U.S. Monetary Policy in an Integrating World: 1960 to 2000

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U.S. monetary policy has a purely domestic mandate. The Federal Reserve's task is to promote "maximum employment, price stability and moderate, long-term interest rates" within the United States.[1] Or, as Arthur Burns put it in 1973, "American monetary policy is not made in Paris; it is made in Washington."[2] That said, this paper will argue that global developments have played a significant role in setting the focus and practice of U.S. monetary policy in the years since Frank Morris became President of the Federal Reserve Bank of Boston. When Frank Morris joined the Fed in 1968, the Bretton Woods system—based as it was on the dollar's unsustainable link to gold—was on the verge of collapse. Even so, the U.S. dollar remained the only viable international transactions currency at that time, and the financial "world" encompassed a mere handful of nations edging the North Atlantic, plus, grudgingly, Japan. Today, of course, the major currencies are floating, the euro is increasingly used as a transactions currency, and investor horizons have widened to include emerging markets on every continent.

Within this changed setting, the U.S. economy has itself become

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[1] Federal Reserve Act. The phrase "maximum employment" is generally interpreted to mean maximum *sustainable* growth and employment.

[2] Cited by Wells (1994, p. 109) from Volcker and Gyohten (1992, pp. 103–104).

considerably more open to international trade and investment flows. Thus, promoting U.S. price stability and maximum sustainable growth has increasingly required taking global developments into account. Usually, these developments have been taken as "givens," inputs to the data set on which policy decisions are based. From time to time, however, international developments—such as major exchange rate shifts—have elicited a Fed policy response aimed at influencing the course of these "external" events. The intent, of course, has always been an improved long-term outcome for the U.S. economy.

Beyond changing the setting in which U.S. policy decisions are made and the considerations on which they are based, international forces have also influenced the evolution of the U.S. financial system and, thus, the practice of U.S. monetary policy. Over the past forty years, foreign opportunities and foreign competition have helped drive financial innovation and regulatory change in this country. These developments, among others, eventually forced the Fed to de-emphasize monetary aggregates and to adopt the federal funds rate as its operating target instead.[3] These same forces also contributed to the demise of the Glass-Steagall (interindustry) and McFadden (interstate) restrictions on bank activities. Shifts in central bank practice overseas may also have encouraged similar changes in this country.

This paper examines the impact of global developments on the practice of U.S. monetary policy, broadly defined to include regulatory and lender-of-last resort functions as well as open market, discount, and intervention activity, over the past forty years. The first section briefly reviews a few familiar facts establishing the increased openness of the U.S. economy. The second section explores episodes when external events beyond those included in the domestic outlook—events like significant exchange rate shifts—appear to have influenced policy decisions. The analysis relies in large part on an admittedly subjective examination of the Records of Policy Actions of the Federal Open Market Committee (FOMC) and of the Board of Governors found in the Board's annual reports. The section explores what sorts of events triggered a policy response. Have the frequency or causes of these episodes changed with the advent of floating rates and increased capital market integration? Do the patterns suggest any lessons? The third section discusses the impact of international forces on U.S. financial innovation and on the evolving practice of U.S. monetary policy and examines a few implications. Section four peers into the future, applying the lessons of the past, and section five provides a summary and conclusions.

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[3] The shift from targeting monetary aggregates to relying on an exchange rate anchor or, more recently, an inflation target (with or without an intermediate interest rate target) is a global phenomenon.

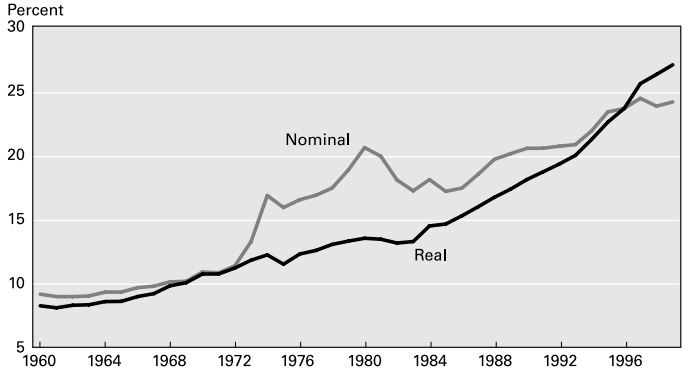
The Increased Openness of the U.S. Economy

Although the world is arguably no more open today than it was at the start of the twentieth century, the U.S. economy is certainly more open than it was at the beginning of the 1960s. As real exports plus imports have grown from less than 10 percent of GDP in the early 1960s to almost 30 percent currently (Figure 1),[4] net exports have come to exert a notable impact on GDP growth on a more frequent basis. In the early years (1960 to 1974), net exports added or subtracted 1 percentage point or more from GDP growth rather infrequently, as Figure 2 shows. But from 1975 to 1984 and again in the late 1990s, net exports affected GDP growth by 1 percentage point or more over 40 percent of the time. The periods of obvious impact coincided with the oil shocks, the huge dollar appreciation and LDC debt crisis of the 1980s, and the more recent Mexican and Asian financial crises and their economic consequences. The pattern is also highly countercyclical, naturally enough, with net exports having a positive impact on U.S. growth just before and during a U.S. recession and a negative impact during a U.S. recovery. Confirming the old saw about the contagious effects of U.S. colds leading to pneumonia overseas, this pattern suggests that the United States has frequently been the instigator of world downturns as well as the engine of world growth. But in recent years, the impact of the Asian crisis on the giant U.S. economy through the trade channel is clearly visible.

Less familiar is the fact that U.S. international trade in securities has grown even faster and now looms considerably larger, relative to GDP, than trade in goods and services (Figure 3). While nominal exports plus imports equaled 23 percent of GDP in 1999, gross U.S. international transactions in securities equaled 200 percent of GDP. These data suggest that private capital flows rather than trade flows have been driving the large exchange rate swings of recent years. Reflecting the promise of this country's "new economy," and concerns about needed reforms in Europe and Japan as well as in many emerging markets, these capital inflows surged notably in the late 1990s and now make up a significant share of the funds raised in the U.S. credit markets. Since 1995, foreigners have provided, on average, 35 percent of the total credit raised by the U.S. nonfinancial sector (Figure 4), up from an average 2 percent in the early 1960s. In addition, in the past three years foreigners have acquired about 10 percent of the increase in U.S. corporate equities outstanding. The stimulus provided by these capital inflows plus the wealth effect of the related increase in U.S. asset prices appears—rather unexpectedly—to

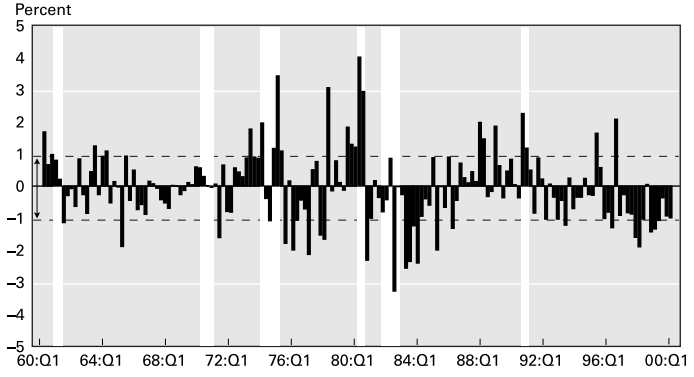
[4] On a nominal basis, exports plus imports have increased from less than 10 percent to almost 25 percent of GDP. The difference reflects the fact that prices have increased less (or fallen more, in the case of computers and other high-tech equipment) for tradable than for non-tradable products.

Figure 1
Exports and Imports of Goods and Services as a Share of GDP



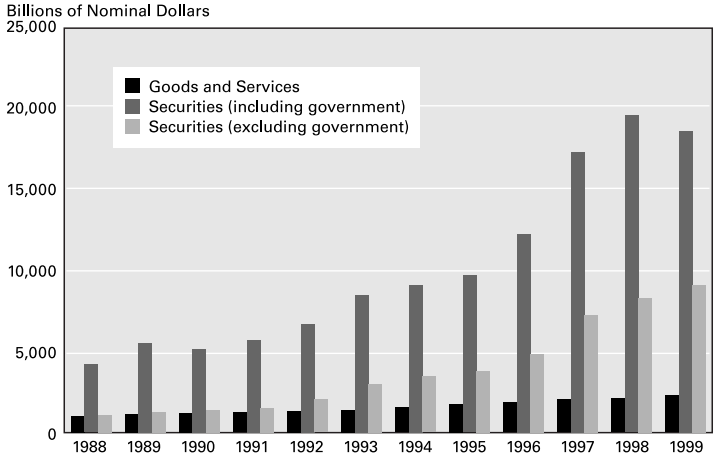
Source: U.S. Bureau of Economic Analysis.

Figure 2
Contribution of Real Net Exports to Changes in Real U.S. GDP
Quarterly Data, Seasonally Adjusted at Annual Rate



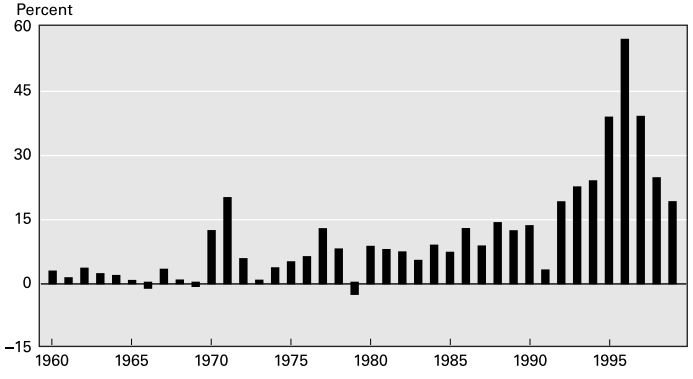
Note: White bars indicate NBER-dated recessions.
Source: U.S. Bureau of Economic Analysis.

Figure 3
U.S. Trade in Goods and Services and Gross International Transactions in Securities



Source: U.S. Treasury International Capital Reporting System, U.S. Bureau of Economic Analysis, Board of Governors of the Federal Reserve System.

Figure 4
Foreign Net Lending as a Share of Total Net Borrowing by the U.S. Nonfinancial Sector



Source: U.S. Treasury International Capital Reporting System, U.S. Bureau of Economic Analysis, Board of Governors of the Federal Reserve System.

have more than offset the negative impact of deteriorating net exports on the U.S. economy.[5]

As the U.S. economy has become more open, access to data on foreign economies has improved, and various new markets have emerged, the preparatory materials for FOMC meetings have come to cover a growing number of countries in greater detail. Still, the minutes frequently label international trends "a key area of uncertainty," and the cumulative spillover effects of synchronous downturns and recoveries remain hard to foresee. Over the forty years covered by this paper (1960 to 2000), FOMC interest has naturally turned from the deficits and gold outflows that drew its attention during the late 1960s to the likely impact of net exports on U.S. demand conditions and of the dollar's exchange rate shifts on price developments in this country. In recent years, for instance, some Committee members have attributed the surprisingly good behavior of U.S. inflation in part to the increased competition and the reduced capacity constraints facing U.S. producers, thanks to the strong dollar, slack conditions in our trading partners, and increased outsourcing from overseas. By comparison, the impact of international capital flows on U.S. asset prices and on investment and consumption activity in this country has received limited attention.

Beyond the Domestic Outlook: How Have International Events Influenced Fed Policy?

As described above, in pursuing their domestic goals of price stability and maximum sustainable growth, the members of the FOMC always consider the likely impact of net exports and the foreign exchange value of the dollar on U.S. demand conditions and inflation. But beyond that considerable influence, to what extent have Fed policymakers based policy decisions on "international" considerations—to affect the foreign exchange value of the dollar, for instance, or in reaction to external financial crises? The conventional answer is almost never. This section reexamines the issue and comes to a somewhat different conclusion.

To look for evidence of international influence, we examined the Records of Policy Actions for the Board of Governors and for the FOMC for the past forty years.[6] This exercise required considerable interpretation, of course, and other readers might come to somewhat different

[5] In addition, White (1999) suggests that the stimulative terms-of-trade effects of an appreciation may work to offset the substitution effects, which tend to shift domestic demand to foreign products. He posits that combined terms-of-trade and substitution effects may partly explain the unexpectedly low inflation and strong consumer spending experienced in the United States in recent years.

[6] Eventually, in the case of the FOMC, the Record of Policy Actions became the Minutes.

conclusions in specific cases. However, the records usually provide a rationale for the decisions made and give some guidance on the weights assigned to the various, often conflicting, arguments put forth in determining the ultimate outcome.[7] For example, in February 1978, a majority of the FOMC members agreed that the weak dollar "militated against" easing while domestic sluggishness precluded tightening. Thus, the compromise outcome, clearly influenced in part by international considerations, was a decision to maintain existing monetary conditions. On occasion, moreover, and usually after some debate, the members of the FOMC have changed the wording of the highly formulaic directives to the New York Fed in order to highlight particular concerns. For example, in May 1973, the directive instructed that FOMC policy be implemented "taking account of international and domestic financial market developments," reversing the usual order. A year later, the usual order ("domestic" first) was restored.

The results of this effort are displayed in Figure 5, which shows the number of times each year that international considerations other than those incorporated in the domestic outlook seemingly affected discount rate decisions or the domestic policy directive for open market operations.[8] The darker bars indicate when international events were the primary reason for action (or lack thereof), while the lighter bars show when international considerations helped tip the balance. The figure does not have a bar representing changes in Regulations D and M,[9] which the Fed made frequently in the late 1960s through the mid 1970s in an attempt to limit capital outflows or encourage capital inflows; such efforts had fallen out of favor by the late 1970s. A possible final instrument, U.S. intervention in the foreign exchange markets, is discussed separately below.

Clearly, as Figure 5 indicates, the episodes when the Board or the FOMC made policy decisions primarily for international reasons are rare.[10] However, possibly because Fed policymakers must often make

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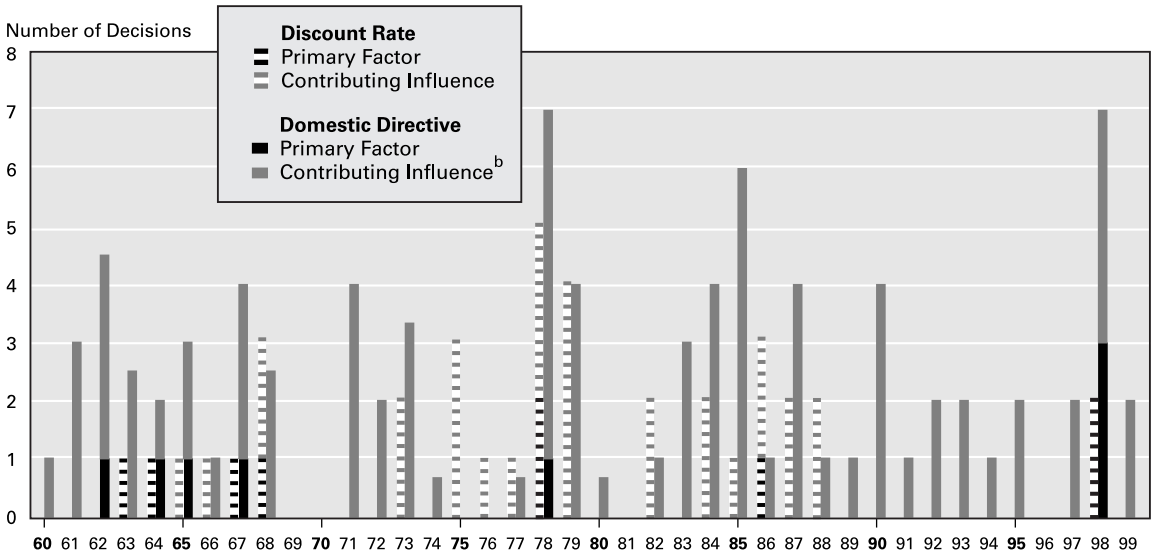
[7] The text indicates, for instance, that "most members noted . . ." while "some" or "a few" mentioned a different point.

[8] The FOMC met sixteen times a year, on average, from 1960 to 1969 and then roughly monthly until 1981 when it began meeting eight times a year. To adjust for these differences in the frequency of meetings, in Figure 5, the number of FOMC decisions partly influenced by international considerations was divided by 2 between 1960 and 1971 and by 1.5 between 1972 and 1982. Because the Board of Governors changes the discount rate whenever it deems appropriate, the number of discount rate decisions influenced by international factors was not adjusted. Neither were the rare occasions when international factors were the primary reason for FOMC policy decisions.

[9] Regulation D governs depository institution (originally member bank) reserve requirements. Regulation M governs the foreign branches of member banks.

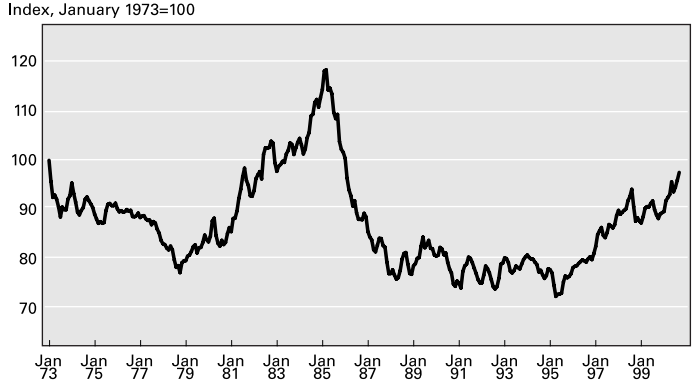
[10] The episodes we identified as times when international factors had a primary influence largely correspond with dates mentioned by Eichengreen (2000), Volcker and Gyohten (1992), and Wells (1994) as the rare instances when international pressures caused a change in Fed policy.

Figure 5
Incidence[a] of International Influence on Federal Reserve Decisions Concerning the Discount Rate and Domestic Directive



[a]Number of decisions on the discount rate and the FOMC directive for domestic open market operations that were influenced by international considerations beyond those incorporated in the domestic outlook.
[b]Adjusted for frequency of FOMC meetings. See footnote 8.

Figure 6
U.S. Trade-Weighted Foreign Exchange Value of the U.S. Dollar[a]



[a]17-country/7-currency (Euro area, Canada, Japan, United Kingdom, Switzerland, Australia, Sweden) weighted-average exchange rate using USIT-constructed weights based on 1/2 U.S. non-oil imports, 1/2 non-agricultural exports combined with third party competition. CPI priced-adjusted monthly data.
Source: Board of Governors of the Federal Reserve System.

decisions in the face of considerable uncertainty and on the basis of conflicting indicators, international developments appear to have influenced policy at least marginally a good deal more frequently than is generally recognized—even in the period of floating exchange rates.

As the bar graph suggests, international issues were generally more influential in periods of dollar weakness (for example, 1978–79 and 1985–87) or at times when currency or debt crises in emerging markets threatened the liquidity (or solvency) of U.S. financial institutions (for example, the mid 1980s and 1998). By contrast, it was relatively easy for central bankers with a mandate for maintaining price stability to ignore dollar appreciations that supported their fight against inflation. (Figure 6 shows the real U.S. trade-weighted foreign exchange value of the dollar in terms of the major currencies from 1973 on.) The most recent decade appears to be an anomaly, however. Other than the pronounced impact of the Asian crisis, international concerns were fairly muted in the early to mid 1990s, even during 1994 and 1995 when the dollar was approaching its post-Bretton Woods lows. Does the recent experience suggest that the United States has learned to live comfortably with a floating dollar? The following subsections will review in more detail the periods when exchange rate shifts and international financial crises have had a perceptible impact on policy.

Exchange Rate Pressures

According to Figure 5, concerns about dollar outflows and the viability of the Bretton Woods arrangements were barely perceptible in 1960 but had become a "malignant preoccupation" (Eichengreen 2000) by 1967–68. These anxieties then diminished as the United States headed into the 1970 recession that prompted a temporary and misleading improvement in the U.S. current account.[11] It should also be noted, however, that Fed policymakers used a variety of tools not covered in Figure 5 as they tried to shore up the crisis-prone fixed exchange rate system.[12] The Fed's search for extra tools reflected its penchant throughout the 1960s and 1970s for pursuing several, often incompatible, objectives simultaneously. In addition to limiting the buildup of dollar assets in foreign official hands, these goals included easing Treasury financing operations, limiting financial disintermediation,[13] promoting the growth of bank credit, especially mortgage loans, discouraging inflation, and, clearly the top priority, encouraging a more complete utilization of the nation's resources.

Among the supplementary tools used for international ends were capital controls, Operation Twist, and intervention in the foreign exchange markets. Begun in 1961, Operation Twist entailed concentrating open market purchases in long-term securities "when feasible."[14] In theory, international capital flows were more responsive to short-term than to long-term interest rates, and this effort was intended to keep short-term rates higher than they would otherwise have been. In addition, starting in 1965 the Fed was responsible for ensuring that banks complied with the government's restraints on foreign investment. When this voluntary credit restraint program promoted the development of the Eurodollar market, the Fed began to use its Regulations D (reserve

[11] The official settlements balance and the liquidity balance, two other measures that attracted much attention in the 1960s, also improved in 1968 and 1969 and in 1970, respectively. See Eichengreen (2000) and Fieleke (1971) for a discussion of these measures.

[12] The decade was studded by a series of currency crises involving the dollar to be sure, but also the British pound, the French franc, and the Canadian dollar, as well as recurring speculation concerning possible appreciation of the deutsche mark.

[13] At that time Regulation Q (governing interest rates on deposits) frequently set ceilings on interest rates payable by member and FDIC-insured nonmember banks below rates available in the money market and at thrift institutions. The goal was to anchor interest rates, particularly for mortgage loans, and to prevent excessive competition for funds from leading to high-risk lending. As a result, during periods of rising interest rates, the banks generally had difficulty attracting or holding funds.

[14] For instance, in May 1967, the FOMC decided that "purchases of coupon issues, if and when feasible," could lighten the supplies of government securities in the maturities in which supplies were heaviest. They also noted that the substitution of purchases of coupon issues for purchases of bills "could be important for balance of payments reasons, as a means of reducing downward pressures on bill rates." Prior to 1961, System open market transactions were conducted only in short-term securities. With the change in policy, 30 percent of the securities purchased outright in 1961 had a maturity of more than one year.

requirements) and M (foreign bank operations) as capital controls, as discussed further below.

In the end, however, these multifaceted but limited efforts to save fixed exchange rates failed. As the United States pulled out of the 1970 recession, its current account resumed deteriorating, and, flooded with huge, unwelcome private capital flows from the United States, the German and Dutch authorities allowed their currencies to float.[15] The Swiss and the Austrians revalued. By August 1971, U.S. liabilities to foreign officials stood at $41.5 billion, almost double their value at the end of 1970, while U.S. reserve assets (mainly gold) had fallen to $12.1 billion. With no acceptable alternative, President Nixon ended the dollar's remaining links to gold. In the end, neither the United States nor the Europeans were willing to sacrifice their domestic economic goals for a chronically endangered system that both the deficit and the surplus countries had come to view as flawed.

International pressures reappeared in the Fed's deliberations when the currency revaluations negotiated at the Smithsonian Institution in December 1971 proved inadequate to correct ongoing U.S. payments deficits, and massive capital flows from the United States resumed. This renewed inflationary onslaught led the Europeans to initiate a joint float against the dollar in early 1973—a fateful step that ended the early Bretton Woods era and started the Europeans on the path to monetary union.[16]

Thereafter, the first oil shock triggered an inflow of petrodollars, a modest dollar appreciation, and a deep U.S. recession. These developments reduced the impact of currency concerns on Fed decision-making.[17] However, when the foreign exchange value of the dollar plunged to consecutive new lows in the late 1970s, the press of international issues reached new highs. Indeed, the 1-percentage-point rise in the discount rate that was announced on November 1, 1978, as part of a joint Treasury–Federal Reserve package to strengthen the dollar was the largest increase in forty-five years. The package included higher reserve

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[15] The Europeans took action in May 1971; the Japanese floated in August. The Canadian dollar had been floating since June 1970.

[16] Mileposts on the path to the European Monetary Union (EMU) included the three-stage Werner Plan for monetary unification (1970); the establishment of the joint float or "snake in the tunnel," an arrangement in which most European Community (EC) members kept their currencies within a 4.5 percent band which undulated within a 9 percent band around the dollar (1973); the establishment of the European Monetary System (1979); the signing and ratification of the Treaty of Maastricht, which laid out the criteria for membership in the European Monetary Union (1992 and 1993); and the start of EMU and the euro, the single European currency, on January 1, 1999.

[17] While the oil shocks clearly emanated from abroad, their impact became part of the domestic outlook. Moreover, the tensions involved reflected the domestic need to choose between offsetting either the demand or the price effects of an oil price shock, not a conflict between domestic and international priorities.

requirements, the threat of forceful, coordinated foreign exchange intervention, plus an increase in the fed funds rate to accommodate the new discount rate. Under Bretton Woods, episodes of dollar weakness had merely threatened foreign complaints and, eventually, the collapse of an unworkable system. Under the new floating regime, a falling dollar meant "continuing domestic inflationary pressures," which called for strong countermeasures.

By sharp contrast, despite a severe, double-dip recession, the strong dollar of the early 1980s elicited little concern. Beryl Sprinkel, who did not believe in foreign exchange market intervention, was Under Secretary of the Treasury, and dollar appreciation was helping the Volcker Fed to meet its overriding goal of subduing inflation.[18] Despite complaints from the nation's manufacturers, the Reagan Administration hailed the strong dollar as a vote of confidence in the vibrant U.S. economy. By late 1984, however, FOMC members began to see the dollar's unprecedented strength as a serious problem affecting manufacturers and farmers and their creditors and distorting investment decisions. Thus, limiting the dollar's rise became a policy goal. With this policy shift, the announcement of the Plaza Accord, and modest U.S. dollar sales,[19] the dollar quickly reversed its five-year appreciation in a matter of months—at which point limiting its *plunge* became a major concern, as emphasized by the G–10 announcement from the Louvre in February 1987. Renewed dollar strength in 1989 led to substantial dollar sales in the foreign exchange market. These dollar *sales* provoked expressions of concern among FOMC members, but, once again, the dollar's appreciation did not.

A further episode of notable dollar weakness occurred in 1994-95 when the dollar again approached its post-Bretton Woods lows on a trade-weighted basis and historic lows against the German mark and the Japanese yen. While this episode also led to modest intervention in the foreign exchange markets, Fed policymakers evinced limited concern about the dollar's behavior, in contrast to the more pronounced anxiety shown during previous periods of dollar depreciation. What had changed? According to the FOMC minutes, what had changed was the Fed's attitude toward foreign exchange intervention.

Intervention Policy

The legal authority and responsibility for U.S. intervention policy have never been clearly delineated. Nor have FOMC members always

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[18] Rather, the renewed influence of international issues from 1982 to 1984 shown in Figure 5 reflected the impact of the LDC debt crisis on the large money center banks, as discussed further below.

[19] These dollar sales involved the purchase of German marks and Japanese yen. By this time, James Baker had replaced Donald Regan as Secretary of the Treasury.

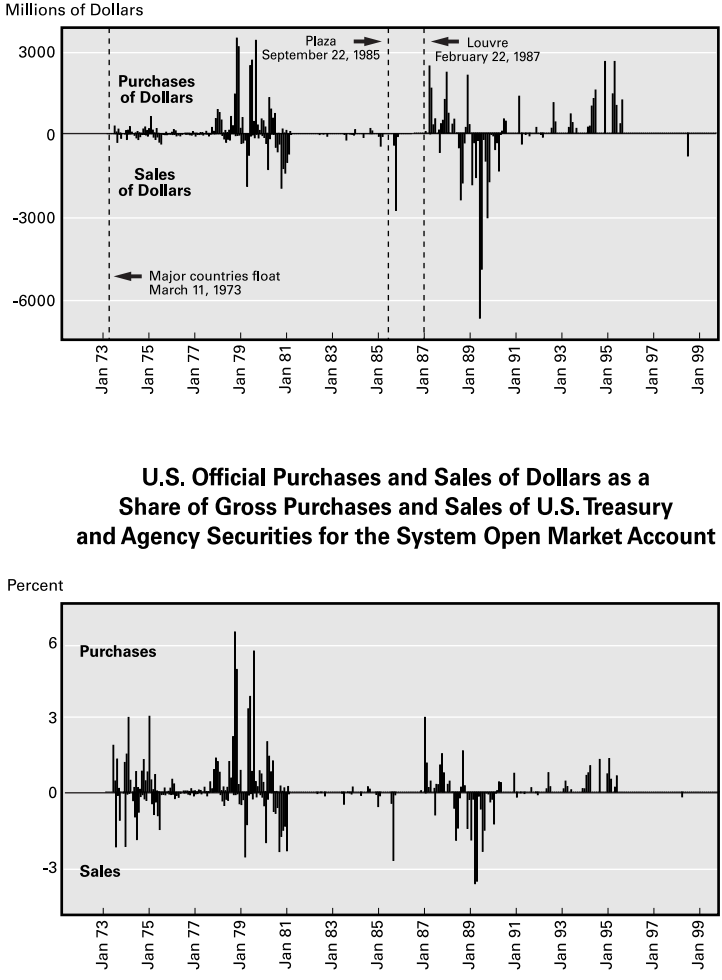
been comfortable with their role in this area. Both the Treasury and the Federal Reserve appear to have congressional authorization to intervene. The Federal Reserve Act allows Reserve banks to deal in specified assets, including "cable transfers," a phrase that referred to foreign exchange in 1913. In addition, section 10 of the Gold Reserve Act of 1934 gives the Secretary of the Treasury, with the approval of the President, the power to buy and sell foreign currencies "for the purpose of stabilizing the exchange value of the dollar." The Act also created a $2 billion Exchange Stabilization Fund (ESF) to permit the Secretary of the Treasury to carry out the provisions of the section.[20]

By tradition, possibly because congressional intention seems a bit clearer in the case of the Treasury, that department has usually taken the lead in foreign exchange intervention policy. But the New York Fed actually conducts all intervention operations. While the Treasury can order the New York Fed to intervene on behalf of the Treasury, it cannot require the Fed to intervene for its own account. However, the two agencies almost always intervene jointly, since working at cross-purposes in foreign exchange matters would clearly be counterproductive. In addition, in the past and with the knowledge of the Congress, the Treasury Department has periodically increased the ability of the ESF to intervene by requesting that the Fed engage in swap transactions. Under these arrangements, which must be authorized by the FOMC, the Fed buys the Treasury's foreign currency spot for dollars, with offsetting forward contracts reversing the transaction. The purpose is to expand the ESF's ability to engage in purchases of foreign currency.

The top panel of Figure 7 displays U.S. intervention activity monthly since 1973, while the bottom panel shows U.S. official purchases and sales of dollars for foreign currencies relative to open market purchases and sales of domestic securities. As the second panel suggests, U.S. foreign exchange intervention has always occurred on a very modest scale compared with domestic open market operations. Rarely amounting to as much as 3 percent of domestic transactions, these data are certainly consistent with the Fed's statements that U.S. foreign exchange interventions are "routinely sterilized" by offsetting operations in domestic securities. Not only is U.S. intervention activity small-scale in comparison to domestic open market operations; it is also small-scale relative to foreign governments' intervention against the dollar. For instance, from October 1977 to the end of 1978, the U.S. authorities bought $10 billion to support the dollar while foreign authorities bought about $37 billion. Again, in the five weeks after the Plaza Accord, the G–5 sold $9 billion, of

[20] The $2 billion represented the bulk of the windfall accruing to the government when the nation revalued gold from $20.67 to $35 per ounce.

Figure 7
U.S. Official Foreign Exchange Intervention[a]



U.S. Official Purchases and Sales of Dollars as a Share of Gross Purchases and Sales of U.S. Treasury and Agency Securities for the System Open Market Account

[a] Against German deutsche marks, yen, Swiss francs, Netherlands guilders, Belgian francs, British pounds, French francs.
Source: Board of Governors of the Federal Reserve System.

which the United States sold $3.3 billion.[21] And, of course, all official intervention activity is dwarfed by the total volume of transactions in

[21] See Pauls (1990) and Solomon (1999, p. 15).

the foreign currency markets, which now exceeds $1.5 trillion each day.[22]

No wonder, then, that most studies of the efficacy of foreign exchange intervention conclude that this activity has no—or at most fleeting—impact on foreign exchange rates. (See Edison 1993; Humpage 1996.) Indeed, if foreign exchange interventions are routinely sterilized, they could only affect the exchange rate by serving as a signal that macro policy is about to change or that, by official judgment, market expectations are no longer linked to economic fundamentals (Dominguez and Frankel 1993a, b). On the other hand, as Schwartz (2000) has pointed out in her review of the literature on foreign exchange intervention, models of exchange rate determination have never been able to explain or predict actual exchange rate behavior. Thus, it is not possible to compare the impact of intervention with the outcome prevailing in its absence. Moreover, these studies generally examine the impact of intervention holding macro policy constant. But, as a comparison of Figures 5 and 7 suggests, from 1973 to 1989 periods of heavy intervention appear to correspond with periods when international developments were exerting at least some marginal influence on Fed policy.[23] After 1989 the correspondence vanishes. But if exchange rate pressures do in fact influence policy outcomes from time to time, then the results of these intervention studies may be biased.

Why did the link between foreign exchange intervention and the influence of international issues on Fed policy appear to weaken in 1989? Or alternatively, why did Fed policymakers express only limited concern as the dollar sank to new lows in 1994–95, and the United States made the sizable interventions shown in Figure 7? The policy records suggest that this discrepancy between words and actions may reflect the fact that, starting in 1989, a significant minority of FOMC members began to oppose U.S. intervention activity. This opposition was not entirely new. When the FOMC first authorized System operations in foreign currencies in 1962, two governors dissented.[24] They argued that such a program required analysis by outside experts, public discussion, and legislative clarification. They also doubted the legality of Fed intervention (although the General Counsels of the FOMC and the Treasury and the Attorney General of the United States had all agreed that the System was

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[22] According to the Bank for International Settlements' triennial *Central Bank Survey of Foreign Exchange and Derivatives Market Activity* last conducted in 1998. The number includes spot transactions, outright forwards, and forex swaps.

[23] If so, whether or not intervention is always fully sterilized becomes a moot point.

[24] The Treasury's Exchange Stabilization Fund had begun conducting foreign exchange operations, with the New York Fed acting as agent, in March 1961. These operations were part of a cooperative effort involving treasuries and central banks on both sides of the Atlantic to counter disorderly conditions in the foreign exchange markets (Board of Governors 1962, p. 54). The dissenting governors were Governors Mitchell and Robertson.

authorized to conduct such operations). Nevertheless, the majority endorsed the new program. And in the years thereafter, the FOMC repeatedly raised the ceiling on System holdings of foreign currencies for its own account and for the account of the ESF. And it repeatedly expanded its reciprocal currency (or swap) arrangements—both in terms of membership and of the dollar value of the commitments.[25] All of these cooperative arrangements provided resources for foreign exchange intervention.

Starting in 1989, however, while the United States was participating in coordinated intervention to limit the dollar's appreciation, a minority group of Fed governors[26] began to dissent from endorsing ever-greater holdings of foreign currencies. In March 1990, in particular, three FOMC members dissented from raising the ceiling for System holdings of foreign currency "warehoused" for the Treasury. They argued that recent interventions to *weaken* the dollar undermined the credibility of the Fed's commitment to price stability, were probably ineffective, and, in the case of the warehousing facility, were inappropriate without an indication of congressional intent. While the majority authorized the increase, many members expressed doubt that intervention could have lasting effect and suggested that future intervention should be limited. Because of these concerns, the System broke with the Treasury and did not participate in intervention sales of dollars made between March 5 and the end of 1990.[27] The following year the Fed resumed intervening with the Treasury on a "moderate" scale, and any interventions since then have been joint.

As Figure 5 suggests, finally, the most recent period of significant dollar weakness engendered further doubt about intervention[28] and an unusually detached response to the dollar's fall. In mid 1994, with the dollar in a steep decline, two members of the FOMC took the unusual step of refusing to ratify System intervention activity that had already taken place. They argued that repeated failures to achieve intervention objectives would raise questions about the credibility of Fed policy more broadly.[29] Moreover, while FOMC deliberations sometimes referred to the inflationary impact of dollar depreciation, the rationale for the significant shift to tighter monetary policy that actually occurred at this

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[25] Membership in the swap network eventually included the central banks of Austria, Belgium, Canada, Denmark, England, France, Germany, Italy, Japan, Mexico, the Netherlands, Norway, Sweden, and Switzerland, and the Bank for International Settlements. At their peak in early 1995, these credit lines equaled $35.4 billion. As discussed below, most of these agreements have been allowed to lapse.

[26] In 1989 and 1990 this group included Governors Angell, Johnson, and LaWare, and President Hoskins from Cleveland.

[27] Board of Governors (1990, p. 33).

[28] Expressed particularly by Governor Lindsey and Presidents Broaddus (Richmond) and Jordan (Cleveland).

[29] Board of Governors (1994, p. 161).

time rarely cited the dollar. For example, in March 1995, the members noted that policy should not be directed to achieving a given level for the dollar but to implementing effective anti-inflation policy, taking account of all relevant factors.

Meanwhile, the fed funds rate doubled to 6 percent in fifteen months, while the discount rate went from 3 percent to 5.25 percent. In both cases, the last 50-basis-point rise took place in early 1995 as the dollar neared its low point. The domestic conditions that provoked these changes included an acceleration in real GDP growth to a peak of 4.4 percent, year-over-year, in the third quarter of 1994 (after which time GDP growth *slowed*) plus a decline in the unemployment rate from 6.6 percent to 5.5 percent.[30] Core inflation (consumer prices excluding food and energy) held steady near 3 percent. Given the policy changes that actually occurred, and the domestic context in which they occurred, it is hard to know whether the FOMC was quite as indifferent to the dollar's 1994–95 decline as Figure 5 suggests. Since then, of course, the dollar's strength has been an asset in the Fed's efforts to keep inflation low.

To supplement evidence of FOMC concerns about the exchange rate found in the Records of Policy Actions, the authors also looked at the impact of U.S. official intervention activity on FOMC decisions to change the fed funds rate, using logit estimations of the FOMC voting patterns and a model of the FOMC's reaction function developed by Stephen McNees (1986 and 1992) and Geoffrey Tootell (1997). In addition to the other explanatory variables used by Tootell,[31] we added U.S. official net purchases or sales of dollars (deflated by the GDP deflator) made in the weeks preceding the FOMC meeting. This variable represents a possible measure of official concern about the dollar exchange rate. In the reaction function equations, the coefficient on dollar purchases is positive, suggesting that intervention to support the dollar tends to be associated with an increase in the fed funds rate, and it is significant at the 10-percent level. Dollar sales, associated with a strong dollar, have no statistically significant impact. Otherwise, the introduction of the intervention variables has little impact on Tootell's original results.

In the logit estimations of FOMC voting decisions, dollar purchases are positively related to the probability of tightening, negatively related to the probability of loosening; both coefficients are highly significant. In other words, according to these results, the larger the official dollar purchases, the more likely the FOMC is to tighten and the less likely it is to loosen. In the case of dollar sales, which enter the equation as negative

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[30] These numbers exceeded the prevailing estimates of potential growth and the NAIRU.

[31] Tootell's explanatory variables were Board staff forecasts of real GDP growth and core inflation in the six-month period immediately ahead and in the following six-month period, the forecast civilian unemployment rate one quarter ahead, and the lagged three-month moving average of M1 growth.

values, the coefficient is positive as expected and highly significant. That is, the larger the dollar sales, the less likely is an FOMC decision to tighten. Dollar sales do not have a statistically significant impact on the probability of a decision to loosen. The regression results and a figure showing a plot of the residuals from the baseline equation and real net intervention activity may be found in the Appendix.

All told, this review suggests that in periods of steep depreciation, the dollar has continued to exert at least marginal, although perhaps dwindling, influence on U.S. monetary policy—even in the current floating-rate era. The size of the U.S. current account deficit, now 4 percent of GDP and rising, could lead to a new test of this tentative conclusion at any time.

International Financial Crises

While less pervasive than exchange rate issues, international financial crises have also influenced Fed policy decisions from time to time. Moreover, the increased severity and scope of these crises have posed new challenges for the Fed in its roles as supervisor and occasional international lender of last resort.

During the 1960s, the notable financial crises involved the major industrialized countries, a club-like group whose governments usually responded to currency pressures in a fairly cooperative fashion—although the degree of cooperation clearly dwindled as the crises recurred. These years saw the development of the London gold pool, for instance, and of the reciprocal currency arrangements (or swap network) that allowed member central banks to draw foreign currencies as needed to bolster their foreign exchange reserves.[32] The FOMC generally expanded and authorized the use of these facilities without much debate, upon request by foreign governments and the U.S. Treasury. And more than once the FOMC actually cited currency weakness in another country as a reason for delaying a move to tighter policy.[33] While the citizens of Britain or France must surely have felt the impact of the devaluations and more restrictive macro policies triggered by crises involving the pound and the franc, central banks and treasuries generally contained these currency upheavals without anything resembling a serious economic downturn, and the U.S. banking system remained largely unaffected.[34]

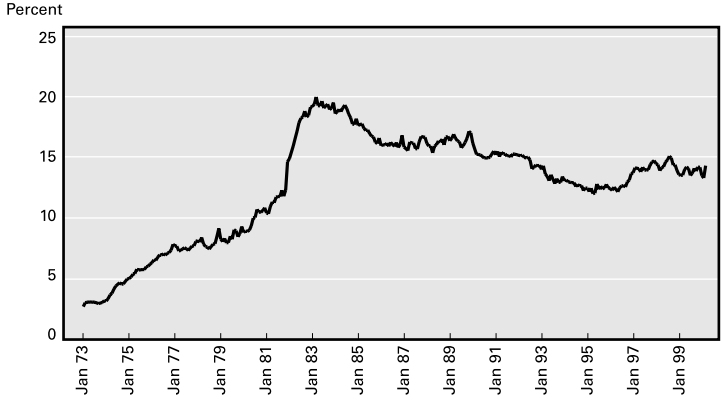
That was not true in the aftermath of the LDC debt crisis of the 1980s, however. The oil shocks of 1974 and 1979–80 had led to considerable

[32] See Solomon (1982) and Perry and Tobin (2000), particularly the pieces by Bator, Cooper, and Eichengreen.

[33] For example, in the fall of 1967 members of the FOMC cited the pressures on the pound as one of several reasons not to tighten U.S. monetary conditions.

[34] Except for the impediments of the capital controls.

Figure 8
Claims on Foreigners as a Share of Total Assets at All Commercial Banks in the United States



Note: Monthly data.
Source: Board of Governors of the Federal Reserve System.

concern about the financing needs of the oil-importing developing countries. Thus, as OPEC members deposited the bulk of their surging oil revenues in U.S. banks or in the Eurodollar market, U.S. lenders took the lead in recycling the petrodollars to the developing countries. U.S. bank claims on all foreigners rose from less than 5 percent of total U.S. commercial bank assets in early 1974, at the end of the voluntary credit restraint program, to 20 percent of total assets at their peak in early 1983. As Figure 8 shows, this growth was particularly rapid between 1980 and 1982. While Fed Chairman Arthur Burns, Fed Governor Henry Wallich, and others periodically warned the banks against allowing excessive concentrations of LDC debt to build up, the banks faced significant market incentives[35] and official encouragement to make these loans. According to William Seidman, economic counselor to President Ford, "the entire Ford Administration, including me, told the large banks that the process of recycling petrodollars to the less developed countries was beneficial, and perhaps a patriotic duty."[36] Moreover, contemporary studies generally concluded that this largely sovereign debt was relatively safe (Beek in Curry 1997; Terrell 1973).

[35] For example, the development of the commercial paper market in the 1970s and 1980s was luring the banks' best corporate borrowers.

[36] Seidman (1993, p. 38), cited in Curry (1997, p. 206).

Those studies notwithstanding, Mexico suspended debt service on an $80 billion foreign debt in August 1982; by late 1983, twenty-seven nations owing $239 billion had rescheduled. Soon after, references to financial strains and the need for monetary conditions to accommodate them began to crop up in the FOMC minutes. For example, in October 1982 the FOMC voted to reduce pressures in the private capital markets, pressures that reflected the "well-publicized problems of a few U.S. and foreign banks and the acute financial difficulties in Mexico and other developing countries."[37] These problems had caused a flight to quality, increased interest rate spreads, and a heightened demand for liquidity.[38] References to strained financial conditions and the impact that higher interest rates would have on LDC debtors and their U.S. creditors continued through 1983–84.

To be sure, the U.S. oil, agricultural, and real estate sectors also suffered serious financial problems in these years, but the LDC debt crisis clearly added significantly to the "financial fragility" of the decade. As Figure 9 shows, the nonperforming share of "all other" loans (the category that includes the LDC debt) and the charge-off rate on these loans grew rapidly in the early 1980s—even relative to the worsening experience with other types of assets. Moreover, while total real estate assets greatly exceeded loans to LDC borrowers, the impact of the real estate crisis was comparatively diffuse. By contrast, LDC assets were highly concentrated at the nation's eight largest money-center banks, where, according to the FDIC data, LDC debt amounted to 250 percent of their capital base. Thus, as was widely recognized at the time, several of these banks were technically insolvent. (See also Cline (1995) for a review of these developments.)

In the event, U.S. authorities did not immediately require the banks to set aside large reserves on their restructured and nonperforming LDC loans. The delay, coupled with public funding for the LDC debtors, allowed the banks to raise additional capital before they began, starting with Citicorp in 1987, to recognize the bulk of their losses on their LDC debt. By late 1989 the money center banks had posted reserves for almost 50 percent of their outstanding LDC loans. Finally, in 1989, the Brady Plan shifted the focus from debt rescheduling to debt relief. With the help of funds from the IMF and World Bank, the debtor nations used various instruments like debt-equity swaps to reduce their debt to manageable proportions. Private sector debt forgiveness amounted to about one-third

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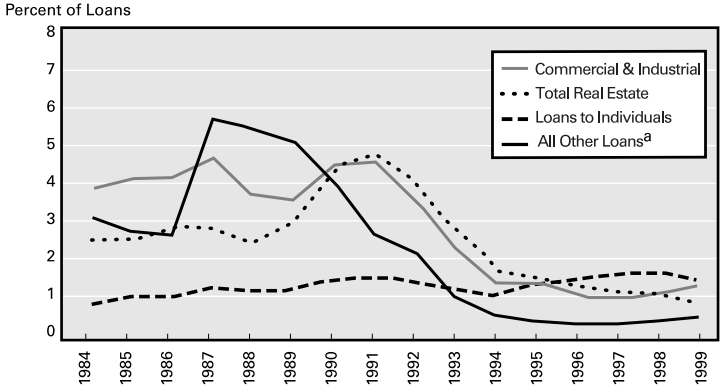
[37] These specific problems occurred in the context of unusually high interest rates. Interest rates on 3-month CDs in the secondary market averaged 16 percent in 1981 and 12 percent in 1982.

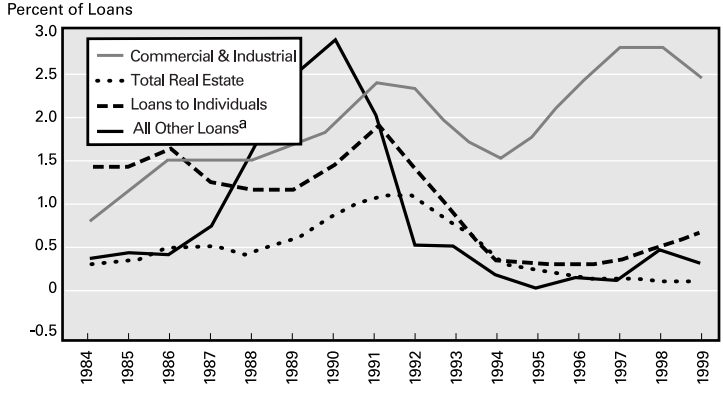
[38] Similarly, in May 1983 five members dissented from a shift to slightly more restraint, in part because of the "tenuous" situation in some developing countries.

Figure 9
Noncurrent Loan Rates at FDIC-Insured Commercial Banks, Year-end



Note: Noncurrent loan rates represent the percentage of loans that are past due 90 days or more or in nonaccrual status.

Annual Net Charge-off Rates on Loans at FDIC-Insured Commercial Banks



[a] Includes loans to foreign governments and depository institutions and lease receivables.
Source: Federal Deposit Insurance Corporation.

of the face value of the $191 billion in outstanding loans, potential losses that could accrue to the lending banks' shareholders.[39]

[39] Cline (1995, pp. 234–35). Debt forgiveness was calculated as the sum of the reduction in the face value of the original debt and the reduction in the present value of interest reductions, less the amount spent on buybacks. Not all of this debt forgiveness actually

In the wake of the first LDC debt crisis, U.S. banks remained relatively cautious about lending to the emerging markets; thus, most U.S. banks were not severely affected by the Mexican peso crisis of 1994–95 or by the early stages of the Asian crisis. Indeed, it was not until the "Asian" crisis had spilled over from Southeast Asia to North Asia to Russia and was starting to threaten Latin America and, finally, Long-Term Capital Management and other highly leveraged institutions and their creditors that U.S. financial markets began to seize up. Referring to the turmoil in U.S. and global money markets, in the fall of 1998 the FOMC lowered the fed funds rate by 75 basis points in three steps; the Board cut the discount rate twice. According to the Board's 1999 annual report, these moves were deemed desirable "to cushion the U.S. economy from the effects of disruptions in world financial markets and to ameliorate some of the resulting strains. . . ."

International Standards, Disclosure, and Market-Based Discipline

The shock of the first LDC debt crisis gave fresh impetus to G–10 efforts to negotiate internationally accepted standards for capital adequacy and other supervisory and regulatory issues. The United States frequently drove these efforts because, obviously, the quality of foreign financial supervision was by then closely linked to the safety and soundness of U.S. banks, and, given the jurisdictional issues involved, improving this quality required a multilateral, market-driven approach. Although the first such multilateral agreement, the Basle Concordat,[40] had been concluded in 1975, progress since then had been slow. Indeed, as William White has pointed out, all too often an international financial crisis was required to move the negotiations forward; thus, real progress on the international capital adequacy standards only began after the Mexican crisis of 1982 (White 1996).

But the motivations behind these initiatives included competitive as well as prudential concerns. While it was essential that the U.S. banks repair the damage that recent crises had inflicted on their capital positions, U.S. regulators did not want to place U.S. banks at a competitive disadvantage vis-à-vis foreign banks enjoying less stringent capital requirements. At the time, foreign banks, particularly the Japanese,[41] were rapidly gaining market share—thanks in large part, it was thought,

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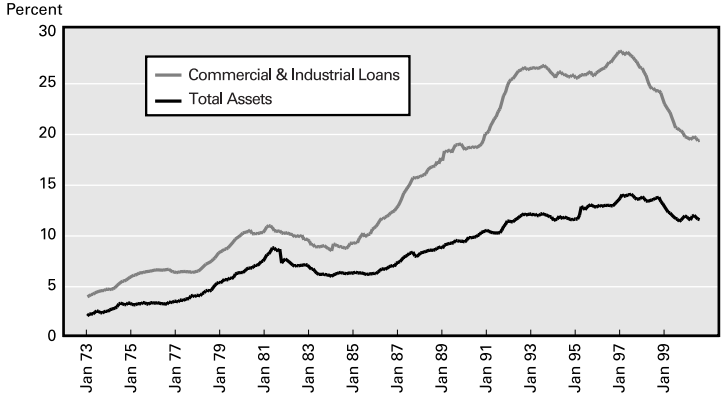
resulted in losses to the banks, however, because the value of much of this Brady debt appreciated on the secondary market that soon developed.

[40] The Basle Concordat established the principle that no foreign bank should escape adequate supervision.

[41] In 1981, one of the world's top ten largest banks, in terms of assets, was Japanese. In 1987, the seven largest banks were Japanese (Wagster 1996).

Figure 10
Selected Assets at Foreign-Related Institutions[a] as a Share of the Same Assets at All U.S. Commercial Banks



[a] Includes branches and agencies of foreign banks, and Edge Act and Agreement Corporations. Excludes International Banking Facilities. Monthly data.
Source: Board of Governors of the Federal Reserve System.

to their less costly capital requirements.[42] As Figure 10 shows, the foreign banks' share of total bank assets in the United States about tripled between the early 1970s and the late 1980s.[43] Thus, when the U.S. regulators moved on their own to require U.S. banks to hold more capital after the Mexican crisis, they met a storm of criticism from the industry, which, in turn, encouraged renewed efforts to reach an international agreement. When international progress stalled, Fed and Bank of England officials forged ahead with a bilateral agreement, incorporating the U.K. practice of using risk-weighted capital standards. Because other nations feared that their banks might lose access to the important U.S. and U.K. financial markets, this deal led to renewed negotiations and, in 1988, eventual agreement on the Basle Capital Accord.

The Capital Accord sets a capital requirement of 8 percent of risk-weighted assets for internationally active banks. Banks must meet

[42] In 1987, unrealized capital gains seemingly comprised the bulk of Japanese banks' capital. Equity plus reserves with no debt provisions (similar to core or Tier 1 capital) amounted to about 2 percent of Japanese bank assets. The ratios for U.S. and U.K. banks were 4.9 percent and 5.4 percent, respectively (Wagster 1996).

[43] In the case of consumer and industrial loans, where foreign competition was particularly intense, the foreign share was approaching 20 percent. Counting loans booked offshore, Japanese banks were thought to have captured about 12 percent of the U.S. banking market (Wagster 1996).

half of the requirement with Tier 1 capital—primarily common stock and retained earnings. The balance may be met with Tier 2 capital, which includes loan loss reserves, subordinated debt, and revaluation reserves for fixed assets and equities—a category of particular interest to the Japanese. Reflecting a compromise between the U.S., U.K., and Japanese authorities, 45 percent of unrealized capital gains on equities may be counted as Tier 2 capital. (The Japanese had long held out for 70 percent.) Market discipline and international peer pressure among supervisors have encouraged widespread compliance with the Accord. Thus, by September 1993, all G–10 banks with significant international operations were meeting its requirements.

Experience has led to a series of revisions to the Accord. Because the original risk categories were coarse and arbitrary, treating all sovereign or all corporate debt the same, they encouraged lenders to favor the riskiest borrowers in each category.[44] Accordingly, the 1999 revisions reflect an increased concern with market and operational as well as credit risk. And, in a search for better measures of credit risk, they propose weighting bank assets by the credit ratings assigned by commercial rating agencies, like Moody's. With U.S. encouragement, the revised Accord also recognizes that banks' internal rating systems could in future provide the basis for setting capital requirements in some cases.[45]

Writing in 1996, William R. White attributed much of whatever success the international community had achieved in creating globally accepted standards to U.S. and, to a lesser extent, U.K. leadership. He suggested, however, that the growing importance of the emerging countries and the increased ability of the Europeans to speak with one voice might undermine U.S. leadership and complicate the process of making further gains by international agreement. In the event, the crises of 1997–98 served to reinforce the validity of the BIS approach with its emphasis on capital requirements, supervisory review, and disclosure and market-based discipline. As those crises also demonstrated, however, market discipline can be fickle as well as harsh.

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[44] Indeed, critics like Jeffrey Sachs have pointed out that the Basle capital standards may have contributed to the Asian crisis because the risk weights encouraged short-term interbank lending. Interbank claims with a residual maturity of one year or less carried a risk-weight of 20 percent, regardless of where the borrowing bank was incorporated. Longer-term claims on banks incorporated in an OECD member have a 20 percent weight. Long-term claims on other banks are weighted at 100 percent.

[45] The Basle Committee on Banking Supervision has sought to apply capital standards to market, interest rate, and operational risk as well as to credit risk. For this purpose, and again under pressure from the United States, where risk measurement and management are relatively well advanced, the Committee has agreed to accept a bank's internal model for assessing "market value-at-risk." In a related initiative, the Fisher Committee, a subcommittee of the Bank for International Settlements (BIS) Euro-currency Standing Committee, has also urged greater disclosure, as opposed to regulation, of various types of risk—particularly for those risks associated with off-balance-sheet items such as derivatives.

The Fed as International Lender of Last Resort

Times when market discipline becomes *too* harsh and markets cease to operate may call for intervention by a lender of last resort (LLR). But international financial crises may have outgrown the Fed's ability to serve that function in the international arena. As these crises have turned global and become increasingly complex, thanks in part to the participation of growing numbers of private agents, the Fed has traded its occasional role as ILLR for the role of leading international facilitator.

During the 1960s and 1970s, as already discussed, the Fed and the central banks of the other major industrial countries provided reciprocal ILLR facilities to members of the North Atlantic community plus Japan through the swap arrangements. Time and again, the FOMC authorized expansions of and drawings on these facilities—seemingly without much debate. Mexico was the only developing country to participate in these swap arrangements, which it used from time to time. For example, in 1976, after the peso devalued by 37 percent against the dollar, the FOMC's Foreign Currency Subcommittee approved a $600 million Treasury–Federal Reserve loan to the Bank of Mexico "to counter disorderly exchange-market conditions . . . pending the receipt of medium-term financing from the International Monetary Fund." Similarly, in August 1982 the Treasury and the Federal Reserve announced that they were participating in a multilateral package to provide the Bank of Mexico with a total of $1.85 billion in short-term financing. The funds were to be made available in line with progress toward agreement between Mexico and the IMF on an adjustment program that would allow Mexico to qualify for drawings under the IMF's Extended Fund Facility.[46]

As these examples suggest, the swap program provided short-term LLR finance to its members in part because the IMF could not—and indeed was not designed to—serve in that capacity. The need for such finance was seemingly taken for granted. The creation of the General Arrangements to Borrow in 1962 also suggests that G–10 governments felt a need to supplement the resources available through the IMF. Like the swaps, this $6 billion facility was only available to the G–10.[47]

In contrast, by the time of the 1994 Mexican peso crisis, the atmosphere had changed. While a majority of FOMC members voted to make a $6 billion swap arrangement available to the Bank of Mexico and to increase from $5 billion to $20 billion the amount of foreign currency that the System was prepared to warehouse for the Exchange Stabilization Fund, two FOMC members dissented. The dissenters argued that developments in Mexico did not clearly threaten U.S. financial stability

[46] Mexico prepaid all of its U.S. swap drawings.
[47] Plus Mexico, in the case of the swaps.

and that it was inappropriate for the Fed to participate in medium-term financing to facilitate debt restructuring.[48] They were also concerned about participating in what appeared to them to be a fiscal action without congressional authorization or more general public approval. The passage of the Mexican Debt Disclosure Act in April 1995 requiring the Treasury and the President to provide detailed reports on all guarantees to, and currency swaps with, the government of Mexico by the U.S. government, including the Federal Reserve, suggests the Congress's displeasure.

Accordingly, the U.S. response to the Asian crisis was very circumspect. This country did not participate in the multilateral package that was made available to Thailand, and it provided only backup, or second-line, support for the other Asian countries in crisis. U.S. funds were made available only on an if-needed basis. By contrast, the Fed did play an important role in facilitating the negotiations that led the major U.S. banks to roll over their Korean credits during that country's dollar liquidity crisis at the turn of 1997–98.[49] The New York Fed assumed a similar role at the time of the LTCM debacle nine months later.

In November 1998 the FOMC voted to allow the reciprocal currency arrangements with the Bank of Japan, the Bank for International Settlements, and the European governments to lapse. The only remaining swap arrangements are those with the Bank of Canada and the Bank of Mexico under the North American Framework Agreement (NAFA) set up in 1994.

For the members of the G–10 plus Mexico, the swap network represented a response to a felt need that the IMF could not fill. Its end reflects current exchange rate arrangements, the pending introduction of the euro and the creation of the European Central Bank, and extensive criticism from parts of academia and the press that domestic and international LLR facilities create moral hazard. It also reflects the fact that world politics are not yet as global as world financial crises. That said, engaging the private sector more fully in resolving financial crises is a highly desirable goal.

The Impact of International Forces on Financial Innovation and the Practice of Monetary Policy

This section reviews how foreign opportunities and foreign competition have helped drive deregulation and financial innovation in this

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[48] Actually, all of the Fed's swap transactions with Mexico were short-term. By contrast, the bulk of the Treasury's swaps were medium-term.

[49] The congressional constraints on ESF lending that followed the Mexican peso crisis limited Treasury-Fed participation in the Thai loan package but had expired when the Indonesian and Korean packages were put together.

country.[50] It focuses first on the impact of the Eurodollar market, an early example of financial innovation that attracted much excitement during Frank Morris's early years at the Fed and about which he wrote two essays.[51] The ready escape from U.S. banking regulation provided by the Eurodollar market contributed to a series of developments that led to the Depository Institutions Deregulation and Monetary Control Act of 1980, described by Senator Proxmire as the most significant banking legislation since the Federal Reserve Act (McNeill 1980). The section then explores how foreign competition has helped forge the path to nationwide banking and broader powers for banks. Finally, it briefly discusses how the resulting financial innovations made it difficult to use the monetary aggregates as a guide to monetary policy, as Frank Morris was among the first to argue. These developments changed the focus and practice of monetary policy both here and abroad.

The Eurodollar Market: An Early Example of Financial Innovation

The Eurodollar market represents one of the earliest examples of financial innovation in the post-World War II era. By tradition, this wholesale market for dollar-denominated deposits at banks outside of the United States sprang up in the 1950s because Communist banks, fearing that their U.S. dollar balances might be seized by the U.S. government, sought to avoid holding direct claims on banks in the United States.[52] Other early customers included Italian banks dodging the cartel that ruled transactions in lire, and British banks seeking to finance non-Commonwealth trade after the U.K. government imposed capital controls during the Suez War and the ensuing sterling crisis.

But it was the return to current account convertibility in Europe in 1959 and the imposition of U.S. capital controls in the 1960s that encouraged the rapid growth of the Eurodollar market. The Interest Equalization Tax on U.S. purchases of foreign securities (1963) and the Voluntary Foreign Credit Restraint program on U.S. banks' foreign lending (1965) encouraged U.S. banks, foreign borrowers, and U.S. firms wanting to invest abroad to look to the Eurodollar market. There they discovered the advantages of operating beyond the reach of costly central bank regulation. Originally, U.S. reserve requirements and interest rate ceilings did not apply to these dollar deposits at foreign banks; neither

[50] Of course, technical and financial innovation have also facilitated increased participation by foreign banks in the U.S. banking market.

[51] Morris and Little (1970 and 1974). Little has always been grateful to Frank Morris for including her—a very junior staff member at the time—as coauthor. His gesture was characteristically generous.

[52] Thus, the Eurodollar predates the negotiable CD, which First National Bank of New York invented in 1961.

did foreign (mainly British) bank regulations, which generally covered assets and liabilities in domestic currency only.

Accordingly, in the mid 1960s when the Fed tightened monetary policy and Regulation Q interest rate ceilings started to bite, the big U.S. banks faced a serious runoff of bank deposits from their domestic offices and began to borrow large sums from the Eurodollar market. In 1969 U.S. bank liabilities to their own foreign branches more than doubled in the first seven months. To remove the "special advantage" enjoyed by the large international banks, the Board of Governors set a marginal reserve requirement of 10 percent on member bank Eurodollar borrowings above a base amount, which shrank if the banks let their Eurodollar liabilities fall below it.[53] Nevertheless, at the end of 1969, large U.S. commercial banks were holding $11 billion in large negotiable CDs (half their 1968 level) and $13 billion in Eurodollar liabilities to their own foreign branches.[54] The following year, as U.S. interest rates declined with the 1970 recession, the Board reversed course and raised the marginal reserve requirement on Eurodollar borrowings even further—to 20 percent—to discourage banks from *repaying* their Eurodollar borrowings. This unusual episode probably represented the peak use of reserve requirements to influence capital movements.

In parallel, starting in late 1966, the Board also began lifting Reg. Q interest rate ceilings on certain time deposits of more than $100,000 to permit the banks to compete for interest-sensitive funds. In 1970 the Board eliminated the ceiling for large CDs maturing in less than 90 days. Once the major currencies had begun floating in 1973, the Board also cut the reserve requirements on Eurodollar borrowings to make them comparable with those on large CDs and bank-related commercial paper, and, in 1975, to support the dollar. The reserve-free base disappeared. In 1978, when the dollar weakened again, the Board eliminated all reserve requirements on Eurodollar borrowings. All in all, over this fifteen-year period, the ready availability of competitive investment facilities at offshore and nonbank institutions encouraged the Fed to reduce its once heavy reliance on interest rate ceilings and large, variable reserve requirements.

Although the Board of Governors had made (dwindling) use of interest rate ceilings and reserve requirements to steer Eurodollar flows, the Fed was also quite sensitive to the U.S. banks' need to remain competitive in the Eurodollar market. In 1977, the Board reduced the reserve requirement on funds lent by a foreign branch of a member bank

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[53] The marginal reserve requirement applied to member bank borrowings from foreign banks, sales of assets to their own foreign branches, and foreign branch loans to U.S. residents.

[54] U.S. bank short-term liabilities to all foreign banks and foreigners amounted to over $26 billion.

to a U.S. borrower to let these branches compete with foreign banks not subject to such requirements. The Fed also tried to make it easier for U.S. banks to participate in the Eurodollar market without the expense of setting up a London or Paris branch. Thus, in 1969 the Fed approved the establishment of the Nassau shells.[55] In 1981 the Board went a step further, approving the creation of International Banking Facilities (IBFs), a set of segregated accounts that provided a U.S. window on the Eurodollar market. The IBFs allow U.S. depository institutions, Edge corporations, and U.S. agencies and branches of foreign banks to accept large time deposits from foreign residents. These deposits are free of reserve requirements and interest rate ceilings and may be used to make loans to foreigners, other IBFs, and the IBF's head office.[56]

Clearly, the development of these markets for Eurodollars and large negotiable CDs let investors with $100,000 earn interest rates higher than those available to small investors. Thus, financial institutions faced pressures to find additional ways to avoid Reg. Q. In 1970, for example, a Massachusetts savings bank introduced the Negotiable Order of Withdrawal or NOW account—in effect, a transactions account with interest.[57] Similarly, in 1977 a few brokerage houses, like Merrill Lynch, cooperating with a few banks (like BankOne, Columbus, OH) created the money market account, a transactions account that earned a market rate of interest. (See Felsenfeld 1999.)

These efforts to escape Regs. D and Q culminated with the passage of the Depository Institutions Deregulation and Monetary Control Act in 1980.[58] Among other provisions, this legislation required a phaseout of the Reg. Q interest rate ceilings and created the money market deposit[59] to let the banks compete with brokerage houses offering similar accounts. As scheduled, Reg. Q interest rate ceilings ended in 1986, and reserve requirements on nonpersonal time deposits and Eurocurrency liabilities have been zero since late 1990.[60]

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[55] These shell branches were generally little more than a brass plate, a bookkeeper, and a set of accounts that allowed U.S. banks to do business under Eurodollar rules while performing the bulk of the related activity at the U.S. head office.

[56] IBF funds lent to the parent become subject to the reserve requirement applicable to Eurodollar liabilities.

[57] The Consumer Savings Bank of Worcester, MA. The U.S. Congress determined that the attractive NOW account was not a demand deposit and permitted its use by individuals and charitable organizations on an experimental basis, first in Massachusetts and New Hampshire, later throughout the Northeast. At the time, NOW accounts were subject to Reg. Q ceilings on savings deposits.

[58] Reinforced by the Garn-St Germain Depository Institutions Act of 1982.

[59] These accounts are available to all types of customers, permit six transfers a month (three by check), and carry no reserve requirement because they are not demand deposits. The statute also allowed the use of NOW accounts nationwide and required that all depository institutions hold reserves at the Fed.

[60] Reserve requirements on Eurodollar liabilities and nonpersonal time deposits with an original maturity of less than one and one-half years have been zero since October 1983.

The Impact of Foreign Competition on Interstate Banking

Interstate banking is another area where competition from foreign banks has served as one catalyst for change in the U.S. banking system—in this instance, rather early in the process. The prohibition against interstate banking contained in the McFadden Act of 1927 was a cornerstone of U.S. banking regulation, reflecting Americans' traditional fear of "national moneyed trusts" and a pragmatic desire to protect local banking interests (Kane 1996). But because foreign bank activities were unregulated at the national level until the passage of the Interstate Banking Act of 1978, foreign banks had a competitive advantage over U.S. banks in establishing a full banking presence in more than one state.[61] Indeed, during the 1970s a number of states began encouraging foreign banks to establish branches and agencies within their borders in order to support their firms' international trade and investment activities. Because most small to mid-sized banks had limited experience in providing international banking services, state legislators viewed the foreign banks' presence as complementary rather than competitive.

As the Chairman of the Board of Governors, G. William Miller, explained during his June 1978 testimony supporting passage of the International Banking Act, sixty-three of the 122 foreign banks with banking operations in this country already had facilities in more than one U.S. state. Of these, thirty-one banks were operating in three or more states, a number the Chairman expected to grow since additional states had passed legislation allowing branches or agencies of foreign banks to begin operations. Further, three large foreign banks with multistate facilities had announced an intention to acquire large domestic banks. As Chairman Miller pointed out, forty-five of these foreign banks had worldwide assets of more than $10 billion and were, thus, comparable with the largest domestically chartered banks. He argued that it was incongruous that these institutions could operate in this country without being subject to the rules of the central bank. In particular, pending a needed review of the McFadden Act, it was unfair to domestic banks and inconsistent with the principle of national treatment that foreign banks be allowed to continue to expand across state lines.

As passed, the Interstate Banking Act of 1978 required foreign banks operating a federally or state-chartered branch or agency to designate a

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Reserve requirements on transactions accounts equaling $0 to $44.3 million are 3 percent. Transactions accounts above that base amount, which changes annually, are subject to a 10 percent reserve requirement.

[61] By this time, most of the very largest U.S. banks had set up Edge corporations in more than one state. However, these subsidiaries, which are limited to international activities, required an allocation of capital not needed for a branch or an agency. Further, a few of these large banks owned or were owned by a bank holding company with a presence in another state. Finally, a few had a handful of out-of-state loan production offices.

home state. Additional branches or agencies could be set up under the same rules that would apply to a domestic bank with the same type of charter in the same state. Existing branches or agencies outside of the home state were grandfathered, if permitted by the host state. In addition, a foreign bank could establish new branches or agencies outside its home state, again if allowed by the host state, as long as they observed the same limits as applied to Edge corporations[62]—that is, as long as all transactions were related to foreign commerce.

Significantly, the IBA also authorized Edge Act corporations owned by either domestic or foreign banks to branch interstate. In other words, as of 1978 domestically chartered commercial banks could establish a national branch network to provide banking services related to international trade. For a time, Edge corporations became a favored way for the large U.S. banks to cross state lines.[63]

Once again, then, developments driven by foreign competition helped to provoke early changes in the domestic status quo, set in the case of interstate banking by the Douglas amendment to the Bank Holding Company Act as well as by McFadden. Since 1956, the Douglas amendment had kept a holding company from acquiring a bank outside of its home state *unless* specifically allowed by the laws of the home state of the bank to be acquired.[64] Most states did not start to pass interstate banking laws until the early 1980s,[65] when, at the federal level, Garn-St Germain allowed for the interstate acquisition of large, failed banks regardless of state laws. (See Savage 1993.)

Indeed, according to Kane, it was the high failure rate of geographically constrained banks and thrifts in 1980s, along with the obvious fusion of national and global financial markets, that largely explains why interstate banking became acceptable in the 1990s.[66] By 1993, the year before Riegle-Neal was passed,[67] most states had interstate bank holding

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[62] The Federal Reserve Act of 1913 enables national banks to buy stock in corporations organized to conduct international or foreign banking activities, as detailed in an agreement with the Board of Governors. Since the act made no provision for federal chartering of these Agreement corporations, they required state charters. The Edge Act revisions passed in 1919 provided for federal chartering of Edge Act corporations. See Houpt (1981).

[63] In 1985 Citibank had sixteen Edge and Edge branch facilities. Bank of America had eleven. Later, as other opportunities to conduct interstate banking opened up, banks closed many of their Edge branches.

[64] Previously, nothing had prevented bank holding companies from owning banks in more than one state, and the 1956 act grandfathered nineteen mostly small companies. Over time the number of grandfathered multibank holding companies fell to seven (Savage 1993).

[65] Maine was the pacesetter. In 1975 it enacted a law allowing a bank holding company in a state with reciprocal legislation to acquire a Maine bank, starting in 1978.

[66] The consensus view would emphasize the problems caused by regional concentration in the banking industry.

[67] Riegle-Neal Interstate Banking and Branching Efficiency Act (1994) permits adequately capitalized and supervised bank holding companies to acquire banks in any state one year after enactment, subject to some restrictions. Starting in June 1997, it also allows

company laws, and several permitted interstate branching by state, nonmember banks. By then, as Savage points out, the spread of loan production offices, nonbank subsidiaries of bank holding companies, and the provision of banking services by nonfinancial firms had already delivered de facto interstate banking. From our perspective, the Edge corporations and their branches deserve a place on this list.

Foreign Competition and the Demise of Glass-Steagall

In similar fashion, competition from foreign banks both in the United States and in more liberal regulatory environments overseas contributed to the demise of the Glass-Steagall provisions separating commercial from investment banking. Foreign banks usually operate in a more permissive regulatory environment than do banks chartered in the United States, and U.S. regulators have generally been quite sensitive to U.S. banks' need to compete with foreign institutions in a variety of domains. Accordingly, the Fed's Regulation K automatically grants to foreign branches of U.S. banks certain powers that have not been available to banks operating in the United States. These powers include underwriting the obligations of the host country, acting as an insurance agent or broker, and, with Fed approval, engaging in other activities that the Fed determines are usually connected with the business of banking in the place where the branch is located. In the case of foreign bank operations in this country, U.S. law and U.S. regulators have taken the view that prohibiting all activities allowed abroad but not permitted to U.S. banks might be unnecessarily harmful to the foreign bank. Under certain circumstances,[68] thus, the foreign bank can conduct any business in the United States that is "incidental" to its business outside the United States.

According to Felsenfeld, by the late 1990s some observers had come to believe that the repeal of Glass-Steagall was no longer necessary, given the flexibility with which the authorities were interpreting "permissible" activities.[69] Nevertheless, when the Senate Banking Committee asked Chairman Greenspan to comment on proposed legislation to modernize the U.S. banking system during his Humphrey-Hawkins testimony in February 1999,[70] he emphatically endorsed the need for change. Supporting the removal of legal impediments to the integration of banking,

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interstate mergers between adequately capitalized and managed banks, again subject to some restrictions.

[68] To qualify for this exemption, the foreign bank's banking business outside the United States must exceed its nonbanking business, and its banking business outside the United States must exceed its banking business inside the United States.

[69] Felsenfeld (2000, p. III-51).

[70] The proposed legislation became the Gramm-Leach-Bliley Act of 1999.

insurance, and securities activities, the Chairman emphasized that U.S. financial institutions compete in global financial markets and that our "archaic barriers to efficiency" could "undermine the competitiveness of our financial institutions . . . and ultimately, the global dominance of American finance."

Financial Innovation and the Evolution of Monetary Policy Anchors

As the innovations and regulatory changes described above took shape, the traditional relationships between the monetary aggregates and the goals of monetary policy began to break down. In the early 1980s, with the introduction of new types of financial liabilities like money market deposits and sweep accounts, the frequently redefined aggregates became increasingly unstable and hard to predict.[71] Frank Morris was one of the first members of the FOMC to voice serious concern about the breakdown in these relationships. At the July 1983 FOMC meeting, for instance, he dissented from the vote to reaffirm the long-run ranges for the monetary aggregates to be included in the Board's Monetary Policy Report to the Congress. He argued that no targets should be set for M1 and M2 because these aggregates were "no longer predictably related to nominal GDP—an essential characteristic of an intermediate target for monetary policy." He preferred to target the broader aggregates, particularly total liquid assets or total domestic nonfinancial debt.[72]

In time, Frank Morris's views came to be widely shared. By the early 1990s the FOMC was warning the Congress and the public on a frequent basis that the monetary aggregates were unreliable guides for policy. For example, in the Board's 1993 Annual Report (p. 19), the FOMC pointed out that "growth in the aggregates could not be relied upon to guide changes in reserve conditions, and the Committee continued to employ a wide variety of information about financial and economic conditions for this purpose." Further, in January 1995, the FOMC discussed inflation targeting as an alternative approach to targeting money supply growth rates, which had been "found to be unreliable guides for monetary policy over the past several years." They concluded that an inflation target might reduce the cost of attaining price stability but might also pose undue constraints on countercyclical policy. Finally, in August 1995, the FOMC changed the wording of its domestic policy directive to the New

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[71] As another source of instability, the stock of U.S. currency held outside of the United States increased steadily from 15 percent of all U.S. currency in circulation and 4 percent of M1 in 1976 to over half of the U.S. currency in circulation and almost one-quarter of M1 in 1999. Data on U.S. currency held abroad are included with the information on the U.S. international investment position in the *Survey of Current Business*.

[72] He also suggested targeting the rate of growth of nominal GDP, although he did not use the phrase "targeting." See Morris (1982 and 1985).

York Fed to include a specific target for the fed funds rate.[73] This change clarified the fact that the FOMC had actually been using the fed funds rate as its intermediate target for some time.

Naturally, other countries have faced similar issues. The end of the Bretton Woods system of fixed-but-adjustable exchange rates "freed" monetary policy from one anchor, while financial innovation akin to that occurring in the United States made targeting money growth increasingly problematic for policymakers across the globe. Under these circumstances, the authorities in many developing countries chose an exchange rate target as an anchor for monetary policy because they lacked the credibility that comes from a history of moderate inflation. All too often, however, these pegged exchange rates became overvalued and led to abrupt depreciation, sometimes accompanied by a sharp economic downturn.

But the developing countries that experimented with floating exchange rates generally found *that* system to be unworkable as well. Most of these countries are simply too open to allow the exchange rate, their primary asset price, to fluctuate by large percentages with the ebb and flow of foreign investment funds. The impact of large exchange rate shifts on the prices of their goods, services, and financial assets—as well as on real demand conditions and resource allocation decisions—is simply too great. Accordingly, since the Asian crisis of 1997–98, many developing countries have returned to thoroughly managed exchange rates, but with a new appreciation for the importance of prudential supervision of their banking systems and, in some cases, for the potential benefits of restrictions on capital movements.[74] Others have adopted permanently fixed exchange rates via dollarization and currency boards. (See Cooper (1999) and Furman and Stiglitz (1998) for further discussion of the difficult problems facing developing nations as they choose an exchange rate regime.)

By contrast, several mid-sized, industrialized countries with moderately good inflation histories—Australia, Canada, New Zealand, and the United Kingdom—have been able to combine an inflation-target anchor with a floating exchange rate with considerable success. From time to time, however, each of these four countries has experienced sizable exchange rate fluctuations that have provoked serious policy concerns. For example, sterling's 27-percent real effective appreciation between early 1996 and early 2000 caused a sharp split between the sluggish tradables sector and the booming services sector that has complicated the Bank of England's policy decisions.

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[73] Previously, the directive had referred to degrees of pressure on reserve positions.

[74] Generally, taxes designed to limit short-term capital inflows. As discussed above, moreover, market forces are encouraging widespread adoption of international standards for banking supervision and regulation.

Most recently, in 1999, the newly formed European System of Central Banks (ESCB) has also adopted an inflation target (alongside a money supply target) as it has sought to define appropriate monetary policy for an economy undergoing vast structural change.[75] But here again, the 27-percent nominal depreciation of the euro against the U.S. dollar since the euro's introduction in January 1999 has become a serious issue for the European Central Bank (ECB), which fears that spillovers from the weak exchange rate will boost inflation expectations.[76] By the summer of 2000, European discussion concerning intervention in the foreign exchange markets had become increasingly intense.[77] Finally, on September 22, the ECB and the monetary authorities of the United States and Japan,[78] with cooperation from the Bank of England and the Bank of Canada, conducted a joint intervention operation to support the euro. This joint effort suggests a growing recognition that the sometimes volatile exchange rate is an important part of the monetary policy transmission mechanism—even for the world's largest economies.[79]

In sum, foreign opportunities and foreign competition—at the regulatory and the firm level—helped to drive financial innovation in this country and abroad over the past forty years. These innovations rendered the monetary aggregates, long the Fed's intermediate policy targets, unsuitable for that role. Accordingly, the fed funds rate now serves as the FOMC's intermediate target as it pursues its "long-term objectives of price stability and sustainable economic growth."[80]

Faced with similar financial innovations in a world of flexible exchange rates and open capital markets, some (mostly developing) countries have chosen to anchor their monetary policy to an exchange rate target—often with considerable difficulty. Others (mostly developed countries with some credibility as inflation fighters) have increasingly opted for an explicit or implicit inflation target. But even in these

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[75] As the widespread move to inflation targets, central bank autonomy, and increased transparency of central bank decision making suggests, central banks and national legislatures also appear to be influenced by foreign practice and demonstration effects. An example of such influence in the United States is the Mack-Saxton Bill, introduced in 1995 and 1997 to establish long-term price stability as the primary goal of Fed policy. (Gramlich (2000) explains why such a change is not necessary.) Another example might be the FOMC's decision in May 1999 to reveal its policy "tilt" immediately after each meeting.

[76] The depreciation of the euro is also aggravating the impact of rising oil prices, which are denominated in U.S. dollars.

[77] In mid September, the ECB announced that it would sell the interest that had accrued on its U.S. dollar reserves (interest equaling 2.5 billion euro) in "a technical adjustment."

[78] On a real, effective basis the yen appreciated 24 percent between the third quarter of 1998 and July 2000. In an economy struggling with falling prices and a fragile recovery, this appreciation was most unwelcome.

[79] See White (1999) for an interesting discussion of the many-faceted role of the exchange rate in the transmission mechanism.

[80] According to the current wording of the FOMC's domestic policy directive to the New York Fed.

countries, the exchange rate plays an important role in the transmission mechanism. When exchange rates stray far from fundamentally appropriate levels, thus, foreign policymakers are finding that they need to take heed.

Reflections on the Future

The trends in the world economy identified in the second section of this paper are likely to continue and indeed may even accelerate. In particular, the U.S. economy is now highly open to influence from abroad. Within the goods market, only the defense industries and a few agricultural products, such as sugar, are now seriously protected from international competition; and many services are increasingly subject to direct competition from abroad. Of course, some activities, such as construction, retail trade, schoolteaching, or medical care, will remain domestic, although even they are subject to influence and takeover through foreign direct investment. Similarly, financial markets are now wide open to international investors; with the securitization of mortgages even that very local form of loan is now internationally marketable.

A new element in the picture is the creation, in January 1999, of the euro, which in financial markets has replaced the German mark, French franc, Italian lira, and eight other European currencies, permitting the development of a European-wide capital market without currency risk. Japan has also shed its last restrictions on inflows and outflows of capital, although the poor performance of the Japanese economy and traditional conservatism of Japanese savers have postponed full exploitation of the new potentialities.

In general, floating exchange rates have served the United States well over the past two decades. An appreciating dollar dampened U.S. growth during the fiscal stimulus of 1981 to 1984, and again during the robust growth of 1995 to 2000; a depreciating dollar stimulated U.S. growth during the years 1991 to 1995, a period of recession and fiscal drag due to tax increases in 1990 and 1993. (The same cannot be said for Japan where, as McKinnon and Ohno (1997) have persuasively argued, exchange rate movements have contributed to destabilizing expectations and poor economic performance.)

A key question is whether past is prologue to the future. It is churlish to raise doubts about the future in a period in which the U.S. economy has performed so well, and to which such good performance Federal Reserve policy has been an important contributor, at least in the negative sense of not having aborted it prematurely. Nonetheless, a case can be made that exchange rate flexibility will not be so benign for the United States during the next two decades as it was during the last two. Indeed, many U.S. firms would welcome a weaker dollar now, both to improve their export competitiveness and to give them more room for domestic price increases

in the face of rising wage rates and materials costs. Much action on the price-raising front would no doubt trigger a reaction from the FOMC, with the effect of strengthening the dollar but also weakening construction and other interest-sensitive expenditures—as well as raising U.S. interest payments on the over $3 trillion in interest-sensitive securities and other claims held by foreigners.

But suppose the U.S. economy slowed substantially without a significant depreciation of the dollar. Then it is likely that American businesses would begin to complain vociferously about foreign competition and would turn to the Congress for protectionist relief, as they did between 1983 and 1985. Or suppose that higher interest rates in Europe, combined with a slowdown in the United States, led to significant shifts in worldwide portfolios, away from dollars toward euro-denominated securities, so that the dollar depreciated not by a tolerable 10 percent but by a startling 25 percent or more. In addition to black headlines from financial journalists around the world, many asset holders would be thrown into confusion and would wonder when the rout would stop, since the *potential* for portfolio shifts would be huge and subject to short-run herd dynamics. Extensive dollar depreciation, in turn, given the openness of the American economy, would permit a corresponding rise in prices of tradable goods and services and would put the FOMC in the dilemma of whether to raise U.S. interest rates in conditions of serious economic weakening.

The general point is that the United States is increasingly exposed to external events and to changes in portfolio preferences around the world. Asset holders (including Americans) face a much wider menu of choices than has historically been the case, as foreign securities markets improve. It is not too early to begin to reflect on how U.S. monetary policy might need to be recast to allow for these changes, with a view to mitigating their impact on the American economy.

Here are two thoughts: First, the Fed should think actively about, and begin to experiment with, undertaking open market operations in selected foreign securities, especially euro-denominated securities. Second, the Fed should examine switching the main focus of its attention for measuring price stability from the consumer price index to the (finished goods) producer price index (PPI), encouraging the European Central Bank, the Bank of Japan,[81] and the Bank of England to do the same.

Since the PPI is composed predominantly of tradable goods, if all four major economies were to focus on the PPI, their targets would be similar, ultimately perhaps identical. (As with the CPI, allowance might be made for exceptional movements in particular prices, for example, oil

[81] The Bank of Japan has recently begun announcing an inflation forecast as a means for guiding inflation expectations.

products, giving rise to a "core PPI.") Over the past two decades, the U.S. PPI rose 1.5 percentage points less than the CPI, while over the past five years the difference has been about 1 percentage point. Thus, a PPI target could be numerically lower than the corresponding CPI target, and conceiving of "zero inflation" on this measure would be less problematic than it would be with the CPI.

Focusing on the PPI would provide the nominal anchor that many observers feel is necessary for monetary policy. In particular, it would satisfy the Maastricht Treaty's injunction to the European Central Bank to target "price stability." It would also achieve a degree of (long-term) coordination of monetary policy among the three major industrial regions, since the focus of monetary policy in each would be similar, if not identical.

With monetary policies focused on the PPI, the consumer price index could, if appropriate, rise by differing amounts in the major industrial economies, thus giving somewhat greater flexibility to differential movements in real wages, which would help to accommodate any low-frequency asymmetric shocks among the three regions. This would take some pressure off the need for exchange rate changes to deal with such shocks over time.

Foreigners hold nearly $6 trillion in marketable securities and other liquid assets in the United States, and, of course, Americans hold much more. A substantial portfolio shift (or, given the large U.S. current account deficit, even a substantial diminution of net capital inflows) would result in a depreciation of the dollar relative to the destination currencies, possibly a substantial depreciation. Given the extensive openness of the U.S. economy, that in turn would result in increases in the dollar prices of most goods and some services. (Ironically, U.S. anti-dumping laws strongly encourage foreigners in periods of dollar depreciation to raise their dollar prices after no more than 60 days.[82]) That in turn could induce the FOMC to tighten monetary conditions, perhaps stemming the outflow of interest-sensitive funds, but depressing the U.S. stock market. Thus, the impact on net capital flows is ambiguous and, especially in the short run, could stimulate further outflows. The question is how much damage to the real economy is tolerable, even if one is confident that some level of asset prices and exchange rates will lead portfolio allocations to be revised and perhaps reversed.

It would be desirable for the Fed to have options other than simply tightening monetary conditions, that is, by intervening in foreign exchange markets with a view to influencing market expectations about exchange rates, which have been shown to be extremely fragile in recent

[82] Failure to do so subjects them to dumping charges and leads to the imposition of anti-dumping duties. Once imposed, such duties are difficult to remove.

years. One strategy would be to wait until a run occurs and rely on cooperation from foreign monetary authorities to provide adequate support in the emergency. Some cooperation is likely to be forthcoming, since other countries will not want to see their currencies appreciate rapidly and far, for reasons of international competitiveness.

An alternative, more foresighted strategy would be for the United States to build foreign exchange reserves or lines of credit during a period of relative financial calm. The swap lines with Europe and Japan that were allowed to expire in late 1998 could be renewed. And the Federal Reserve could begin, initially on a modest scale, to engage in open market purchases of foreign securities.[83] This would put some downward pressure on the dollar exchange rate, which would be welcome to many U.S. firms and would not put undue pressure on an economy whose growth seems to be slowing down. And it would build up U.S. holdings of foreign assets at a time when they are relatively inexpensive. Higher reserves would be welcome if significantly disturbing private switches out of dollar-denominated assets were to occur in the future. It would also represent a partial response to the diminishing supply of Treasury securities projected to be available for open-market purchase in the coming years.[84]

Of course, the Federal Reserve should not purchase foreign securities without cooperation with other central banks, to avoid intervention at cross-purposes. As is well known, in a world of n currencies there are only $n-1$ independent exchange rates; independent action by n central banks is not possible. The "*nth* country problem" has been generally solved by U.S. abstention from the foreign exchange market. Until September 2000 it seemed the European Central Bank would also adopt a position of abstention, leaving room for some U.S. activity. With European intervention, cooperation in a U.S. buildup of euro-denominated reserves becomes necessary.

Summary and Conclusions

It is often suggested that U.S. monetary policy is largely or even entirely inward oriented, taking into account only the needs of the U.S. economy, with little or no reference to the rest of the world. We have tried to show that this view is largely incorrect, in at least three different respects.

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[83] In June 1999 the Bank of England began to accept euro-denominated bonds issued by European governments and international agencies as collateral for repurchase agreements. The Bank started to conduct open market operations via repos in early 1997.

[84] This strategy might also deliver some advantages in terms of increased risk-sharing across nations, which analysts suggest could increase welfare by noticeable amounts. See Athanasoulis and van Wincoop (2000).

The first, generally accepted respect is that greater engagement with the rest of the world in both trade and financial transactions leads the U.S. economy to be more directly affected by overseas developments than it was three or four decades ago. Exports have occasionally accounted for as much as 40 percent of annual U.S. economic growth; U.S. prices are influenced by world price developments, most obviously in the case of oil. Movements in exchange rates can also affect prices of imported goods, hence prices of domestic substitutes for imported goods. More intense foreign competition has reduced the sensitivity of domestic prices to the pressures of aggregate demand, and it has undoubtedly contributed to shifting downward the level of unemployment that is consistent with price stability. These changes in the structure of the U.S. economy in response to greater openness have of course affected the way the Federal Reserve responds to U.S. economic developments.

Second, a perusal of FOMC records reveals extensive references to international developments in discussions of the future direction of monetary policy. These international factors were not always or even often decisive in determining U.S. monetary policy; but they were frequently factored into the overall evaluation of the economic environment. And occasionally—during some periods of pronounced dollar weakness, for instance, or during the emergence of the debt crisis in August 1982 and the international financial crisis of late 1998—the FOMC's desire to affect the course of these developments played a major role.

Third, external competitive pressures have facilitated substantial changes in the structure of the U.S. financial system. Indeed, arguably, they were an important factor in breaking down the geographical and business barriers that had shaped the U.S. banking system since the 1930s.[85] This interplay between financial innovation and changes in the regulatory structure of the U.S. banking system has in turn affected how monetary policy works. As Frank Morris was one of the first to note, these innovations made the monetary aggregates increasingly poor guides for policy decisions. The ensuing search for a substitute has led to the current policy focus, both in the United States and abroad, on short-term interest rates and the central bank's ultimate goals—price stability and sustainable growth.

These diverse channels of international influence on U.S. monetary policy will no doubt continue and even intensify in the future. In the 1960s, "international" work could generally be left to one designated member of the Federal Reserve Board, with occasional attention from the

[85] The Board of Governors (as opposed to the FOMC) spends much time on regulatory issues, which have been dominated, except in periods of financial crisis, by the changing competitive structure of financial services.

Chairman. These days most members of the Board are drawn into international matters at least occasionally, as are many of the Reserve Bank presidents, and foreign developments demand much attention from the Chairman. Just as many domestically oriented agencies of the U.S. government, like the SEC or the FBI, are finding that they cannot meet their responsibilities without intensive work with their foreign counterparts, so too the Federal Reserve is likely to grow increasingly internationalized as it strives to stabilize the U.S. economy. Financial supervision and the provision of international lender of last resort facilities are two areas where the need for cooperation is particularly keen. While the development of international standards represents considerable progress on the supervisory front, a resolution of the issues surrounding the lender of last resort remains more elusive.

Finally, as our review of FOMC decision-making suggests, on occasion, big exchange rate swings widely viewed as unrelated to macroeconomic fundamentals still plague even the largest economies. Thus, the world's major central banks are likely to want to devote ongoing—or even increased—attention to stabilizing their exchange rates. The fact that most major central banks are now focused on attaining similar low rates of inflation should help in this regard. Nevertheless, because exchange rate shifts sometimes reflect forces other than changes in the relative price of traded products, we believe that the Fed will need, among other things, to stand ready to engage more extensively in open market operations in foreign securities. Thus, it will also need to build its stock of such assets.

Appendix Table 1
FOMC Voting and Reaction Functions

	Logit Estimates of FOMC Voting			Reaction Functions		
	(1) Original Equation	(2) Original Equation with Dollar Purchases	(3) Original Equation with Dollar Sales	(4) Original Equation	(5) Original Equation with Dollar Purchases	(6) Original Equation with Dollar Sales
Dependent Variable: Vote for Tightening				Dependent Variable: Change in Federal Funds Rate		
C	−.02	−.26	−.05	−.10	.08	−.04
	(−.04)	(−.69)	(−.13)	(−.62)	(−.41)	(−.20)
QH1	.07	.07	.09	.01	.01	.009
	(2.24)	(2.48)	(3.08)	(.87)	(.87)	(.73)
QH2	.11	.13	.05	.05	.06	.05
	(2.68)	(3.02)	(1.18)	(2.49)	(2.70)	(2.59)
PH1	.12	.18	.16	.002	.02	.006
	(1.57)	(2.39)	(2.16)	(.06)	(.38)	(.14)
PH2	.11	−.0008	.11	.04	.02	.03
	(1.31)	(−.009)	(1.34)	(.94)	(.37)	(.73)
URF	−.46	−.41	−.46	−.05	−.06	−.06
	(−8.40)	(−7.54)	(−8.43)	(−2.31)	(−2.14)	(−2.38)
M	.04	.04	.05	.009	.009	.01
	(3.70)	(3.47)	(3.99)	(1.58)	(1.63)	(1.63)
RBUY		.03			.005	
		(5.27)			(1.87)	
RSELL			.05			−.000004
			(5.44)			(.002)
Dependent Variable: Vote for Loosening						
C	1.56	1.76	1.52			
	(3.82)	(4.27)	(3.71)			
QH1	−.31	−.33	−.31			
	(−10.81)	(−11.22)	(−10.88)			
QH2	−.04	−.04	−.05			
	(−0.93)	(−.84)	(−1.12)			
PH1	.13	.07	.16			
	(1.55)	(.80)	(1.85)			
PH2	−.41	−.35	−.45			
	(−4.35)	(−3.57)	(−4.63)			
URF	−.08	.09	−.07			
	(−1.50)	(−1.66)	(−1.33)			
M	−.05	−.06	−.05			
	(−4.22)	(−4.55)	(−4.02)			
RBUY		−.03				
		(−3.17)				
RSELL			−.006			
			(−1.42)			

Appendix Table 1 (continued)
FOMC Voting and Reaction Functions

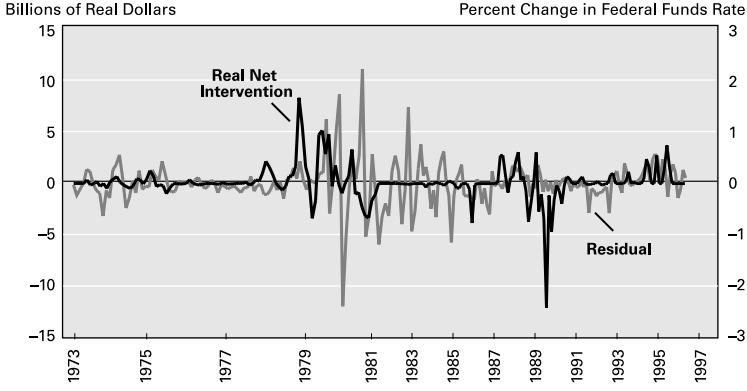
	Logit Estimates of FOMC Voting			Reaction Functions		
	(1) Original Equation	(2) Original Equation with Dollar Purchases	(3) Original Equation with Dollar Sales	(4) Original Equation	(5) Original Equation with Dollar Purchases	(6) Original Equation with Dollar Sales
Observations	2406	2406	2406	237	211	211
Log-Likelihood	−2002.7	−1977.8	−1979.4	−116.8	−108.1	−109.9

Definitions of Variables

QH1	Forecast of real GDP growth over the next 6 months
QH2	Forecast of real GDP growth over the 6 months starting 6 months from now
PH1	Forecast of inflation over the next 6 months
PH2	Forecast of inflation over the 6 months starting 6 months from now
URF	1-quarter-ahead civilian unemployment forecast
M	Lagged 3-month moving average of M1 growth
RBUY	U.S. official purchases of dollars (deflated by GDP deflator) in intermeeting period just past, millions of dollars
RSELL	U.S. official sales of dollars, that is, negative purchases (deflated by GDP deflator) in intermeeting period just past, millions of dollars

The Green Book was used for all the forecasts.

Appendix Figure 1
Reaction Function Residuals and Real Net Intervention in Foreign Exchange Market



Note: The real net intervention was calculated by dividing the nominal intervention by the implicit price deflator (1996=1) for the year in which the FOMC meeting occurred.

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