (various issues); Federal Republic of Germany: ***Monthly Report of the Deutsche Bundesbank*** (May issue); Italy: ***Relazione Annuale all'Assemblea Generale Ordinaria dei Participanti,*** Banca d'Italia; Canada: ***The Fiscal Plan,*** Department of Finance (February 1989): France: Institut de Prtvisions Economiques et Financiéres pour le Dtveloppement des Entreprises, ***Revue de l'Ipecode;*** United Kingdom, Central Statistical Office.

1 Book value of debt outstanding at the end of the year.

2 Canada, France, Italy, and the United Kingdom: in percent of GDP.

3 Data for 1988 are preliminary.

4 For 1985-88 data are estimated by adding the fiscal deficit to the corresponding stock of debt in the previous year.

excessive debt accumulation. Once such a constraint is firmly established, there may arise unusual situations that warrant a departure from longer-term objectives.. We would expect them to be few and far between. The existence of automatic stabilizers in the tax system'already provides some counter-cyclical element in fiscal policy without the need to go to constant fine tuning.

Fiscal policy is, by its very nature; a more ***disaggregated*** policy instrument than monetary policy. However inconvenient this is for. us macroeconomists, there is increasing evidence that the effects of fiscal policy actions depend critically on how those actions are carried out.[61] Does a cut in the deficit take place through reductions

61 Frenkel and Razin (1987).

in expenditures or increases in taxes? Do expenditure changes fall primarily on tradable goods or on nontradables? Do tax changes affect mainly investment or saving? Are taxes of the lump sum variety or specific? Does the country undertaking the fiscal action have a current account deficit or surplus? Are the fiscal measures permanent or transitory? It all matters.

To sum up, the way in which fiscal policy is managed will have an important influence on the environment in which monetary policy must operate in pursuit of its objectives. By promoting proper incentives for long-run resource allocation and by avoiding an excessive accumulation of debt, it can improve prospects for sustainable noninflationary growth and for exchange market stability. In some respects, it may even be able to compensate for certain constraints imposed on monetary policy. For example, as increasing international capital mobility links real interest rates across countries, structural tax policies represent a way of altering the mix between consumption and investment at any given real interest rate.[62] But fiscal policy is not well suited for resolving short-term dilemma situations faced by monetary policy.

This is not the place to attempt an appraisal of the scope for structural policy changes in industrial countries.[63] That would constitute a paper in itself. There is, however, one element of structural policy—namely, measures to increase wage and price flexibility—that has a direct bearing on the task facing monetary authorities.

As suggested earlier, some industrial countries will have an incentive to give greater weight to exchange rate targets in the design of monetary policy than will others. For those who do opt for greater exchange rate fixity, domestic wages and prices have to carry more of the burden of responding to changes in supply or demand conditions. Indeed, in a common currency area, all of the adjustment in real exchange rates has to occur via inflation differentials. Other things equal, the lower the flexibility of wages and prices, the greater will be the output and employment losses associated with unfavorable real economic shocks. It is in this context that structural policies which increase the flexibility of the economy can make an important con-

62 Feldstein (1988).

63 Structural policies include those that raise the productive capacity of the economy and those that increase its flexibility.

tribution. These would include trade policies that enhance competition, goods markets deregulation, and labor market reforms. Among the latter, measures that reduce barriers to occupational and regional mobility and that lower the social charges associated with hiring new workers, or in shifting them between sectors, are apt to be particularly helpful. Mundell (1957) singled out labor mobility as a key criterion for an optimal currency area more than 30 years ago. It is just as relevant today.

Even in those industrial countries that are willing to rely more on nominal exchange rate flexibility to achieve needed adjustments in real exchange rates, structural policies have a role to play in seeing that nominal exchange rate changes get "passed through" to relative traded goods prices. Policies that, for example, reduce nontariff barriers to imports and increase competition in the trade and distribution network, can increase the effectiveness of exchange rate changes and thereby decrease the size of the exchange rate change needed to obtain a given alteration in competitiveness.

A positive development of the 1980s has been the increasing awareness of the supply-side implications of structural policies.[64] These structural policies should be viewed as complements—rather than as substitutes—for appropriate macroeconomic policies. They should provide a stable framework in which monetary and exchange rate policies can operate with greater effectiveness in achieving their ultimate objectives.

Toward more promising policy strategies

Identifying policy strategies that are not likely to work is one thing. Finding strategies that will is another. In this section we discuss some broad guidelines for the conduct of economic policy in today's interdependent global economy,. These should not be confused with proposals. For one thing, several of our suggestions are already present in the ongoing policy coordination process, while others are feasible only over the long term. Thus, rather than advancing a com-

64 Gyohten (1988) sees the *G-7* coordination process as now in a third stage where the emphasis is on structural measures; in contrast, he characterizes the first and second stages as emphasizing exchange rate realignment and macroeconomic policies, respectively.

prehensive proposal for reform of the international monetary system, our aim is simply to stimulate discussion.

We begin with the notion that any successful exchange rate system needs some mechanism for avoiding both global inflation and global deflation. In our view, the responsibility for establishing a ***nominal anchor*** falls to the largest industrial countries. Specifically, monetary policy in these countries should be directed toward price stability so as to maximize prospects for sustainable noninflationary growth. Fiscal policy can assist in establishing a nominal anchor by forgoing excessive debt accumulation that itself would handicap the ability of the monetary authorities to carry out their task.

A relevant question is whether maintenance of such a nominal anchor requires something beyond the existing commitments of domestic monetary authorities. In this connection, it has been proposed that monetary policy in the larger industrial countries might target a common basket, such as the prices of a group of primary commodities. As noted by its proponents, such a basket has a number of potential advantages:[65] (1) commodities are traded daily in auction markets so that the price index can be calculated almost continuously; (2) the index has relevance for many countries since most commodities are produced, consumed, and traded on a worldwide basis; and (3) internationally traded commodities are relatively standardized, minimizing both quality measurement problems and systematic productivity biases as between tradables and nontradables. The problem, however, is that stabilizing such a commodity price index would not likely stabilize the broad price index of goods and services since there will be changes in the commodity terms of trade—a shortcoming that it shares with all partial baskets.[66] In fact, it is precisely because of such changes in the terms of trade that we see such commodity baskets as a possible "indicator" or early warning signal—rather than as a target—for monetary policy,[67] and as one among many indicators at that.

On a broader level, we see little to suggest that more explicit international anchoring rules have consistently produced better inflation performance. Cooper (1982), for example, documents large,

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[65] Heller (1987).

[66] Cooper (1988).

[67] Angell (1987) and Boughton and Branson (1988).

long-run swings in wholesale prices—on the order of 30-70 percent in both directions—during the nineteenth century gold standard. Similarly, Meltzer (1986) found that short-term prediction errors for prices were much higher during the gold standard than during the 1950-80 period.

We see this responsibility for price stability as a collective one of the largest industrial countries, rather than as the responsibility of any one country alone. In this sense, it is now more appropriate to speak of the "N-3" (or "N-5" or "N-7") countries, rather than the "N-1" countries for the system. This collective orientation, in turn, reflects the greater symmetry in economic influence among the major industrial countries that characterizes today's global economy vis-à-vis 20, or even 10, years ago; see Table 3. No longer is there

Table 3
Shares of Selected Countries in World Totals

	United States	Japan	Fed. Rep. of Germany	Other
Share of National Currencies in Total Identified Official Reserve Holdings[1]				
1975	85.1	0.6	6.6	7.7
1987	67.1	7.0	14.7	11.2
Share of World Trade[2]				
1956	16.2	3.3	7.4	73.1
1987	14.1	8.0	11.0	66.9
Share of World Output[3]				
1962	41.5	4.4	6.7	47.4
1987	28.5	15.0	7.1	49.4

1 IMF *Annual Report,* 1980 and 1988.

2 Based on the sum of imports plus exports. IFS *Supplement on Trade Statistics,* Supplement Series No. 15, 1988.

3 GDP at market prices. IFS *Supplement on Output Statistics,* Supplement Series No. 8, 1984, and IFS *Yearbook* 1987.

an obvious hegemon which combines a dominant position in international trade and finance, an unblemished record for price stability, and a willingness to assume the obligation of being the "N-1" country. Indeed, one way of characterizing the policy coordination process is as a pragmatic mechanism for dealing with shared leadership.

This trend toward greater symmetry also partly explains why exchange rates alone are not likely to serve as the nominal anchor for the system. Not all countries can simultaneously rely on a fixed (nominal) exchange rate to guide their monetary policies. At least one country has to set the inflation rate for the system as a whole. Collective agreement on real exchange rate targets is likewise not the answer to the nominal anchor problem since real rates are consistent with any inflation rate.[68]

What would be the role of coordination in such a system? There are at least two immediate functions (aside from policing beggar-thy-neighbor codes). One is to mobilize peer pressure to strengthen individual country commitments to their internal balance objectives. The second is to deal with potential "adding up" problems that arise when the joint outcome of individual country internal balance targets is global inflation or deflation.[69] Solomon (1988), for example, sees insufficient attention to such adding up problems as having contributed to the buildup of global inflationary pressures in 1972-73 and to the depth of the global recession in 1981-82.

Our second basic guideline is that exchange rate commitments should be tailored to the characteristics and circumstances of individual economies. Moreover, we interpret this guideline as suggesting that exchange rate commitments should be looser and quieter in the largest industrial countries than in smaller, more open economies—some of which may even eventually opt to join regional currency areas.

This is emphatically not a call for benign neglect of exchange rates. As pointed out earlier, we regard a reasonable degree of exchange rate stability for key currencies as a public good for the system. The issue is how that public good should be produced and in what amounts?

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68 Adams and Gros (1987) provide a lucid analysis of the nominal anchor problem associated with real exchange rate targets.

69 Such "adding up" problems also apply to the level of world interest rates, and to the aggregate monetary-fiscal policy mix. This has been termed "absolute coordination" (Currie, Holtham and Hughes-Hallett [1988]).

In seeking to promote exchange market stability, the larger industrial countries would assume a set of responsibilities. First and foremost, by setting the stance of monetary and fiscal policy on a stable, noninflationary course and by endeavoring to correct bad external imbalances at their source, they would provide a more stable focus for exchange rate expectations.[70] The issue is not whether misalignments on the order of 1983-85 can recur; it is whether they can recur when fiscal policy is better disciplined and when external imbalances are much smaller. While the counter-factual is unobservable, we think that more disciplined policies would go a long way toward more disciplined exchange markets. That is also why we regard the coordination of policies as the key element of the ongoing *G-7* coordination process. Second; authorities in these countries would regularly develop their own (quiet) estimates of equilibrium real exchange rates. As we indicated earlier, these estimates are likely to be subject to substantial margins of uncertainty. Nevertheless, unless one accepts the view that "the market rate is always the right rate," an independent evaluation is needed. Third, in those (it is hoped unusual) cases where there is a "large" difference between the market rate and the consensus official view of the equilibrium rate consistent with fundamentals, authorities would intervene. This intervention could take the form of a statement of official views on the desirable direction of exchange rate movements, of concerted, sterilized exchange market intervention, and—if necessary—of coordinated adjustments in monetary policies. The Plaza Agreement and its aftermath is a good case in point. Again, we emphasize that these are *contingent* responsibilities—contingent upon strong evidence of bubbles or large misalignments in exchange markets.

Although such exchange rate commitments on the part of the larger countries would be looser than in many target zone schemes, they would not necessarily be less effective. This is because the stabilizing effect of any official exchange rate commitment on expectations depends on its *credibility.* One can argue that a looser commitment wherein authorities "keep their powder dry" for large, clear-call misalignments and do not claim that the primary assignment of monetary policy is for external balance, will be more credible than

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70 The likelihood that the 1990s will start with a significantly better inflation performance on the part of the largest countries than did the 1980s should itself be a positive factor.

a (nominally) tighter and louder commitment. In evaluating the credibility of a commitment, market participants are also apt to weigh the costs of exchange rate instability against the costs of reduced monetary control. We would submit that for the largest economies, the costs of reduced monetary control are perceived to be large enough to tip the balance in favor of exchange rates only when exchange markets are seriously misbehaved.[71]

Let us turn next to the rationale for tighter and louder exchange rate commitments—perhaps even eventually common currency areas—for the smaller, more open economies.

In the section on clarifying basic concepts, we outlined the attraction of "tying one's hands" on monetary policy for a central bank that does not have its own strong anti-inflationary credibility.[72] Such a hard currency policy is likely to be most beneficial and credible when there is a conservative central bank to anchor to, and when the effects of international cost competitiveness and of price arbitrage in tradable goods loom large in the economy. The conservative central bank ensures that the loss of monetary independence is compensated by imported price stability. Openness makes the output and employment costs of inflationary behavior hit home harder and faster. In this regard, we would note that each of the three "poles" (North America, Europe, and the Pacific) often mentioned as possible regional currency areas has at least one—in fact, usually more than one—strong central bank with a good reputation for price stability. Also, as previously mentioned, the smaller industrial and newly industrialized economies have relatively high openness ratios:

A second motivation for stabilizing the exchange rate is to minimize the adverse effects of exchange rate variability and uncertainty on the volume of trade flows.[73] The incentives to avoid such uncertainty

71 Suzuki (1989, p. 6) seems to share this assessment when he concludes: "Although the degree of economic integration among European countries, the United States and Japan is much less than in the European Community, exchange rate stability is still desirable if it can be achieved at a small cost."

72 Chouraqui (1988) also argues that the nominal exchange rate may be superior to monetary aggregates as a disciplining mechanism since it is an instantly observable market price, which if stabilized, will not be subject to the problems of interpretation which often arise with monetary targets.

73 Mussa (1986) provides strong evidence that variability of real exchange rates is typically much greater under floating than under pegged rates. The second link between exchange rate variability and trade flows has proved much harder to document; see International Monetary Fund (1984), Gotur (1985).

should be higher for more open economies, and for those trade flows that account for a large percentage of a country's total trade. On this latter point, a rough calculation suggests that ifexchange rates within each of three regional currency areas were truly fixed, approximately one-third of world (non-oil) trade would be conducted at fixed rates; see Table 4. Note also that if exchange rates were more closely tied together within regional currency areas, exchange rate variability across zones would presumably be of lesser concern (since the latter would affect a smaller share of world trade).

Table 4
Non-Fuel Merchandise Trade Matrix, 1985

(In billions of U.S. Dollars)

	TO			
	United States and Canada	**Japan and Asian NIEs**	**European Community**	**Other**
FROM				
United States and Canada	**(98.7)**	**43.3**	**48.4**	**78.6**
Japan and Asian NIEs	**117.1**	**(62.7)**	**37.7**	**78.8**
European Community	**66.8**	**22.4**	**(312.5)**	**185.1**
Other	41.8	31.0	84.2	(98.5)

Source: United Nations data on exports. Figures in parentheses give trade within the regional grouping.

Stabilizing exchange rates within regions would also build upon existing regional integration efforts. These include the single market program and discussions of monetary union in Europe, the Canada-U.S. Free Trade Agreement in North America, and the sharp increase in intraregional trade and investment among Japan, the newly

industrialized economies, and other Asian countries.[74] Larger integration objectives can give exchange rate commitments enhanced credibility because authorities have more at stake in keeping them.

Despite these potential advantages, it would be a mistake to underestimate the obstacles that stand in the way of tighter exchange rate commitments—and even more so, of regional common currency areas—particularly over the short term. Four of them merit explicit mention. First, the pace of, and commitment to, increased regional integration clearly differ across poles. Europe—with its now 10 years of successful operation of the EMS, its plans for 1992, its agenda for increased monetary policy coordination, and its larger integration objectives—has gone way beyond where North America or the Pacific are, or where they may want to go. In a similar vein, the extent of intraregional trade is greater in Europe than in either North America or Asia; Asian countries, in particular, now conduct a substantial share of their trade with the United States (see Table 4). Second, greater fixity of exchange rates within regions leaves unanswered the question of how to respond to real shocks that impact more severely on some countries in the currency area than on others. This points up the importance of factor mobility, real wage flexibility, and a tax and fiscal transfer system that operates at the level of the exchange rate union. Each of these adjustment and financing mechanisms would need to be better developed. Third, in a system of currency areas characterized by two-tier exchange rate commitments, there needs to be some coordination of exchange rate policy across the two tiers; the problem of formulating a consistent dollar policy for the EMS as a whole is a case in point. Finally, care would need to be taken to ensure that regional currency areas adopted an outward-looking stance and contributed to better global allocation of resources. Some countries—particularly if they have their own strong anti-inflationary credibility—may, in fact, view these obstacles as prohibitive, and opt instead for other exchange arrangements.

At this stage no one can know with any confidence whether the system will evolve in a "tri-polar" direction. The outcome will depend as much on political developments as on economic ones. We do think,

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74 Japan's trade with the rest of Asia has increased dramatically, from 18 percent of Japan's total imports and exports in 1976 to more then 25 percent in 1988IV-89I. Also, the Japanese manufacturing industry has increased sharply its offshore production in the region; see Maidment (1989).

however, that a successful exchange rate regime should recognize that the optimal degree of exchange rate flexibility is probably not the same across countries and that options for reducing exchange rate variability also include reducing the number of exchange rates, that is, creating single currency areas.

The final topic we take up in this section is the role of the International Monetary Fund in the coordination process. The Fund has, for some time now, been assisting the *G-7* exercise of policy coordination.[75] This is in addition to the Fund's own surveillance activities, including Article IV consultation discussions with individual member countries and the twice-yearly discussions by the Fund's Executive Board and the Interim Committee of the staffs *World Economic Outlook.*

The standard justification for having an international institution participate in policy coordination is that it facilitates use of a common data base and provides a source of impartial analysis for any dialogue on policy consistency. When the coordinating group is small, the international institution may also contribute a systemic perspective on proposed policy agreements, while still keeping the group small enough for administrative efficiency.

A fairly detailed description of the procedural framework underlying current coordination efforts can be found elsewhere.[76] We simply note here that the broad policy guidelines discussed earlier raise a host of thorny analytical issues. These include: how to check the consistency of large-country internal balance objectives; how to estimate the "adding up" effects of large-country monetary and fiscal policy stances; how to distinguish "good" from "bad" external imbalances; how to evaluate the relative costs of alternative ways of correcting bad imbalances; and how best to estimate equilibrium real exchange rates. In our view, a good start has been made on some of these problems, in part through the application of "economic indicators" and the analysis of alternative medium-term scenarios. Suffice to say that more remains to be done to strengthen the analytical foundation of

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[75] The Managing Director of the Fund began to participate in the surveillance dibcussions of the *G-5* Ministers and Governors in 1982 following the Versailles Summit. A Fund staff representative began to participate in certain meetings of *G-5* Deputies in *1986.* The *G-5* was extended to the *G-7* in *1987.*

[76] Crockett (1988).

policy coordination and that the Fund is committed to contributing to that effort.

Model evidence

There is a burgeoning literature on the use of econometric models to evaluate questions, of policy assignment and of international macroeconomic policy coordination.[77] This literature is relevant to our earlier discussion because it provides some empirical feel for the relative importance of factors that may lead authorities to prefer one policy strategy over another. At the risk of overestimating the consensus yet reached across different models and studies, a number of conclusions stand out.

Perhaps the main one is that policy rules that do better for some kinds of shocks tend to do worse for other kinds. We see that as supporting our argument that the first-best policy strategy is to make the policy response contingent upon the source of the shock. When this is not feasible, then the second-best is to assign policy instruments to targets on the basis of the relative variance of shocks hitting that economy.

A second message is that fixity of *nominal* exchange rates performs on balance less well than freely flexible exchange rates, at least for the three largest industrial countries[78] (although the results depend to some extent on how the fixed-rate anchor is modeled). A related finding—albeit a still hotly debated one—is that variability in exchange rates (due to speculative bubbles, fads, or changes in subjective risk perceptions) does not seem to be an important cause of variability in other macroeconomic variables.[79] Again, we find this evidence consistent with our case against rigid exchange rate commitments.

A third conclusion is that monetary policy is relatively ineffective in hitting narrow real exchange rate targets.[80] Not surprisingly, this points toward wide bands if the exchange rate is to be used as an intermediate target.

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77 See Bryant and others (1989), which includes model simulation results as well as a survey of other evidence.

78 Taylor (1988).

79 Taylor (1988) and Frenkel, Goldstein, and Masson (1988c). Miller. Weller, and Williamson (1988), however, dispute this.

80 Frenkel, Goldstein and Masson (1988c).

Lesson number four is that an attempt to precisely target variables such as nominal income or real exchange rates risks throwing the economy into a dynamically unstable pattern.[81] Moreover, this risk appears to be quite sensitive to the choice of the target path for the real exchange rate.[82] We interpret this as favoring "gross-tuning" over "fine-tuning" and as emphasizing the importance of getting an accurate estimate of the equilibrium real exchange rate (if it is to be a policy target).

We would regard the evidence dealing with coordination rules that aim at two target variables as more tentative. Much of this literature has been focused on a comparison of assignment rules with the traditional assignment pairing monetary policy with external balance and fiscal policy to internal balance,[83] and with the "reversed assignment" preaching the opposite.[84] As indicated earlier, we have strong reservations about both these assignments since such rules pay insufficient attention to the source of the shocks. This being said, the simulation results thus far suggest that the traditional assignment outperforms the reversed assignment.[85] But these results may be misleading. Specifically, they assume that the requisite flexibility exists for fiscal policy. In the more likely .case where government spending is subject to time lags and other constraints related to the political process, the reversed assignment sounds more sensible. In such a framework, fiscal policy might be adjusted to an external balance target, but only infrequently, in response to a clear signal that current account developments were unsustainable. In fact, once fiscal policy is assumed to be less flexible, the better simulation performance of the traditional assignment largely disappears.[86]

In the section on monetary policy objectives, we argued against orienting monetary policy exclusively toward domestic targets, without any weight given to external repercussions. At the same time, we argued for a selective and flexible response to both domestic and

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81 McKibbin and Sachs (1988).

82 *Ibid.*

83 Williamson and Miller (1987).

84 Genberg and Swoboda (1987) and Boughton (1988).

85 Currie and Wren-Lewis (1988) and Frenkel, Goldstein and Masson (1988c).

86 Frenkel, Goldstein, and Masson (1988c).

foreign shocks. We illustrate these key points below using simulations of a global macroeconomic model developed in the Fund, namely MULTIMOD. Given space limitations, the presentation has to be abbreviated, but one hopes it can still give a flavor of the main forces at work.

We compare the response of the U.S. economy to shocks to U.S. consumption or investment, and also to changes in the foreign demand for U.S. exports and for U.S. assets, under several different assignments of policy instruments to targets.[87]

The three policy rules that we consider are the following:

(1) nominal GNP targeting using short-term interest rates (with no external objective),
(2) assigning the short-term interest rate to a target for the real effective exchange rate, and government spending to nominal domestic demand; this is the "blueprint" of Williamson and Miller (1987),
(3) assigning the monetary policy instrument to nominal GNP, and government spending to the current account balance; that is, the "reversed assignment."

Chart 2 compares the resulting paths for several macroeconomic variables, in response to a positive shock occurring in 1988 to consumption or to investment in the United States, and equal in each case to 1 percent of U.S. GNP.[88] In the short run, the GNP effects of the two shocks on impact are similar: they put pressure on supply

87 The model used is presented in Masson and others (1988), with the modifications described in Frenkel, Goldstein and Masson (1988c). The policy rules are implemented slightly differently than in that paper, however. The "blueprint" rule is assumed to use a linear feedback relationship of real exchange rates onto interest rates, rather than the cubic equation of the earlier paper which was found to give unsatisfactory results when the magnitude of exchange rate changes differed markedly between countries. The "reversed assignment" rule targets nominal GNP here, rather than nominal domestic demand as previously, in order to make it more comparable to the nominal GNP targeting rule. The latter two rules have a higher feedback coefficient of nominal GNP in the interest rate equation than previously, permitting a sharper differentiation of these two rules from the blueprint rule. Qualitatively, however, the conclusions of the earlier paper still obtain.

88 The shock is a temporary one, but it has persistent effects because the residuals in the equations for consumption and investment exhibit autocorrelation, and because of dynamics related to asset stock accumulations and lagged adjustments.

Chart 2

Responses of U.S. Variables to Temporary Consumption and Investment Shocks

(each equal to 1% of GNP in 1988)

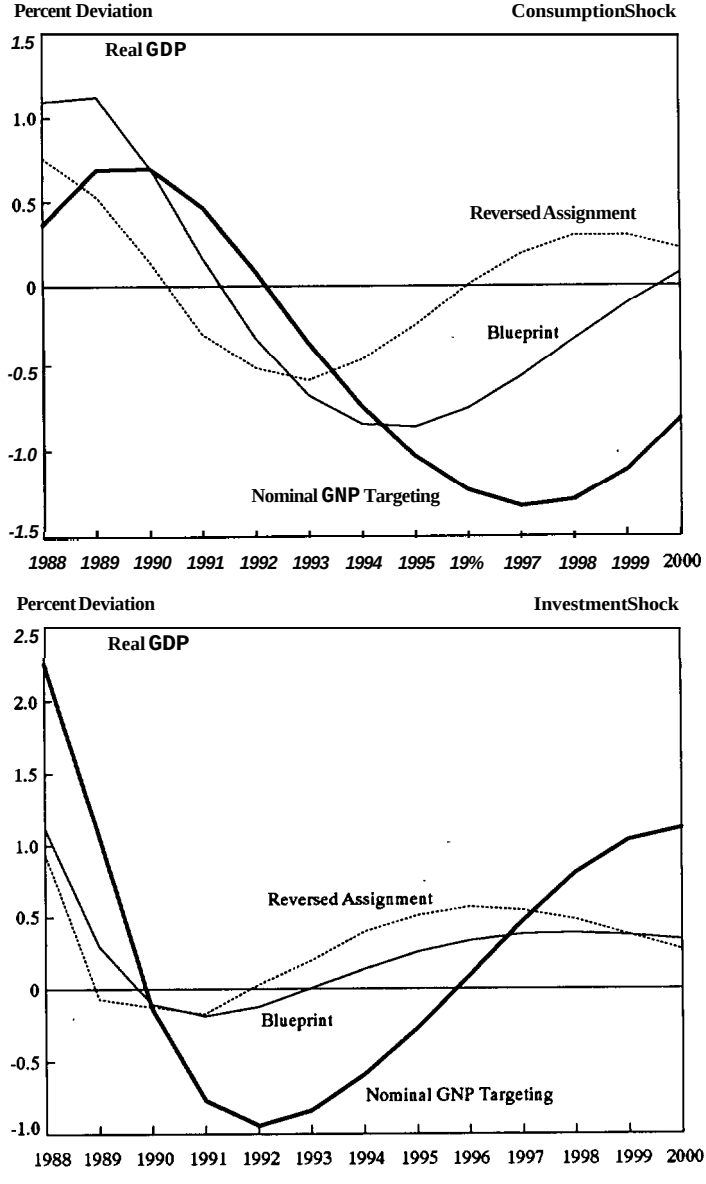
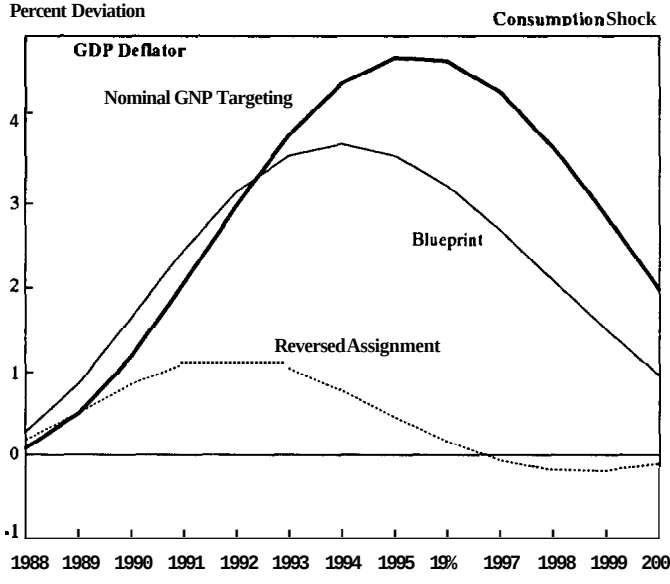


Chart 2 (continued)

Responses of U.S. Variables to Temporary Consumption and Investment Shocks

(each equal to 1% of *GNP* in 1988)



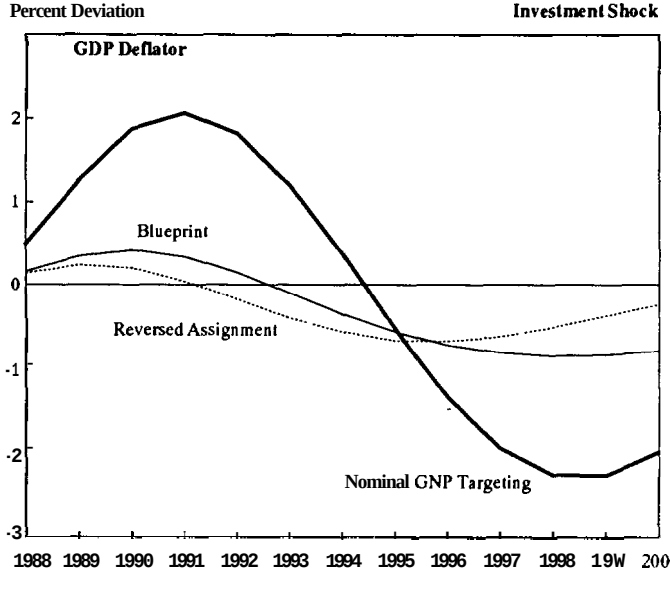
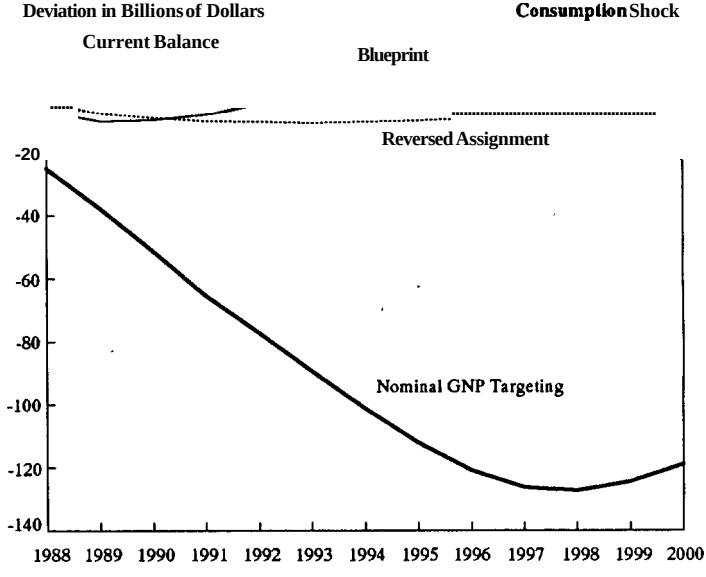
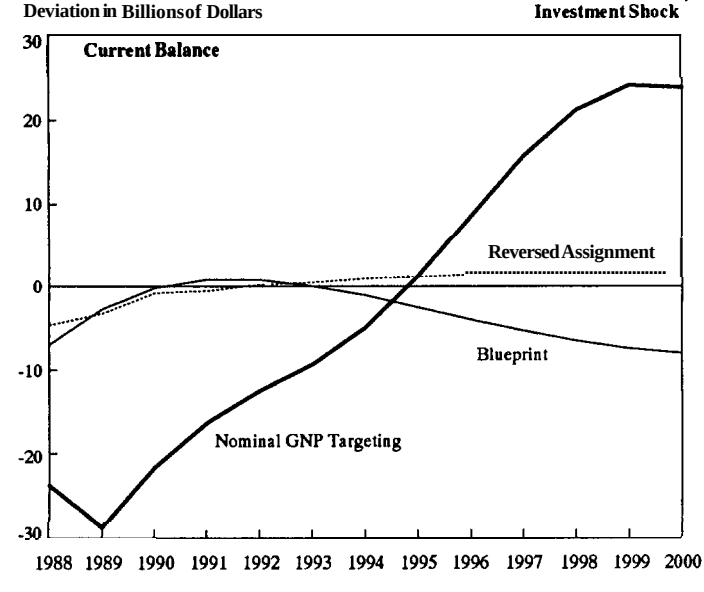


Chart 2 (continued)

Responses of U.S. Variables to Temporary Consumption and Investment Shocks

(each equal to 1% of *GNP* in 1988)





and tend to force up prices. However, their medium-run implications are quite different. If consumption increases without an increase in aggregate supply, it may bring about a persistent current account deficit which is unsustainable.[89] In the case of an increase in investment, the aggregate demand increase will also be associated with an increase in aggregate supply. Starting from a balanced current account, the investment increase will initially be associated with a deficit, but if the investments are profitable, the subsequent increase in supply will later return the current account to balance. In the light of their different implications, the appropriate policy responses to the two types of shocks are also different. None of the rules considered here, however, is designed to distinguish between the two types of shocks.

Nominal **GNP** targeting tends to be slower to neutralize the consumption shock in the simulations. There are two related reasons. First, unlike the other rules, it must rely solely on monetary policy. Second, the strength of the feedback from nominal income to interest rates is limited by the danger of instrument instability; too strong a reaction would require a reversal as the lags in effects of monetary policy on real activity and prices worked themselves out, leading to a whipsaw movement in interest rates.[90] As a result, price level pressures build up, as does a trend deterioration in the current balance, which only tends to stabilize at the end of the simulation period.

The other two rules benefit from an extra instrument—government spending—and also respond to an external indicator—either the real exchange rate or the current balance—which gives useful information about subsequent effects on output and prices. The shock to consumption leads to large current account deficits, which are not automatically reversed. The reversed assignment rule, because it resists this trend movement through cutting government spending, is most successful in stabilizing output and prices; moreover, monetary policy leans against the increase in nominal income, and tightens

89 Whether the current account path is unsustainable depends on the initial external position, and also whether real interest rates exceed real growth rates. If the latter is true, then growth will not solve external imbalances; some adjustment in spending will eventually be necessary.

90 The feedback coefficient was chosen in such a way as to give the closest control of the target, while not producing instrument instability.

moderately. In contrast, the blueprint assignment of monetary policy to the real exchange rate leads to some easing of monetary policy because the consumption shock (increasing the demand for U.S. goods) leads to some real appreciation of the dollar, which is resisted by lower interest rates. Thus, from the point of view of the domestic targets of price stability and income stabilization, monetary policy is moving in an inappropriate direction; this is offset to some extent by a tightening of fiscal policy in response to the increase in domestic demand.

The shock to U.S. investment, while giving rise to similar short-term effects (that is, stimulus to economic activity, a current account deficit, and exchange rate appreciation) has very different medium-term implications. The two rules that respond to external indicators tend to resist the investment boom to a greater extent than does nominal income targeting. As a result, they yield a lower level of output, a higher price level, and smaller current account surplus at the end of the simulation period. Here, unlike the case of the consumption shock, the hypothesized extra instrument (fiscal policy) does not necessarily lead to a better outcome.

The general lesson illustrated by these simulations is that the response to short-run deviations from macroeconomic targets should be conditioned on an assessment of the likely nature and medium-term implications of the underlying shocks. Chart 3 plots outcomes under the same three policy rules, this time when faced with shocks to two external variables. One is a shock to foreign portfolio preferences, which is assumed to lead to a shift out of dollar assets, causing a 5 percent depreciation on impact of the dollar against other industrial country currencies.[91] Such a shock can be interpreted as "misalignment" in the sense of Williamson and Miller (1987): the exchange rate change is not the result of a change in the equilibrium competitive position of the United States, nor of a change in the sustainable capital flows facing the United States.

The blueprint rule attempts to offset the shock by raising U.S. interest rates. It is broadly successful in insulating aggregate output and the price level (as well as the real exchange rate) in the medium

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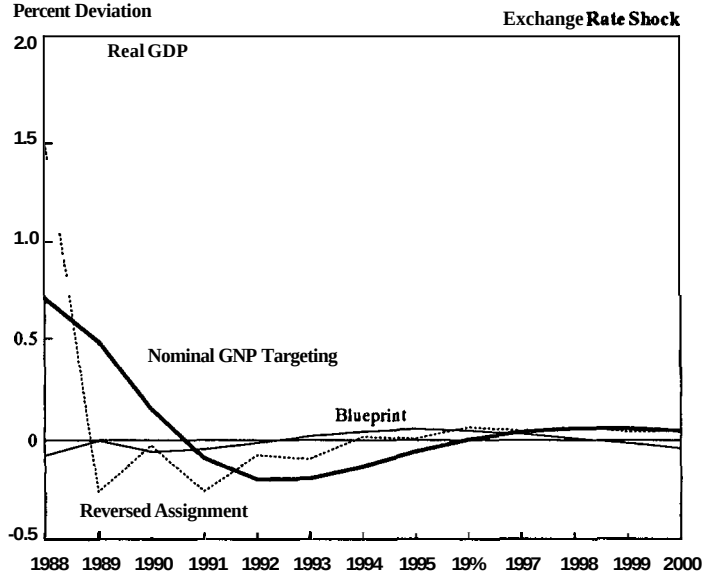
91 **Thereafter, the risk premium is assumed to return to its baseline level, in accordance with an estimate based on historical data of the degree of persistence of these shocks.**

Chart 3

Responses of U.S. Variables to Temporary Foreign Shocks

(each equal to 1% of GNP in 1988)



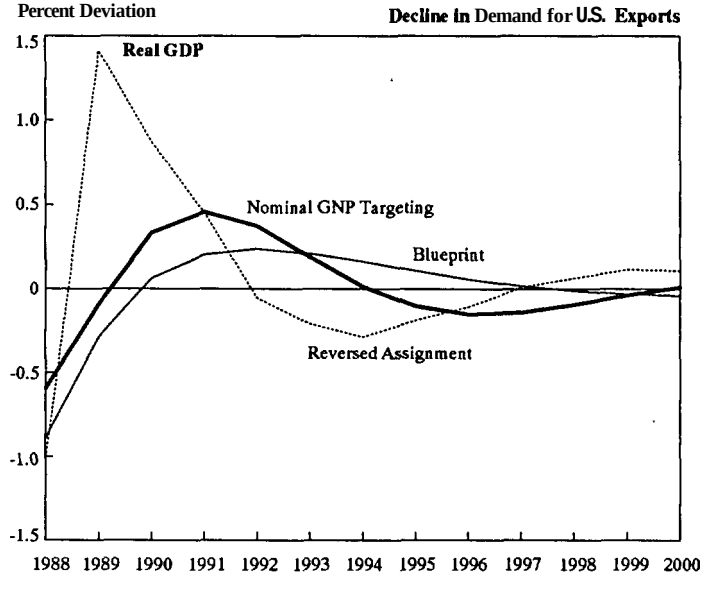
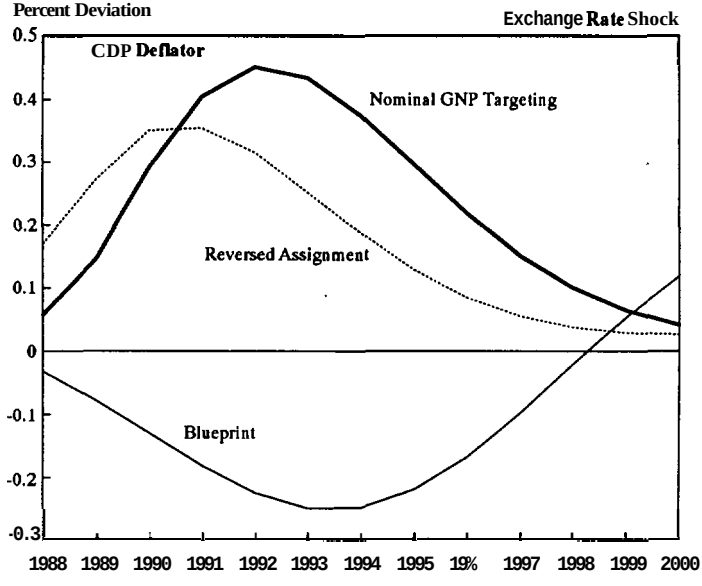


Chart 3 (continued)

Responses of U.S. Variables to Temporary Foreign Shocks

(each equal to 1% of GNP in 1988)



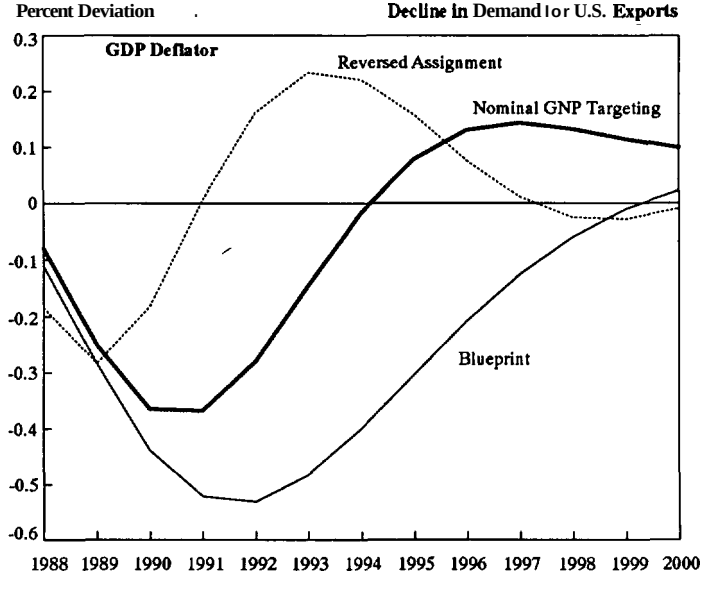
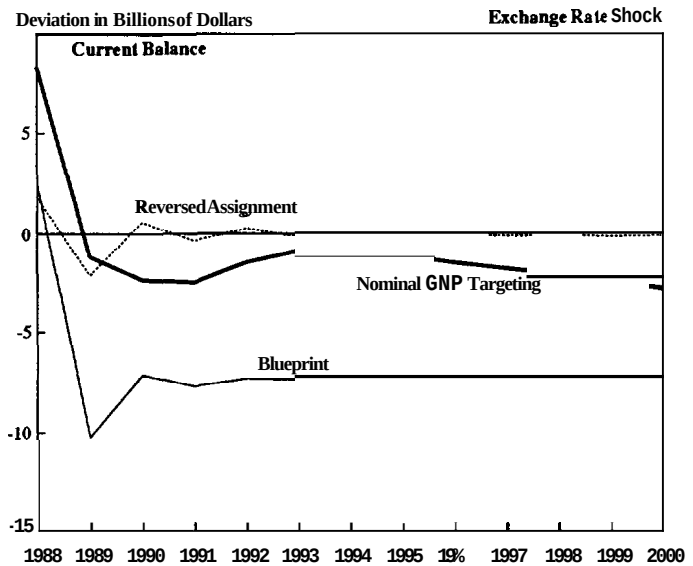
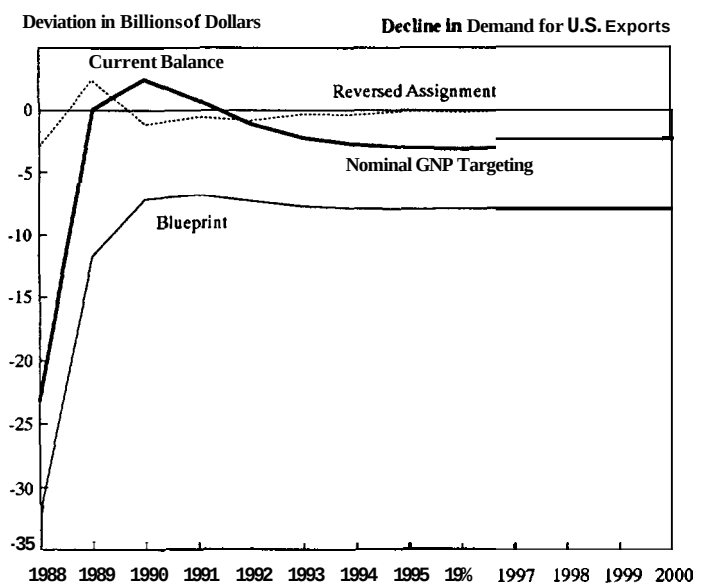


Chart 3 (continued)

Responses of U.S. Variables to Temporary Foreign Shocks

(each equal to 1% of GNP in 1988)





term. However, the resulting higher interest rates crowd out to some extent domestic investment, and lead to lower aggregate supply. Moreover, higher interest rates cause a deterioration of the U.S. net investment income balance (given its position as a net debtor), and the current account remains in persistent deficit after the first year. The other rules allow more stimulus to output in the short run as a result of improved competitiveness, but only a moderate amount of increased inflation. Unless exchange rate stability has other advantages not captured in the simulations, the superiority of the blueprint rule is not clear-cut.

The second external shock is (a negative) one to U.S. exports (a 5 percent decline in manufactured export volumes). It has as its principal initial effect, a deterioration of the U.S. current account balance, as well as a fall in U.S. GNP. The reversed assignment rule attacks these symptoms directly, by tightening fiscal policy and easing monetary policy, at least initially—with conflicting influences on output and prices. Nominal GNP targeting also leads to an easing of monetary policy, while the blueprint tightens monetary policy to resist the depreciation of the dollar (it also eases fiscal policy). Which of these different policy mixes is the most appropriate one? The answer is that it depends on whether the shock is temporary or permanent, or more generally, on its persistence. If there is a permanent decline in the demand for U.S. goods, then in equilibrium a real dollar depreciation is appropriate; if temporary, then some smoothing may be desirable. The export shock reported in Chart 3 is temporary, but exhibits considerable persistence. How much of its effect should be resisted depends on a judgment about the costs of various variables being away from long-run equilibrium.

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Commentary on 'International Dimensions of Monetary Policy: Coordination Versus Autonomy'

Robert Solomon

The paper of Frenkel, Goldstein, and Masson (FGM) addresses the key policy problems that confront the industrial countries as they enter the last decade of the twentieth century.

Out of their experience as theorists, analysts, and policy advisers, the three authors offer a number of judgments about the management of policy instruments among countries with varying degrees of mutual interdependence.

I find myself in whole-hearted agreement with most of the judgments that are put forth in the paper. I shall, therefore, confine my comments mainly to one topic, among the many that are covered, on which I differ with the authors. That is the role of fiscal policy in macroeconomic management and, therefore, also in policy coordination.

I shall not discuss what FGM have to say about exchange rate guidelines in the plausible belief that John Williamson will focus on that subject.

Underlying the paper's judgments about policy strategies and policy instruments is the authors' rejection of three so-called corner solutions. They provide persuasive arguments against the independent pursuit of policy objectives as advocated by Feldstein (1988) and others who oppose policy coordination. FGM point out, correctly, that policy coordination is not at all inconsistent with the pursuit by countries of "their own best interests."

The second comer solution that the authors reject is a regime of fixed (and even adjustable) exchange rates à la Bretton Woods, the

EMS, or target zones. Among the reasons is that such a regime would divert monetary policy from its primary role of promoting "internal. balance" (the term that has come down to us from James Meade meaning adequate growth with relatively stable prices).

The third comer solution is "sand in the wheels" of capital mobility as advocated by Tobin (1978) and others—that is, restrictions of one sort or another on international capital flows.

While opposing a return to Bretton Woods, FGM would not leave exchange rates and current account positions solely to determination by market forces. Although they believe that monetary policy should be aimed at internal balance in general and price stability in particular, they see the need for some exchange rate management.' This is so because exchange rates can misbehave. Speculative bubbles can occur. So can misalignments. When large differences exist between market exchange rates and the "consensus official view of the equilibrium rate,'' FGM advocate coordinated adjustments of monetary policies. Thus they would, at such times, divert monetary policy from its domestic goals.

This leads them to consider policy instruments that could complement monetary policy. With two objectives—internal balance and some management of exchange rates—two instruments are also needed.

Regarding sterilized intervention in foreign exchange markets, they arrive at the sensible mainstream view that it is not powerful enough to be a full-fledged second instrument, but it can be helpful at times, especially if it is carried out in a "concerted, coordinated way."

The discussion of fiscal policy is, in my opinion, the least satisfactory part of the paper, for the following reasons.

First, FGM observe that fiscal policy is less flexible than monetary policy. True; the dials on fiscal policy can be reset less frequently than those on monetary policy. But what matters is not the flexibility of instrument setting but the flexibility of impact on target variables. After all, some well-known monetary theorists insist that monetary policy acts with a lag of one and one-half to two years. The lags of fiscal policy's impact could be shorter.

Second, the point is not to compare fiscal policy with monetary policy but to ascertain whether fiscal policy can be used as a second instrument to complement monetary policy—either to help maintain internal balance when monetary policy is aimed at the exchange rate

or to act on the external balance while monetary policy deals with internal balance..

Third, instead of judging fiscal pqlicy in this way, FGM put forward the normative proposition that fiscal policy should be "guided by considerations of long-term efficiency, resource allocation, income distribution, and economic growth rather than by short-term considerations of demand management and fine tuning." They take this position, in part, because they are concerned about the widespread increase in the ratio of debt to GDP in the industrial countries.

I would argue that fiscal policy can be used as an instrument of demand management while fiscal discipline is respected over time. In principle, it can be flexed around any desired average level of fiscal restraint.

FGM also characterize fiscal policy as a "more disaggregated instrument" than monetary policy. Since either taxes or expenditures can be altered, choices exist among types of expenditures and tax rates and so on. Why is this a disadvantage? Once again, the relevant comparison is not with monetary policy. The question is, is fiscal policy usable as a second instrument?

My view is that we should not allow a decade's misuse of fiscal policy—primarily by the United States, but also by some other industrial countries earlier in the 1980s—to give that policy a bad name.

Let me sum up in four propositions:

1. Nations need to use their macroeconomic policies in a coordinated way in order to maintain adequate growth and stable prices.

2. Nations also need to influence exchange rates at times. Thus they require at least two policy instruments.

3. At present, there is only one active policy instrument—namely, monetary policy.

4. It is desirable, therefore, that fiscal policy become usable for demand management purposes.

Since everything is up-to-date in Kansas City, perhaps our hosts would like to sponsor a symposium on how to reform and improve fiscal policy.

I am old enough to recall the period in the 1950s when we recognized the postwar "revival of monetary policy." As a title for the Kansas City Fed's symposium, I would suggest "The Revival of Fiscal Policy."

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Commentary on 'International Dimensions of Monetary Policy: Coordination Versus Autonomy'

John Williamson

I find the debate in which we are engaged today, which concerns how to organize the G-7 process of policy coordination in the short run, and possibly also, how to institutionalize an international monetary system in the long run, a productive one. I believe it is proving more productive than "fixed versus floating exchange rates" or "monetary versus orthodox theories of the balance of payments," in large part, because the parties are less entrenched in positions encrusted by ideological baggage and more willing to learn, to adapt, and to converge. At least, I believe that to be true of myself, and I find encouraging evidence in this paper that it is also true of Frenkel, Goldstein, and Masson.

Let me start by listing a number of topics on which I endorse the positions espoused in the paper.

Agreed propositions

(1) The proposition that the choice between policy coordination and autonomy should be made on the basis of which can yield the best results, rather than treating either as a priori desirable. I agree with their judgment that, on that criterion, coordination is worth pursuing.

(2) The thesis that the choice between coordination and autonomy is distinct from that between rules and discretion.

(3) Rejection of both the proposition that current imbalances should always and everywhere be eliminated, and the proposition that cur-

rent imbalances are a matter of no consequence.

(4) The lost faith in the belief that speculation can be relied on to be stabilizing. The corollary of this is that the authorities have a duty to develop their independent evaluation of equilibrium real exchange rates; I detect encouraging convergence on this issue.

(5) Rejection of what the authors term "three flawed comer solutions."

(6) The argument that the large margin of error inherent in calculations of equilibrium exchange rates implies a need for wide bands.

(7) The argument that, whilk a commodity price basket may be a useful early warning signal, it should not be a target.

(8) The proposition that the multi-polar world of the future will require a nominal anchor provided collectively by the majbr three (?) countries in the system. (I note, however, that the authors do not yet seem to have any very specific vision of the form that this collective provision might take. They neither endorse nor criticize the "blueprint" proposal to use collective monetary policy to pursue a collective target for the growth of nominal demand [Williamson and Miller 1987], nor do they offer an alternative mechanism for implementing the principle they endorse.)

(9) The proposition that exchange rate commitments should be looser among the G-3 than, for example, within Europe, where many smaller countries may find a relatively rigid exchange rate peg a useful way of linking themselves to the system.

That is a lot of agreement. In contrast, I can find only two hard propositions with which I disagree.

Announcement of the band

The first is that exchange rate bands among the G-3 should be not only wide but also "quiet," that is, kept secret from the public. To support this preference they argue that speculative excesses and serious misalignments are probably the exception rather than the rule; they express the hope that improved macro policy might influence speculative behavior favorably; and they seem to believe that announcements are terribly costly. The latter belief is not stated explicitly but has to be inferred from their analogy to a sprinkler system that is left permanently on. If they really believe announcement to be costly, they owe it to us to explain the nature of those costs rather than to

take refuge in analogy. Likewise, one can hope that improved macro policy will improve speculative behavior, but it would be unwise to rely on it. Bubbles and fads are, after all, deviations from the rate justified by the fundamentals, so it is not clear that better fundamentals should be expected to resolve the problem.

I agree that speculative excesses and serious misalignments are probably the exception rather than the rule (although the rise of the dollar in 1989 suggests they are not all that exceptional). I also agree that intervention and changes in monetary policy should be contingent responses to large differences "between the market rate and the consensus official view of the equilibrium rate consistent with fundamentals." But keeping the band secret prevents it from filling two vital roles:

(1) creating Krugman's "bias in the band" which helps to minimize the contingencies which will call for intervention and changes in monetary policy (Krugman 1987) and

(2) improving public policy debate along the lines sought by the U.S. Congress when it included the exchange rate reporting provisions in the Omnibus Trade Act, a quest so far thwarted by the Treasury's obsession with secrecy.

Monetary policy and price stability

My second disagreement with Frenkel and the others concerns their proposition that monetary policy should be focused on achieving price stability. I realize that challenging this proposition in an audience containing many central bankers exposes me to the danger of being misinterpreted as the sort of clown who would tell the Pope that he should not pray, so let me quickly affirm that my disagreement does not stem from any lack of fidelity to the god of price stability. Rather, I wish to argue that price stability should be pursued by macroeconomic policy in total, rather than just by monetary policy.

The trouble is, that if one argues that the monetary authority should concern itself only with price stability, one invites the fiscal authority to adopt a strategy of concerning itself only with real growth, the other half of the assignment urged by Mundell (1971) in his infamous article on the policy mix. If the Mundellian assignment is implemented in a non-Mundellian world where both monetary and fiscal policy influence nominal income which, in turn, determines both output and

(the change in) inflation almost regardless of the monetary-fiscal mix that produced that income level, the resulting outcome is entirely predictable: high real interest rates and the rising debt/GNP ratios shown in Table 2 (and rightly deplored by Frenkel-Goldstein-Masson).

I accept that there is a second-best political economy argument for telling central bankers that their prime responsibility is to secure price stability, since otherwise, there may be no counterweight to the Darmans of this world. But in designing guidelines for the G-7, let alone principles on which to base a restored international monetary system, we should not settle for second best. And there is absolutely no doubt that it is possible to expect better macroeconomic outcomes if one can use both the expansionary thrust of fiscal-monetary policy to manage the level of nominal demand and the fiscal-monetary mix to manage, when needed to counter misalignments, the exchange rate. Frenkel and the others acknowledge as much in a footnote. It is much to be regretted that their criticism of the notion of assignment is marred by their endorsement of a rigid assignment of monetary policy to price stability alone.

Assignment

Ironically, on several occasions Frenkel-Goldstein-Massoncomplain about the assignment in the Williamson and Miller (1987) "blueprint." I am beginning to think that we may have made a tactical error in describing our proposals that way, since that language seems to have spawned a number of misconceptions. I increasingly suspect that many of our differences are cosmetic rather than substantive.

The reason for choosing the language of assignment to describe a part of our proposals was to emphasize the truth of the argument developed by Robert Solomon in his comment on the Frenkel-Goldstein-Masson paper. Specifically, once one has agreed that there are limits to the exchange rate misalignments that policy should tolerate, there is no option but to be willing to change interest rate differentials in order to manage exchange rates, since unsterilized intervention is the one policy instrument that can be relied on to work. (Frenkel and the others acknowledge this explicitly, and seem willing to go along with the implications, even though they clearly hope that the occasion to resort to exchange rate oriented monetary policy

will arise only rarely.) And once one has agreed that monetary policy may have to be used to manage the exchange rate, one has to face the possible need for a second instrument to achieve an intermediate target for the growth in nominal domestic demand. Fiscal policy fits the bill. So we summarized a part of our proposals as assigning interest differentials to achieving exchange rate targets and fiscal policy to achieving the target growth rate of domestic demand.

As noted above, however, our presentation seems to have nurtured a whole range of misconceptions. Let me spell these out.

(1) One misconception is that the blueprint assigns monetary policy to external balance and fiscal policy to internal balance. This is just not so. We summarized our proposals as assigning international differences in monetary policy to an intermediate target, the exchange rate, and fiscal policy to another intermediate target, the growth of nominal domestic demand. Thus the Frenkel-Goldstein-Massonsummary misrepresents our summary in two crucial respects. First, it fails to note that at the world level, monetary policy is assigned as they would wish, to the control of a relevant nominal magnitude; it is only international differences in monetary policy that are assigned to exchange rate management. Second, we did not assign the two policy instruments.to the two objectives of internal and external balance, but to the two intermediate targets of exchange rates and demand growth; those two intermediate targets are, of course, calibrated to pursue internal balance (continuously) and external balance (in the medium run), but to omit mentioning the intermediate targets obscures the essential logic of the proposal, which is to limit random deviations of exchange rates from the level appropriate to medium-run needs.

(2) Another misconception is that the blueprint implies treating all incipient changes in payment imbalances the same way, as "bad." Not so. The derivation of current balance targets is indeed an imprecise science, but it rests on the same factors that Frenkel and the others consider in discussing whether or not a shock (such as an investment boom) should be financed or adjusted. If an investment boom is big enough to be discernible to the authorities, they can argue with their G-7 peers that this creates a need to appreciate the exchange rate target and allow a correspondingly larger expansion of domestic demand. And if it is not big enough to be discernible to the authorities or convincing to their peers, then the appreciation

needed for the deficit to be financed rather than adjusted away can surely be accommodated within the band.

(3) A third misconception—for which, however, I fear Marcus Miller and I must bear some responsibility, since we omitted the implications of the wide band from our summary of the assignment—is that the blueprint leaves little scope for monetary policy to contribute to the management of domestic demand. In fact, if badly behaved foreign exchange markets are the exception rather than the rule, a country in a cyclically typical situation will normally be able to use monetary policy for that purpose. And even countries out of line with the world conjuncture will normally be able to get substantial domestic leverage by allowing their exchange rates to leave the center of the band. (Perhaps recognition of this under-emphasized feature of the blueprint will make it more palatable to Frenkel and the others?)

(4) A fourth misconception apparently provoked by our casting the blueprint in terms of assignment is that the whole proposal is heavily dependent on frequent changes in tax rates. My own view is that, under normal circumstances, it will be quite sufficient if the annual budgetary process pays proper attention to the budget's implications for aggregate demand as well as to the allocative and distributive objectives that provide the rationale for having a budget at all. I cannot understand the objections to fiscal flexibility of Frenkel-Goldstein-Masson. In what way is long-run efficiency compromised by ensuring that the cyclically-adjusted deficit is appropriate to the state of the cycle? Why does it matter that the impact of a fiscal change depends on the form of that change? And why do the "delays and difficulties associated with correcting the large U.S. federal budget deficit undercut the case[3]"—rather than underscore the need—"for greater flexibility of fiscal policy?"

On reflection, I have decided that the guideline for fiscal policy embodied in the blueprint cbuld be materially improved by incorporating as a medium-run rule the fiscal thrust of the "reverse assignment." That is, each country would be asked to identify the medium-run fiscal stance compatible with its current account target, a sustainable debt position, and a normal real interest rate. It would then choose a medium-run (say, five-year) path for adjusting its fiscal deficit toward the target position. Deviations from that target path might then be allowed in the interest of stabilizing demand. One hopes this reformulation will help the process of convergence.

Conclusion

This paper contains many constructive propositions about how to organize macroeconomic policy coordination among the industrial countries. Perhaps its principal defect is that the authors are too timid; they allow their analysis to be unduly constrained by the positions that the G-7 authorities are presently prepared to endorse. In seeking ways to urge these governments forward toward more effective policy coordination, I would suggest that they think less about assignment and more about the choice of intermediate targets.

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8
The Dollar in the 1990s: Competitiveness and the Challenges of New Economic Blocs

Rudiger Dornbusch

Currency markets are not known for their long horizon. Far beyond their view, "the Dollar in the 1990s" is best left to academic speculators who can afford to look at fundamentals. And even here we must be cautious because "It's not over 'til it's over" as Yogi Berra has taught us to remember.

The topic is broad, ranging in interpretation from the international monetary system—fixed or flexible, with rules of the game and coordination—to the specific level of exchange rates as they are likely to emerge from adjustments that are overdue, trend inflation differentials and dynamic comparative advantage. There are three important reasons to expect a change in the international financial system in the next decade. They are respectively:

- dissatisfaction with the current system because of excess volatility, persistent misalignment and the lack of an adjustment mechanism;

- increased international financial intermediation resulting from domestic deregulation; and

- a major repositioning of the United States in the world economy as a consequence of the emergence of competing economic blocs.

I will speculate here on how these three factors are likely to shape

the international role of the dollar. Specifically I concentrate on two questions: what will be the value of the dollar in 1995 and what are the consequences of enhanced intermediation and competing economic blocs.

Problems of the current monetary system

The systemic problems of the post-1973 international monetary system have been amply discussed and need only a reminder. They are mainly three: volatility, misalignment, and the lack of an effective adjustment mechanism.

Excess volatility

Mussa (1986) and Stockman (1988) have drawn attention to the sharply increased level of real exchange *rate* volatility in the post-1973 monetary system. The variability of real exchange rates, which was practically absent under fixed rates, has become quite extraordinary as Chart 1 makes clear for the United States-Germany case.

Chart 1

Real Exchange Rate Changes
United States - Germany

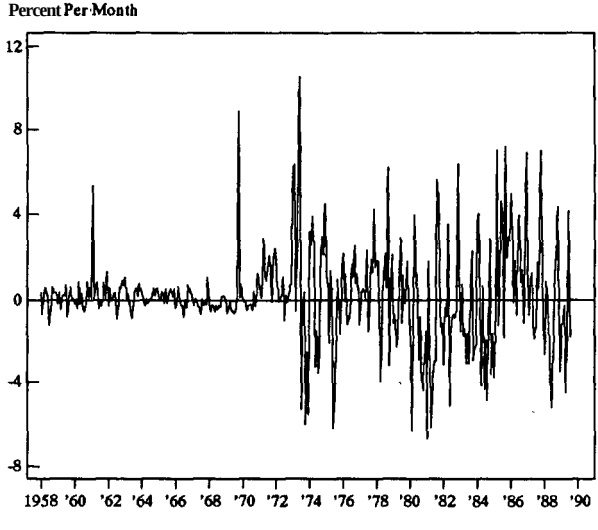


Chart 1 shows relative consumer prices measured in a common currency. Under the Bretton Woods system, real exchange rates fluctuated very moderately and there were only .rare spikes from adjustments in .the fixed rates. Since 1973, volatility has been the rule. The discussion has not closed on the question of whether the volatility reflects increased variability of the ***equilibrium real*** exchange rate as a result of increased variability of underlying fundamentals or simply instability that is visited on foreign exchange markets by the conjunction of relatively sticky goods prices and highly volatile nominal exchange rates. There is no proof that there might not be an equilibrium model to explain these facts, but none has been offered and the suspicion is by now pervasive that the volatility is contrived rather than of an ,equilibriumvariety.

It is interesting to observe that the higher volatility of real exchange rates is accompanied by higher volatility of real commodity prices, but not by increased volatility of U.S. nominal short-term interest rates. This is shown in Table 1.

Table 1
Volatility (Coefficient of variation)

	1958-71	1973-89	1979-89
U.S.-German Exchange Rate*			
Real	5.4	20.0	20.2
Nominal	4.9	17.1	19.7
Real Commodity Prices**	6.1	26.5	23.1
U.S. Interest Rates	37.4	34.1	31.4

*Using consumer prices
**IMF non-oil commodity price index deflated by U.S. CPI

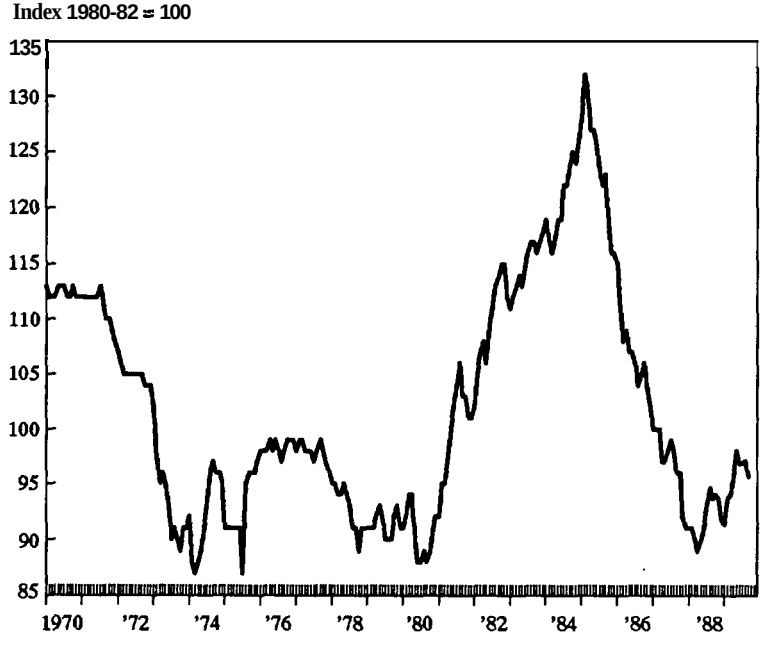
It would be interesting to trace further where else in the macroeconomy volatility has risen. If real variables have not, in fact, exhibited increased real variability, as Stockman and Baxter (1988) claim, then we should not expect on equilibrium grounds their higher real exchange rate variability. After all, why would all the adjustment be in real prices, and none in real quantities?

Misalignment

Chart 2 shows the real exchange rate of the dollar (using the Morgan Guaranty data for the multilateral rate, including LDCs.) The argument for persistent misalignments centers on episodes such as 1980-85 where the real value of the dollar appreciated without, at least in the end phase, any plausible fundamentals. The rising real value of the dollar in 1988-89 is of much the same nature.

Chart 2

United States Real Exchange Rate



To have a firm view of whether an exchange rate is or is not misaligned it is, of course, necessary to have some model of the equilibrium exchange rate. What equilibrium rates might be is wide open to discussion, but plausible limits might be set. One possible and timely way was suggested by Krugman (1986) where the sustainability of external deficits was used as a rough criterion.

Any suggestion that market rates are anything but equilibrium rates, properly reflecting fundamentals, raises immediately very serious

methodological questions. To judge whether a rate is right we need a model. The commonly accepted model uses, beyond the structural equations, the assumptions of informed, rational speculation. On this basis, whatever the market yields must be right, even if an observer cannot understand what possible fundamentals the market sees to warrant apparently aberrant moves. It is tempting to reject the entire rational speculation paradigm, but two difficulties emerge. First, rejection is not enough since it has to be rejection in favor of an alternative paradigm and the fact is that we do not have a better one. Second, the rational paradigm is methodologically very powerful; a good example is the peso problem where events, not observed for a decade in the data, were in the minds of speculators who ultimately turned out to be rightly concerned.

But even though the rational paradigm is attractive, and alternatives are unavailable, there is now overwhelming evidence that the hypothesis of informed, rational speculation must be rejected. The important body of work by Frankel and Froot (1987) as well as the impressive evidence assembled by Ito (1988) simply reject as plausible this paradigm.

The search is on for a better model not only as a matter of intellectual curiosity, but more fundamentally, because if markets malfunction, intervention in one form or another becomes appropriate. Which form it should take depends on our understanding of how the market malfunctions. But even as the search for a better paradigm is on, it is tempting to look for immediate remedies. For some, specifically Williamson and Miller (1987), destabilizing speculation should be limited by target zones. Others, including Tobin, Summers (1989), and Dornbusch (1988) have suggested financial transactions taxes. The purpose of a financial transactions tax is to penalize short horizon speculation and that way, stretch traders' horizons; it is hoped that the longer horizon will lead them to support real exchange rates that more nearly reflect fundamentals.

Lack of an adjustment mechanism

In the 1960s, under fixed exchange rates, the lack of a constraint on U.S. inflation policy was seen as the chief defect of flexible exchange rates. Deficit countries had to adjust because of reserve shortages; surplus countries had to adjust because of import inflation, and the

U.S. could afford not to adjust because it was running the system.[1]

If flexible exchange rates were thought to resolve the adjustment problem, they certainly have failed to do so. Today, the main concern is that U.S. fiscal policy is not effectively checked. The spillover effect of the fiscal stance (via trade imbalances, real exchange rate misalignment, and real interest rates) is widely seen as a systemic problem. The reason the adjustment problem is present is that capital flows dominate real exchange rate movements and thus create interdependence effects. This applies, as was well known from theory, to fiscal policy. Perhaps surprisingly, the stickiness of prices or inflation made it even more true for changes in monetary policy.

The lack of an adjustment mechanism is typically cited for the case of the United States, but also for Germany inside the European Monetary System (EMS). The adjustment problem reflects the fact that economies are interdependent, whatever the exchange rate regime. As long as imbalances are regarded as "policy problems" there is an issue of coordination. One response is to argue that imbalances are not a policy issue: governments optimize fiscal policy intertemporally to achieve tax smoothing,[2] monetary policy has no real effects (except for noise and surprise) under conditions of rational expectations equilibrium economics, and fiscal policy likewise has no effects if households are appropriately Ricardian.

In such a world, imbalances reflect equilibrium responses to intertemporal tastes and opportunities. There is no reason for policy to interfere with imbalances since they are the outcome of intertemporal optimization decisions. One common rendition of this view is to argue that Japan's surpluses reflect predominantly demographic factors that are self-correcting over the next half century.

The alternative view is that imbalances do present a policy issue. If governments do not optimize in setting the intertemporal tax and debt policy, if money is not neutral or if households are not exhaustively Ricardian, then there is a policy issue. And it is enough for any of these conditions not to be met in one country for a worldwide coordination issue to arise. From the now extensive work on coordination, it is clear that there are no easy answers. Differences in

1 See Mundell (1968, 1971), Mundell and Swoboda (1968). and Officer and Willett (1969).

2 See Lucas (1988), and Barro (1989).

economic structure, beliefs about the model, objectives, structure of games all come together, as Frankel has shown, to leave the adjustment and coordination problem wide open. Once again, unless there is a good model of what is wrong with the way the economy operates (including policymakers), it is difficult to argue how to do better.

There is little evidence to support the equilibrium model, but it is hard to define the alternative, preferred paradigm. Without such a paradigm, prescription of exact guidelines, as in Williamson and Miller (1987), is hard to rationalize. Discussion of the problem of coordination has rapidly gone to the point of recognition that there is certainly no easy answer.[3]

In summary, once more with Yogi Berra, whatever the exchange rate regime there is a sense of "deja vu, all over again." In the 1960s the United States was blamed for overall deficits; this time round, it is the current account deficit. In either event, the system does not work to keep deficits and spillovers in limits.

We move from here to a discussion of two central questions underlying an analysis of the dollar in the 1990s: is the dollar overvalued today and what will happen when U.S. fiscal correction ultimately occurs.

Dollar overvaluation

The question of the long-run value of the dollar is simply this: can the U.S. achieve a reduction in the fiscal deficit—which I assume will be accomplished over the next five or six years—at the current real exchange rate under conditions of full employment? Adherents of PPP exchange rate theory believe that the question is basically misplaced, while students of trade theory would argue that real depreciation is required to affect a transfer as is implied by a reduction in net foreign borrowing.

There are two views on the current level of the dollar. One is that the dollar is ***probably*** overpriced, that it will decline significantly, and that policy should not seek to interfere with depreciation. This view has been argued by Feldstein (1988, 1989), or Dornbusch and

3 See Cooper and others (1989), Federal Reserve Bank of Boston (1989), and Frankel and Rockett (1989).

others (1989). The second view, advocated primarily by McKinnon (1988, 1989), is that the dollar is undervalued relative to the deutsche mark and the yen, that dollar appreciation is appropriate, and that it should be brought about by tighter U.S. monetary policy? Following appreciation, the dollar should be fixed in this view. We first review the PPP model.

PPP and equilibrium exchange rates

The large decline of the dollar since 1985 has led some observers to argue that, on PPP grounds, the dollar is broadly in the right place today, if not, in fact, overvalued. Indeed, as noted above, McKinnon and Ohno have argued that the dollar is undervalued.

Since Cassell invented PPP the theory has not failed to be controversial.[5] Some have argued that, more often than not, it gives the wrong indication of where equilibrium exchange rates should be. It must be remembered that the theory emerged during massive wartime changes in relative national price levels. When-price level divergences are moderate and real disturbances are large, the theory is certainly a poor guide. From trade theory it is accepted that changes in fundamentals (tastes, technology, resource endowments, real government spending, and the like) do have effects on equilibrium real exchange rates. Whenever these changes take place, exchange rates should move away' from PPP patterns to allow adjustments in equilibrium relative prices. The PPP view, contrary to *trade* theory, implicitly holds that these relative price changes are unnecessary as part of any adjustment, that they are quantitatively negligible, or that there were no significant real disturbances in the first place.

A close relative of PPP is the relative wage view. Here it is argued that changes in relative unit labor cost or simply in absolute hourly compensation (measured in a common currency) are now such that the dollar is properly aligned.

Both approaches are thoroughly misleading because they implicitly assume that the underlying real economies do not experience divergent trends in fundamentals. I will argue, on the contrary, that these divergent trends were, in fact, very important.

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4 See, too, Ohno (1989).

5 For a review, see Dornbusch (1989).

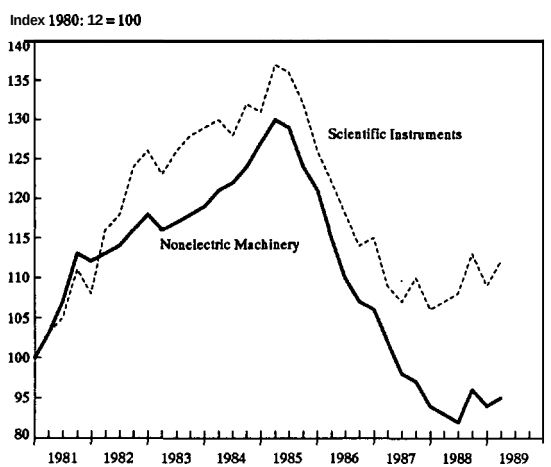
Consider first the relative PPP theory. The equilibrium exchange rate derived by McKinnon, for example, is based on the trends in prices of a basket of traded goods in the United States and in Japan. Using a benchmark year, the required depreciation or appreciation, relative to the base year, of the dollar is measured by the inflation differential.

The essential difficulty here comes from two directions. First, the obvious point that the base year need not represent an equilibrium situation. More importantly, the calculation assumes constant equilibrium relative prices. But, of course, the point is that the equilibrium relative price may need to change for one of two reasons. Foreign goods may have become better in some quality attribute or, as of given attributes, consumer tastes may have shifted from home to foreign goods. In either event, the real price of foreign goods should rise (barring very special cost conditions) and that means the real exchange rate of the dollar has to depreciate. If goods were identical, their real prices would be unchanged. But in a world of product diversification, changes in relative prices are to be expected.

Going beyond this argument, it is also important to note that, in fact, the decline of the dollar since 1985 has not even restored competitiveness pervasively. Chart 3 shows the relative price of exports

Chart 3

Relative Traded Goods Prices



in terms of imports for.scientific instruments and for nonelectric machinery in the United States. For the former, there is a loss in competitiveness relative to 1980; for the latter, there is a moderate gain. It is true that since 1985 the United States has gained competitiveness, but compared to 1980 for example, that is not uniformly the case. Indeed, in many industries, import prices today are even below their 1980 levels while U.S. export prices have increased significantly. If we look at the 1980s as a period where developing countries and Japan have made major progress in manufacturing, the return to the 1980 level of relative prices is entirely insufficient. Table 2 shows the U.S. bilateral trade balance in manufacturing with developing countries. The data leave little doubt that there is massive structural change underway. The debt crisis accounts for some, but most of the change reflects the extraordinary manufacturing performance in Asia.

Table 2
U.S. Manufacturing Trade with Developing Countries
(in Billions of $)

	Exports	Imports	Balance
1981	67.3	39.1	28.4
1988	78.0	108.8	−30.8

Source: U.S. Department of Commerce, ***Highlights*** of ***Foreign Trade***

Just as price comparisons, wage-based PPP is misleading. Consider the data in Table 3 on hourly compensation measured in U.S. dollars. On the surface, the United States, at current exchange rates, is a low wage country compared to Germany. In that perspective, the dollar has gone far enough. But two adjustments are essential: what is labor productivity and what is produced. On the second point, Germany produces high value added, upper level products (BMWs, Mercedes, and so forth), whereas the United States produces a much less desirable range of goods. The high German wage is justified by the fact that workers sell differentiated products that can command rents in a way that U.S. firms today cannot rival. Thus the U.S wage

may well be too high, considering what U.S. workers produce today. It is true, foreign direct investment here may change that, but for the time being, wage comparisons are not enough.

Table 3
Hourly, Compensation in Manufacturing
(1988 Wage in U.S. $, Index U.S. = 100)

United States	100	Korea	18
Germany	130	Taiwan	19
Italy	93	Hong Kong	17
Japan	95	Singapore	19
France	93	Mexico*	12
United Kingdom	76	Brazil*	11
Spain	63		

*1987 data

Adjustment for productivity is shown in Table 4. The productivity adjustment leaves the impression of a very favorable development for U.S. labor costs over the past decade. But once again, the question must be asked about what is being produced.

Table 4
Unit Labor Costs in Dollars
(Index 1977=100)

	United States	Germany	Japan	Korea
1970	71	43	59	53
1977	100	100	100	100
1980	131	150	117	146
1985	143	101	107	130
1988	142	180	188	158

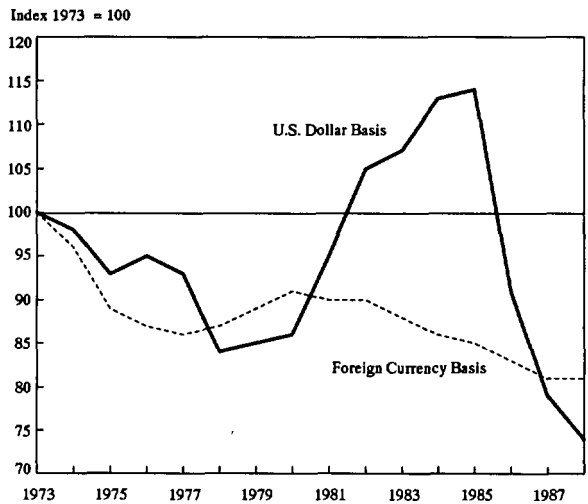
Source: U.S. Department of Labor

Data such as those shown in Table 4 have been used to argue that

the United States has had a substantial improvement in competitiveness. Chart 4 (from the U.S. Bureau of Labor Statistics) tries to makes that point.

Chart 4

United States Manufacturing Unit Labor Costs Relative to 11 Competitors, 1973 - 88



The measurement of productivity includes adjustment for quality. In the United States, these adjustments are sophisticated and overstated. When that consideration is taken into account, most of the U.S. superior productivity performance in the 1980s vanishes and with that also, the foundation for arguing that U.S. relative cost performance has been strong. If we add the fact that there may have been a large change in the relative demand for foreign-type goods (based on characteristics and learning) the argument is further weakened.

All this suggests that a much closer scrutiny of the data is required. One simple possibility is that the mix of products has shifted over the years, and the mix of demand. Even at a very high value of the deutsche mark or the yen, their goods continue to be sold. On that interpretation, imbalances must be corrected by expenditure changes combined with real exchange rate changes that assure a market for U.S. goods that do not sell well even when they are relatively cheap.

PPP and full employment

The preceding discussion has turned on whether the dollar is over or undervalued; all participants in the debate, at least implicitly, accept that market valuation can depart from the equilibrium rate. The difference in view, therefore, is primarily a difference of the equilibrium different observers have in mind and a difference as to what role the exchange rate is to play.

For McKinnon and Ohno, the PPP exchange rate view is a policy prescription as to the level at which the dollar should be fixed once and for all. Monetary policy is then charged with defending the chosen parities by appropriate rates of credit expansion, and fiscal policy looks after balanced trade. In this assignment, there is no policy variable that assures full employment! Specifically, in the current U.S. context, a tightening of money (resulting in dollar appreciation) combined with fiscal tightening might balance trade, although that is not clear, but the combination would definitely create unemployment. In this sense, the McKinnon-Ohno recommendation would seem a questionable policy. To see a more complete picture, we have to look at the transfer issue.

Transfers and real exchange rates

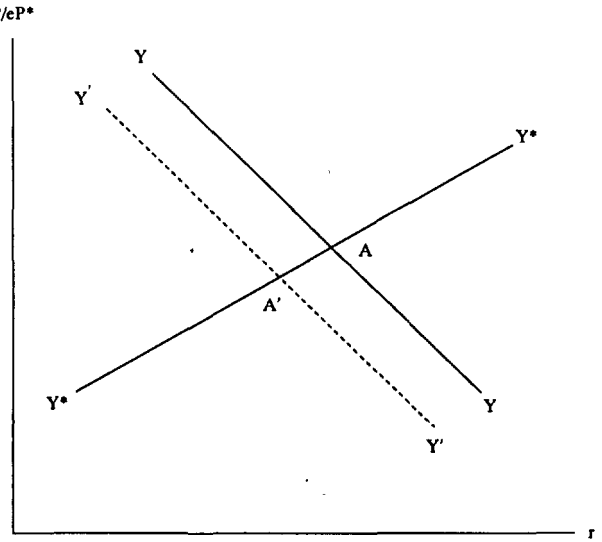
Consider now a simple two-country model where excess demand in each country (at full employment) depends on the real interest rate, the real exchange rate, and on fiscal policy:

(1) $Y(R,r,f)=0$

(2) $Y^*(R,r,f^*)=0$

where $R = P/eP^*$ is the real exchange rate, r the real interest rate and f and f^* denote a measure of the structural fiscal posture. It is assumed that home real depreciation increases demand for domestic output and reduces demand for foreign goods while higher real interest rates reduce demand in each country. Figure 1 shows the internal balance schedules YY for the home country and Y^*Y^* for the rest of the world. Point A represents the initial full employment equilibrium.

Figure 1



A restrictive fiscal policy at home will create an excess supply and therefore requires, for full employment, either layered real interest rates or a real depreciation. This is shown by the shift of the home country's internal balance schedule down and to the left to Y'Y'. In the new full employment equilibrium at A' both countries' goods markets are, once again, in balance.

The transfer exercise has two important lessons to offer. The first is negative: under current fiscal policy, an easy money policy in the United States and resulting real depreciation from A to a point like A' is undesirable. Abroad, it would leave employment unchanged as the U.S. gain in competitiveness and trade deficit reduction is offset by higher investment spending, (that is, we move along Y*Y*). But in the United States, because fiscal policy has not changed, both real depreciation and lower real interest rates are expansionary. As a result there will be excess demand for goods and inflation. Thus calling for a lower dollar via easy money (or even at an unchanged real interest rate, if that were possible) is poor policy. advice.

The second important lesson is that when and if fiscal policy in the U.S. is contracting, the resulting slack needs to be corrected by a combination of lower world real interest rates and by a real depreciation of the dollar. The view that fiscal correction can be achieved

at full employment without any change in competitiveness is difficult to understand? .

What level for the dollar?

If the argument is accepted that U.S fiscal correction will take place, and that U.S. full employment is desirable and that real exchange rate adjustments are required to accommodate the change, how much must the dollar fall? The extent of dollar decline depends on three factors. A first element is the extent to which foreign direct investment in the United States will create demand for U.S. labor. The higher direct investment, the less real depreciation is required. Of course, in making that statement it is assumed that direct investment replaces, at least in significant part, imports rather than other domestic production.

The second qualification comes from the direction of market access. Today markets in many developing countries and, of course in Japan, are closed to U.S. exports. If market opening policies are successful then this is, of course, a preferred alternative to real depreciation. It creates demand for U.S. goods and services and hence, for U.S. labor. As a result, it would help accommodate a restrictive fiscal policy in the U.S.[7]

A third qualification concerns currency blocs. Relative to which currencies can the dollar depreciate? There is little prospect of increased lending to Latin America and as a result, that bloc will stay with the dollar and so will Canada. That leaves only half or less of U.S. trade to be affected by currency depreciation. The real depreciation relative to these trading partners—Japan and Europe—will have to be substantially larger so that the average comes out right. If a 15 percent real depreciation of the dollar is required to yield full employment after fiscal tightening, then 30 percent relative to the yen and the deutsche mark will be appropriate. Moreover, with ongoing inflation differentials of 3-4 percent (reinforced by the direc-

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6 I believe Ohno (1989) argues that U.S. home goods prices might decline even through relative traded goods prices remain unchanged. That raises the question of why internal deflation should be preferred to exchange rate movements.

7 Some caution must be taken about what happens to the resources released abroad by the market opening. It is assumed that they are directed to meeting the increase in real demand that results from the real income gain abroad.

tion of exchange rate trends) there is an extra 15 percent depreciation just to keep real exchange rates constant over a five-to-six-year horizon. The combination, without much strain, leads to the conclusion that the dollar-yen exchange rate will have to move upward of 45 percent in the next few years.

What will assure that the rate, in fact, moves the required amount? If monetary policy is devoted to full employment and fiscal policy to balancing the budget, then rates will fall as easy money accommodates fiscal tightening. The only risk is that fiscal policy balances the budget and monetary policy is overconscious of inflation. In that case, the dollar could remain overpriced and unemployment would be the certain result. Ireland in the 1980s offers a striking example of this inappropriate policy mix.

Crowding in and intermediation

An important question in the context of U.S. fiscal adjustment in the coming years is how it will affect the external balance. Will budget cuts translate into trade improvement or into increased domestic investment? Our standard answer would be that capital markets are integrated internationally and that real interest rates cannot move far apart internationally over any significant period of time. This leads to the conclusion that real exchange rate changes would have to do at least part, and perhaps most, of the crowding-in of demand. An entirely different view on this subject has been developed by Feldstein.[8]

Feldstein and Horioka discovered a surprisingly tight link between national saving and investment rates. This is shown in Chart 5 for the 26-year averages for industrialized countries. The finding says that if a country increases its saving rate, then (on average) its investment rate will rise by a significant portion of the increase in saving. In other words, increased savings are retained nationally; they do not flow out into the world capital market. On latest estimates, three-quarters of the increase in saving would be retained in higher investment and only one-third would flow out. That implies U.S. budget cutting has only minor current account effects and primarily raises investment.

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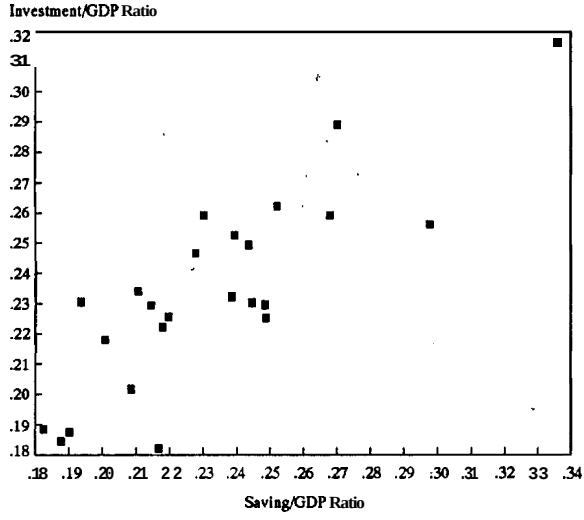
8 See Feldstein (1983), and Dooley and others (1987).

Chart 5

'Investment and Saving 1950 - 1986 Averages for 23 OECD Members



At question today is the interpretation of the strong saving-investment correlation. The most plausible story is that capital markets work on two levels: there is a wholesale market which is intensely integrated at the international level and a retail market which has few, if any, linkages. A good example might be the U.S. housing market. In the 1960s, U.S. housing was dominantly intermediated by ***local*** saving and loan institutions which attracted ***local*** deposits and made ***local*** housing loans. This housing finance was virtually nontraded. Today, housing loans are administered by local financial institutions, but the homogeneous claims are traded nationally, packaged for the wholesale market. As a result of the deregulation, saving from anywhere can go to housing investment anywhere.

Thus the Feldstein finding may well tell us that a central feature of the world capital market is its extreme segmentation. This is, of course, a very striking suggestion since all casual evidence points in exactly the other direction: intense speculation across borders at the slightest sign of capital gains. But the housing example is useful because it is clear that in the U.S. capital market of the 1970s, non-traded mortgages coexisted with a highly efficient wholesale market.

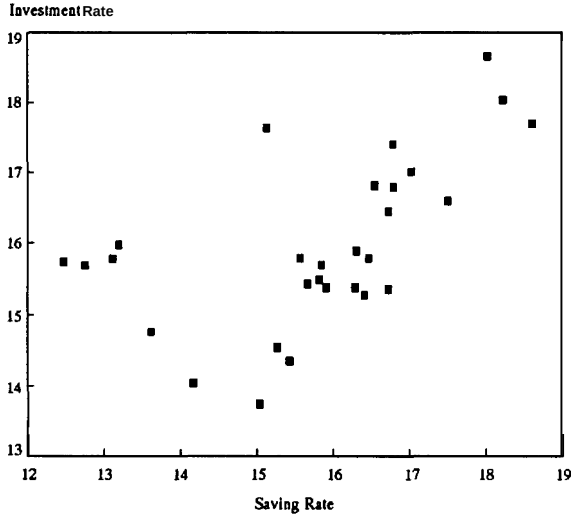
If the Feldstein finding reflects primarily nontraded credit there is another striking implication: financial deregulation and competition will give low saving countries access to the saving pool of high saving regions. As a result, the world economy will operate more in allocating credit by interest rates and world credit rating and less by local availability.

Chart 6 shows the U.S. saving and investment rates in the 1960-86 period. The black dots refer to the 1980s. We note the striking discrepancy between the 1980s (marked as black dots) and the earlier period. It is clear that the general positive correlation observed in the period averages in 1960-86 broke down in the United States in recent years. Current account deficits have become large as the decline in the national saving rate was not matched by a corresponding decline in the investment rate.

It is interesting to speculate whether this new development reflects a worldwide breaking down of reluctance to cross-border lending or whether it is peculiar to the U.S. case. The latter could be argued if foreign investors care which country they finance. It may make a difference whether the decline in saving occurs in a large country

Chart 6

United States Saving and Investment Rates Percent of GNP



with a developed financial market or in a small country with little scope for uncomplicated cross-border investment. Moreover,.it may make an important difference whether the decline in saving arises in the private sector or in the public sector. With a developed market in government debt there may be scope for easy cross-border financing while a decline in private saving may require more complicated intermediation.

More thorough going financial integration may be removing the strong positive correlation of saving and investment that used to be the rule. Perhaps, in the tradition of Goodhart's rule, the Feldstein regularity disappears just as it is firmly established. In the U.S. case, European and Japanese saving are finding their way into the U.S. capital market as large institutional investors start looking at world outlets for their local saving pool.

In the context of Europe 1992, financial integration will have a major bearing on saving-investment relations. There will be a leveling effect introduced so that high saving countries may retain much less of their saving. If imperfect international capital mobility is, in fact, the basis for the observed correlations, we would expect more organizations to develop means of overcoming the risks that stand in the way of capital flows. It may be risky to borrow for 30 years in dollars in the United States in order to make yen loans in Japan. But multinational corporations who operate in multiple markets are natural agents for diversifying away the 'risks and thus exploit cost of capital differences. Direct foreign investment, which is becoming very sizable, may then be a reflection of the cost of capital differentials arising from cross-border reluctance of portfolio capital flows.

We noted above that for the United States in the 1980s the saving-investment correlation seems to be diverging from the traditional pattern. The two complementary interpretations are that the saving reduction was due, in part, to budget deficits and hence, more easily financed in the world market and that the United States was increasingly deregulating the nontraded credit market. As a result, low saving has translated increasingly into deficits rather than local crowding out. By implication, crowding in will not be the automatic counterpart of increased public sector saving. .Hence, once again, real exchange rate changes will be necessary.

The other implication of this analysis is to recognize that domestic

financial deregulation will increasingly affect the domestic vs. external crowding out induced by budget deficits. Specifically, if the Japanese saving rate falls, in a deregulated financial setting, a relatively large external balance effect could be expected. Is that sufficient comfort to expect that the Japanese surplus is self-liquidating? We argue in the next section that this is not the case.

New world economic blocs

U.S. fiscal adjustment over the next few years is not the most important determinant of dollar prospects and of the role of the United States in the world economy. The more decisive development is that the United States will become "smaller"—the emergence of an Asian co-prosperity area and Europe 1992 offer the prospect of two large, competing blocs that are inward looking, with a tight internal exchange rate link. These areas are bad news for U.S. trade prospects, and they create for the first time, serious competition for the dollar as an international asset.

The Japan problem

Japanese external capital flows have macroeconomic, microeconomic, and political implications. The macroeconomics keep the dollar overly strong and postpone adjustment; the microeconomics run the other way, financing U.S restructuring of U.S. industry and thus, lessening the need for even more massive dollar realignment. The political implications are plain: Japan will want to buy a front seat at the negotiating table of world politics. It is difficult to decide which is the more lasting, decisive, and divisive factor.

There are three major scenarios for international capital flows. First, a major U.S. adjustment of the national saving rate and as a result, (with the help of dollar depreciation) an end to the U.S. deficit. Second, the formation of three relatively closed trade and financial blocs; one would be centered in Asia around Japan, one in an enlarged Europe driven by Europe 1992 and the irresistible integration tendencies this forces on adjacent countries, and the third built around the United States. Finally, there is the alternative of a drop in Japanese saving rates and a phasing out of Japan's external surpluses.

Is all this temporary? A good starting point is an assessment of

the changing pattern of net foreign assets: the United States is rapidly becoming a large net debtor; Japan is on the other side of the swing, acquiring an increasingly large piece of the world economy. Estimates by the International Monetary Fund report the massive change in net foreign investment positions, including portfolio investment as well as direct foreign investment. (See, too, Chart 7.)

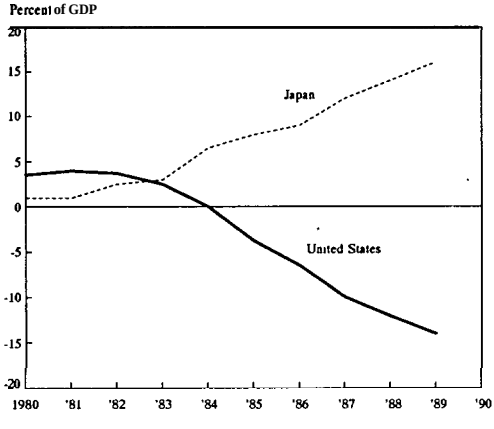
Table 5
Net External Assets
(in Billions of $)

	1982	1989
Canada	−107	−172
United States	126	−710
Japan	24	419
France	−12	−10
Germany	27	233
Italy	−21	−37
United Kingdom	56	143

Note: These data include not only the net position in government ddbt, but also private portfolio and direct investment.
Source: IMF *World Economic Outlook*

Chart 7

Net External Assets



The question today is whether we must extrapolate these trends into an ever widening U.S. net debtor status and an ever increasing Japanese accumulation of claims and assets from Hawaii to Detroit, from Manila to Seoul. The immediate instinct ought to be a memory of the 1970s. At that time, many observers predicted that by the early 1990s the oil producing countries of the Middle East would own not only London and New York but most of the world. The oil producers have disappeared as an economic force as fast as they came on the scene; will the same happen with Japan?

The Japanese role in world trade and payments, unlike that of Saudi Arabia, is irreversibly on the rise. The ascent of Japan is built not on the throw of a dice in commodity markets (or even more fragile, on a cartel), but rather on the firm foundations of a massive accumulation of human capital, progress in manufacturing, and an extraordinary closed system that protects the gains from progress against sharing with other countries. It is conceivable that the Japanese miracle might be brought down—the most obvious way is if world competition is forced onto the Japanese domestic distribution system, on land pricing, and on the fantastically inefficient agriculture. But that is not about to happen, even with Super 301 action by the United States. Japan simply will not push all the way the measures that would bring down the high Japanese saving rate.

Table 6
Gross National Saving Rates
(Percent of GNP/GDP)

	1960-79	1980-86
United States	19.8	17.1
Japan	34.4	31.0
Europe	24.5	20.8

Source: **OECD** *Historical Statistics*

There will, no doubt, be some internationalization of the Japanese economy, but there is little chance that the Japanese model will fall apart. Those who see cracks in the Japan, Inc. model are overly optimistic; the central fact remains that Japan is a closed, insular economy that is looking backward to the memories of vulnerability in the 1930s (however imagined), the aftermath of the oil crises, and

the Nixon commodity shocks. Such an economy does not embrace full-scale economic revolution, throwing out the structure that has protected the economy and society in the last few decades.

The reality, then, is a continuing high rate of Japanese saving and, as a counterpart, growth of Japanese acquisition of assets worldwide. But if that is the case, in which directions will Japan expand?

US. Adjustment? So far, there is no friction; the United States has large deficits and low private saving and Japan provides the matching finance. The United States has strong demand and overspends and Japan delivers both the goods and the finance. U.S. deficits thus appear an almost essential counterpart to the Japanese surpluses. Can one exist without the other? What happens if the United States adjusts?

Today the United States saves less than in any previous decade and the prominent budget deficit is only half the bad news. More disturbing is the extraordinarily low private saving rate. We do not even know why net private saving has declined from 7.6 percent of GNP in 1950-79 to only 5.6 percent in the 1980s. The reasons for low private saving are poorly understood and therefore, there is little reason to believe that anything will change. And public policy in the form of incentives is a poor way to help out; private saving would rise, but this would come at the cost of a more-than-offsetting increase in the budget deficit. The brunt of the adjustment will, therefore, have to come from budget correction.

The most plausible scenario involves a major, early U.S. adjustment in the budget. It is not difficult economically to achieve the higher saving; the difficulty is "only" on the political side. Economically, the adjustment is not difficult because taxation is broad-based and tax administration is highly efficient. As a result, taxation produces very little disincentives. At low marginal tax rates there is little disincentive from taxation on work effort, saving or investment and only a very moderate rise in marginal rates would suffice to balance the budget. The introduction of a 5 percent value added tax would accomplish the same even better. But, of course, the politics is not easy. ("Read my lips"!) The consensus is that it will take a crisis to change the nation's attitude and perhaps a major dollar collapse might be the trigger for more responsible policy. Until further notice, the United States will, therefore, borrow and that means Japan, or someone else, will lend.

But when budget adjustment does take place we would need

crowding in: at that time lower interest rates and a sharply lower dollar would close the external gap and with it the need for external borrowing. With the United States disappearing as a borrower in world capital markets Japan's net lending would have to go elsewhere, whether it be Asia or Latin America. Of course, balanced trade accounts for the United States would not mean an end to Japanese direct foreign investment. On the contrary, the lower the dollar the larger the incentive for Japanese firms to use the United States as a workshop with cheap labor.

Japan with ***balanced trade?*** There is a second scenario where Japan spends rather than lends, with trade balanced and net foreign assets steady rather than rising. This would take a drop in the high Japanese saving rate. In time, it will happen. Demographic trends make for a much more rapid aging in Japan than in other OECD countries and the aging will involve more spending, less saving.

Table 7
Changing Age Structure in OECD Countries
(Percent of Population Age ***65*** and Over)

	Japan	United States	Germany	OECD
1980	9.1	11.3	15.5	12.2
2000	15.2	12.2	17.1	13.9
2020	20.9	16.2	21.7	17.9

Source: OECD

But, as the table shows, the demographic factors will take three decades to come fully into operation. That is far too distant to be of comfort today. The reality of the moment is too large and concentrated surpluses, too much visibility of Japanese capital. Japan will have to look for almost bottomless opportunities of investment for the next three decades. The United States will not be the major borrower for long, nor will Europe. Asia and Latin America are plausible for direct investment although it is difficult to see a scale of tens of billions of dollars. After all, all of Latin America has a deficit on goods and services of less than **$20** billion!

Japan go home. Another scenario is outright disturbing and unattractive. This scenario is one where Japan's success and increasing visibility leads to a political backlash worldwide which, in turn, drives Japan into a retreat, consolidating her position in Asia.

It is no secret that there is a worldwide resentment against Japan. Among the reasons is the perception of a very closed Japanese society, apparent lack of a genuine and sincere interest in progress of the world economy, and the sheer envy for Japan's success. Japan has done little or nothing to dampen this growing problem: promises of development capital for Latin America have not come off and cooperation in the Brady Plan, for example, has shrunk to little. Japan suffers the ambiguity of having been a free rider too long, inexperienced and shy, yet tempted to play a big-time role. Japan is an outsider in the western world and just as she herself cannot make up her mind to play the game full out, the major industrialized countries and their electorates cannot get accustomed to treating Japan other than as a very distant, very rich relative who shows up at a family gathering mostly unwelcome and uninvited. The rich uncle from America was naive and jovial; the rich Japanese relative does not fit in.

There is resentment and there is insecurity and fear in America because the United States is no longer #1. All this will find its way into commercial policy and the regulation of direct foreign investment before long. Debtor countries in Europe and Latin America have endlessly paraded the signs saying "Yankee Go Home;" how long will it take before we see "Japan Go Home" in the streets of industrialized countries? There is a genuine ambivalence about foreign direct investment—it does create jobs and is far better than the alternative of imports, but it does bring in a foreign landlord. Foreign direct investment fosters productive change, but it evokes from those who must change and adapt, a reaction of hostility all the more irrational, the easier the focus on the "foreign" takeover.

World politics will, in the end, set the pattern for trade and payments flows. The United States is, of course, #1, but no longer strong or determined enough to provide the leadership for the world economy. Japan is clearly far too small to assume the top position and it certainly is entirely unacceptable that Japan dominate the industrialized countries' world. Germany and Britain have traded places and France, de facto, has slipped below Italy, but there is no room at the top for Japan. Neither the United States nor the emerging European bloc

would accept Japan at the top. The clear implication is a tri-polar world.

Japan will be driven to develop her own trade and finance zone in Asia. Japan is a high saving country, in part for demographic reasons, and the investment opportunities in Japan are falling short of saving potential. Capital export, therefore, is inevitable. In the past, the chief concentration of Japanese assets was in securities and direct investment in the United States. This will not stop, but a deteriorating climate will make Japan focus increasingly on alternative markets. It is difficult to avoid the conclusion that Japan's energies will increasingly focus on developing the Asian region rather than trying to own and operate Wall Street.

The way Japan, *Inc.* operates also facilitates the formation of an Asian co-prosperity zone: government and business work hand-in-glove and business moves jointly. They move together as a group, because they are so keenly aware of vulnerability on their own. The decision will be made by consensus, and the rest is routine.

The Asian co-prosperity scheme is the most likely option for Japan. But also, Japan might look to Russia as a new and major market. One is drawn to the conclusion that Japan will look for a much more substantial, extraordinary market for Japanese money, technology, and capital goods.

The link between money and politics is almost inevitable. At stake is not whether Japan gets a seat on the United Nations Security Council or the position of managing director at the International Monetary Fund. Japan's massive saving rates of the next three decades (and the lack of economic motivation in the United States) will force a change in world politics. It is likely to go beyond trade and finance zones; because Japan is involved and Japan is different, it cannot be business as usual. The post-World War II status quo will go.

Just as apparent as the Japanese co-prosperity is the development of an inward-looking Europe. The very idea of Europe 1992 has turned the area from Euro-sclerosis to Euro-phoria. Where a few years ago policymakers did not know how to cope with the prospect of dismal growth, today's growth is of the best kind—generated by animal spirits.

An important part of the new Europe is a strong commitment to negligible inflation. The convergence to German inflation has been substantially achieved and is credited with the return to growth. It is very unlikely that this success would be easily jettisoned. Fixed

exchange rates are now the rule as is apparent from the heroic Spanish entry into the Emns, without devaluation at a conspicuously overvalued exchange rate. European exchange rate arrangements were invented to fight more effectively the lack of symmetry in the international adjustment process. In the end, they have become a formidable detriment to U.S. policy interests.

At the present time, significant risk premia continue to prevail for softer currency countries. Given the commitment to fixed rates, and less than full credibility, these countries experience high real interest rates and hence high growth rates of their internal debts. Increasingly, these countries will strive to make their currency commitments harder. Thus Europe is moving effectively toward a single currency. The intra-European removal of all and any restraints on capital flows and the freedom to provide financial services across borders complements the fixed rates in creating a single financial bloc.

For the dollar, the intra-European trade integration and the financial integration cannot be seen as other than as bad news. The trade integration is already provoking defense investment by U.S. firms inside Europe with adverse consequences for U.S. located production. Financial integration abroad undermines the dollar as a world currency. The combination certainly reinforces the dollar decline that is already required by the current imbalance.

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Commentary on 'The Dollar in the 1990s: Competitiveness and the Challenges of New Economic Blocs'

Jeffrey A. Frankel

Rudi Dornbusch loves to be controversial, and by that criterion he has clearly succeeded.

His paper on the dollar touches briefly on a great many issues. I am tempted to make an analogy with yesterday's raft trip on the Snake River. The point is not just that both the paper and the raft trip concern experiences with floating. In both cases, one is breathless by the end of the ride, yet the white-water parts have gone by so fast that one is not quite sure what one has seen. Rather than reviewing the whole ride from beginning to end, I will pick out some of the most spectacular rapids.

One section is on the famous Feldstein-Horioka finding. Feldstein and Horioka upset conventional wisdom in 1980 when they found that changes in countries' national saving rates were not offset by borrowing from abroad at the going interest rate, but rather, were mostly reflected as crowding out of investment within the country—and when they interpreted the finding as evidence of low international capital mobility. The correlation between saving and investment across countries can be seen in Rudi's Chart 6.

Dozens of papers inspired by Feldstein-Horioka have appeared over the last 10 years (25 are cited in Frankel, 1989a), many essentially making the econometric point that national saving, particularly the government budget deficit, is endogenous. But when one corrects for such endogeneity, the results change little. In my view, the saving-investment correlation does, in large part, reflect failure of real interest rates to be equalized across countries. But real interest differentials

have several components, of which barriers to the movement of capital across national boundaries constitute just one. (The others concern the currency of denomination of assets, rather than the country of issuance.)

The best measure of barriers to international financial integration is the magnitude of the covered interest differential. Covered differentials do show what one would expect: near-perfect financial integration for most major industrial countries by the beginning of the 1980s, with the United Kingdom and Japan having joined the club in 1979. Three-month covered interest differentials show that during the decade the most rapidly liberalizing countries, in descending order, have been: Portugal, Spain, France, New Zealand, Denmark, and Australia.[1] In the case of the European countries, the removal of capital controls is associated with the plans for 1992 integration, as discussed in the Dornbusch paper.

There are several reasons why changes in national saving could have large effects on investment despite the perfect international integration of markets in short-term deposits and bills. Rudi raises one of the most interesting and important for future research: due to information imperfections, investments in real estate and other kinds of real capital are not perfect substitutes for short-term deposits, or for similar investments in other countries. This imperfection has as much to do with financial integration within countries as across countries. Nevertheless, it can explain why one country's shortfall in, for example, corporate retained earnings, results in less business fixed investment (the cost to the corporation of selling bonds, whether to domestic or foreign residents, being greater than the cost of internal financing).

It follows that, not only liberalization internationally, but also deregulation and innovation domestically, should be reducing the saving-investment coefficient over time. The paper points out some implications of this greater ease of financing shortfalls in saving.

For the United States in the 1980s, the major implication has been that the large fall in national saving, particularly the increase in the federal budget deficit in the early 1980s, was reflected primarily as a capital inflow from abroad, appreciation of the dollar, and trade

[1] Frankel (1989c).

deficit (especially vis-à-vis Japan), rather than as crowding out of investment. One would expect that the saving-investment coefficient would have fallen in the 1980s. The U.S. time series is plotted in Chart 7. As Rudi notes, the inclusion of the 1980s has indeed reduced the correlation. I compute that the regression coefficient has fallen from .9 (in the period 1929 to 1979) to .2 in the 1980s.[2]

Rudi notes, "It is interesting to speculate whether this new development reflects a worldwide breaking down of reluctance to cross-border lending or whether it is peculiar to the U.S. case." The answer to this question is available from Feldstein's latest word on the subject. Feldstein and Bacchetta (1989) find for a cross-section of countries that the coefficient has indeed fallen, from .9 (in the 1960s) to .6 in the 1980s.

There is also an implication for the 1990s. On demographic grounds, it is widely expected that the saving rate in Japan will decline over the next 20 to 40 years. In a deregulated financial setting, the implication is that the Japanese current account surplus will fall commensurately. (Rudi warns us away from complacency regarding the Japan-U.S. trade imbalance, however, with the assertion that "Of course, Japan is closed to U.S. exports.")

The central topic now is U.S. adjustment. A lot of nonsense has been written on the question of how the U.S. trade deficit should or will be reduced, and here I am entirely with Rudi. First, I agree with his view that the U.S. deficit is an issue that merits concern. It is important for economists to keep explaining that some trade deficits are good; but this deficit is not one of them. I don't believe that the American people, if presented the choice explicitly, would opt for the reduced standard of living for their children that current low levels of national saving and current account balance imply. Second, I agree that because policymakers have little control over private saving, the solution lies in raising public saving, in part by raising taxes. (Rudi's preferred tax is a 5 per cent V.A.T. Mine is a federal gasoline tax comparable to those in Europe and Japan. It could be sold politically as necessary on environmental grounds—which it is—and at the same time, it would raise enough revenue to solve the deficit problems.) There is also the question of policy

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2 The regressions use the dependency ratio and the share of military spending as instrumental variables (for private and public saving, respectively). The source is Frankel (1989a), Table 2.

coordination: if we succeed in cutting our budget deficit, should we ask something in return from our ***G-7*** trading partners, and if so, what? I will return to this question later.

The third point on which I agree with Rudi is that a depreciation of the dollar is a desirable part of the needed U.S. adjustment. One often hears attacks on the "devaluationist school." The empirical proposition is that "no relationship is observed between the dollar and the trade deficit." The theoretical statement is that "a change in the value of the dollar is neither necessary nor sufficient to improve the trade balance." Both of these propositions are true, as literally stated, but they miss the point.

The effect on the trade balance depends on the circumstances in which the dollar falls. Rudi points out the two important lessons of the theory of the transfer problem that are precisely appropriate here.

(1) A dollar depreciation ***that resulted from a monetary expansion*** would be undesirable under present conditions, because it would lead to excess demand for goods and to inflation. I would also add that the effect on the trade balance would be small, and perhaps not even positive (because the effect of higher demand on imports would counteract the exchange rate effect).

(2) "When and if fiscal policy in the United States (is adjusted), resulting slack (will) need to be corrected by a combination of lower . . . real interest rates and by a real depreciation of the dollar." This is not the same as saying that the dollar necessarily ***will*** fall; only that a fiscal correction ***without*** a decline in the real interest rate and the dollar would lead to a possible recession and would thus be undesirable.[3]

I have been less certain than some economists like Feldstein that the dollar will, in fact, fall in the short run. Calculating from trade fundamentals, Rudi reaches "the conclusion that the dollar/yen exchange rate will have to move upward of 45 percent in the next few years." (Elsewhere we are told that the horizon is five or six years, which takes us to 1995, the center of the decade that was the assigned topic for the paper.) At the current rate of 144 ¥-/$, the forecast goes below 100 ¥-/$. This is a bet I would be willing to take. I don't have the usual economists' objection: that if such a

[3] In the aftermath of a fiscal contraction, if a real depreciation did not come about as the immediate consequence of a nominal depreciation, it well might come about as the eventual consequence of deflation.

forecast were a good one, market investors would already know it, would sell dollars today, and thus drive the dollar down instantly. My reasoning is rather that the market can and does depart from economic fundamentals for relatively prolonged periods of time.[4]

A survey of foreign exchange forecasting services and multinational corporations, conducted the week before this conference by Currency Forecasters' Digest, reported a consensus forecast that the dollar would appreciate to 190 ¥-/$ by the end of 1993, a 33 percent increase (with even a larger appreciation forecast against the mark: 40 percent, to 2.34). This is the sort of forecast that Ron McKinnon has been making on Purchasing Power Parity grounds. The Digest also reports a differential in expected inflation rates that, cumulating to 1993, gives an expected real appreciation of 45 percent against the yen! This forecast is probably wrong; it is another bet that I would take. With that level for the dollar, in the absence of recession, the U.S. trade deficit would probably climb to $200 billion (with appropriate lags).

One reason that many market participants are bullish on the dollar at the moment is that they have heard forecasts like Rudi's "45 percent depreciation" for years, and such forecasts have usually been wrong. The market shifts over time the relative weight it assigns to forecasts of the Dombusch type and forecasts of the McKinnon type. Because there is so little consensus on the right model for the exchange rate, the market is perfectly capable of extrapolating the upward trend that the dollar has shown thus far in 1989, buying dollars and sending its value higher still..If economists like Dornbusch, Feldstein and Krugman think that the market is computing fundamentals incorrectly, it is useful for them to point this out. But when making a one-year forecast, it doesn't help to know that the current market level is "wrong," if the market might still be wrong one year from now.[5]

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4 *Euromoney* magazine runs a yearly August review of between 10 and 27 foreign exchange forecasting services. During the period 1978 to 1981, most reported that they used models based on economic fundamentals; only one or two said they relied on technical analysis. By the mid-1980s this pattern had reversed. In the 1988 review, 12 reported using only technical models; one, only fundamental models, and 12 employed a combination of techniques.

5 Admittedly, Rudi's assigned task of predicting the developments of the coming decade is impossibly difficult.

There is only one part of the paper to which I take definite exception. That.is Section IV, where Rudi signs on to the view that Americans should lie awake at night worrying that the dollar economic bloc is losing ground to a yen economic bloc in Asia and a 1992 bloc in Europe. There is alarmist talk of Japan's establishing an "Asian co-prosperity zone," and equally alarmist talk about Europe. The concluding paragraph contains the striking sentence, "For the dollar, the intra-European trade integration and the financial integration cannot be seen other than as bad news."

The increasing share of the yen in trade and finance at the expense of the dollar is an undeniable, but relatively minor, phenomenon. The same is true of the deutsche mark and ECU. It is true that the United States as the issuer of the dollar may lose a small amount of resources in the form of seigniorage. However, the dollar will remain the world's key currency, not just in the coming decade, but well into the coming century.

A far more major phenomenon is the increasing share of Japanese and European industry as a percentage of world output. This trend is independent of questions of currency usage or of integration within Europe and Asia. Just because integration is good for Europe (and I believe that it is), does not mean that it is bad for the United States. The problem, I sometimes think, is that the American newspaper readership has confused the financial pages' rankings of countries in the Group of 7 with the sports pages' rankings of teams in baseball's National League. I agree that slow productivity growth in the United States over the last 15 years is a problem: I do not agree that greater success among our trading partners is, in itself, a bad thing.

I return to the central policy proposition of the paper with which I agree: to reduce its current account deficit, the United States should cut its budget deficit and Alan Greenspan should then allow the real interest rate and dollar to decline. The final question is the coordination one: should we ask something of our G-7 partners in return? Rudi kindly refers to my results on coordination under uncertainty. Because of uncertainty regarding disturbances, goals, and models, the United States doesn't even know what to ask of our trading partners in a G-7 meeting. Currently, such meetings focus on a list of "indicators," including trade balances, money growth rates, and inflation. I don't think we should ask for trade balance targets; they are too close to "managed trade" (which *Business* Week and the others have recently

pronounced the latest "revisionist" fad). I also don't think the G-7 should set targets for M1; there is too much uncertainty in velocity, and we don't even know whether a foreign monetary expansion would have a positive or negative effect on the U.S. economy. Rather, if we are going to coordinate policies to any extent with our trading partners, I favor focusing on targets for nominal GNP.[6]

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6 As explained in Frankel (1989b).

Commentary on 'The Dollar in the 1990s: Competitiveness and the Challenges of New Economic Blocs'

Alexander K. Swoboda

At the risk of oversimplifying and of losing both the subtlety of the argument and the many insights contained in its development, Rudiger Dornbusch's message can be summarized in three major points.

First, persistent current account imbalances are evidence of the lack of a (satisfactory) adjustment mechanism in today's world economy. To correct such imbalances from a U.S. perspective requires a massive improvement in the U.S. trade balance and, for that purpose, given foreseeable productivity trends, a large real depreciation of the dollar will have to take place in the 1990s. The real depreciation will have to be the larger if, as should occur, a correction of the U.S. budget deficit takes place. As for monetary policy, it should be eased to maintain full employment and stable growth. In addition, an aggressive commercial policy that pries open foreign markets, especially the closed Japanese one, should be pursued and, if successful, would help correct the U.S. external deficit significantly.

Second, domestic financial market deregulation will increase international capital mobility or, more precisely, the portion of changes in national savings rates that result in changes in the current account rather than in changes in investment. Thus, budget cutting in the United States would result in a significant, though far from one-to-one, improvement in the U.S. current account, the counterpart to which will, again, have to be dollar depreciation in real terms.

Third, this will not be enough to make what Dornbusch calls "the Japan problem"—the Japanese current account surplus and desire

to accumulate foreign and especially U.S. assets, thus ''overvaluing'' the dollar—go away. When the U.S. budget is finally brought into equilibrium, and with rising resentment against Japanese direct foreign investment in the United States and in Europe, Japan will have to look elsewhere for an outlet for its excess saving. A Japanese led Asian co-prosperity zone is the likely outcome leading, with the emergence of post-1992 Europe, to a tri-polar economic and currency world. And the tone, if not the letter, of Dornbusch's argument suggests that the three blocs are likely to be inward looking and hostile to one another. The conclusion, in Dornbusch's words, is that these trends certainly reinforce the dollar decline that is already required by the current account imbalance.

I will divide my comments on Dornbusch's paper into three parts. I will begin by addressing some of the points made in the paper itself. I will do so only briefly since a detailed commentary would add another paper to the conference proceedings. Second and again briefly, I will raise a few ,questions as to the future role of the dollar in the international financial and monetary system—rather than as to its future value. Finally, I will sketch, but only sketch, some of the implications I see for the conduct of macroeconomic policy and for international coordination of such policies.

The latter two parts of my remarks are offered to provoke a discussion of some of the issues raised in the agenda prepared by this conference's organizers but not taken up in detail in Dornbusch's paper.

Dornbusch's argument

Even though I agree with a number of Dornbusch's conclusions, notably on the trend toward a tri-polar world, the declining international role of the dollar, or the proper assignment of U.S. fiscal and monetary policy, I also have qualms about some of his reasoning, about some of his policy recommendations, and about his vision (explicit or implicit in the tone of some of his remarks) of Japan, Europe, the United States, and of the relationship among the three. Let me try to 'group my many comments on individual parts of his argument into five main points.

(1) On the required real depreciation of the U.S. dollar, Dornbusch may well be right, but then, he may almost as well be wrong. Among the many reasons I would be skeptical about any prediction

such as his, let me just list four. First, we don't know how much of a given transfer can be effected at constant terms of trade. Second, we have very little information on the elasticity of the trade balance with respect to the terms of trade, and even less with respect to the real exchange rate. And it is not simple regressions of one endogenous variable on another one over an arbitrary sample period that will sort this issue out. Third, even if we had a fair idea of the response of the trade balance and the real exchange rate to a particular shock, we have little idea where on that path the economy currently is. (Put another way, has the dollar already depreciated as much as it should, given the initial supposedly fiscal shock of the early eighties, or does it have still some way to go before it starts up again and then, when?). Fourth and specifically on the yen-dollar rate, Rudiger Dornbusch's estimate may be overpessimistic since that rate affects not only Japanese-American trade but also U.S. competitiveness in third markets.

In any event, the importance of dollar depreciation can be overemphasized and tends to raise the real exchange rate to the status of a target, or intermediate instrument of policy, a status it does not deserve. After all, the real exchange rate is an endogenous variable set, in the long run, by real factors such as "real" (structural of which possibly fiscal) policies, tastes, technology and endowments, something that Dornbusch fully recognizes.

(2) Underlying much of Dornbusch's discussion is the notion of an equilibrium or target current account and of the lack of an adjustment mechanism to reach it. I would argue that there indeed exists an effective adjustment mechanism: current accounts, real exchange rates, interest rates, and output levels all adjust to underlying saving-investment balances. Of course, we may not like the outcome. The basic reason why we may not is, I believe, because existing differences between national saving and national investment and the associated current account imbalances may reflect distortions in savers' and investors' choices, a socially inappropriate level of the budget deficit, an inappropriate structure of taxes, and so on. The obvious way to deal with the problem is to remove the distortions and do so at source, without overdue attention to the impact on real exchange rates. After having adopted the proper policies we may not—we will certainly not—end with current account balance, but with a pattern of current account deficits and surpluses we can live with.

(3) An immediate policy implication of this last point is the assignment that Charles Freedman emphasizes in his paper for this conference, that Rudiger Dornbusch also proposes, and that Hans Genberg and I have recently analyzed and developed.[1] The natural assignment to adopt under floating exchange rates is to assign fiscal policy (both the level and structure of taxes and spending) to the current account, and monetary policy to the price level in the long run and, possibly, to income stabilization in the short run.

(4) Does all this have a bearing, as Dornbusch sometimes seems to imply, on the choice between fixed and flexible rates? Some but not all that much. The traditional argument that countries subject to large terms of trade shocks would, if they peg, suffer large incipient variations in nominal prices and, if the latter are rigid downward, in employment is, of course, correct. But, as the variability of the real exchange rate (RER) is itself a function of the exchange rate regime, the evidence on the required variations in RERs drawn from the flexible rate period, where nominal exchange rate fluctuations dominate RER fluctuations, is not much of a guide to the magnitude of domestic price-level variability that pegging would have entailed.

(5) There is, finally, Dornbusch's view of Japan and Europe as inward-looking, protectionist, areas. There is here an underlying "Japan-bashing" tone which I find, to say the least, unhelpful. Not only does the attitude not help if, as is obvious, we should all hope the emerging tri-polar world will be open, competitive in markets, and cooperative in policy, it also raises false hopes. The decline of the United States, if there is one (which I personally doubt), cannot, in my view, be arrested by an opening up of Japan and the dismantling of "Japan Inc." The opening up of Japan and the reform of its distribution system is no doubt desirable, would benefit world income, and should, indeed, be pursued, partly with the help of an active commercial policy. But the prime beneficiary will be the Japanese and the contribution to redressing saving-investment imbalances and moderating required RER changes is at best marginal.

The international role of the dollar

Dornbusch's paper focuses on the future value rather than on the

1 See Genberg and Swoboda (1987) and (1989).

future role of the dollar in the international monetary system. To do justice to the latter topic would take a full paper but a few comments are, nevertheless, offered below.

First, there is no doubt that the dollar is still, and by far, the dominant international currency, be it as a reserve currency, an invoicing currency, or in the denomination of internationally traded financial assets. The question is whether it will continue to play this leading role and if so, for how long? A few figures, taken from a recent paper by Black (1989), indicate that the role of the dollar is decreasing, but fairly slowly. For instance, although the dollar remains the main currency of issue in the international bond market, its share declined from 56.5 percent in 1982 to 43.2 percent in 1987, while that of the yen rose from 6.5 percent to 12.4 percent. The share of the other important currencies, the Swiss franc and the deutsche mark, held relatively steady over the same period. As far as the currency composition of banks' external assets is concerned, the dollar again plays the dominant role by far with 56.9 percent of the total. However, the role of the yen has been rising rapidly to third place with 14.6 percent, thus coming very close to the deutsche mark's 14.9 percent in 1987. Turning to the role of the dollar as an international reserve asset, Black's figures confirm that it is declining slowly, though it still retains a very high share of 70.6 percent of the total by the end of 1987.

There are several reasons to believe that the role of the dollar will decline further but only slowly, unless U.S. policy turns unstable and the three emerging blocs become very hostile. In the first place, the decline of the dollar reflects changes in the underlying world structure of economic and political power. But the evolution toward a tripolar currency world is likely to lag behind geopolitics. Just as becoming an international financial center and an international currency is a slow process in which geography and historical accident have important roles to play, the decline of such centers and currencies is a drawn-out process as the case of sterling illustrates. Substantial capital has been built up and invested in the dollar's role and the United States still has the world's most open, broad, deep, resilient, and transparent financial markets.

One might still ask, with this conference's organizers, whether a continued strong international role of the dollar is compatible with a U.S. net debtor status? I think the answer must be yes but not with

a continuously rising net debtor position, continued large current account deficits which are seen as signalling an incipient crisis and the closing down of U.S. financial and goods markets. This is why inappropriate macroeconomic policies on the part of the United States and/or a threat of economic warfare could abruptly accelerate the otherwise slow decline of the international position of the dollar.

But, you may ask as Robert Mundell recently has, would not continued demand for "quality international assets" imply a continued net capital inflow into the United States and force a continued U.S. current account deficit? I think not, even though I do agree that the United States remains a dominant supplier of quality international assets. For, continued foreign demand for U.S. assets can be satisfied with a balanced American current account. We are back to the questions of the 1960s. It is not impossible to envisage U.S. gross foreign assets and liabilities growing while the U.S. international investment position remains balanced, the growth in short-term liabilities being matched by a growth in its long-term assets.

That having been said, we are moving toward a tri-polar world. The crucial question, of course, is whether the blocs will be hostile and closed, or open and cooperative; here I am more optimistic than Dornbusch. Be that as it may, in the medium run the decline in the international role of the dollar should give some scope for increased concentration on U.S. domestic goals without bringing forth policy reactions from abroad that frustrate U.S. policy.

Implications for macroeconomic policy and coordination

Assuming that we are, indeed, moving toward a tri-polar world, at least at the industrialized countries core, what are the implications for the conduct of monetary policy within the blocs and for coordination among them if a breakdown into hostile blocs is to be avoided? This is obviously too broad a topic to be taken up in any depth here.[2] A few remarks may, however, be in order.

Within the currency blocs, national monetary policy will have to be dictated by the requirements of external balance if exchange rates are to be credibly fixed within each area. And, within each area,

[2] For a discussion of this topic see Swoboda (1989).

the n−1 problem will have to be faced and solved. These are the requirements for the smooth internal functioning of the blocs which, in turn, would seem to be necessary for relatively open competition and effective coordination of policy among them. The twin hypotheses that goods and asset markets will be even more closely integrated worldwide tomorrow than today—and Dornbusch would agree, I believe, that all market pressures are working in that direction,—and that current account imbalances will continue for better or for worse to be concerns of policy have a number of implications for the shape that such coordination of policies should take.

In such a world, it is particularly important that fiscal policy, or more broadly saving-investment policy, be assigned the task of correcting current account imbalances. (It is also important that some modicum of international agreement exist as to what constitutes, roughly speaking, balance in that respect.) Focus on the exchange rate, real or nominal, as an instrument for, or intermediate target with respect to, current account balance distracts attention from the basic problem and may well prove destabilizing rather than stabilizing. Whether relations between the three blocs should be ruled by a fixed or a flexible exchange rate system is a separate issue, to be settled on other than current account equilibrium grounds. Having said that, it must be recognized that it is hard to imagine a fixed exchange rate system surviving large and protracted current account imbalances; but it should also be recognized that a flexible rate system is unlikely to function smoothly with such imbalances.

Whichever exchange rate system is chosen to rule relations among the three blocs, what matters is that the choice must be a clear one and that national monetary and macroeconomic policies will be run in a fashion that is consistent with the logic of the chosen system. Contingent rules of the assignment type would be helpful in that respect. In addition, there is a need for a credible commitment on the part of all major players to a basic code of conduct that includes openness of trade in goods, services and assets, multilateralism and the avoidance of competitive depreciation. With such a code, an appropriate coordination of policies of the type just outlined, and the will to address international imbalances at source, there is no reason why relations among the three emerging blocs should not be characterized by competitive markets, cooperation, and a modicum of civility.

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Overview: Central Bank Perspectives

John W. Crow

I'd like to share with you some thoughts on three main areas for monetary policy, with the benefit of the exposure they have been given these past couple of days. I will start with some remarks on monetary policy objectives, then comment more briefly on some points related to monetary policy transmission, and end on the vexed question of the international dimension.

My remarks will likely reflect to a degree the fact that Canada is a small "large economy."

The Bank of Canada Act, in its preamble, calls upon the Bank "to regulate currency and credit in the best interests of the economic life of the nation, to control and protect the external value of the national monetary unit and to mitigate, by its influence, fluctuations in the general level of production, trade, prices, and employment."

Now, this is a long list of objectives for one instrument. I trust, therefore, that you'll be gratified to learn that the preamble continues "... so far as may be possible within the scope of monetary action."

And the one thing that I would emphasize in this is that what is very clearly within the scope of monetary action is to preserve the value of money—to strive to provide a solid anchor for nominal values in the economic system.

The dimension of monetary policy is right for this purpose, even if it is not the only public policy affecting aggregate spending. And experience tells us that the value of money will not, realistically, be preserved—broad price stability will not be attained—unless monetary policy is framed and executed in such a way as to give price stability

strategic importance. If monetary or credit aggregates as intermediate targets or information variables help in this endeavor, they should be used.

Price stability is a valuable input into a well-functioningeconomy. In particular, the persistently popular notion that price stability gets in the way of growth does not, in my view, bear critical scrutiny. Since our economies are based on money, markets, and information, the reverse has to be true.

This truth is, of course, well brought out in those many cases where the domestic monetary system has been badly treated, for whatever reason that seemed good at the time. But even if we discard the extremes, we should not discard the key point. What we can most usefully worry about, and encourage others to think about, now and in the future, is how to assure price stability.

The policy alternative to price stability might be characterized as a policy of making gestures at holding the rate of inflation where it happens to be. Given the element of inertia in cost and price formation, such a rate of inflation might conceivably be held in the short run without necessarily provoking an erosion of confidence. And any inflation slippage can be attributed to bad luck. In practice, this kind of approach is bound to lead to a ratcheting up of inflation and an erosion of confidence, because the risks with inflation are taken systematically in an upward direction. Eventually, of course, the price and cost pressures have to be subdued, but then in a more wrenching manner than would have been needed if price stability had been sought earlier. Furthermore, you don't really get back to where you started, because credibility has been lost in the process, and restoring credibility seems to take longer still.

Any emphasis on the responsibility of monetary policy for price stability does not imply that fiscal policy and monetary policy are two solitudes—just that they have different qualities and are, therefore, not simple substitutes. The stance of fiscal policy can make monetary policy's job easier. And looking at it the other way, there is certainly a feedback from monetary policy to the stance of fiscal policy through monetary policy's effect on interest charges on public debt. Still, the distinction between monetary and fiscal policy, in this age of deficits and public debt overhangs, is a vital one to underline. It emphasizes that monetary policy should not, in the end, be aligned in such a way as to make financing fiscal deficits either easier or more difficult.

Monetary policy's macroeconomic concerns—for monetary expansion and total spending, for the path of inflation, and for price stability—are challenges enough to be getting on with.

In this vein, let me emphasize one thing that is different about the late 1980s, compared with a period that I think about quite a bit these days, the late 1960s. What is different is that now we have the dubious benefit of having experienced the economic vicissitudes of the 1970s—inflation, recession, stagflation. Many countries' monetary policies in the late 1960s, and very early 1970s for that matter, were not, in retrospect, as unyielding in resisting inflation as they might usefully have been. The reasons are complex, as they were bound to be, and were well-analyzed by Arthur Burns in his Per Jacobsson Lecture, "The Anguish of Central Banking." However, without any doubt, the result was that the inflation problem was allowed to fester. It then got out of hand in ways we all know too well, and that is in important measure why the 1970s as a whole were such bad economic news. So given this lesson, and given the readiness of monetary authorities to act on it, we can trust that the 1990s will, to that crucial extent, not be like the 1970s.

I have managed to get this far without mentioning the exchange rate. Let me now introduce it.

My first comment is somewhat parochial. Our colleagues across the Pacific seem to see us as more tied in to the U.S. dollar than we see ourselves. This is not the place to speak extensively on the subject, but I should emphasize that in Canada we do operate under a flexible exchange rate regime and find no reason to change at this time. Some among you will recall that Canada, reflecting the world-price volatility of natural resource output, which makes up a sizable part of our total output, and a large share of our exports, was one of the more inveterate floaters through the period of the Bretton Woods regime. Perhaps my counterparts' comments reflect the fact that while the Canadian dollar has certainly moved vis-à-vis the U.S. dollar in recent years, the amplitude has, unsurprisingly I think, not been nearly as great as for the Australian dollar or the Japanese yen.

One of the oldest phrases in the monetary policy hymn book, coming right after "carrying the burden," is the acknowledged need to balance external and domestic objectives. In this spirit, let me recall for you one phrase of our preamble " . . . to control and protect the external value of the national monetary unit . . . " This can, quite

reasonably, be taken to mean that monetary policy should have a special care for the exchange rate. This is at one level reasonable because monetary policy is technically well-fitted to the task—certainly better than fiscal policy. Indeed, there is almost no comparison. And as we have been reminded today, with the best will in the world, exchange market intervention cannot be viewed as playing more than a stopgap role.

However, while recognizing the technical point, I would suggest that we not lose sight of what is really important here. For example, inviting you to consider again our preamble, let me suggest that the surest way to "protect the external value of the national currency unit" is by holding to a domestic monetary framework that protects its domestic purchasing power. Put another way, there cannot really be an exchange rate policy divorced from the fundamental principles driving monetary policy.

I'll come back to some aspects of this question a little later in the context of international considerations, but first some observations on monetary policy transmission.

My first is that the growth in the relative size of the public debt, especially when public debt is heavily weighted with floating rate debt, means we probably have to accept the fact that short-term interest rates may well have to move more, or to hang in more, to have the same impact on aggregate spending as earlier. Furthermore, everything we see indicates that the channels of private sector financing are so much more flexible than they used to be. This also means that interest rates have to work harder than before.

On the other hand, with floating rate debt much more common than it used to be among private borrowers as well, interest rate changes have more leverage on the current decisions of past borrowers and not just on those currently contemplating a spending decision. However, in this general area of private sector debt, let me point out also that the Canadian corporate sector has not seen its indebtedness, and interest rate risk, pushed up in the way that has apparently occurred in the United States and was analyzed yesterday by Ben Friedman.

My final observation on transmission is in a somewhat different category. Since actions of monetary easing or tightening pop out in both exchange markets and money markets, it is quite appropriate at one level at least to regard the exchange rate as part of the monetary

transmission mechanism. Indeed, it is possible to construct a "monetary conditions index" that incorporates both effects, weighted by their estimated shorter- to medium-term impact on spending. One important caveat, especially in the case of Canada, where we have undergone major swings in our international terms of trade reflecting fluctuations in world commodity prices, is that not all exchange rate movements are to be laid at the door of monetary policy. But in any case, it is clear that taking into account the transmission through the exchange market can add measurably to one's view of the strength of the transmission to the domestic economy from monetary policy actions.

However, since exchange rates are ratios between respective national monies, this brings me right up against my final set of preoccupations, those regarding the international dimension.

As I noted at the beginning, the international dimension of monetary policy is, in my view, a particularly difficult aspect to grapple with. And the Kansas City Fed, not ducking the issues, has allocated a good half of the symposium's time to it. Echoing Bob Solomon, perhaps next year the Kansas City Fed will follow up with a symposium on the international dimension of fiscal policy. Let me just note here that it was very appropriate for fiscal policy to be referred to this morning.

The essence of the challenge is easy to catch—"hang together or hang separately;" "never send to know for whom the bell tolls," and so on. Is there really a choice in a strongly interconnected world between policy autonomy and some form of policy coordination? In putting it this way, I am accepting the point, implicit it seems for those choosing the program wording for this conference, that the weaker form exercise of systematic cooperation, which is clearly benign, in practice leads to the stronger form, coordination. At the same time, accepting, like the universe, coordination does not imply that coordination has to be continuous or at the same intensity all the time.

And, of course, most of the practically interesting and important questions lie somewhere between the poles of all-out coordination and all-out autonomy. Furthermore, they have, like all interesting and important questions, given rise to a vast literature, although not to date generating any very robust, that is, all-purpose, analytical conclusions. Still, the coordination process has continued, and will

continue, with, at the very least, the justification that it can help to block off one clearly damaging possibility—that of the industrial world, and therefore everyone else, sliding into a protectionism born of frustration with current account imbalances. While this justification may indeed be compelling, it must also be conceded that it is hardly inspiring.

In any event, let me orient my observations by asking what international economic coordination implies for monetary policy.

I began these comments by emphasizing the crucial responsibility of monetary policy for monetary stability. This was in a national context. The issue that concerns me is how, if at all, monetary stability can be pursued in a global coordination context. And I think that it may safely be added that this is certainly an issue for the 1990s, because it has not been settled in the 1980s.

There may, of course, be many reasons why it has not been settled, not least of which is the inherent difficulty of constructing international monetary arrangements among sovereign nations. It will not be easy in Europe, despite the already existing strong sense of community, as Governor Leigh-Pemberton reminded us yesterday.

The point, however, that I want to dwell upon is more specific. Whatever the theory of international economic coordination, the way the process seems to have worked over the most recent years has been to emphasize the role of monetary policies, policies of achieving particular patterns of short-term interest rate differentials among countries, in stabilizing exchange rates while the necessary fiscal or structural changes are made to address the underlying imbalances.

This may not be so bad, as a kind of short-term fix. As I noted earlier, monetary policy has a comparative advantage over other instruments in exchange rate matters. But there are also very evident dangers that stem from the fact that the approach is essentially relativistic—there is no clear central anchor—and the undeniable fact that the saving-investment imbalances are not being corrected very quickly.

There is another element to this—an element that could, in fact, have implications within Europe, given the intracontinental current account differences, as well as on the broader international scene. Since these saving-investment imbalances are more readily tolerated on a rising tide of demand, the temptation is evidently more than usually present to search for reasons for seeing the economic system

as demand deficient. Clearly the potential of the combination of a relativistic, or non-anchored, approach to monetary policy, with a presumption that the problem to be guarded against most strongly is a shortage of spending, can be a powerful force behind inflation.

From this angle, the broad challenge to monetary policies may be to avoid being put upon—to avoid playing too many roles and finishing up making things worse both domestically and internationally. But, of course, the extent with which this is avoided brings us into areas beyond the strict purview of monetary policy.

Overview: Central Bank Perspectives

Leonhard Gleske

First I would like to join others in expressing my thanks to the Federal Reserve Bank of Kansas City and its president, Roger Guffey, and to Tom Davis for inviting me to this symposium that takes place in such an exciting environment here in Jackson Hole. I am especially pleased to be here because participation in this symposium is one of the last activities in my professional life as a central banker. After having served for more than 25 years as a member of the Bundesbank's Central Bank Council, I shall retire at the end of this month. But, of course, I will continue to take a close interest in monetary policy issues; even though I will no longer take an active part in policymaking in the 1990s.

One of the main issues for the 1990s is the evolution of the European Economic Community toward an Economic and Monetary Union. Governor Leigh-Pemberton, in his luncheon address of yesterday, dealt with the implications for monetary policy of "Europe 1992." I was tempted to add a few remarks on this issue from the point of view of a central bank whose economy and currency, the deutsche mark, have grown into a role that has, somewhat critically, sometimes been called dominant but, more positively, has served and continues to serve as a stability anchor for the European Monetary System. During the transition period, before the full implementation of economic and monetary union, monetary policy will continue to be conducted under national responsibility, but more and more in an environment which is characterized by full freedom of capital movements and increasing integration of financial markets. For the

monetary policy of the Bundesbank this will be, of course, a very important issue in the 1990s. But my time is too short to deal with this question here, so I resist this temptation.

Instead, I will concentrate my remarks on two points. The first one concerns the role of monetary aggregates as an intermediate formal target or as a guide for the conduct of monetary policy. Charles Freedman makes some very interesting points on this issue in his paper.

The second issue concerns the likely development of the international monetary system into a tri-polar currency system and the implications such a change might have for exchange rate and monetary policy. In his paper, Yoshio Suzuki predicts that such a tri-polar system will be in place by the mid-1990s.

Let me begin with the issue of monetary targeting. It has always been a strong conviction in the Bundesbank and its predecessor (the so-called Bank Deutscher Lander which was established in 1948 under American influence), that the primary goal for a central bank is price stability. I have nothing to add to what Charles Freedman has said in formulating convincing arguments in favor of such a strict definition of the central bank's task. It is the primary role of central banks to look after the stability of domestic prices. As one important achievement of the EMS, all participating central banks have now endorsed this principle. Officially, it was first expressed in 1987 in the so-called Basle-Nyborg report of EEC Governors on the functioning of the EMS and recently repeated in a draft decision to be adopted by the EEC Council of Ministers which the governors were asked to formulate. This decision will extend and strengthen the role and responsibilities of the Committee of Governors of EEC central banks in the first stage of the Economic and Monetary Union. This Committee of Governors will likely develop in the 1990s into something that can be called a European Federal Reserve Board or a European Central Bank Council.

Monetary targeting can be very helpful in achieving the final goal of domestic price stability. For myself, I was never as strongly convinced as many monetarists are, of a close relationship between the monetary aggregates and the real economy. Under most circumstances it will be a useful concept. But, in some circumstances, strict adherence to an aggregate without further analysis as an indicator for policy can lead one to wrong conclusions.

In the political and socioeconomical environment in which central banks have to act, a monetary policy based on an aggregate as an intermediate target can facilitate the task of convincing politicians and the general public of the appropriateness of a policy that otherwise could provoke strong opposition. That will be the case, in particular, when a central bank, in order to fight inflation or to prevent inflationary forces from spreading to all sectors of the economy, has to embark on a restrictive path, necessarily accompanied by high interest rates. In the early 1970s, when inflation rates in Germany during the last stage of the Bretton Woods System reached unprecedented levels, the Bundesbank came under severe pressure to demonstrate its ability and firm determination to pursue a non-accommodating monetary policy in order to break the domestic inflation spiral. This was the dominant political consideration which led to the adoption of a formal monetary targeting framework in Germany in the mid-1970s.

In the given German context, this strategy was designed to give private and public decisionmakers clear guidance about the general stance of monetary policy and give them a monetary framework for nominal spending and price and wage setting. The ultimate aim was to facilitate agreement among the social groups, minimize friction between the various areas of economic policy, and reduce the potential output and employment costs of inflation control.

Although target-guided policies could not always be implemented without friction and, for a number of years, we had to accept strong deviations from our annual targets, the Bundesbank has adhered to this practice up to now. Monetary targeting proved to be particularly useful in breaking inflation spirals after the first and second oil price hikes in 1974 and 1979 and after the deutsche mark's "depreciation crisis" in the early 1980s. Since then, a supply-side orientation of economic policy, the budget consolidation course pursued by the federal government, moderate wage settlements, and the temporary market falls in world energy and raw material prices have greatly facilitated the Bundesbank's task. In 1988, inflation was down to a record low of less than 1 percent. The Bundesbank feels that adherence to monetary targets may be a good method of consolidating this disinflation process, even though it has proved especially difficult in the last few years to reconcile domestic monetary targeting with the requirements of exchange rate management.

The reason why a target-based monetary policy has been repeatedly confronted with difficulties in the case of Germany is not so much because of deregulation in the financial markets, as has been the case in other countries. Interest rate regulations were abolished more than 20 years ago and monetary policy in Germany has been conducted on the basis of market oriented instruments. Deregulation has had only a limited effect on the aggregates. But, as a medium-sized country which is the biggest exporter in the world economy and which, since the second half of the 1950s, has had practically no restrictions on capital movements, external factors are playing an important role with far-reaching implications for the monetary aggregates. With the globalization of international financial markets and the growing role of the deutsche mark as a reserve and investment currency, these influences have become even more important. Repeatedly, German monetary policy has been confronted with the problem of reconciling its target-oriented policy with the need to avoid, as far as possible, a misalignment of the exchange rate of the deutsche mark, without endangering the achievement of the final goal of its policy which is domestic price stability. The development of the aggregates has not always been a reliable guide in deciding about the appropriate direction of monetary policy.

I will give just one example: in 1986 and 1987, non-banks in Germany recorded a huge inflow of foreign exchange via a growing current account surplus, accentuated by strong inflows of short and long-term capital. Accordingly, we saw a strong overshooting of monetary targets. After thorough analysis, we came to the conclusion that to tolerate this overshooting was better than to react to it with a monetarist answer of further tightening monetary conditions. The main cause of this overshooting was not, as happened quite often in the 1960s and 1970s, an export induced surplus in a worldwide expansionary and sometimes inflationary environment, but an import price-induced surplus in a world economy characterized by uncertainties and moderate growth rates. In Germany, this overshooting took place at a time of a strong appreciation of the deutsche mark with welcome stability effects on the one side, but contributing to the uncertainties in the business community on the other side. At the same time, growing real imports, welcomed in the framework of the adjustment process, were a cause for low domestic real growth rates.

Let me add another scenario. In Germany now, we are close to

our monetary target for **1989.** There seems to be, from this point of view, no need for a further tightening of monetary policy. The high liquidity preference of German investors, which was one of the reasons for overshooting in previous months, has normalized after the announcement that the plan to introduce a withholding tax on interest rates has been abolished. But, at the same time, the huge net capital outflow which had its cause, in large part, in withholding **tax** considerations, has been reversed into a capital inflow to the non-banking sector of the economy. **An** even larger current account surplus than last year, combined with a capital inflow to non-banks, could easily lead again to a similar overshooting of aggregates as was the case from **1986** to **1988.** But this time, the causes and the environment are both totally different. The growth in the current account surplus is, to a large extent, export induced. In addition, we are living in a world economy with strong real growth in a number of industrial countries, mainly in Europe, some of which are experiencing inflationary pressures, and with a domestic economy that is' fully employing all its physical capacities and a deutsche mark, that has been, for some time, more on the weak side. Under those conditions, a new overshooting could not get the same answer as a few years ago and monetary policy would have to react. To avoid misunderstanding, I **am** not saying that such a scenario will become a reality. My intention is only to demonstrate that the development of the money supply, in light of the complex interrelationship between monetary aggregates and the real economy, needs a careful interpretation and analysis of the causes behind the growth of the monetary aggregates. Monetary policymakers must examine whether the factors contributing to monetary growth reflect inflationary .forces at home and whether an ample money supply, even if caused by noninflationary factors, in a certain environment could induce inflationary dangers. The concept of a policy based on monetary targeting is not as simple as it seems to be to a number of monetarists.

I have much sympathy with the view of Charles Freedman when he says that it is most useful to think of financial aggregates, both money and credit, as playing the role of policy guides, rather than that of formal targets for the next few years. But I also agree with him that the distinction between these two concepts—policy guide and formal target—is one of degree rather **than** substance. In its policy, the Bundesbank has proved to be flexible. In the context of its

monetary policy, the Bundesbank repeatedly has also taken into account other factors, especially external influences, and has accepted an overshooting of its monetary target when justifiable.

But we do see, also, the danger for a central bank in using a formal target. It could become confronted with a loss of confidence in the chosen aggregate, and even more, a loss of its own credibility if it appears not to be able and willing to achieve the announced target growth rate for the chosen aggregate on most occasions. Frequent or continued overshooting or undershooting can, indeed, pose a credibility problem. But we believe that this risk may be controlled as long as the final objective, price stability, is achieved. In Germany, this has been the case over all the years since 1986, when we accepted and tolerated the overshooting. At any rate, the Bundesbank has always endeavored to give a convincing justification to the public as to why it would not have been appropriate to try to attain a specific monetary target at any cost. This, too, may have contributed to the maintenance of its credibility.

Charles Freedman makes another remark in his paper in the context of monetary targeting which brings me to my second point: namely, the implications for monetary policy of an emerging tri-polar international monetary system. As one of the conditions under which an aggregate could be used as a formal target for monetary policy, Freedman mentions a stable relationship between the monetary aggregate and the target variable, either nominal spending or prices. The example of Germany shows that countries that are strongly integrated into the world economy may have a more complex interrelationship between the development of their money supply and the real economy than countries where—like the United States—the domestic economy, because of its size, is much less influenced by external factors. In the case of Germany, the export of goods and services counts for one-third of GNP. The figure for Japan is not even half this size, and for the United States, this figure is still, even after a strong increase over the last two decades, below 10 percent. Imbalances in the combined account of current transactions and capital movements of non-banks, one of the determining factors for monetary aggregates besides domestic credit expansion and domestic monetary capital formation, have often been quite large in Germany, while they compensate each other much more in Japan and the United States. Under those conditions, monetary targeting is confronted with very

difficult problems. Small countries in Europe, normally with an even higher share of foreign trade in their GNP, have, therefore, refrained from the targeting of monetary aggregates. They pursue an exchange rate oriented policy and, in a number of cases, have tied their exchange rates to those of their most important trading partners since they are satisfied with the results of the economic policies of these partners, mainly in terms of price stability.

Surely, the United States as well has had some problems as far as the money supply as a monetary target was concerned. But these problems had more to do with the effects of financial deregulation than with external factors and they were, I suppose, more of a transitional nature. I agree with Lyle Gramley and others, that the innovation process will probably continue in the future and influence the money supply. But I believe that innovation will develop more smoothly than in the past and not in such an erratic way as in the early 1980s, so that a target oriented monetary policy will be able to cope with it better than at some time in the past. I have noted also the point made by Lyle Gramley and by some others in the discussion, that the external factors will.also be playing a larger role for the United States in the conduct of monetary policy than in the past. But still, compared to GNP, the external factors will remain relatively small and the impact on monetary aggregates, as well as on the real economy, will remain much smaller than is the case for most medium and small-sized economies in Europe.

Normally, there will, I suppose, continue to exist a more stable relationship in the United States between the monetary aggregates and the real economy than in economies of a smaller size. Perhaps it is no accident that monetarism as a theoretical concept was invented in the United States, after Milton Friedman and Anna Schwartz had written their famous book on American monetary history.

One consequence of regional integration into a single market of a big size will be a substantial reduction of the foreign sector for this now bigger economy, compared to the sometimes extremely high proportion for individual member economies. This will be the case in Europe, where interregional trade is playing a very important role. Such a development will presumably create better conditions for a monetary policy that is based on aggregate targets. But the implementation of such a monetary policy for the whole area will become feasible only after a common monetary authority has been established.

This is a political aim for Europe, but we are still far away from this and I doubt whether this will ever happen in the Pacific area. Anyway, I do not believe it will be an issue in the 1990s, at least not in the terms I just described.

But I can imagine that, in a continuing process of integration, monetary coherence within these areas will increase with one or more countries of sufficient size pursuing a policy with the aim of forming a core of monetary stability, thus providing the whole system with an anchor resulting in relative exchange rate stability within each area. One of the challenges of the world in the 1990s will be, as Yoshio Suzuki outlines in his paper, how to make the "domestic" stability in each currency area compatible with the stability of exchange rates among these three areas while maintaining free trade and free capital movements in the world under the free floating exchange rate system. I agree with Yoshio Suzuki that, on the domestic front, tri-polar countries should conduct monetary policies which emphasize money growth as the intermediate target and give top priority to domestic price stability. This would, indeed, limit the scope for influencing foreign exchange rates in the shortterm through interventions and manipulation of interest rate differentials.

However, large currency areas may enjoy less external constraints for their real economy than individual countries under the present system, and exchange rate movements among big currency blocs may become, if they appear, more tolerable than under present conditions. The impact of exchange rate movements on these large "domestic" markets would be much smaller than today for a number of medium and small-sized economies. This does not mean pleading for a policy of "benign neglect" as to the exchange rates of these currency blocs. But as the United States with its repeated policy of "benign neglect" in the past has shown, at least to some degree and for a certain time, a large domestic market can absorb the impact of exchange rate movements better than economies with a relatively large foreign sector.

However, this does not mean that there would no longer be a need for close cooperation among these currency blocs. Governor Leigh-Pemberton has rightly pointed out that such a cooperation would remain necessary and it should be based on the priority goal of price stability. But even a close cooperation will not always exclude the possibility of capital flows causing exchange rate movements that

influence the real economies. Therefore, there remains a need for some elasticity of exchange rates between those currency areas. But because of their size, they would be in a better position to cope with such exchange rate movements now than would smaller economies.

Overview: Central Bank Perspectives

Alan Greenspan

Much of this conference has focused on the fact that our markets and financial systems are evolving at a pace not fully envisioned only a few years ago. They are enhancing the avenues of credit available to borrowers and the convenience of efficiency of financial markets and services. However, the changes are also adding immensely to the complexity of our financial system and are accordingly closing the risks. Now, if this is a side issue to the central focus of this conference, monetary policy will not be functioning in a vacuum during the 1990s.

With the memory of October 1987 still fresh in our minds, it is important that we stand back, not only to take stock of what has happened, but to understand better the economic causes of financial innovation and globalization and to identify potential accompanying risks and ways to limit such risks. Fending off such risks will be one of the roles of central banking in the 1990s.

Contributing to the evolving of our financial markets is a process that I have described elsewhere as the downsizing of economic output. That is, the creation of economic value has shifted increasingly toward conceptual and intangible values with decidedly less reliance on physical volumes. In fact, if the weight of all materials (the tons of grain, cotton, ore, coal, steel, cement and so forth) we produce were added up, their average volume per capita might not be much greater today than it was say 50 or 75 years ago. This would mean that increases in the conceptual components of GNP, that is, those reflecting advances of knowledge and ideas, would explain, by far,

the major part of the rise in real **GNP** in the United States and presumably, the industrial world as a whole.

Downsizing has largely been a response to the need to reduce the costs of moving goods and services to their most highly valued use, thereby conserving on energy, labor, and other valuable resources. Reinforcing this process has been quantum advances in technology spurred by economic forces. In recent years, the explosive growth of information gathering and processing techniques has greatly extended our analytical capabilities of substituting ideas for physical volume. Since irreversible conceptual gains are propelling the downsizing process, these trends almost surely will continue into the twenty-first century. The purpose of production of economic value will not change. It will continue to serve human needs and values, but the form of output will be increasingly less palpable.

Understandably, downsizing is having a profound impact on international trade. Obviously, the less the bulk and the lower the weight, the easier it is to move goods. Clearly, as cross-border trade grows irreversibly over the long run, worldwide surpluses and offsetting deficits on current accounts can be expected to grow as well. That is, owing to the forces that are acting to boost the share of output going to trade, net cross-border financial claims relative to **GNP** can be expected to continue to rise.

Moreover, new technology, especially computer and telecommunications technology, is boosting gross financial transactions at an even faster pace than the net transactions required to finance current account deficits. Rapidly expanding data processing and virtually simultaneous or instantaneous information transmission capacity are facilitating the development of a broad spectrum of complex financial instruments which can be tailored to the hedging, funding, and investment needs of a growing array of market participants. Some of this has involved an unbundling of financial risk to meet the increasing specialized risk-avoidance requirements of market participants. Exchange rate and interest rate swaps, together with financial futures and options, have become important means by which currency and interest rate risks get shifted to those most willing to take it on. The proliferation of financial instruments, in turn, implies an increasing number of arbitrage opportunities which tend to further boost gross financial transactions volume in relation to output.

Portfolio considerations also are playing an important role in the

globalization of securities markets. As the welfare of people in the United States and abroad becomes more dependent on the performance of external economies and exchange market developments, it is natural for both individual investors and institutions which directly or indirectly manage the assets of individuals to acquire or raise the share of foreign securities in investment portfolios. Such diversification provides investors a means of protecting against depreciation of the local currency on foreign exchange markets and domestic economic disturbances affecting asset values on local markets.

Clearly, as international trade continues to expand more rapidly than global output and domestic economies become even more closely linked to those abroad, the objective of diversifying international securities portfolios, will become increasingly important. Moreover, since the U.S. dollar is still the key international currency, such diversification has been and may continue to be disproportionately into the dollar as a proxy for all nondomestic currencies. This, of course, presumes the continued role of the dollar as the key international currency, which I do.

As international financial trading and transactions have surged, demands for clearing services across a wide range of financial instruments have expanded rapidly, placing pressures on clearing and settlement systems. Partly as a consequence, volumes on payment systems, both domestically and cross border, have mushroomed. As the magnitudes of transactions escalate, monetary authorities will have to become increasingly concerned about systemic risk. Existing schedule settlement and payment delays raise the spector of defaults in any of the myriad of uncovered transactions which can ricochet through the financial markets both domestically and across borders.

The various clearing, settlement, and payment systems have been endeavoring to reduce the systemic risk by shortening the time lags between commitment and final settlement, in effect, endeavoring to reduce float. Obviously, if all financial transactions were completed concurrently and with finality, float would disappear and systemic risk resulting from the time differences in settlement, clearing, and payments, would be eliminated. Perhaps in 20 or 30 years, computer technology will have advanced to the point where such an overall world financial system would be feasible. But in the period immediately ahead, this is clearly not yet practical.

To be sure, technology exists today to maintain a real time con-

current settlement, clearing, and payment system which would reduce levels of float to zero. The reluctance to introduce such a system presumably implies that the cost of implementation exceeds the present cost of the risks of systemic failure. Hence, pending the ultimate rationalization of financial transactions and the elimination of float, one of the major concerns of monetary authorities in the 1990s and the early part of the next century is going to be the substantial acceleration of float. Since this will be a factor in the stability of the world financial system, it will, of necessity, impact on our various monetary policy strategies.

It is worth noting that computer and telecommunications technology, while an important factor contributing to the globalization of securities markets and to certain financial system risks, can be used and is being used to limit risk. Information systems increasingly are permitting securities firms to monitor their global positions on a timely basis and virtually around-the-clock trading in some securities enables market participants to shed unwanted risk promptly. Such technology also permits clearing systems to monitor member positions in their own markets on a timely basis and to share member position information with other clearing systems, thereby enhancing control of overall risk to clearing and settlement systems.

To an important degree, more standardization in the areas such as clearing and settlement and capital standards holds the promise of enhancing efficiency while, at the same time, strengthening market structures. Moreover, international coordination of policies in these areas will act to reduce the scope for so-called regulatory arbitrage; that is, artificial reasons for investors or securities advisers to favor one national market over others.

At the present time, a considerable amount of effort is being expended to coordinate within and across borders in these various areas. In some cases, this involves regulatory authorities; in some other cases, it involves the private sector and still others, it involves the combination of both. For example, there are a number of bilateral discussions between the SEC and securities market regulators in other countries on issues relating to the exchange of information and enforcement of securities market laws. Also, central banks within the context of their responsibilities for national payment systems have been addressing risks associated with securities, clearing and settle-

ment and are working to coordinate policies on payment system netting arrangements.

In closing, the stability of our financial markets must, of course, at root, rest on the performance of the world economy. Thus, at the very top of our consideration in maintaining a sound financial structure is the pursuit of sound economic policies both domestically and, to the extent relevant, on a coordinated international basis. In this regard, conferences like this, by identifying and addressing important policy issues, can make a valuable contribution.

At the same time, we must seek to strengthen that financial structure through appropriate market performance, recognizing that even systems with formidable safeguards will be unable to ensure against the disruption resulting from a massive speculative imbalance. Through the cooperative efforts of the private and public sectors we can go a considerable distance in improving the safety and soundness of our financial markets systems but we cannot realistically expect to eliminate all risks in these systems.

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