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## In This Issue . . .

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Critics of U.S. fiscal policy in the 1980s argue that U.S. government deficits have lowered investment, thereby lowering future productivity and income, while raising future debt-servicing claims against that income. An opposing view argues that fiscal policy boosted investment, especially from 1981 to 1985.

In the first article in this *Review*, "U.S. Investment in the 1980s: The Real Story," John A. Tatom explains why some measures of U.S. investment performance look relatively weak in this decade. According to Tatom, recent real business fixed investment measures are the highest in nearly 60 years, especially when adjusted for the relatively larger amounts of unused plant and equipment compared with that during previous investment booms. The major difference in the data supporting each view is that the prices of capital goods have fallen sharply compared with other goods, so that a given share of income devoted to saving and purchases of capital goods could buy substantially more of them in this decade than earlier. Analyses that indicate that domestic investment and saving have been weak reach this conclusion by ignoring this decline in prices, the recent business cycle experience and the decline in labor force growth in this decade. According to Tatom, the strength of real net investment can be most easily seen in the resumption of productivity growth, following its stagnation in the 1970s. This accelerated productivity growth reflects faster growth in the net capital stock per worker.

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In the second article in this issue, "The FOMC in 1988: Uncertainty's Effects on Monetary Policy," Michelle R. Garfinkel examines the various economic factors that influenced the deliberations and decisions of the Federal Open Market Committee in 1988. Garfinkel points out that, among other things, the potential long-term effects of the stock market crash of October 1987, the continuing movements in the value of the dollar in foreign exchange markets and the changing relation between the monetary aggregates and nominal output generated unusual uncertainty among the FOMC members about the economic outlook. In light of this uncertainty, the FOMC sought greater leeway in targeting money growth and adopted a more flexible strategy for implementing short-run policy.

To understand the intended role of greater flexibility in monetary policy, Garfinkel reviews the long-run and short-run policy decisions of the FOMC during 1988. The discussion focuses on how the changing economic environment and the FOMC's desire for greater operational flexibility influenced the evolution of monetary policy throughout the year.

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Fluctuations in interest rates are commonly attributed to the value of some economic indicator. At various times, different statistics have been thought to affect rates. In the third article in this *Review*, "Interest Rates

and Economic Announcements," Gerald P. Dwyer, Jr. and R. W. Hafer investigate whether announcements of government statistics systematically affect interest rates.

To analyze the effects of such announcements, the authors examine the behavior of changes in the three-month Treasury bill rate and the 30-year government bond rate around days on which government statistics are first made public. Focusing on the market's reaction to the unexpected part of the announcement, Dwyer and Hafer find that, at least for 1980 through 1987, there is little empirical support for the notion that interest rates respond in a predictable fashion to unexpected changes in inflation, real economic activity or the trade balance. They do find evidence indicating that unexpected changes in money influenced rates, but this occurred only during the early 1980s.

\* \* \*

Since 1981, the U.S. trade deficits on a balance-of-payments basis have averaged more than \$100 billion per year. The inflows of foreign capital into the United States have transformed the position of the United States from creditor to debtor. Many observers, politicians and financiers have decried this shift not only as a sign of current U.S. weakness, but as the harbinger of future calamity. Economists, conversely, have generally argued that foreign capital benefits U.S. labor and investors.

In the fourth article of this issue, "Is America Being Sold Out?" Mack Ott analyzes the controversy surrounding this transformation and the validity of the concerns about the economic implications of foreign ownership of U.S. assets. The article reviews the intensity of public concern as expressed in opinion polls and takes these expressions as an agenda for the analysis. Both the scope of current foreign ownership and its pattern are assessed as well as the prospective foreign ownership if current trends continue.

\* \* \*

The final article in this *Review* is "Money and the International System," the 1989 Homer Jones Memorial lecture presented by H. Robert Heller of the Board of Governors of the Federal Reserve System. In his lecture, Dr. Heller examines the role of money and monetary stability and the choice between a national or an international monetary standard.

Dr. Heller begins by discussing the importance of both money that is broadly accepted as a means of payment and the existence of a stable price level for economic and political freedom. He notes that monetarists and "internationalists" generally agree on the importance of human freedom; however, they differ in terms of the type of monetary standard they believe will achieve their goal. In his view, monetarists can be characterized as advocating a national monetary standard with flexible exchange rates and little, if any, need for international policy coordination. Internationalists, in contrast, advocate a global monetary standard; they view the nation-state as a political construct with limited economic importance. Dr. Heller then introduces some considerations that he believes can be used to help in deciding which monetary system will be more useful: among these are the provision of a stable financial environment and price stability within an economically and financially integrated system. He concludes by stating that, as global integration of economic and financial markets proceed and as political interdependence increases, monetary integration will increase as well.

## ***John A. Tatom***

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# **U.S. Investment in the 1980s: The Real Story**

**A** CENTRAL proposition of conventional analyses of fiscal policy in this decade has been that unprecedented federal budget deficits have crowded out domestic investment, especially business investment. In this view, the Reagan administration did not achieve one of its central goals: to raise investment, productivity and growth. Instead, investment has been seriously eroded, and the burgeoning foreign claims on this nation's future income will confront a smaller capacity to generate that income than would otherwise have occurred. Professor Benjamin Friedman sums up this view of recent fiscal policy, arguing that it violates "the basic moral principle that had bound each generation of Americans to the next since the founding of the republic: that men and women should work and eat, earn and spend, both privately and collectively, so that their children and their children's children would inherit a better world."<sup>1</sup>

An opposing view of fiscal policy argues that business investment was boosted substantially by the incentives adopted early in this decade.

In this view, the rise in both interest rates and the value of the dollar in the early 1980s were reflections of the unusual strength of U.S. investment and the associated reallocation of world capital stocks and income toward the United States.<sup>2</sup>

This article provides a critical perspective on the conventional view of domestic investment in this decade. Although there are measures of investment that suggest that it was depressed, this article will show that these measures have crucial limitations. A closer inspection will show that domestic investment and capital formation have been relatively strong, especially from 1980 to 1985.

## **INVESTMENT AND SAVING IN THE NATIONAL INCOME ACCOUNTS**

Understanding the relationships among domestic investment, the government's budget position

<sup>1</sup>Benjamin Friedman (1988), p. 4. Some of the other popular proponents of the conventional view include Business Week (1987) and (1988), Cooper (1986), Frankel (1986), Benjamin Friedman (1986), Jonas (1986), Kennedy (1987), Modigliani (1988), Peterson (1987) and Summers (1987).

<sup>2</sup>See Milton Friedman (1988), Reynolds (1989), Poole (1988), Tatom (1985), (1988) and Sinn (1988). The link be-

tween the reallocation of U.S. investment abroad to domestic investment, the nominal supply of dollars for international transactions and movements in the exchange value of the dollar are detailed more fully in Tatom (1986) and (1987a).

and the nation's foreign transactions can be facilitated by considering some national income and product account (NIPA) identities. Investment refers to purchases of durable goods that are used to produce future goods and services, such as business plant, equipment and inventory purchases and new housing. The accumulation of such real assets through investment has to be financed and the source of such financing is saving, the portion of income that is not spent on current consumption.<sup>3</sup>

In the NIPA, one way to measure gross national product or the nation's gross income is to add up expenditures or purchases of final goods and services. The principal types of such purchases of domestic products are personal consumption and housing purchases by households, purchases by businesses, government (G) or export sales to foreigners (X). Business purchases include investment in plant, equipment and inventory changes; business investment spending and residential investment comprise gross private domestic investment (I). Another way of measuring income is to add up the components of income according to what households do with it: pay taxes (T), save (S), or spend on consumption of domestic product or foreign imports (M).

Since consumer purchases appear in both expenditures and income, they cancel each other out when these two approaches are compared; the remaining components of purchases (I + G + X), by definition, must equal the remaining uses of income (T + S + M). Such an identity is written as:

$$(1) I + G + X \equiv T + S + M.$$

This identity can be rewritten in a couple of useful ways. The first way focuses on the government budget and trade deficits and the gap between domestic saving and investment. The budget deficit (BD) is the excess of government spending over receipts, which equals (G-T) above.<sup>4</sup> The trade deficit (TD) is the excess of

imports of goods and services over exports, or (M-X) above. The identity can be rearranged by subtracting T, X, and I from both sides, and substituting the definitions of the deficits to obtain

$$(2) BD \equiv TD + (S-I).$$

This identity shows the relationships of three gaps: the government budget deficit, the trade deficit and the gap between private domestic saving and investment. A government budget deficit must be financed by an excess of private domestic saving over investment or by a trade deficit.

The nation's trade deficit represents a net credit flow from foreigners, or asset accumulation by foreigners in the form of loans or equity holdings in the United States. The trade surplus is called "net foreign investment" by the United States in the NIPA accounts. When it is negative, it represents an inflow into the United States, so the trade deficit can be called "net foreign saving" (NFS).<sup>5</sup>

By rearranging identity 2, we can obtain an identity of saving and investment, which shows that saving used to finance private domestic investment can come from private domestic sources (S), the government sector (government saving, or -BD) or foreign savers (NFS). Viewed this way, the identity emphasizes that changes in investment must reflect similar changes in saving. Movements in the budget deficit or domestic investment relative to domestic saving have counterparts in the trade deficit.

## THE CONVENTIONAL VIEW OF INVESTMENT IN THE 1980s: AN EMPHASIS ON CROWDING OUT

A rise in the budget deficit (BD) due to increased spending or decreased taxes must change the right-hand side of identity 2 by an

<sup>3</sup>Purchases of consumer durable goods (like automobiles, furniture and appliances) also involve investment and saving, but in the NIPA account such purchases are treated as consumption. Reynolds (1989) includes such purchases in investment and argues that U.S. investment was unusually strong in the early 1980s. Like his findings, the results below would be reinforced if the unconsumed share of consumer durable purchases were included in investment and saving.

<sup>4</sup>Only purchases are included in G, but T is measured net of transfer payments. Thus, the difference, (G-T),

measures the excess of government spending over receipts, or the budget deficit.

<sup>5</sup>When the United States has a trade deficit and, simultaneously, the rest of the world has a balanced government budget, then the rest of the world must be saving more than its domestic investment, and this excess foreign saving equals the NFS of the United States.

equal amount. The financing of the deficit requires either increased domestic saving,  $S$ , reduced domestic investment,  $I$ , or increased foreign saving (which means a larger trade deficit,  $TD$ ). Generally, the budget deficit must "crowd out" spending elsewhere by reducing exports ( $TD$  must rise), domestic consumption spending ( $S$  must rise) or domestic investment ( $I$  must fall). The conventional view emphasizes the crowding out of domestic investment.

Developments in the 1980s, however, indicate that the foreign sector cannot be ignored. The trade deficit has risen sharply in the 1980s, reducing the downward pressure on investment expected in the conventional analysis. To maintain and service this rise in net borrowing from abroad, a future flow of U.S. income has been promised to foreign savers. Thus, a budget deficit mortgages the future U.S. standard of living either by reducing the capital stock and future income or by reducing the amount of future output that can be consumed domestically, or both.

### **A SUPPLY-SIDE VIEW: TAX INCENTIVES FOR INVESTMENT**

The alternative view does not focus on the budget deficit as either the principal influence on investment or the most significant macroeconomic change in the 1980s. It focuses instead on tax changes early in the decade that increased investment incentives and investment, especially its business component. The supply-side view argues that such tax law changes raise the optimal capital stock, temporarily raising investment, despite any indirect effects that these tax incentives may have on the budget deficit or interest rates.<sup>6</sup>

Actions like those adopted in the early 1980s that provide generous new tax credits for investment or accelerate depreciation will hasten the replacement of obsolete plant and equipment and make possible the purchase of new

facilities that otherwise might not have been considered. Moreover, as investment demand rises, the demand for funds to finance it increases as well. Firms compete with each other to attract investment financing by bidding up returns on both equity and debt instruments.

The cost of capital to firms, including market interest rates, rises as firms expand investment, but by less than the value of the new investment incentives; net of these tax benefits, the cost of capital falls. The net cost of capital rises for firms that do not have access to these incentives, however, including foreign firms operating abroad. Thus, these changes in market rates of return and the cost of capital result in a reallocation of capital and production among nations, expanding domestic investment in the United States and lowering it abroad.<sup>7</sup>

Similarly, when such investment incentives are reduced, the optimal domestic capital stock declines and the movements in investment, both domestically and abroad, are reversed. To the extent that the Tax Reform Act of 1986 reversed the earlier incentives, the optimal capital stock and the pace of domestic investment declined, despite any positive effects arising from movements in the budget deficit and interest rates.<sup>8</sup>

### **THE GOVERNMENT DEFICIT, SAVING AND INVESTMENT: THE RECORD**

Figure 1 shows the total government deficit and net foreign saving measured as shares of nominal GNP.<sup>9</sup> These measures correspond to two of the gaps in identity 2 above, measured as shares of nominal GNP. As the figure shows, budget deficits, especially the federal deficit, are strongly cyclical; the share of tax receipts tends to fall while the share of spending, especially unemployment compensation, rises during the shaded recession periods. Similarly, cyclical in-

<sup>6</sup>There are a variety of arguments that suggest that deficits do not affect investment via the conventional mechanism, but they are not the central issue in the investment debate. Tatom (1985) discusses the effects of budget deficits on economic activity. In addition, it is arguable whether tax law changes in the early 1980s raised the observed budget deficit; instead, these changes mainly offset other tax increases. See Tatom (1984) and Meyer (1983).

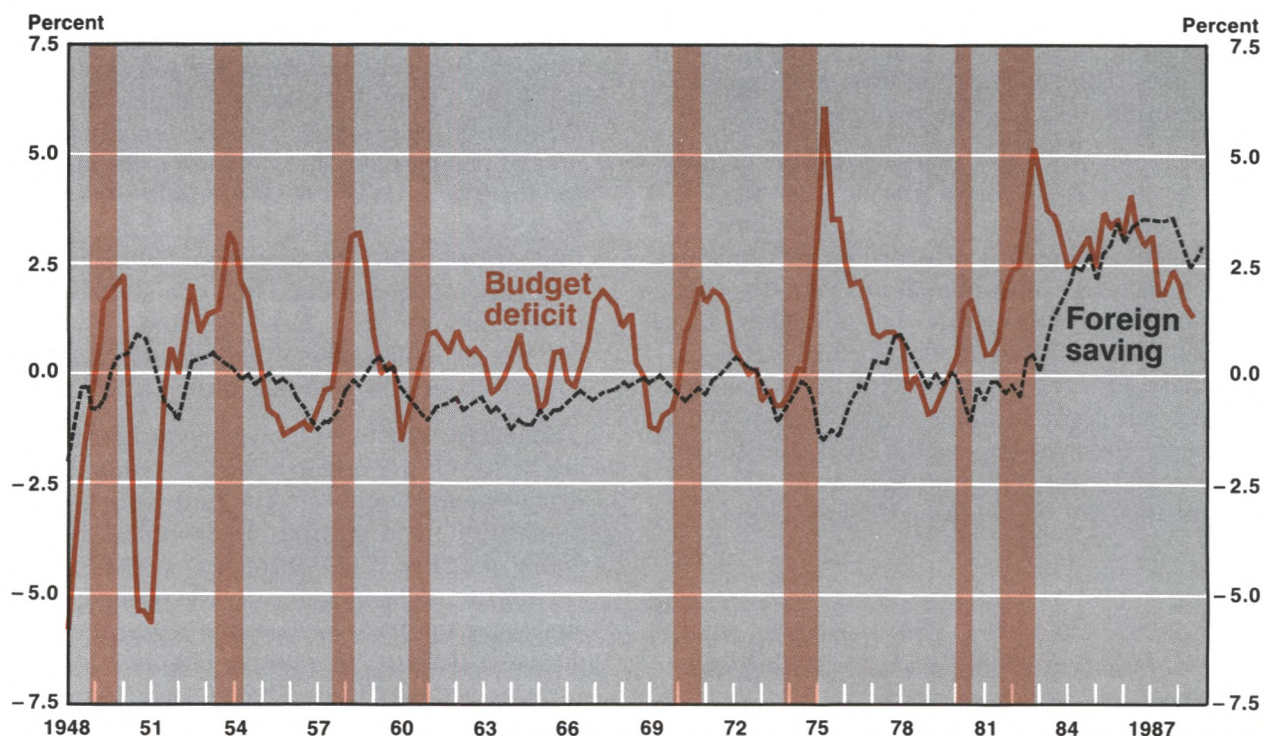
<sup>7</sup>Tatom (1986), (1987a), shows that movements in the value of the dollar were associated with changes in the U.S.

supply of dollars for international asset purchases consequent to changes in investment incentives.

<sup>8</sup>U.S. investment abroad would also be expected to rise, as in fact, it did. See Tatom (1987a).

<sup>9</sup>State and local governments have run budget surpluses in the 1970s and 1980s, so the total government deficit share has been smaller than that of the federal government since 1970. Before 1970, state and local government budgets were more nearly in balance, so there is little difference in the two deficit shares before then.

**Figure 1**  
**Government Budget Deficit and Foreign Saving**  
**as Shares of GNP**



creases in income and reductions in unemployment raise the share of tax receipts, while reducing the government spending share somewhat. Thus, periods of business recession coincide with periods of relatively large deficits.

Net foreign saving has been quite small historically and, until this decade, was generally negative; that is, on average, U.S. residents were net investors abroad. Also, such foreign saving did not exhibit much variation until the 1980s. As figure 1 indicates, the recent rise in the government deficit was matched, in part, by a rise in the U.S. trade deficit or net foreign saving.<sup>10</sup>

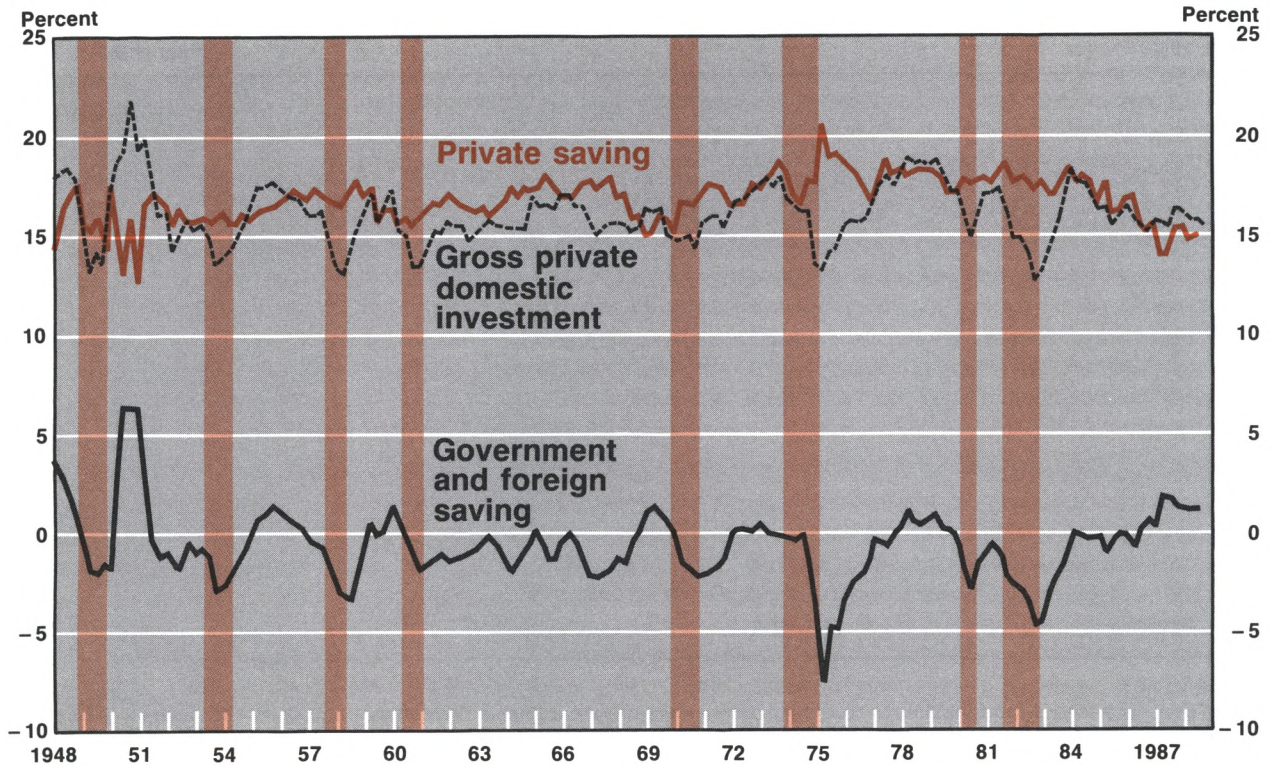
Figure 2 summarizes the net relationship of the government budget deficit and trade deficit to total domestic investment and the composition of its financing. The total of government

and foreign saving is shown in the figure, along with private saving and gross private domestic investment; all three are measured as shares of nominal GNP. The rise in the government budget deficit in the early 1980s and its subsequent reduction dominate the movement in the total of government and foreign saving; this ratio falls sharply in 1981-82 and then recovers somewhat. This total share rises quite sharply in 1986-88, as tax increases associated with federal tax reform, especially on income from capital, reduced the budget deficit and reduced U.S. investment incentives; the reduction in the budget deficit exceeded the associated reduction in net foreign saving. The private saving rate, which often moves inversely with the budget deficit share, is unusually high in the early 1980s, but falls beginning in 1985 and reaches

<sup>10</sup>One of the simple confusions that arises from NIPA terminology is that the net foreign saving rise was actually associated with a reduction in U.S. investment abroad, not a rise in foreign investment in the United States. This accounts for the movements in the flow and value of the

dollar in international exchange. Moreover, it means that the rise in foreign saving was really a reallocation of U.S. investment spending from foreign to domestic uses. See also Boskin and Gale (1986), Ohmae (1988) and Tatom (1986), (1987a).

**Figure 2**  
**Saving and Investment as Shares of GNP**



about 15 percent, near the lowest level shown, in 1987-88.<sup>11</sup>

The share of gross private domestic investment is also strongly cyclical: housing purchases and new plant, equipment, and inventory purchases fall relatively more than income when sales are falling and unemployment is rising. Similarly, as sales growth and employment expand cyclically, such investment purchases rise faster than income. The 1980 and 1981-82 declines in the investment share are associated with recessions. At its peaks in 1980-81 and

1984, the share of gross private domestic investment in GNP exceeded 17 percent. This proportion compares favorably with those at earlier peaks in 1948, 1955-56 and 1972-73, but was exceeded from 1977 to 1979 and in the 1950 cyclical recovery. Gross private domestic investment generally does not exhibit unusual strength as a share of GNP in the 1980s when compared with its earlier performance; moreover, like the private saving rate, it falls off from 1985 to 1988, although not to historically record lows.<sup>12</sup>

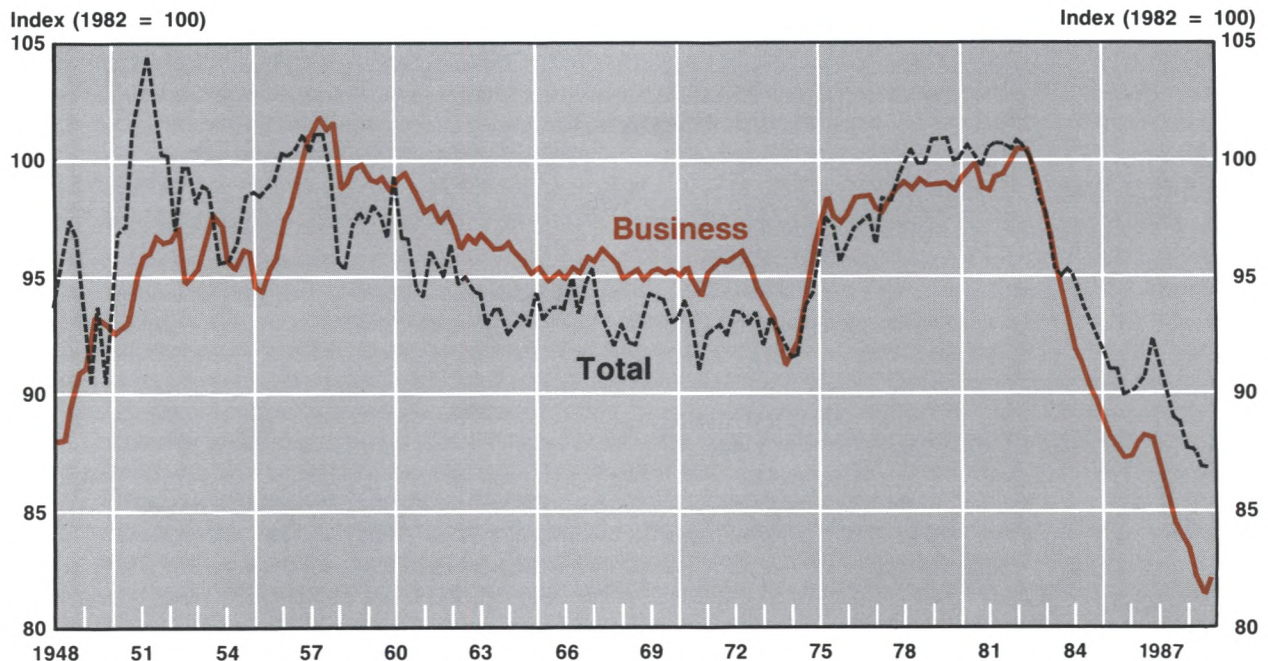
<sup>11</sup>An explanation for this relationship is provided in Barro (1974), Kormendi (1983), Aschauer (1985) and Tatom (1985), among others.

<sup>12</sup>Modigliani (1988) takes another approach to the effects of the budget deficit. He credits administration policies with substantially raising the growth of real personal disposable income per capita (and consumption), but argues that this is transitory or illusory because it arose from unsustainably

low taxes or high national borrowing. In fact, however, from 1980 to 1987, personal disposable income rose 67.3 percent, essentially the same as the 66.9 percent rise in national income. Moreover, the tax wedge in their difference rose 71.9 percent, so that taxes actually depressed per capita disposable income and consumption growth over the period.



**Figure 3**  
**Relative Price of Total and Business Fixed Investment Goods**



“Total” is based on the implicit price deflators for gross private domestic investment and GNP. “Business” is based on the deflators for nonresidential fixed investment and GNP.

Other factors besides the business cycle influence investment, and these could account for the apparent lackluster recent performance of the investment share shown in figure 2. Major changes in business taxes or other costs associated with housing, plant, equipment or inventory will influence investment. For example, when business investment tax credits were suspended in 1966-67 and 1969-71, sharp declines in the investment share followed. Similarly, the 1986 decline was related, in part, to the end of the investment tax credit in 1986. Another key factor has been the cost of operating plant,

housing, and especially equipment. In 1974 and 1979, oil prices doubled, substantially raising the cost of operating plant and equipment. Not surprisingly, investment fell sharply relative to GNP both times.<sup>13</sup>

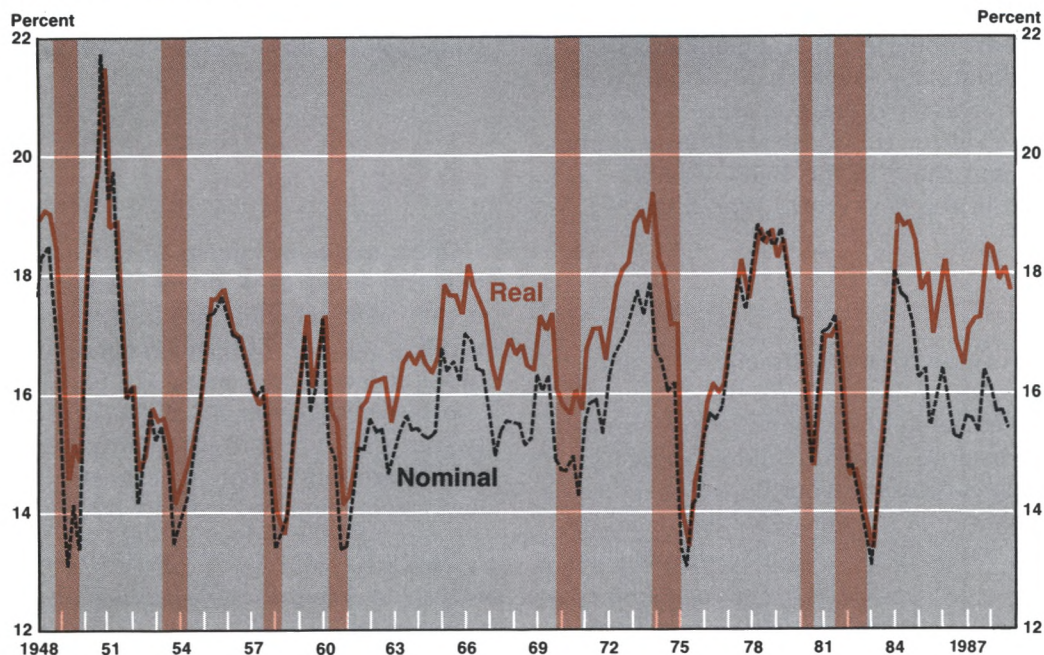
### RELATIVE PRICES AND REAL INVESTMENT

Another factor that influences the investment share is the relative price of investment goods. Total spending on investment or other goods in-

<sup>13</sup>Energy-related investment is positively related to unexpected changes in the relative price of oil and energy. Thus, the decline in investment in 1986 could be attributed to a decline in such prices. When investment in petroleum and natural gas exploration shafts and wells, mining and oil field machinery, and public utility gas and petroleum

pipelines are excluded from the investment share, the pattern shown in figure 2 and in figures 4 and 5 below remains the same. This is not surprising since the dominant effect on aggregate investment is typically the opposite to that in the energy-related sector. See Tatom (1979a,b) for example.

**Figure 4**  
**Nominal and Real Gross Private Domestic Investment**  
**as Shares of GNP**



cludes both a price and a quantity component; similarly, the investment share is the product of the relative price of investment goods and the quantity of such goods relative to real GNP. Gross private domestic investment equals the price ( $P_I$ ) times the quantity or real investment,  $R$ ; similarly, the index for the price of the nation's output ( $P$ ) times the measure of the quantity of GNP, called real GNP ( $X$ ), equals nominal GNP. Thus, the share of nominal investment is  $(P_I R / P X)$  or the product of the relative price ( $P_I / P$ ) and the real share of investment ( $R / X$ ). As a result, the movements in the nominal share in figure 2 are only representative of real investment activity when the relative price of such goods is unchanged or changes little.

The relative price of investment goods has fallen sharply in the 1980s, however. As figure 3 shows, the relative price of all investment

goods declined about 15 percent from 1980 to 1988; for business plant and equipment, the decline was about 17 percent. Prices generally rose 41 percent over the period according to the GNP deflator, but the deflator for gross private domestic investment goods rose only about 23 percent and that for business fixed investment rose only about 18 percent.<sup>14</sup> When the relative price falls, the share of spending declines proportionately unless the real share of spending increases. Since the nominal share of investment did not plummet in the 1980s, the real share of investment must have risen.

### *The Share of Real Investment Rose in the 1980s. . .*

Figure 4 shows the nominal and real share of investment in nominal GNP and real GNP, re-

<sup>14</sup>The unusual decline in the relative price of investment goods could arise because of measurement errors. Such a suspicion recently has arisen for computer equipment, for example. Declining computer prices have produced an unusually large decrease for the nonelectric equipment industry, but other equipment producers, like electric equipment and transportation equipment, also show unusual decreases in their relative price. See Tatom (1988).

The reason for the decline in the price of investment goods is beyond the scope of this article, but the decline is relatively greater for internationally-traded goods like equipment than it is for structures. It is most easily tied to an unusual rise in productivity in the U.S. traded goods sector (see Tatom 1988) and to a sharp decline in the growth of world trade. The latter was associated, at least in part, with the dramatic decline in world oil trade.

spectively. The performance of the real share indicates that investment in the 1980s was unusually strong and that it was associated with the unusual decline in the relative price of investment goods. Indeed, there have been few periods when real investment was as large a share of real GNP as it was in 1984-88. In these earlier periods, however, the unemployment rate was substantially lower than recently and measures of capacity utilization were much higher. Adjusted for this cyclical difference, the real investment share in the 1980s was unprecedented in the post-World War II era.<sup>15</sup>

### **. . . Especially for Business Plant and Equipment**

The controversy over investment's strength typically focuses on business fixed investment, not total investment. Movements in inventory or residential fixed investment could account for the favorable conclusion from figure 4. Figure 5 shows the share of real nonresidential fixed investment in real GNP and its cyclically-adjusted counterpart.<sup>16</sup> The case for relatively strong investment is even stronger in figure 5. Despite the energy price and recession-induced declines in the share, the 1986-87 tax-reform-related decline, and the generally poorer cyclical performance of the economy in the 1980s, the real business fixed investment share has been quite strong relative to its history.<sup>17</sup> At its lowest level in 1982, it was generally as high as it had been at most previous business cycle peaks.

<sup>15</sup>The share of real gross private domestic investment in real GNP was 19.6 percent in 1929; from 1930 to 1948, it was usually in single digits, but it exceeded 15 percent in 1930 (15.2 percent), 1941 (15.3 percent), and in 1946-48 (16.2 percent, 16.7 percent, 18.8 percent, respectively). In 1984, the share equaled that in 1948, the second highest level in 60 years. In 1929 and 1948, however, cyclical factors strongly boosted investment; unemployment was 3.2 percent of the civilian labor force in 1929 and 3.8 percent in 1948. In 1984 and 1985, the unemployment rate exceeded 7 percent.

Real business fixed investment in real GNP was 13.1 percent in 1929 and 12 percent in 1930. The share did not reach a double-digit level again until 1947-48 when it was about 11.5 percent. This pace was not exceeded until 1978, when it reached 11.6 percent. The 1978 share has been equaled or exceeded each year since then, except in 1983 when the share was 11 percent. The 1985 share of 12.5 percent was the modern peak.

<sup>16</sup>The cyclically adjusted share is based on a regression of changes in the logarithm of the actual share on current and four significant past changes in the logarithm of the manufacturing capacity utilization rate for the period III/1949 to III/1988. This regression has an adjusted  $R^2$  of 0.39, a standard error of 7.76 percent, and a Durbin-Watson statistic of 1.89. The regression indicates that a 1 percent rise in the utilization rate raises the share of such

The cyclically-adjusted share indicates the recent strength quite clearly. This share surged to record levels when the 1981 tax act was passed in the third quarter of 1981 and remained there until tax reform began to reduce business investment incentives in the first quarter of 1986. This share has rebounded somewhat since its trough in the first quarter of 1987.

## **THE GROSS VS. NET INVESTMENT CONTROVERSY**

One counter argument to the strength of domestic investment or its business component is that such spending has been boosted by an accelerated pace of obsolescence. The increased obsolescence is associated with an increasingly shorter-lived capital stock that is of lower quality. According to this argument, after subtracting depreciation, new investment has been depressed compared with its past performance.<sup>18</sup>

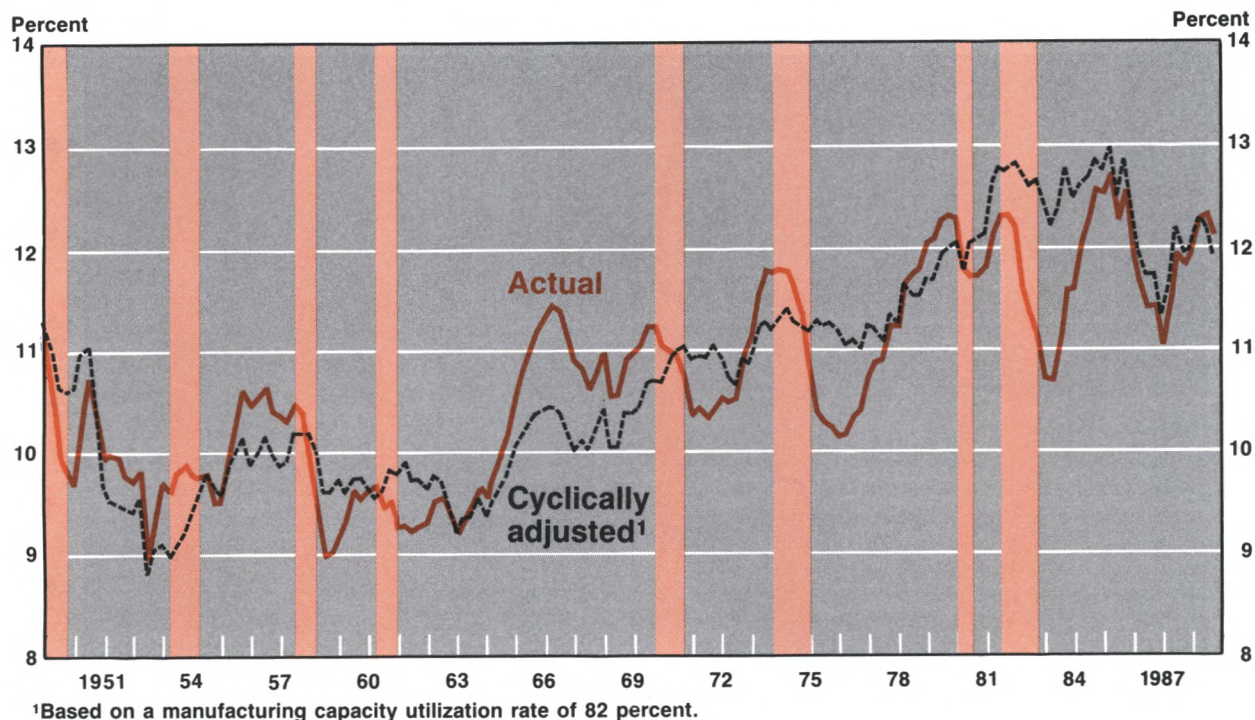
Figure 6 shows *net* nonresidential fixed investment as a share of GNP using both nominal and real measures. Again, relative price movements affect performance in this decade, but, either way, the net investment share appears relatively weak. Compared with a recent peak of about 4 percent in 1979, net investment declines to about 3½ percent in 1980-81, and then plummets. Except for a temporary recovery in 1984-85, the shares have been generally lower in this decade. In particular, net investment fell

investment by 0.9 percent. The adjusted share is computed on the basis of an 82 percent utilization rate, about the postwar average.

<sup>17</sup>The decline in the price of investment goods relative to the GNP deflator or, what is nearly the same, the price deflator for consumption goods and services, has the same implication for nominal saving rates as for investment rates. When the price of goods yielding future consumption services falls relative to current goods and services, a given saving rate out of nominal income implies a proportionately larger real saving rate. Thus, a given flow of future consumption can be obtained with a proportionately smaller share of saving in nominal GNP. Since the private saving rate (figure 2) did not decline as sharply, as the relative price of investment goods, the effective saving rate was relatively high, especially in 1982-85.

<sup>18</sup>The methods of estimating discard and obsolescence rates used in the national income and product accounts have not been altered since they were introduced in the late 1940s. Many analysts prefer the use of the unadjusted gross data because of the uncertain accuracy of depreciation data. See Denison (1979), for example. The Council of Economic Advisers (1989) discuss this distinction, pointing out the advantages of the gross measure.

**Figure 5**  
**Real Business Fixed Investment as a Share of GNP**



to nearly its lowest recorded level following the tax reform act of 1986. Thus, the figure suggests that net investment was indeed quite weak in the 1980s, especially when nominal measures are used. The apparent weakness in the measures, however, is subject to the same qualifications as gross investment: the real measures are not as low and, adjusted for cyclical differences, the real net investment share was not depressed in the 1980s.<sup>19</sup> Moreover, there are other reasons to doubt the validity of the apparent weakness of net investment.

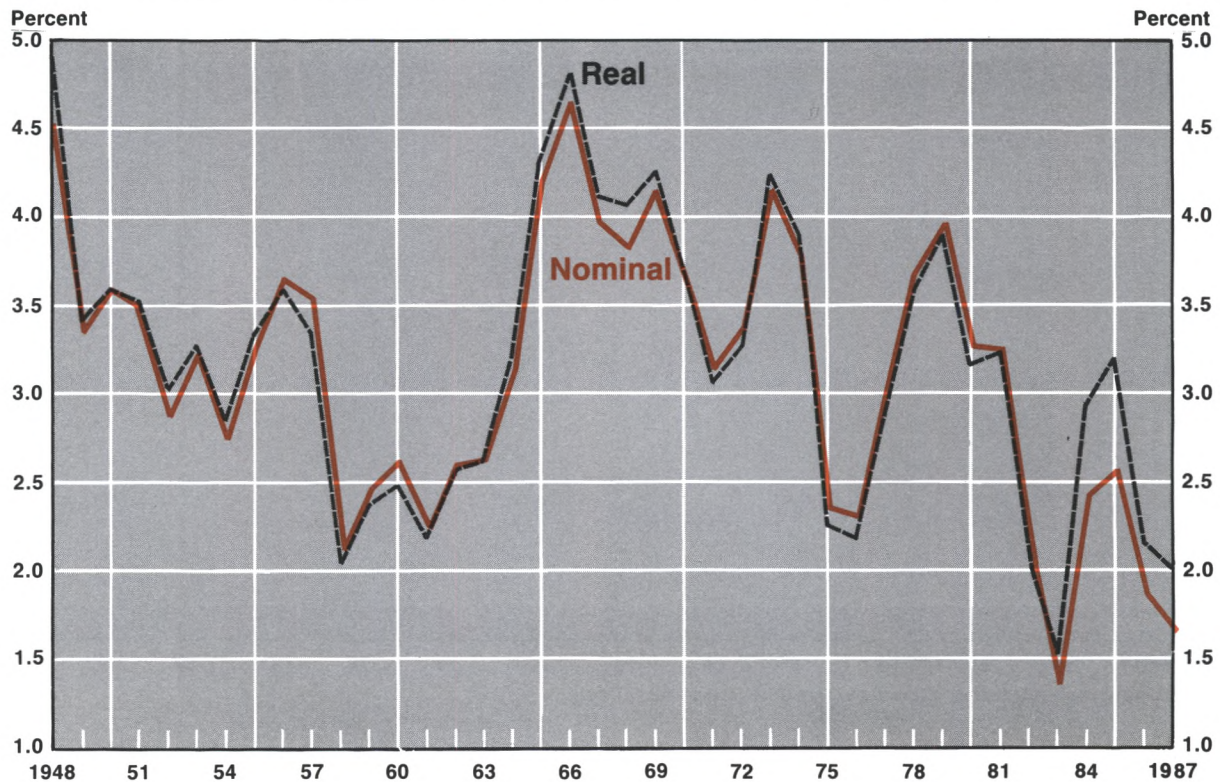
Did the capital stock become markedly shorter-lived in the 1980s, raising the rate of obsolescence of the given stock of business plant and equipment? One indicator of the

changing age of the capital stock is the mix of plant and equipment; equipment normally has a much shorter expected service life than structures do. The top panel of figure 7 shows a noteworthy shift in the mix of investment from 1980 to 1985. It was not a swing toward equipment, however. Instead, following the sharp upward trend that raised the share of equipment in total business fixed investment from about 51 percent in 1961 to 67 percent in 1978, the share declined, especially in 1981-82, then rose, but did not reach 67 percent again until 1985. Tax reform reduced the incentive to invest in structures relatively more than it did to purchase equipment. Thus, the equipment share surged to record highs in 1986-87. The bottom panel of figure 7 shows the depreciation rate

<sup>19</sup>The higher peaks of the net investment ratio in 1956-57, 1966, 1969, 1973 and 1979 than in 1981 and 1984-85 are due to cyclical differences noted above. The average manufacturing capacity utilization rate in those earlier years was 86.5 percent, significantly higher than the 79.6 percent average in 1981 and 1984-85. When adjustments

like those in footnote 16 are applied to quarterly data prepared by this Bank, the average real net business fixed investment share was sharply higher in these three years than the average for the six previous peak years listed above.

Figure 6  
**Net Business Fixed Investment as a Share of GNP**



for the net stock of private nonresidential capital. This rate rose from about 9 percent of the net capital stock in 1980 to about 9.7 percent in 1984 and 1987. This rise reflects the pre-1980 increase in the share of shorter-lived equipment in total investment.

The rise in the depreciation rate suggests that the increase in the share of real gross investment overstates the strength of capital formation.<sup>20</sup> But net investment, independent of other measurement problems, understates capital formation. When scrapped old equipment is replaced by new equipment of equal market value, no

net investment occurs. Nevertheless, the newer vintage plant or equipment embodies a newer technology and is more productive than the older, discarded plant or equipment, so that output rises despite the absence of net investment.

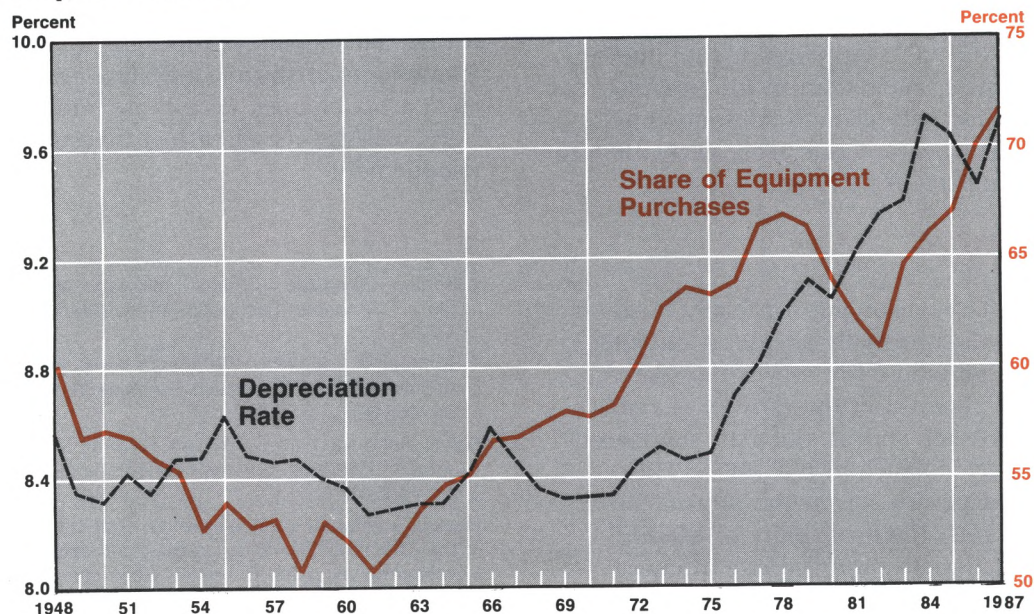
### **CAPITAL PER WORKER AND PRODUCTIVITY**

The performance of net investment in figure 6 is misleading for another reason. Gross and net investment are measures of changes in

<sup>20</sup>Direct estimates show that the average age of the net nonresidential stock of capital (1982 prices) has not fallen. The U.S. Department of Commerce (1987) estimates that the average age generally rose slightly from 1969 to 1981 and that it has been higher in this decade than in the 1970s, on average. The gross stock, a measure that

removes depreciated capital from the stock estimates only as it is discarded or removed from service, has a declining average age in the 1970s, reaching its lowest level in 1981. Its age subsequently rose and has exceeded its 1979 age every year since 1981, and generally by growing amounts.

**Figure 7**  
**Share of Equipment in Real Business Fixed Investment and**  
**Depreciation Rate for the Real Net Nonresidential**  
**Capital Stock**



capital goods, but the purpose of investment is to affect the total plant and equipment available. Moreover, it is the total quantity of capital per worker that influences output per unit of labor, or productivity, and the standard of living, not the share of new investment goods in output. Growth in the stock of capital per worker is expected to alter the way people work and raise productivity, measured as the rate of output per individual worker or per hour. Since net investment is a measure of the change in the capital stock, it must be added to the existing stock and the total must be compared to available labor resources, if a meaningful assessment of the contribution of capital formation to income per worker is to be made.

Since 1979, labor force growth slowed markedly. Such a slowing would imply a rise in the growth rate of capital per worker and productivity, unless capital stock growth slowed as

much. From 1979 to 1988, the growth rate of the civilian labor force has been 1.7 percent, well below the 2.7 percent growth registered from 1974 to 1979. The growth of the constant-dollar net nonresidential fixed capital stock slowed from a 3.2 percent rate from the beginning of 1974 to the beginning of 1979 to a 2.9 percent rate over the next nine years.<sup>21</sup> Thus, the capital-labor ratio showed faster growth in the 1980s.

The capital stock grew about 2.4 percentage points per year faster than the labor force from 1948 to 1973. In response to the oil price shock in 1973-74, however, the capital stock's relative growth nearly came to a halt, as firms adjusted to a lower desired proportion of capital per worker.<sup>22</sup> Since 1979, relative capital growth resumed, with capital stock growth averaging 1.2 percentage points faster than the growth of the labor force, despite the fact that oil and

<sup>21</sup>The constant dollar net nonresidential capital stock measure is described in U.S. Department of Commerce (1987). Revisions appear in Musgrave (1988). Quarterly net capital stock data estimated by this Bank, adjusted for the capacity utilization rate in manufacturing, and data for

business sector hours show that the growth of utilized capital per hour declined from 3.5 percent from IV/1948 to IV/1973 to 0.6 percent from IV/1973 to IV/1980, and then rose to 1.5 percent from IV/1980 to IV/1988.

<sup>22</sup>See Tatom (1982) and (1979a, b).

energy prices had risen about as much in 1980-85 as they had in 1974-78.<sup>23</sup>

Productivity has reflected the renewed strength of capital formation as well. Output per hour in the business sector rose at only a 0.5 percent rate from 1973 to 1980, after rising at a 2.9 percent rate from the end of 1948 to the end of 1973. From 1980 to 1985, however, productivity rose at a 1.6 percent rate, more than three times faster than in the previous period.<sup>24</sup> Productivity growth subsequently slowed to a 0.4 percent rate from early 1986 to the fourth quarter of 1988.

## CONCLUSION

U.S. domestic investment, especially business investment, was unusually strong in the 1980s. The policies adopted early in this decade contributed to a renewal in the growth of both capital per worker and productivity compared with their performance in the 1970s. This strength is surprising, given the unusual slack in labor markets, the availability of existing unused capital goods, and the rise in energy costs that immediately preceded this decade.

While some measures, like the nominal gross investment share or net investment shares of GNP, suggest that investment was not unusually strong in this decade, this perception is incorrect. Such a view exploits appearances arising from a strong decline in the relative price of investment goods, the business cycle and a sharp slowing in labor force growth. When these factors are considered, the strong rise in capital per worker and productivity, at least until the effects of the 1986 tax reform set in, are readily reconciled with a relatively strong performance of investment.

The differing assessments of investment performance in the 1980s are central to correctly judging past and prospective policies. For example, investment performance has deteriorated in the past two years. Whether this is judged a continuation of the purported dismal investment performance of the 1980s or another dramatic

example of the influence of tax policy on the economic environment can affect future policy choices significantly. Proponents of the first view want to raise taxes to reduce the budget deficit, which they view as central to the task of improving the performance of the U.S. economy, including investment and productivity. They deny the direct influence of tax policy on investment behavior, especially in this decade. Proponents of the second view emphasize that such a tax change, despite its budgetary implications, will perversely affect investment and productivity.

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<sup>23</sup>Evidence for the redistribution of world capital stocks and productivity toward the United States can be found in Tatom (1986), and (1987a, b).

<sup>24</sup>The increase in the constant dollar value of the capital stock was 19.8 percent from the end of 1980 to the end of 1987, much larger than the 7.1 percent and 12.1 percent increases in the population and in the civilian labor force, respectively, for the same period. The current value of the business capital stock rose 46.1 percent, or by \$1.3

trillion, substantially more than the \$563 billion rise in net indebtedness to foreigners, as measured by the cumulative current account deficit over the same period. When residential, consumer and government assets are added in, the rise in domestic current fixed assets for the same period is about \$3.9 trillion, a 46.8 percent increase. The substantial growth in capital assets relative to debt to foreigners suggests that the U.S. standard of living has been boosted by the use of net foreign saving in the 1980s.

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# **The FOMC in 1988: Uncertainty's Effects on Monetary Policy**

**D**URING 1988, as the economy continued in an historically long expansion, the Federal Open Market Committee — henceforth, the “Committee” — faced the task of pursuing its long-term objective of reasonable price stability, while promoting growth in output on a sustainable basis and improvements in the nation’s external accounts.<sup>1</sup> As the year began, the Committee believed that accomplishing this task was complicated by uncertainties associated with the long-term effects of the stock market crash of October 1987 and the continuing movements in the dollar, as well as the changing relation between the monetary aggregates and nominal output. In the Committee’s view, these uncertainties, among others, warranted a greater degree of flexibility in the implementation of monetary policy. Otherwise, unexpected economic developments easily could drive a wedge between desired and actual outcomes.

To explain the challenge faced by the Committee and the role of flexibility in meeting that challenge, this article examines the formulation of monetary policy by the Federal Open Market

Committee in 1988. The discussion focuses on how changing economic conditions and the desire for greater operational flexibility influenced Committee’s decisions during the year.

## **LONG-RUN OBJECTIVES**

As mandated by the Full Employment and Balanced Growth Act of 1978—or equivalently, the Humphrey-Hawkins Act—the Board of Governors of the Federal Reserve System reports semiannually to Congress on the Committee’s annual growth rate targets for monetary and debt aggregates. In February, the Committee establishes and reports on its objectives for the current year; in July, the Committee reports its progress toward achieving those objectives, its decision to reaffirm or alter its targets for the current year and the tentative targets for the following year. The relevant one-year period for the growth rate targets is from the fourth quarter of the previous year to the fourth quarter of the current year.<sup>2</sup> Table 1 summarizes the Committee’s reports to Congress on its long-run objectives for 1988.

NOTE: Citations referred to as the “Record” are to the “Record of Policy Actions of the Federal Open Market Committee” found in various issues of the *Federal Reserve Bulletin*. Citations referred to as the “Report” are to the “Monetary Policy Report to the Congress,” also found in various issues of the *Bulletin*.

<sup>1</sup>For a description of the Committee’s membership during 1988, see the shaded insert on pages 18 and 19.

<sup>2</sup>As discussed by Hafer and Haslag (1988), among others, such a procedure eliminates the problem of intra-year base drift; however, it does not circumvent the inter-year base drift problem.

**Table 1**  
**The FOMC's Long-Run Operating Ranges**

Date of meeting	Target period	Ranges	
		M2	M3
July 7, 1987 <sup>1</sup>	IV/1987-IV/1988	5-8%	5-8%
February 9-10, 1988	IV/1987-IV/1988	4-8	4-8
June 29-30, 1988	IV/1987-IV/1988	reaffirmed	reaffirmed
June 29-30, 1988 <sup>2</sup>	IV/1988-IV/1989	3-7	3.5-7.5

<sup>1</sup>Ms. Seger dissented. She wanted the 1988 target ranges to be the same as those for the previous year. She stated, however, that she would be willing to reduce these target ranges if economic developments between July 1987 and February 1988 called for such a move.

<sup>2</sup>Ms. Seger dissented. Given the prevailing uncertainty about the economic outlook, she preferred to retain the 4-8 percent range for M2 and M3 at that time.

The Committee decided, as it had in the previous year, not to establish a target range for M1 in 1988:

The behavior of this aggregate in relation to economic activity and prices has become very sensitive to changes in interest rates, among other factors, as evidenced by sharp swings in its velocity in recent years. Consequently, the appropriateness of changes in M1 this year will continue to be evaluated in light of its velocity, developments in the economy and financial markets, and the nature of emerging price pressures.<sup>3</sup>

In setting its 1988 target growth ranges for the broader monetary aggregates, M2 and M3, at 4 to 8 percent, the Committee decided to reduce the lower bound of the range by 1½ percentage points below that established for 1987. The midpoints for the target growth ranges of these two monetary aggregates also were reduced ½ percentage point below the tentative ranges set for 1988.<sup>4</sup> The Committee felt that

such a reduction would help to focus attention on the need for relatively restrained expansion in domestic demand to accommodate the adjustment in the nation's external accounts and would underscore the Committee's commitment to achieving reasonable price stability over time.<sup>5</sup>

Because of continuing uncertainty regarding the velocities of M2 and to a lesser extent M3, the members agreed that widening the target ranges for these aggregates would be appropriate:

In light of the experience of recent years, which have been marked by large swings in velocity, the ranges were widened somewhat. Institutional change is a source of continuing "noise" in the relationship of money growth to economic activity; in addition, there clearly is a strong, systematic sensitivity of velocity to changes in market rates of interest.<sup>6</sup>

Moreover, the wider ranges seemed appropriate given the increased uncertainty about the economic outlook due to the decline in the stock market in October 1987. The Committee noted that "the eventual effects on domestic demand of the October stock market plunge and the subsequent drop in interest rates remained unclear."<sup>7</sup>

At the time the targets were established, the members believed that the growth in the broader monetary aggregates would be around the middle of the targeted ranges. Because of the sensitivity of the M2 and M3 velocities to movements in market interest rates and the increased uncertainty about the economic out-

<sup>3</sup>Record (May 1988), p. 323. See Hafer and Haslag (1988) for a discussion of the Committee's omission of the M1 target. Stone and Thornton (1987) provide a critical analysis of the existing explanations for the recent, puzzling decline in the velocity for M1. Also, Hafer (1986) discusses the impact that the decline in M1 velocity had on the decisions of the FOMC in 1985.

<sup>4</sup>Report (March 1988), p. 152.

<sup>5</sup>Record (May 1988), p. 322.

<sup>6</sup>Report (March 1988), p. 152. Also, see Record (May 1988), p. 322.

<sup>7</sup>Report (August 1988), p. 525. Also, see Record (May 1988), pp. 320-21.

## Organization of the Committee

The Federal Open Market Committee (FOMC) consists of 12 members, including seven members of the Federal Reserve Board of Governors and five of the 12 Federal Reserve Bank presidents. The chairman of the Board of Governors is traditionally elected chairman of the Committee. The president of the New York Federal Reserve Bank, also by tradition, is elected the Committee's vice chairman. All Federal Reserve Bank presidents attend Committee meetings and present their views, but only those who are current members of the Committee are permitted to vote. Four memberships rotate among the Bank presidents and are held for one-year terms commencing March 1 of each year.<sup>1</sup> The president of the New York Federal Reserve Bank is a permanent voting member of the Committee.

Members of the Board of Governors at the beginning of 1988 included Chairman Alan Greenspan, Vice Chairman Manuel H. Johnson, Wayne D. Angell, H. Robert Heller, Edward W. Kelley, Jr. and Martha R. Seger.<sup>2</sup> John P. LaWare joined the Board in August 1988.

The following Bank presidents voted at the meeting on February 9-10, 1988: E. Gerald Corrigan (New York), Edward G. Boehne (Philadelphia), Robert H. Boykin (Dallas), Silas Keehn (Chicago), and Gary H. Stern (Minneapolis). In March, the Committee membership changed and the presidents' voting positions were filled by E. Gerald Corrigan (New York), Robert P. Black (Richmond), Robert P. Forrestal (Atlanta), W. Lee Hoskins (Cleveland) and Robert T. Parry (San Francisco).

The Committee met eight times at regularly scheduled meetings during 1988 to discuss economic trends and decide the future course of open market operations.<sup>3</sup> As in previous years, telephone consultations were held occasionally between scheduled meetings. During each scheduled meeting, a directive was issued to the Federal Reserve Bank of New York. Each directive contained a

short review of economic developments, the general economic goals sought by the Committee, its long-run monetary growth objectives and instructions to the Manager for Domestic Operations at the New York Bank for the conduct of open market operations. These instructions were stated in terms of the degree of pressure on reserve positions to be sought or maintained. Directives issued earlier in the year qualified the degree of pressure sought with a special reference to the sensitive conditions in the financial markets. The reserve conditions stated in the directive were deemed consistent with specific short-term growth rates for M2 and M3 which, in turn, were considered consistent with desired longer-run growth rates for these monetary aggregates. The Committee also specified intermeeting ranges in the federal funds rate. These ranges provided a mechanism for initiating consultations between meetings whenever it appeared that the constraint of the federal funds rate was inconsistent with the objectives for the behavior of the monetary aggregates.

The account manager has the primary responsibility for formulating plans regarding the timing, types and amount of daily buying and selling of securities in fulfilling the Committee's directive. Each morning the manager and his staff plan the open market operations for that day. This plan is developed on the basis of the Committee's directive and the latest developments affecting money and credit market conditions, the growth of monetary aggregates and bank reserve conditions. The manager also consults with the Board's staff. Present market conditions and open market operations that the manager proposes to execute are discussed each morning in a telephone conference call involving the staff at the New York Bank, one voting president at another Reserve Bank, and the staff at the Board. Other members of the Committee may participate and are informed of the daily plan by internal memo or wire.

<sup>1</sup>Starting in 1990 the one-year terms for membership will be on a calendar-year basis.

<sup>2</sup>Mr. Kelley was absent and so did not vote at the August meeting.

<sup>3</sup>No meetings were held in January, April, July or October.

The directives issued by the Committee and a summary of the discussion and reasons for Committee actions are published in the "Record of Policy Actions of the Federal Open Market Committee." The "Record" for each meeting is released a few days after the next Committee meeting. Soon after its release, it appears in the *Federal Reserve Bulletin*. In addition, "Records" for the entire year are published in the annual report of the Board of Governors. The record for each meeting in 1988 included:

- (1) a staff summary of recent economic developments—such as changes in prices, employment, industrial production and components of the national income accounts—and projections of general price, output and employment developments for the year ahead;
- (2) a summary of recent international financial developments and the U.S. foreign trade balance;

- (3) a summary of open market operations, growth of monetary aggregates and bank reserves and money market conditions since the previous meetings;
- (4) a summary of the Committee's discussion of the current and prospective economic and financial conditions;
- (5) a summary of the monetary policy discussion of the Committee;
- (6) a policy directive issued by the Committee to the Federal Reserve Bank of New York;
- (7) a list of the members' votes and any dissenting comments; and
- (8) a description of any actions regarding the Committee's other authorizations and directives, and reports on any actions that might have occurred between the regularly scheduled meetings.

look, however, the Committee recognized that outcomes consistent with the Committee's goals could differ. Accordingly, the Committee sought greater leeway in targeting money growth. The greater leeway or flexibility was afforded by the 1 percentage-point increase in the width of the targeted ranges for M2 and M3.<sup>8</sup> Furthermore, to assure the consistency of its actions with its long-term objectives, the Committee felt, as in previous years, that it would be necessary to monitor the behavior of the broader monetary aggregates in light of indicators of the strength of expansion of economic activity, price pressures and conditions in financial markets, including the market for foreign exchange.<sup>9</sup>

When the Board presented the July Report to the Congress, the broad monetary aggregates were growing at annual rates of approximately 7 percent, close to the upper bounds of their targeted ranges. Nevertheless, the Committee expected that M2 growth would moderate sufficiently in the second half of 1988 so that its

growth rate over the full year would fall around the middle of its targeted range. The lower growth rate in M2 for the second half of the year was thought to be consistent with the expected and desired lower growth in output needed to achieve price stability goals. While some members expected that M3 growth over the full year would exceed that of M2, they did not expect it to exceed the upper bound of its range. Thus, the 1988 growth rate ranges for M2 and M3 established in February were reaffirmed in July 1988.<sup>10</sup>

In its July Report, the Committee provisionally set the 1989 target ranges for M2 and M3 at 3 to 7 percent and 3.5 to 7.5 percent, respectively. Given the high levels of resource utilization and the resurging fears of future inflation at that time, a majority of the Committee agreed that reducing the ranges for 1989 would be consistent with the Federal Reserve System's goal of price stability and would communicate the System's intention to pursue that goal.<sup>11</sup>

<sup>8</sup>Report (August 1988), p. 525 and Record (May 1988) p. 322. Some members were wary of such widening, as it might signal "a further retreat from effective monetary targeting" and partially remove a "desirable discipline" requiring re-evaluation of policy if the monetary aggregates deviated from otherwise narrower targeted ranges. See Record (May 1988), pp. 322-23.

<sup>9</sup>Report (March 1988), pp. 152-53. Also, see Greenspan (1988), pp. 612-13. Nuetzel (1987) discusses the Commit-

tee's move to place greater weight on indicators of economic activity and price pressures relative to the behavior of the monetary aggregates to guide the implementation of monetary policy. Also, see Heller (1988).

<sup>10</sup>Record (October 1988), p. 658.

<sup>11</sup>Report (August 1988), pp. 518-19, and Record (October 1988), p. 658.

Table 2

**Actual and Expected Money Growth in 1988**

Aggregate	Target range <sup>1</sup>	Actual <sup>2</sup>
M2	4-8%	5.2%
M3	4-8	6.3

<sup>1</sup>The target period for M2 and M3 is from IV/1987 to IV/1988.

<sup>2</sup>Data are taken from the Board of Governors' H.6 release (February 23, 1989).

The Committee also reaffirmed the need to maintain some flexibility in the general strategy for monetary policy:

Recognizing the variability of the relationship of these measures [M1, M2, M3 growth rates] to the performance of the economy, the Committee agreed that operating decisions would continue to be made not only in light of the behavior of the monetary aggregates, but also with due regard to developments in the economy and financial markets, including attention to the sources and extent of price pressures and to the performance of the dollar in foreign exchange markets.<sup>12</sup>

Continued uncertainties about the economic outlook and the relation between the growth in the monetary aggregates and other key economic variables also prompted the Committee to maintain the wider target ranges for M2 and M3 growth and, once again, to forego establishing a target for M1 growth.

Table 2 shows that the actual 1988 growth rates in M2 and M3 — 5.2 percent and 6.3 percent, respectively — were within their target ranges; however, M2 and M3 growth rates fluctuated considerably during the year. These fluctuations influenced the Committee's short-run policy decisions during 1988.

**SHORT-RUN POLICY OBJECTIVES**

The Committee holds eight meetings during the year to determine, in light of the economic

environment, the changes in short-run monetary policy necessary to achieve its long-term goals. The Committee formulates a domestic policy directive to serve as a basis for the day-to-day policy implementation between meetings. The directive is issued to the Federal Reserve Bank of New York where the Manager for Domestic Operations of the System Open Market Account is held responsible for implementing the instructions stipulated in the directive.

Maintaining the approach used in previous years, the directives issued during 1988 placed primary emphasis on the degree of restraint on reserve positions expected to be consistent with the Committee's money growth targets and goals for the economy. Under the current borrowed-reserves operating procedure, the desired degree of reserve restraint translates into a target for borrowed reserves (reserves borrowed from the Federal Reserve Banks). The target level of borrowed reserves (the borrowings assumption) includes adjustment plus seasonal borrowings. A statement in the directive to increase (decrease) the degree of pressure on reserve positions would indicate a higher (lower) target level of borrowed reserves. Inducing the higher (lower) level of borrowed reserves, for a given discount rate, would imply an increase (decrease) in the federal funds rate.<sup>13</sup>

In the first two directives in 1988, however, emphasis was also placed on financial market conditions:

In the aftermath of the stock market crash last October, the Committee modified the System's procedures by placing greater emphasis on money market conditions and less on bank reserve positions in carrying out day-to-day open market operations. . . . During this period, it was considered important to assure the markets of the System's intention to provide adequate liquidity, and it was feared that significant variation in money market conditions could add to the unusual uncertainties already in the markets.<sup>14</sup>

At the beginning of 1988, the Committee believed that, given the fragility of financial markets evidenced by wide fluctuations in bond and

<sup>12</sup>Report (August 1988), p. 518.

<sup>13</sup>Specifically, the amount of borrowed reserves is assumed to be a negative function of its opportunity cost — that is, the difference between the discount rate (the interest rate charged for reserves borrowed from the Federal Reserve System) and the federal funds rate (the interest rate paid on reserves borrowed from the other depository institu-

tions). For a discussion of the implementation of monetary policy under the borrowed-reserves operating procedures, see Gilbert (1985), Heller (1988) and Thornton (1988).

<sup>14</sup>Report (August 1988), p. 528. See also, for example, Record (February 1988), pp. 116-17, Record (April 1988), p. 239, Record (May 1988), p. 324, and Record (July 1988), p. 472.

equity prices, a policy focused primarily on meeting reserve objectives could create excessive volatility in those markets. To avoid or to dampen temporary fluctuations in the money markets, a policy that was flexible with respect to meeting reserve objectives seemed appropriate to the Committee.<sup>15</sup> Toward the middle of 1988, when it appeared that financial markets had stabilized, no reference to sensitive conditions in financial markets was made in the directive.<sup>16</sup>

In addition to stating the desired degree of reserve pressure (maintained, increased or decreased) and possible modifications in the intermeeting period, the directives indicated the expected growth rates in M2 and M3, conditional on the desired degree of reserve pressure, and established a range for the federal funds rate. If the federal funds rate were to diverge from the specified range, the chairman could initiate a Committee consultation in the intermeeting period.

The following discussion highlights key economic developments during 1988 and shows how they influenced the Committee's formulation of short-run policy objectives. Tables 3 and 4 summarize the directives issued in 1988. Table 3 shows the desired degree of reserve pressure, the expected growth rates of M2 and M3, and the monitoring range for the federal funds rate specified in the domestic policy directives. It also reports the borrowings assumption in effect at each meeting.<sup>17</sup> Table 4 lists the policy guides used to determine whether modifications in the degree of reserve pressure would be desirable in the intermeeting period. The ordering of policy guides is as listed in the directives. Finally, table 5 shows the actual (revised) intra-year growth rates in M2 and M3 and the rates expected by the Committee.

### **February 9-10 Meeting**

The data available for review at the first meeting of 1988 suggested that, although the

economy had continued to expand through the fourth quarter of 1987, growth in output was slowing toward the end of the year. Moreover, because consumer spending had slowed substantially in the late months of 1987, the observed growth in production was associated chiefly with an increase in inventories. While Committee members generally thought that increased inventories could exert downward pressure on business activity in the first half of 1988, some members believed such pressure would be limited.<sup>18</sup>

The Board's staff projected that the growth in output over 1988 would be fueled primarily by growth in export demand. Their projections indicated that output growth would be sluggish in the first half of the year, but would build momentum in the second half. The projected transition from an expansion driven by growth in consumer demand to one driven by growth in export demand generated some uncertainty among the members about the economic outlook. In addition, some members expressed concern about the possibility of lagging effects of the October 1987 stock market crash on consumer and business spending and about the sensitivity of financial markets.<sup>19</sup>

The Committee's long-run concerns centered on the possibility of higher future inflation because of the strong growth in demand and the high levels of capacity utilization. Although available economic data reflected only modest wage increases, the Committee thought that continued expansion with lower rates of unemployment and rising prices inevitably would result in higher wage demands and wage increases.<sup>20</sup> Furthermore, there was some evidence that higher production costs were resulting in higher retail prices. The members believed that "the key to avoiding both more inflation or a recession in a period of major adjustments in the trade balance would be the dif-

<sup>15</sup>Record (May 1988), p. 324. See also footnote 14. At the March meeting, however, some members indicated that such fluctuations in money market interest rates were not "detracting from the functioning of the market or the implementation of policy." Provided that market participants understood the System's procedures, fluctuations in money market interest rates would reveal movements in expectations of market participants and changes in the market for reserves and credit. See Record (July 1988), p. 472.

<sup>16</sup>Report (August 1988), p. 528, and Record (August 1988), p. 542.

<sup>17</sup>The borrowing assumptions were not explicitly stated in the directives.

<sup>18</sup>Record (May 1988), p. 320.

<sup>19</sup>*Ibid.*, p. 320-21.

<sup>20</sup>*Ibid.*, p. 322. Also, in January, growth in M2 and M3 had recovered from the sluggish pace at the end of 1987. In January, M2 grew at an annual rate of 8.8 percent, up from 2.2 percent in December. Similarly, M3 grew at an annual rate of 8.1 percent in January, up from 2.4 percent in December.

**Table 3**  
**The FOMC's Short-Run Operating Ranges**

Date of meeting	Target period	Expected growth rates		Degree of reserve pressure	Intermeeting federal funds range	Borrowings <sup>1</sup> assumption
		M2	M3			
February 9-10, 1988	November-March	6-7%		Maintain, with flexibility	4-8%	\$200 million
March 29, 1988 <sup>2</sup>	March-June	6-7		Increase somewhat with flexibility	4-8	300
May 17, 1988 <sup>3</sup>	March-June	6-7		Maintain pressure initially, with probable increase later	5-9	400
June 29-30, 1988 <sup>4</sup>	June-September	5.5%	7%	Increase slightly	5-9	600
August 16, 1988 <sup>5</sup>	June-September	3.5	5.5	Maintain	6-10	600
September 20, 1988	August-December	3	5	Maintain	6-10	600
November 1, 1988 <sup>6</sup>	September-December	2.5	6	Maintain	6-10	600
December 13-14, 1988 <sup>7</sup>	November-March	3	6.5	Increase slightly	7-11	500

<sup>1</sup>The borrowings assumption in effect immediately after the December 15-16, 1987, meeting was \$300 million. Changes in the borrowings assumption were made in some of the intermeeting periods. These changes were made in light of incoming information indicating that increased or decreased pressure on reserve positions was desirable or when a shift in the borrowings function was identified. (See, for example, the discussion of the December meeting.)

<sup>2</sup>Ms. Seger dissented. She thought that the risk of additional inflation was less than the downside risks; in particular, she argued that tightening of reserve conditions could be especially harmful, given the sensitivity of financial markets and the weakened condition of many depository institutions.

<sup>3</sup>Messrs. Hoskins and Parry dissented. Past efforts to tighten reserves were insufficient, in their view, to counter the additional inflationary pressures that were inevitable given the current trend of expansion and prospects for future expansion with already tight labor markets. Thus, failure to tighten reserve conditions now would require much greater tightening in the future. Mr. Hoskins also noted that growth of the monetary aggregates was already near the upper limit of the target ranges and that failure to increase the degree of pressure on reserves under current circumstances would detract from the credibility and consequently effectiveness of monetary policy.

<sup>4</sup>Messrs. Angell and Kelley and Ms. Seger dissented. They preferred to maintain the current degree of reserve restraint, at least for the initial period following the meeting. Mr. Angell emphasized that the effects of previous restraining actions had not yet fully emerged, and expressed concern about the potentially counterproductive effect of further restraint on the dollar and thus on improvements in the external balances. Mr. Kelley recognized that inflation had the potential to accelerate, but he felt that there was insufficient evidence to justify further tightening at this time and thereby incur the risk of undue slowing in economic growth. Ms. Seger stressed that slower economic growth was already suggested by current business indicators, and in the context of earlier tightening actions whose impact had not yet fully materialized, she concluded that further tightening would create an unnecessary risk to the economic expansion.

<sup>5</sup>Mr. Hoskins dissented. Pointing to the current indications of increasing price pressures, he felt that increased pressure on reserve conditions would be more consistent with the Committee's long-run price stability objectives. He thought that such an action would enhance the credibility of the Fed's stated anti-inflationary intentions.

<sup>6</sup>Ms. Seger dissented. She believed that the bias in the directive toward further restraint was not appropriate in light of the recent indications of the slower economic expansion and her outlook for reduced price pressures in the next year.

<sup>7</sup>Ms. Seger dissented. She thought that the future pace of economic expansion would be compatible with progress in reducing inflation. In her view, given the restrained growth of the monetary aggregates, additional restrictive actions could add significantly and unnecessarily to pressures on interest-sensitive sectors of the economy and increase the downside risks in the economy.

**Table 4**  
**Ordering of Guides to Monetary Policy**

<b>Date of meeting</b>		
February 9-10, 1988	}	Financial markets, business expansion, inflation, foreign exchange, monetary aggregates.
March 29, 1988		
May 17, 1988		
June 29-30, 1988	}	Inflation, business expansion, foreign exchange, financial markets, monetary aggregates.
August 16, 1988	}	Inflation, business expansion, monetary aggregates, foreign exchange, financial markets.
September 20, 1988		
November 1, 1988		
December 13-14, 1988		

NOTE: This ordering is as listed in the domestic policy directives.

**Table 5**  
**Actual and Expected Rates of Money Growth**

<b>Period</b>	<b>M2</b>		<b>M3</b>	
	<b>Expected</b>	<b>Actual<sup>1</sup></b>	<b>Expected</b>	<b>Actual<sup>1</sup></b>
November 1987-March 1988	about 6-7%	6.8%	about 6-7%	7.2%
March-June 1988	about 6-7	6.0	about 6-7	6.5
June-September 1988 <sup>2</sup>	about 3.5-5.5	2.9	about 5.5-7	5.2
August-December 1988	about 3	4.0	about 5	5.3
September-December 1988	about 2.5	4.6	about 6	5.8

<sup>1</sup>Actual growth rates are taken from the Board's release.

<sup>2</sup>The June-to-September growth rates for M2 and M3 were revised to 3.5 percent and 5.5 percent, respectively, from 5.5 percent and 7.0 percent at the August 16 meeting of the FOMC.



ficult task of maintaining restrained growth in domestic demands over an extended period.”<sup>21</sup>

In an effort to strike a balance between the risks associated with a possible weaker expansion in the short run and those of future inflation, the Committee's directive called for maintaining the degree of pressure on reserve positions.<sup>22</sup> Because of the uncertainties revolving around financial market conditions and the economic outlook, the directive indicated that some flexibility in the implementation of monetary policy might be appropriate. In particular,

... financial market conditions still exhibited some degree of fragility and, against the background of substantial uncertainty in the economic outlook, unanticipated developments might well continue to warrant occasional departures from the focus on reserve objectives for the purpose of moderating temporary fluctuations in money market conditions.<sup>23</sup>

In addition, depending on financial market conditions as well as forthcoming indications of economic activity and price pressures, greater or lesser reserve restraint would be appropriate in the intermeeting period.<sup>24</sup>

The Committee anticipated that the reserve conditions would be consistent with an annual rate of growth for M2 and M3 of about 6 to 7 percent from November to March. The monitoring range for the federal funds rate was set at 4 to 8 percent.<sup>25</sup>

### **March 29 Meeting**

In the intermeeting period, strong growth in M2 and M3 continued.<sup>26</sup> The level of adjustment

plus seasonal borrowings averaged \$238 million, just above the borrowings assumption, and the federal funds rate averaged 6.59 percent during the six-week period ending March 23.<sup>27</sup>

Economic data indicated that the economy had continued to expand during the first quarter of 1988; however, growth in output was slower than that in the last few months in 1987. A large part of the moderation in output growth was attributed to the deceleration in inventory investment, as businesses corrected their previously high inventories. The ongoing expansion was driven largely by the unexpected, marked increase in domestic final demand in the first quarter.<sup>28</sup>

Although inflation and wage trends essentially were unchanged, the Committee's concerns about future inflationary pressures were not eased substantially. The February rate of unemployment was 5.7 percent, its lowest level since the middle of 1979. Capacity utilization rates were relatively high in many industries. In addition, during the intermeeting period, the dollar had declined 2.25 percent on a trade-weighted basis relative to the other G-10 currencies. Many argued that this decline, perhaps reflecting a skepticism in the world market about the speed with which the U.S. trade deficit was adjusting, could provide an additional potential source of upward movement in prices.<sup>29</sup> Moreover, the staff revised upward their forecasts of future economic expansion. Committee members generally felt that, with high rates of capacity utilization in many industries, additional price pressures would be created by increased domestic and export demand growth.<sup>30</sup>

<sup>21</sup>Ibid.

<sup>22</sup>Ibid., p. 324. There was also concern that further easing of the degree of reserve pressure could have an adverse effect on the dollar in foreign exchange markets and on financial markets, unless market participants believed that the economy was weakening (Ibid.). It should be noted that the decline in the borrowings assumption from the December 1987 to the February 1988 meetings (as shown in table 3) reflects reduced reserve pressure that had been implemented in the intermeeting period.

<sup>23</sup>Ibid., p. 324.

<sup>24</sup>Ibid., p. 326.

<sup>25</sup>Ibid.

<sup>26</sup>In February, M2 and M3 grew at annual rates of 8.6 and 10.1 percent, respectively, and in March, M2 and M3 grew at annual rates of 7.8 and 8.2 percent, respectively.

<sup>27</sup>Record (July 1988), p. 469. Around the time of the February meeting, the federal funds rate was about 6½

percent. See Record (May 1988), p. 320.

<sup>28</sup>Ibid., p. 468-69.

<sup>29</sup>Ibid. Currencies of Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland and the United Kingdom are included in the trade-weighted G-10 index, used by the Federal Reserve Board as a measure of the relative strength of the dollar in foreign exchange markets. When the value of the dollar falls, holding all else constant, goods produced in the United States become more attractive to foreign importers and individuals in the United States than goods produced elsewhere. The resulting shift in demand can create domestic price pressures. Furthermore, a dollar depreciation can increase the cost of production for firms relying heavily on imported intermediate goods, thereby creating additional price pressures.

<sup>30</sup>Ibid., p. 470-71.

In the discussion, some Committee members suggested that the effects of high capacity utilization had not yet fully shown up in price and wage growth because of individuals' expectations of a policy response to increased inflation.<sup>31</sup> Moreover, consumer prices and wages had not yet exhibited signs of acceleration because of the recently declining energy prices and the relatively small increases in food prices.<sup>32</sup> Nevertheless, the members believed that any added pressure on wages "would make achievement of the ultimate objective of price stability considerably more difficult."<sup>33</sup>

As table 3 shows, the policy directive issued at the close of the meeting called for a marginal increase in pressure on reserve positions to slow the growth of the broader monetary aggregates. Such an action, reflected in the increased borrowings assumption, was thought to be consistent with annual growth rates in M2 and M3 of 6 to 7 percent for the period from March to June, a slowdown from their rapid growth rates in the first quarter.

Given the uncertainties about the economic outlook and concerns about the fragility of financial markets, the Committee again voted to permit the focus of day-to-day implementation of monetary policy to shift away from reserve objectives if necessary. Furthermore, depending on forthcoming information as indicated in table 4, greater or lesser reserve restraint would be acceptable in the intermeeting period. The monitoring range for the federal funds rate was maintained at 4 to 8 percent.<sup>34</sup>

### May 17 Meeting

Immediately following the March meeting, some actions were taken to firm reserve positions slightly. Adjustment plus seasonal borrowings averaged about \$330 million during the four-week period ending April 20 and averaged \$440 million between April 21 and May 4. Additional restraint on reserve positions was implemented just before the May meeting "in light of

information that indicated considerable strength in the economy and a related increase in concerns about the potential for greater inflation."<sup>35</sup> By the May meeting, the federal funds rate had risen to 7 percent.

As had been expected, strong growth in domestic and export sectors continued to boost economic growth. Preliminary statistics suggested that unemployment in April declined to 5.4 percent, its lowest rate since 1974, and capacity utilization rates had increased substantially. From March to April, the industrial production index had risen at an annual rate of 6.4 percent; moreover, the U.S. merchandise trade deficit had improved in March. The continued strength in economic expansion was accompanied by a slight weakening of the dollar and signs of increased inflationary pressure and higher labor costs.<sup>36</sup>

The staff's forecasts for the economic outlook depended partly on how the added risks of greater inflation and wage growth would affect financial markets. If the added risks placed pressures on financial markets so as to restrain final domestic demand, "the extent and duration of any pickup of inflation might be limited."<sup>37</sup> The forecasts indicated that, in this case, reduced growth in domestic demand combined with the current large inventories eventually could reduce the rate of inventory investment. Furthermore, the staff predicted that growth in business fixed investment would fall and real federal purchases would decline. Nevertheless, in light of the weakening dollar and the high capacity utilization rate, growth rates of prices and wages were expected to increase in the coming quarters.<sup>38</sup>

The majority of the members generally agreed that additional restraint was needed. In their discussion, the risks of excessive expansion and augmented inflationary pressures seemed to dominate the economy's downside risks due to increased inventories, fragile conditions in financial markets and a relatively weak outlook for

<sup>31</sup>Ibid., p. 470.

<sup>32</sup>Ibid., p. 469.

<sup>33</sup>Ibid., p. 471.

<sup>34</sup>Ibid., pp. 473-74.

<sup>35</sup>Record (August 1988), p. 539.

<sup>36</sup>Record (August 1988), pp. 538-39. For example, the seasonally adjusted consumer price index for all urban consumers had risen at annual rates of 5.3 percent in

April and 4.2 percent in March, up from 2.1 percent in February. Further, the seasonally adjusted producer price index for finished goods rose 4.6 percent and 3.4 percent, respectively, in March and April, after not changing in February. Note that the civilian unemployment rate in April has been revised to 5.5 percent.

<sup>37</sup>Ibid., p. 540.

<sup>38</sup>Ibid.

construction. In addition, the importance of maintaining credibility was noted:

...the members generally agreed that some further tightening of reserve conditions was needed to counter the risks of rising inflationary pressures in the economy. A failure to act in timely fashion not only would be inconsistent with the Committee's commitment to achieving price stability over time but would in fact compound the difficulties of accomplishing that objective.<sup>39</sup>

The Committee members disagreed, however, about the extent and timing of additional tightening of reserves. Immediate action was considered by some to be potentially damaging to financial markets unless market participants anticipated such an action. Further, the impact of the previous move to increase pressure had not yet been fully realized in terms of growth of domestic demand. Finally, growth in the monetary aggregates was expected to slow, primarily because of a reversal of the temporary rise in transaction accounts related to taxes during April. Yet, others thought that immediate action could have a favorable effect on inflation expectations and reduce the need for increased restraint in the future.<sup>40</sup>

The Committee's directive called for maintaining the existing pressure on reserve positions in the initial period following the meeting with possibly higher pressure after some weeks depending on forthcoming information.<sup>41</sup>

In contrast to prior directives since the stock market crash in October 1987, this directive did not explicitly include a special reference to the sensitive conditions in the financial markets that required some flexibility in the conduct of open market operations. The members felt that the "normal" approach to the implementation of monetary policy—that is, with primary emphasis on the degree of pressure on reserve positions and less emphasis on money market conditions — would be appropriate; the special reference "no longer served a clarifying purpose in communicating the Committee's intentions."<sup>42</sup>

The directive issued at the close of this meeting, however, did not fully abandon the spirit of flexibility; financial markets would continue to be closely monitored. Although the primary focus of the directive was placed on meeting reserve objectives, changes in those objectives could be made in light of incoming information in the intermeeting period. The directive stated that, depending on further developments in the economy, "somewhat greater reserve restraint would, or slightly lesser reserve restraint might, also be acceptable later in the intermeeting period."<sup>43</sup>

The reserve conditions contemplated by the Committee were expected to be consistent with a 6 to 7 percent annual growth rate in M2 and M3 from March to June. The monitoring range for the federal funds rate was increased by 1 percentage point to 5 to 9 percent, because of past actions to increase the pressure on reserve positions and possible further restraint.<sup>44</sup>

### *June 29-30 Meeting*

Actions were taken to increase the degree of pressure on reserve positions as suggested by the May directive. Adjustment plus seasonal borrowings averaged \$530 million in the four weeks ending June 15. The federal funds rate rose from 7 percent around the time of the prior meeting to approximately 7 3/8 to 7½ percent by the middle of June. Despite the additional restraint imposed on reserve positions in the latter part of June, however, adjustment plus seasonal borrowing averaged only about \$520 million over the two weeks ending June 29. Nonetheless, the federal funds rate rose further to about 8 percent and, as expected by Committee members, growth in M2 and M3 fell from their robust pace earlier in the year.<sup>45</sup>

From the May to the June meetings, the strong expansion in economic activity continued.

<sup>39</sup>Ibid.

<sup>40</sup>Ibid., pp. 540-41.

<sup>41</sup>The increase in the borrowings assumption from the previous meeting, as indicated in table 3, reflects actions in the intermeeting period to increase reserve pressure and, hence, is consistent with the stated desired degree of reserve pressure. It should be noted that the increase in the borrowings assumption does not reflect the expectation of additional restraint in the beginning of the intermeeting period.

<sup>42</sup>Ibid., p. 542.

<sup>43</sup>Ibid., p. 543. As indicated in table 4, although the special reference to "sensitive" conditions in financial markets was absent from the directive, conditions in financial markets were first on the list of policy guides in the directive issued at the May meeting.

<sup>44</sup>Ibid.

<sup>45</sup>Record (October 1988), p. 655. Annualized growth in M2 fell from 8.8 percent in April to 3.9 percent in May, and annualized growth in M3 fell from 7.8 percent in April to 4.9 percent in May.

While unemployment rose to 5.6 percent in May, it was still below its average in the first quarter. Moreover, the industrial production index grew at a relatively fast pace of 6.4 percent from April to May. The information reviewed by the Committee indicated that the impetus to the current expansion was continued growth in both domestic and export demands. Improvements in the external accounts, due mostly to a decline in imports, was accompanied by a sharp appreciation of the dollar.<sup>46</sup> Furthermore, signs of increased price pressures were clear. The consumer price index was moving at a pace close to the average in the first quarter, but producer prices and average hourly earnings were gaining momentum in May.<sup>47</sup>

Staff forecasts suggested that the growth in economic activity would be moderated by several factors, including the impact of the drought on agricultural output and a more pronounced slowdown in inventory investment than was originally expected. In addition, recent pressures on financial markets — particularly, the rise in interest rates — could restrain future growth in domestic spending. Because of further improvements in the U.S. trade balance, however, the expansion was expected to continue, though at a reduced pace.<sup>48</sup>

Concerned about the credibility of its goal to achieve reasonable price stability, some members suggested that maintaining the current degree of restraint might create a signal of easier monetary policy. Others felt that increased restraint might be excessive. In particular, the effects of earlier actions to place greater pressure on reserve positions had not yet fully materialized in terms of the strength of business expansion. Moreover, further restraint would impose added pressure on an already stronger dollar, supported by recent improvements in the trade balance and expectations of tight monetary policy, with adverse implications for the needed improvement in external balances.<sup>49</sup>

A majority of the members voted for a slightly increased degree of pressure on reserve positions, as indicated in table 3. Additional restraint or ease would depend on the forthcoming indications of inflationary pressures, business expansion, future developments in the foreign exchange and domestic financial markets and the behavior of monetary aggregates. The reserve conditions contemplated were expected to be consistent with annual growth rates in M2 and M3 of 5.5 percent and 7 percent, respectively, from June to September. The monitoring range for the federal funds rate was maintained at 5 to 9 percent.<sup>50</sup>

### August 16 Meeting

Following the June meeting, as specified in the June directive, more restrictive actions were taken. In the first two weeks of July, average adjustment plus seasonal borrowings surged to \$1.3 billion, reflecting a large increase in borrowings over the long July 4 weekend and other special circumstances. In the subsequent four weeks, adjustment plus seasonal borrowings fell back to around the targeted level of \$600 million, and preliminary evidence indicated that the growth of the broader monetary aggregates, especially M2, fell in July.<sup>51</sup>

During the intermeeting period, incoming data indicated a further expansion of economic activity and additional inflationary pressures. Preliminary evidence suggested that the industrial production index rose at an annual rate of 13 percent from June to July. Moreover, the capacity utilization rate for all industries in June was estimated to be 85.1 percent, up from the second quarter average of 82.9 percent.<sup>52</sup> The seasonally adjusted producer price index for finished goods had increased at an annual rate of 6.9 percent from June to July. The federal funds rate had risen recently from its average rate in June — from around 7¾ percent to 7 7/8 percent — and on August 9, the

<sup>46</sup>*Ibid.*, pp. 654-55. Since the last meeting, the dollar had appreciated 6 percent on a weighted average basis in relation to the other G-10 currencies.

<sup>47</sup>*Ibid.*

<sup>48</sup>*Ibid.*, pp. 655-57.

<sup>49</sup>*Ibid.*, p. 660.

<sup>50</sup>*Ibid.*, pp. 660-61.

<sup>51</sup>Record (November 1988), p. 755. Revised annual growth rates in M2 were 5.5 and 4.4 percent, respectively, for

June and July, and M3 grew at annual rates of 6.8 and 7.3 percent respectively for June and July.

<sup>52</sup>The estimate for the annual growth rate in the industrial production index from June to July has been revised to 14 percent. Also, the estimated capacity utilization rate for total industry during June has been revised to 83 percent.

Board increased the discount rate from 6 percent to 6.5 percent.<sup>53</sup>

By the August meeting, the expansion in economic activity appeared to have strengthened, with indications of accelerating prices and labor costs. Total nonfarm payroll employment rose sharply in June and July, and the unemployment rate in July was below the second-quarter average. While the consumer price index had not risen substantially, chiefly because of declining oil prices, recent movements in the producer price index were indicative of accelerating prices. The dollar had risen 2.5 percent compared with the other G-10 currencies since the June meeting, reflecting further improvement in the trade balance and the recent tightening of reserve conditions.<sup>54</sup>

Other effects of the previous tightening were starting to emerge. In particular, the expansion of the monetary aggregates had exhibited a marked deceleration in recent months, and interest rates had risen 50 to 75 basis points since the June meeting. The staff continued to expect pressures in financial markets to restrain domestic spending. Despite the appreciation of the dollar, the staff expected continued improvements in the nation's trade balance to be the driving force to further economic expansion. The relatively high rates of capacity utilization were perceived to point to increased inflationary pressures.<sup>55</sup>

The members agreed that, given the recent rise in the discount rate, it would be appropriate to maintain the current degree of pressure on reserve conditions. While many members felt that further tightening of reserve conditions might well be needed, others thought that previous moves to tighten might prove to be sufficient. Some members argued that increased pressure could induce an excessive, upward movement in the dollar and thereby inhibit further improvement in the external balance. Some also expressed concerns that an increase in in-

terest rates could have adverse effects on debtors and troubled financial intermediaries. Others pointed out that increased inflationary pressures would have a similar effect by fostering even higher nominal interest rates.<sup>56</sup>

As reported in table 3, the directive adopted by the Committee called for maintaining the current reserve conditions, although greater or lesser restraint might be appropriate in the intermeeting period, depending on the behavior of prices and economic indicators. The reserve conditions contemplated by the Committee were expected to be consistent with annual growth rates of approximately 3.5 and 5.5 percent, respectively, for M2 and M3 from June to September. In light of the recent increase in the discount rate, the directive increased the federal funds monitoring range to 6 to 10 percent.<sup>57</sup>

### September 20 Meeting

Reserve conditions hardly changed in the intermeeting period. The federal funds rate averaged about 8 1/8 percent over the period, close to the level prevailing at the time of the August meeting, and the growth of the monetary aggregates continued to decline.<sup>58</sup>

Information available for review at the September meeting suggested a slight moderation in expansion of economic activity from the intense pace earlier in the year. The moderation was especially evident in labor markets; although there were substantial gains in nonfarm payroll employment in July and August, the pace of growth had slowed, and the unemployment rate rose to 5.6 percent in August. Similarly, capacity utilization rates remained generally high, but rates in manufacturing edged lower. Further, gains in industrial production in August were much smaller than they had been in previous months.<sup>59</sup>

Recent developments in domestic spending also suggested that the pace of economic expan-

<sup>53</sup>By the August meeting, the federal funds rate was approximately 8 1/8 percent. See Record (November 1988), p. 755.

<sup>54</sup>Ibid., pp. 754-55.

<sup>55</sup>Ibid., pp. 755-56.

<sup>56</sup>Ibid., p. 757.

<sup>57</sup>Ibid., pp. 758-59. An increase in the discount rate without a change in the borrowings assumption is a restrictive policy. To maintain the borrowings assumption with a given increase in the discount rate that initially reduces

the level of borrowed reserves, the Federal Reserve must remove nonborrowed reserves from the economy until the federal funds rate increases enough to restore the level of borrowed reserves back to its assumed level.

<sup>58</sup>Record (January 1989), p. 21. M2 grew at an annual rate of 2.3 percent in August, while M3 grew at an annual rate of 4.6 percent over the same period.

<sup>59</sup>Ibid., p. 20.

sion was slowing. Growth in sales of nondurable goods was sluggish and the level of sales of durables had fallen in July and August. In addition, the U.S. merchandise trade deficit had dropped substantially in July, primarily because of a reduction in imports. The weakening of the dollar earlier in the intermeeting period, attributed to reports of soft employment conditions, was virtually offset by the strengthening of the dollar due to the trade reports.<sup>60</sup>

Despite evidence that economic growth was slowing from its pace in the summer, price pressures persisted. While the seasonally adjusted producer price index of finished goods increased at an annual rate of 3.4 percent in August, down from a 6.9 percent increase in July, the seasonally adjusted consumer price index for all urban consumers increased at an annual rate of 5.2 percent in July, up from 4.1 percent in August and 4.2 percent in June. Increased price pressures were perceived to be driven by the substantial increases in food prices resulting from the summer drought and increasing gasoline prices.<sup>61</sup>

In their discussion of objectives for short-run policy, the members took into account the recent moderation in monetary growth. (Table 5 shows the deceleration in the expansion of M2 and M3 from June to September.) In the view of at least some members, this moderation would tend to restrain future domestic spending, thereby reinforcing the recent slowdown of the economic expansion. Although some members felt that previous actions to tighten might prove to be sufficient to achieve expansion in economic activity consist with reasonable price stability, many remained concerned that the risks of inflation might intensify:

Some favorable developments that had tended to dampen inflation, such as declining oil prices and a rising dollar, might well be reversed. More fundamentally, given current utilization rates of labor and other production resources, the economy was probably near the point where expansion at a rate somewhat above the economy's trend growth potential could result in greater pressures on wages and prices.<sup>62</sup>

Some members, pointing to recent movements

in expectations of inflation as revealed in financial markets, especially for long-term debt, saw a greater possibility that the economy might be on a less-inflationary course.<sup>63</sup>

The Committee's directive called for an unchanged degree of pressure on reserve conditions until more information, suggesting the desirability of an alternative policy action, became available. (See tables 3 and 4.) Those believing that inflation could intensify were willing to wait for additional evidence. The previous restrictive policy actions might have been sufficient to avoid additional inflation. Further tightening could have a disruptive impact on financial markets and an unwanted effect on the dollar that could hamper or even reverse improvements in the U.S. external balances.

The Committee was prepared to take the measures needed to carry out its anti-inflationary commitment. In particular, all members agreed to adopt a

... directive that would more readily accommodate a move toward firming than an adjustment toward easing in the weeks ahead. Some commented that near-term developments were not likely to call for a policy change in this period, while others saw a greater likelihood that intermeeting developments would point to the desirability of some firming. The potential need for some easing was viewed as remote.<sup>64</sup>

The members expected that the contemplated reserve conditions would be consistent with annual growth rates of 3 percent and 5 percent, respectively, for M2 and M3 over the period from August to December. The monitoring range for the federal funds rate was maintained at 6 to 10 percent.<sup>65</sup>

### **November 1 Meeting**

Between the September and November meetings, adjustments plus seasonal borrowings averaged about \$630 million, just above the borrowings assumption, and the average federal funds rate rose to about 8¼ percent. Growth in the monetary aggregates continued to fall in September; preliminary data indicated that M2 growth had been particularly weak in October.<sup>66</sup>

<sup>60</sup>Ibid., pp. 20-21.

<sup>61</sup>Ibid.

<sup>62</sup>Ibid., p. 22.

<sup>63</sup>Ibid., p. 21.

<sup>64</sup>Ibid., p. 23.

<sup>65</sup>Ibid.

<sup>66</sup>Record (February 1989), p. 67. Revised statistics indicate that M2 grew at annual rates of 2.1 and 2.9 percent, respectively, in September and October. The annualized growth rate for M3 increased from 3.6 percent in September to 5.4 percent in October.

Reinforcing the evidence from the previous meeting, the data available at the November meeting revealed a moderation in the expansion of economic activity. Although the civilian unemployment rate fell to 5.4 percent in September, third-quarter growth in total non-farm payroll employment fell from its pace in the first half of the year. Preliminary evidence showed that industrial capacity utilization fell slightly in September, but the rate was still relatively high, and the pace of growth in industrial production slowed from its fast pace in the summer months. Moreover, private domestic final demand exhibited substantially slower growth in the third quarter than it had in the first half of the year.<sup>67</sup>

The Committee welcomed evidence of a slowdown in economic growth; however, the evidence did not mitigate its concern about the risks of greater inflationary pressures in the future. At the producer and consumer levels, inflation had declined slightly in September relative to August, because of falling energy prices, and wage increases were modest. But, the third-quarter average rates of growth in the consumer and producer price indexes exceeded their respective average growth rates for the first half of 1988.<sup>68</sup> Furthermore, the dollar had depreciated significantly relative to the other G-10 currencies since the August meeting.<sup>69</sup>

Forecasts by the staff suggested that "any decline in inflation would be limited, largely because of continuing pressures stemming from still strong demands pressing against reduced margins of unutilized labor and other production resources."<sup>70</sup> The majority of the members expected that the economic expansion would continue at a more moderate pace in the coming months "partly in light of the monetary policy tightening that already had been implemented this year."<sup>71</sup> Additional improvements in

the trade balance and increases in inventory investments were expected to contribute to continuing economic growth.

Despite the Committee's concern about future inflationary pressures, a majority of the members believed that the "current relatively balanced performance of the economy and the uncertainties surrounding the outlook argued for an unchanged policy at this point."<sup>72</sup> As table 3 indicates, the directive called for maintaining the current degree of pressure in reserve positions. However, most of the members believed that policy implementation should continue to be especially alert to possible economic developments that could warrant some firming in the intermeeting period. Placing additional or less pressure on reserve positions might be acceptable depending on developments in the intermeeting period. (See table 4.) Most of the members anticipated that additional restraint would be warranted in the intermeeting period.<sup>73</sup> The reserve conditions contemplated were expected to be consistent with annual growth rates of 2½ percent and 6 percent, respectively for M2 and M3 from September to December.<sup>74</sup>

### **December 13-14 Meeting**

In the several weeks after the November meeting, it became apparent that the relation between borrowed reserves and the federal funds rate had changed. The demand for borrowed reserves seemed to shift back so that a given level of borrowed reserves was associated with a higher federal funds rate. To accommodate the shift, the borrowings assumption was reduced, thereby putting downward pressure on the federal funds rate. Because incoming information indicated that the strength of economic expansion was greater than expected and contained greater potential for inflation than desired by the Committee, the accommodation was only partial; therefore, the adjusted

<sup>67</sup>Ibid., p. 66.

<sup>68</sup>Ibid., pp. 66-67. For example, in the third quarter, annual growth in the seasonally adjusted consumer price index rose to 4.7 percent, up from 3.7 percent in the first quarter and 4.5 percent in the second quarter.

<sup>69</sup>Ibid., p. 67. Between August and October, the dollar had depreciated 3.25 percent on a trade-weighted basis in relation to the other G-10 currencies.

<sup>70</sup>Ibid., p. 68.

<sup>71</sup>Ibid.

<sup>72</sup>Ibid., p. 69.

<sup>73</sup>Ibid., p. 69-70. Such a "bias" toward potential restraint appears to have been partly driven by what the Committee perceived as a "continuing need to sustain the System's commitment to its long-run objective of controlling inflation, including the desirability of making clear that the current rate of inflation was unacceptable." See Record (February 1989), p. 69.

<sup>74</sup>Ibid., p. 70.

borrowings assumption was expected to be consistent with a slightly higher federal funds rate. The average rate at which federal funds traded over the intermeeting period rose from around 8¼ percent to 8½ percent. In general, rates in short-term credit markets and, to a lesser extent, those in long-term credit markets, rose over the intermeeting period. Growth in the broader monetary aggregates exceeded the Committee's expectations.<sup>75</sup>

The information reviewed at the December meeting pointed to a rapid economic expansion, once the effects of the drought were removed. The strength of the expansion appeared greater than what the Committee had perceived it to be at the previous meeting. Although the unemployment rate rose from 5.3 percent in October to 5.4 percent in November, total nonfarm payroll employment made large gains in those two months. Preliminary evidence indicated that the industrial production index rose sharply over the intermeeting period and capacity utilization rates for November were relatively high by recent standards.<sup>76</sup> Further, while growth in overall consumer spending appeared to moderate, total retail sales increased markedly over the intermeeting period.<sup>77</sup>

There was no clear evidence that the general price level was accelerating. But the greater-than-expected economic expansion, accompanied by signs of accelerating labor costs as well as a weakening of the dollar in foreign exchange markets, increased the Committee's concerns about future inflation.<sup>78</sup> Most members believed that, without additional restrictive policy actions, potential growth in economic activity in

1989 would not be consistent with avoiding higher inflation in the future because of the already high rates of resource utilization:

... in the absence of a timely move to restraint, greater inflation would become embedded in the economy, especially in the labor-cost structure. A new wage-price spiral would then be very difficult to avoid and the critical task of bringing inflation under control would be prolonged and much more disruptive.<sup>79</sup>

The risks of greater inflation would be augmented if the dollar fell substantially from its current level.

Many members believed that, if the inflation condition were allowed to worsen, rising interest rates due to greater inflationary expectations eventually could lead to a downturn in the economy. Other members were more concerned about the downside risks associated with additional restrictive actions:

In addition to job and output losses, a recession could impede progress in bringing the federal budget into balance and could have severe repercussions on the viability of highly leveraged borrowers and many depository institutions.<sup>80</sup>

In general, the members perceived that risks of greater inflation in the future would pose a greater threat to future growth in economic activity than would a slightly more restrictive policy.<sup>81</sup>

The uncertainties about the impact of further monetary restraint generated some disagreement among the members about the exact timing and degree of additional restraint. On the one hand, a gradual restraining policy would

<sup>75</sup>*Ibid.*, p. 71, and Record (Federal Reserve Press Release, February 10, 1989), p. 4. M2 grew at an annual rate of 6.9 percent and M3 grew at an annual rate of 6.6 percent in November. At the December meeting, the Committee reviewed the procedures for the implementation of monetary policy, in light of the recent unusual behavior of the relation between borrowings and the federal funds rate. In the several weeks prior to the meeting, once the fundamental change in that relationship had been identified, day-to-day policy actions were carried out with some flexibility. Some members suggested that a move to place more emphasis on the federal funds rate relative to the degree of pressure on reserve positions might be appropriate since the unusual behavior of the relationship between the federal funds rate and borrowing could continue. Because of the perceived advantages of the currently used operating procedure, however, it was decided that no changes in the procedures for policy implementation would be made, although "flexibility would remain important in accomplishing Committee objectives under changing circumstances." [Record (Federal Reserve Press Release, February 10, 1989), pp. 15-16.]

<sup>76</sup>Record (Federal Reserve Press Release February 10, 1989), pp. 1-2. The capacity utilization rates for the total industry rose from 83.7 percent in September to 84.0 percent and 84.1 percent, respectively, in October and November. The industrial production index rose at an annual rate of 7.2 percent in October and 4.4 percent in November, up from 0.9 percent annual rate of growth in September.

<sup>77</sup>*Ibid.*, pp. 2-3. Total retail sales rose at annual rates of 20.1 percent and 15.7 percent, respectively, in October and November, after having declined at an annual rate of 2.6 percent in September.

<sup>78</sup>*Ibid.*, pp. 6-8. Over the intermeeting period, the dollar's trade-weighted exchange index fell approximately 2.3 percent.

<sup>79</sup>*Ibid.*, p. 8.

<sup>80</sup>*Ibid.*, p. 7.

<sup>81</sup>*Ibid.*, p. 10.



minimize the possible disruptive effects in domestic and international financial markets; immediate action could lead to an escalation of interest rates in world markets, with especially damaging consequences for less-developed debtor nations. Moreover, sharp tightening could impose excessive restraint on the growth of the monetary aggregates and, ultimately, on the growth of economic activity. On the other hand, it was thought that immediate tightening could contain perceived increased price pressures and inflationary expectations more effectively. Without some tightening, growth in M2 and M3 could accelerate.<sup>82</sup>

The directive called for an immediate slight increase in the degree of pressure on reserve conditions, as shown in table 3. Further tightening actions would be implemented at the beginning of 1989 unless economic and financial conditions were to deviate substantially from the Committee's expectations (see table 4). Given the reserve conditions contemplated by the Committee, growth in M2 and M3 were expected to be 3 percent and 6½ percent, respectively, from November 1988 to March 1989. Because of the restrictive policy actions specified in the directive and those expected to be implemented in the intermeeting period, the monitoring range for the federal funds rate was raised to 7 to 11 percent.<sup>83</sup>

## CONCLUSION

The Committee's uncertainty about the economic outlook motivated it to adopt a more flexible strategy for the implementation of monetary policy in 1988. This additional flexibility manifested itself in long-run goals for money growth and in short-run policy implementation. The changing economic environment played an important role in the evolution of policy in 1988 in terms of the changing emphasis toward monetary restraint.

At the beginning of the year, the Committee believed that sharp fluctuations in money market interest rates should be resisted. In addition, it was concerned that economic growth

could slow substantially. Consequently, the Committee placed greater weight early in the year on conditions in financial markets in the implementation of policy, though the latter also would continue to be guided by the behavior of the monetary aggregates, price pressures and other indications of economic activity. The additional flexibility permitted temporary departures from reserve objectives to avoid unusual fluctuations in money market interest rates.

As the year progressed, it became increasingly apparent to the Committee that financial markets were sufficiently stabilized and that the stock market collapse in the previous year would not have a devastating effect on aggregate economic activity. Accordingly, the Committee abandoned some of the additional flexibility it had sought since October 1987, and returned to its earlier practice of placing primary emphasis on reserve positions. At the same time, incoming information heightened the Committee's concerns about future inflation. Specifically, the strength of the economic expansion was perceived to be incompatible with the Committee's long-term goal of reasonable price stability. In response to the increased risks of future price pressures, the Committee moved toward a more restrictive monetary policy starting in late March.

In the second half of the year, when the increased risks of future price pressures came to the forefront of the Committee's concerns, the uncertainty stemming from the dollar's movements and the impact of previously implemented restrictive monetary policy on the economy were given increased emphasis in the Committee's deliberations. As the dollar gained notable strength against other major currencies in the summer and there were some indications of a moderating economic expansion, no changes in the degree of pressure on reserve positions were made. When the dollar started to decline in foreign exchange markets, there was also increasing evidence that the economic expansion was more in line with the Committee's goal of price stability and again, no policy changes

<sup>82</sup>Ibid., pp. 10-11. The members also discussed the implications for the tightening of reserve positions combined with an increase in the discount rate. Despite the fact that a rise in the discount rate could communicate the Committee's commitment to fight inflation, an increase in the discount rate was not seen as an appropriate policy action at that time by most members. Like a sharp, immediate increase in the degree of pressure on reserve positions, an

increase in the discount rate could disrupt domestic and international financial markets. Nevertheless, the Committee did not rule out the possibility during the intermeeting period and agreed to call a special consultation in the event that the Board of Governors agreed to increase the discount rate (Ibid., p. 11.).

<sup>83</sup>Ibid., pp. 13-15.

were made. By the end of the year, when signs of a rapid economic expansion re-emerged and the dollar's value started to fall in foreign exchange markets, the Committee responded quickly by tightening monetary policy further.

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**Gerald P. Dwyer, Jr. and R. W. Hafer**

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# Interest Rates and Economic Announcements

**T**HE ANNOUNCEMENT of some government statistic, like the latest unemployment rate or the nation's most recent trade balance, often is used as the rationale for observed changes in financial markets that day. One reporter, for example, suggests that

[i]n the early 1980s, investors were overly concerned with credit and monetary figures, focusing on Federal Reserve data. These days, professionals are preoccupied with inflation, the dollar and the health of the economy.<sup>1</sup>

Another reporter points out the unsystematic nature of such interpretations with the wry comment that

[t]he trade deficit doesn't matter as much any more. At least, not to the stock market. At least not this month.<sup>2</sup>

Do announcements of government statistics systematically affect financial markets? There is a substantial literature on the relationship between interest rates and stock prices and announcements of the money stock. Overall, this evidence supports the conclusion that announcements of the money stock had an important influence on interest rates in the early 1980s.<sup>3</sup>

This influence arose when the Federal Reserve first announced in October 1979 that it would use the money stock as a target for monetary policy, then largely disappeared in 1982 and 1983 when the Federal Reserve moved away from monetary aggregate targeting.<sup>4</sup>

Existing studies of the relationship between interest rates or stock prices and announcements of other economic data find little evidence that either is affected by these announcements. For example, Pearce and Roley (1985) investigate the effect of unexpected changes in inflation and real activity on stock prices and find little response of stock prices. Hardouvelis (1987) examines this relationship for interest rates and stock prices and finds that they are systematically affected only by announcements of the money stock.

One common aspect of these studies is that they examine subperiods associated with changes in monetary policy. Changes in policy regimes provide an obvious basis on which to expect changes in the effect of money stock announcements on financial markets. There is no obvious reason, however, for changes in the ef-

<sup>1</sup>Wallace (1988).

<sup>2</sup>Sease (1989).

<sup>3</sup>This is less obvious for stock prices. As Thornton (1989) has demonstrated, money announcements are not suffi-

ciently important for stock prices to be reliably associated with changes in the money stock.

<sup>4</sup>See Gilbert (1985) and Thornton (1988) for a discussion of the changes in operating procedures.

fects of announcements of other economic data to occur *only* when the Federal Reserve changes operating procedures.<sup>5</sup> It is quite possible that a temporal association between interest rates or stock prices and the announcement of a particular statistic is fleeting compared to estimates based on multi-year sample periods of about three years.

The purpose of this paper is to examine the temporal response of short- and long-term interest rates to announcements of certain key government statistics. Unlike previous studies, we do not constrain the investigation by using only time periods of alternative monetary policy operating procedures. Rather, we attempt to determine whether the different announcements vary in importance over different time periods, even as short as one year.

## MONEY, INFLATION AND REAL ACTIVITY

We examine the relationship between changes in interest rates and announcements using regressions that can be written as

$$(1) \Delta R_t = \alpha + \beta U_t + \varepsilon_t,$$

where  $\Delta R_t$  is the change in the interest rate in period  $t$ ,  $U_t$  is a vector of the unexpected parts of the announcements of some government statistics,  $\varepsilon_t$  is the error term, and  $\alpha$  and  $\beta$  denote the set of parameters to be estimated. We focus on the unexpected parts of the announce-

ments because, when the change in the price of an asset like Treasury securities or stocks is measured over a short period, the change in the asset's price may be affected only by the unexpected part of the announcement.<sup>6</sup> For the most part, previous empirical analyses indicate that changes in interest rates are systematically associated only with the unexpected part of weekly announcements of the money stock.<sup>7</sup> In addition to the money stock announcements, we study the effects of announcements of inflation, real economic activity and the trade balance.

We examine the effects on both short- and long-term interest rates. Under the expectations hypothesis of the term structure, any differential response of interest rates reflects differences in the impact of the unexpected change in economic variables on current and predicted future short-term interest rates.<sup>8</sup> If the expected change in money, inflation, industrial production, etc., is partly transitory, then the effect on the current short-term rate will be larger than on the long-term rate.<sup>9</sup>

### Unexpected Money

The evidence in previous studies clearly indicates that the relationship between changes in interest rates and the unexpected part of the money announcement in the early 1980s is positive. There are three possible explanations for this association: an "expected liquidity" effect; an "expected inflation" effect; and a "real economic activity" effect.<sup>10</sup>

<sup>5</sup>Using only these periods to look for changes in the effect of announcements on financial markets becomes increasingly implausible as the changes in operating procedures become more distant in the past.

<sup>6</sup>The lack of generality of the proposition that asset prices are affected only by the unexpected part of announcements is made by, among others, LeRoy (1982), especially pp. 205-08. It can, however, be justified as an approximation (Sims, 1984). The extension to interest rates, an inverse function of the price, can be justified as an approximation.

<sup>7</sup>Some have found that the expected component of the change in money also exerts a statistically significant effect on changes in interest rates. See, for example, Hein (1985) and Belongia and Sheehan (1987). Several studies have shown, however, that such results may stem from certain anomalies in the data. For example, Belongia, Hafer and Sheehan (1986) find that the significance of expected changes in money stems from one observation in which a benchmark revision in the data coincided with a so-called Social Security week. The removal of this observation reduces expected money's coefficient to statistical insignificance. Other researchers, for example, Clark, et al. (1988), also have argued that the inclusion of Social

Security weeks leads to the spurious result that expected changes in money influence interest rate changes. For a discussion of the effects of Social Security weeks on the observed changes in money, see Hafer (1984).

<sup>8</sup>The evidence in Flavin (1984) and Campbell and Shiller (1987), for example, indicates that the expectations hypothesis accounts for much of the variation of long-term interest rates relative to short-term rates.

<sup>9</sup>Under the expectations hypothesis of the term structure, the change in the long-term interest rate is the sum of the discounted change in expected future interest rates, a term due to the return from holding the bond and terms due to the expected short-term rates appearing in one but not the other bond. See Flavin (1984), p. 231. If the coefficient relating the changes in expected interest rates to the unexpected part of the announcement decreases with term to maturity, then the usual algebra indicates that the response will be less for long-term interest rates.

<sup>10</sup>Cornell (1983) and Sheehan (1985) discuss these explanations and provide useful surveys of the evidence.

The expected liquidity effect is based on the supposition that a larger forecast error is associated with an expectation that the Federal Reserve will engage in more contractionary open market operations in the near future relative to what they would have done otherwise. As a result of the expected contractionary open market operations, near-term interest rates increase. The expectation of higher interest rates in the near future, though, raises current rates to maturity on securities that mature after the expected contractionary open market operations.<sup>11</sup> An unexpected increase in the money stock is thus associated with an increase in interest rates.

An alternative explanation can be cast in terms of expected inflation. Under this explanation, an unexpected increase in money leads economic agents to revise their expectations of future inflation upward. Because nominal interest rates are the sum of the real interest rate and the expected inflation rate, an unexpected increase in expected inflation, *ceteris paribus*, leads to an increase in nominal interest rates.

The real economic activity effect predicts that interest rates will respond positively to an unexpected money increase. According to this explanation, the money announcement reveals information about money demand in the economy. If the announced stock of money depends on the demand for money, an announced money stock greater than expected indicates that money demand is greater than expected. If the demand for money depends, among other things, on expectations of future real economic activity, an unexpected increase in the money stock reflects an increase in expected real activity.<sup>12</sup> Because economic activity and real interest rates are positively correlated, an unexpected increase in the money stock is associated with an increase in real and nominal interest rates.

### Unexpected Inflation

Whether announcements of inflation are related to changes in interest rates due to an effect on expected monetary policy or expected inflation, an announcement that inflation is greater than expected can result in an increase in interest rates. If an announcement of infla-

tion greater than expected for the recent period increases expected future inflation, there is a direct effect on the nominal interest rate. On the other hand, with a goal of lower inflation, the Federal Reserve may be expected to offset the higher inflation (or the perception of higher future inflation) by a more restrictive monetary policy. In either case, an unexpected increase in inflation increases nominal interest rates. As for the money stock, the relative effect on short-term and long-term rates reflects how permanent the change in inflation is expected to be. The more transitory it is, the smaller the relative effect on long-term rates.

### Real Activity

An unexpected increase in real activity raises nominal interest rates through two channels. One is from agents' revised expectations that future real activity will be higher, thus causing expected real interest rates and, hence, nominal rates to increase. The other is from the expected reaction of the Federal Reserve. If economic agents expect the Fed to tighten monetary policy on news of stronger future economic growth, then interest rates can increase because of the expected liquidity effect.

### Trade Balance

The trade balance is exports minus imports. When exports are less than imports, the trade balance is negative, a situation that characterizes most of the 1980s. An announcement of a larger-than-expected trade balance can increase or decrease nominal interest rates. A larger trade balance today is associated with larger trade balances in the future.<sup>13</sup> Even with this qualification, however, the effect of announcements of trade balances on interest rates is ambiguous. Because the trade balance is the negative of the capital account, a larger trade balance is associated with a smaller balance on capital account. A larger trade balance and a smaller balance on the capital account can be associated with either a decrease in the supply of foreign funds to the United States or a decrease in the demand for funds in the United States. A decrease in the supply of funds would be associated with an increase in interest rates

<sup>11</sup>The current one-day rate also can increase because of intertemporal substitution.

<sup>12</sup>See Fama (1982).

<sup>13</sup>There is evidence of positive autocorrelation in the data. Over the sample period used in this paper, the first six values of the autocorrelation function are 0.85, 0.85, 0.83, 0.80, 0.76 and 0.75.

in the United States.<sup>14</sup> A decrease in demand would be associated with a decrease in interest rates in the United States. Given these two possibilities and no ancillary evidence to support either, the hypothesized effect on nominal interest rates of an unexpected increase in the trade deficit is uncertain.

## THE DATA

Daily interest rates on three-month Treasury bills and 30-year Treasury bonds are used in our empirical analysis. These rates are closing quotes supplied by the New York Federal Reserve, calculated as averages of rates reported by primary government security dealers between 3:15 p.m. and 4:00 p.m. Eastern Standard Time. The changes in rates are measured as the difference between the interest rate from one day's close to the next.<sup>15</sup>

To estimate the unexpected part of the announced values of the economic series, we use the initial announced values of the series minus the median response from the survey conducted by MMS International.<sup>16</sup> This widely used survey polls approximately 50 to 60 government securities dealers weekly, asking them to indicate their expectation of the change in the narrow money stock (M1). At most a week before an announcement of several other economic series, the survey participants also are asked to indicate their forecasts of the change in other series, such as the Consumer Price Index.

In this study, we use the survey forecasts for M1, the Consumer Price Index (CPI), the Producer Price Index (PPI), the industrial production index, the unemployment rate and the trade balance. Because the survey forecasts of the price indexes and industrial production are

all measured in terms of monthly percentage changes, the unexpected part of the announced values also are measured as a monthly percentage change. The actual and the forecasted unemployment rates are both measured as percentages of the number of unemployed relative to the labor force. The forecasts of M1 and the trade balance are stated in terms of their dollar values. We measure the unexpected part of these variables as the percentage difference between actual and forecasted values relative to the actual values.

Although other economic variables obviously might be included in this analysis, the series used in this study represent a broad range of economic activity, reflecting changes in inflation, real activity and foreign trade. Moreover, the variances of changes in the Treasury bill rate and the Treasury bond rate are greater on the days with these announcements than on other days.<sup>17</sup>

To abstract from the effects of intervening announcements, we include in our regressions changes in interest rates only for those days on which these announcements occur. Since past intervening announcements are prior information and, under rational expectations, are uncorrelated with the current unexpected change, this restriction does not bias our analysis. A future unexpected change in a variable will be currently unknown and, under rational expectations, also would be uncorrelated with the current unexpected change.<sup>18</sup>

Means and standard deviations of the unexpected changes in M1, the price indexes, industrial production, the unemployment rate and the trade balance are presented in table 1.<sup>19</sup>

<sup>14</sup>We assume that the United States is not small relative to the rest of the world.

<sup>15</sup>The three-month Treasury bill rate is measured using the standard discount interest rate formula. The bond rate is the yield to maturity.

<sup>16</sup>MMS International and Douglas K. Pearce provided several of the series examined here. Actual changes in the series are taken from relevant government and Federal Reserve publications.

<sup>17</sup>The F-statistic for testing the hypothesis that the variance of the change in the Treasury bill rate is the same on days with these announcements and days without these announcements is 1.86 with 679 and 1292 degrees of freedom, which has a marginal significance level of less than 0.001. The F-statistic for testing this hypothesis using the variance of the change in the Treasury bond rate is 1.43, also with 679 and 1292 degrees of freedom and a marginal significance level less than 0.001.

<sup>18</sup>This and the prior statement assume that the forecasts are essentially the same as rational expectations. It is, of course, true that our estimated coefficients can be affected by other events on the same day that are correlated with excluded variables.

<sup>19</sup>There are 95 months used in table 1. There are only 94 observations for the unexpected change in the CPI, because the survey value is missing for the announcement in January 1986. There are 94 observations on the unexpected change in unemployment, because the Treasury bill rate is not available for April 5, 1985, when the unemployment rate was announced. Therefore, we do not use this observation. Finally, 93 observations are used for the trade balance, because only 11 values were announced in 1987: and two values were announced on the same day in April 1987. We use just the announcement for the more recent month, March.

Table 1

### Descriptive Statistics on Measures of the Unexpected Part of Announcements (February 1980 to December 1987)

Variable	Mean	Standard deviation	Number of observations
Narrow money stock	0.06%	.46%	376
Consumer price index	-0.01	.20	94
Producer price index	-0.10	.34	95
Unemployment rate	0.01	.21	94
Industrial production	-0.03	.39	95
Trade balance	-13.18	98.23	93

Given the numerical precision of the data and the size of the associated standard errors, all but one of the mean forecast errors (our measures of the unexpected components of the announcements) are not different from zero. For example, the unemployment rate is announced as a percentage, say, 5.4 percentage points and is forecasted to this same level of numerical precision. A mean of 0.01 is zero within the precision of the data. Only one of the six series, the producer price index, has a mean value that is significantly different, both numerically and statistically, from zero at the 5 percent marginal significance level. This cursory analysis of the data along with other work indicates that these survey data are useful approximations of rational expectations and can be

used to estimate the unexpected parts of the series being announced.<sup>20</sup>

An issue that generally is not dealt with when using these data is the fact that the measurement of the expected and actual changes in some of the variables is only in increments of 0.1. That is, forecasts and actual values for the CPI, the PPI and the industrial production index are all collected as monthly percentage changes with only one digit after the decimal point. Because there is a relatively small range of forecast errors at this level of precision, there are a limited number of values that the forecast errors actually take. Even so, the information in table 1 indicates that there is sufficient variation to estimate a meaningful relationship between these data and changes in interest rates.<sup>21</sup>

## EMPIRICAL RESULTS

The period used in our analysis runs from February 1980 through December 1987. The beginning of the period is dictated by the lack of survey forecasts of the trade balance prior to that time. The end of the period is dictated by data availability. The vector of observations for each right-hand-side variable includes zeros for those days when a series is not announced.

### Regressions by Year

Previous analyses generally estimate equation 1 over all of the available data and for periods corresponding to changes in the Federal Reserve's operating procedures.<sup>22</sup> Because we are concerned with the pattern of the coefficient estimates on money and other variables over time, we ignore these particular periods and estimate equation 1 for the full period and for each year. Because we have no *a priori* information that dictates the correct periods, this approach allows us to gauge the effects of the

<sup>20</sup>For other analyses of this data, see, among others, Pearce and Roley (1985).

<sup>21</sup>For example, the forecast errors for the CPI measure of the inflation rate range in increments of 0.1 from -0.6 to 0.5. The modal error is zero, and the forecast errors are dispersed around this value, not (as would be possible) virtually always .1 or .2 in absolute value. Similar comments apply to the PPI and the industrial production index. The forecast errors of the unemployment rate, also measured to a precision of 0.1 percentage points, range from -0.5 to 0.7 by increments of 0.1.

<sup>22</sup>As noted above, previous researchers generally delineate sample periods by changes in monetary policy operating procedures. These include the October 6, 1979, shift away

from emphasizing the behavior of the federal funds rate and placing more importance on the behavior of the monetary aggregates and the October 1982 shift back to interest rates. While statistical tests generally do not reject the use of these breakpoints, it has been questioned whether the procedures used are adequate to reject the *a priori* break point being tested. That is, if October 6, 1979, is not the true breakpoint in the relationship but another relatively close date is, the test procedures used will not reject October 6 as the break. Indeed, evidence presented in Hafer and Sheehan (1989), based on time-varying parameter estimates, indicates that the often-used October 1979 and October 1982 sample breaks are not consistent with the data.

**Table 2**  
**Change in Treasury Bill Rate and Unexpected Part of Announcements**

Period	Constant	UM1 <sup>1</sup>	UCPI	UPPI	UU	UIP	UTB <sup>2</sup>	$\bar{R}^2$ /DW
1980-87	0.007 (0.86)	0.183 (7.70)*	0.066 (0.58)	0.082 (1.30)	-0.164 (1.53)	0.019 (0.33)	-0.009 (0.38)	0.08 2.01
1980	0.016 (0.43)	0.284 (3.80)*	0.129 (0.31)	0.248 (1.10)	-0.418 (1.07)	0.112 (0.56)	-0.379 (1.45)	0.14 1.73
1981	0.022 (0.66)	0.351 (4.25)*	0.155 (0.47)	0.602 (1.24)	-0.543 (1.10)	0.058 (0.22)	-0.018 (0.36)	0.14 2.02
1982	-0.009 (0.34)	0.227 (2.75)*	0.019 (0.06)	-0.187 (0.66)	0.112 (0.31)	-0.060 (0.50)	0.016 (0.39)	0.02 2.46
1983	0.001 (0.15)	0.154 (5.48)*	-0.105 (0.87)	0.033 (0.54)	-0.250 (2.07)*	0.043 (0.74)	-0.052 (0.44)	0.24 1.92
1984	0.008 (0.67)	0.036 (0.89)	-0.011 (0.05)	0.027 (0.29)	0.072 (0.51)	0.080 (0.94)	-0.129 (1.00)	-0.04 1.99
1985	0.004 (0.40)	0.031 (0.64)	-0.010 (0.03)	0.064 (0.75)	-0.059 (0.27)	0.512 (3.76)*	-0.111 (0.57)	0.13 2.13
1986	-0.006 (0.95)	-0.049 (1.59)	0.065 (0.48)	-0.038 (1.16)	-0.107 (1.61)	0.173 (2.69)*	-0.027 (0.29)	0.06 2.02
1987	0.034 (2.12)*	0.004 (0.11)	0.083 (0.42)	0.115 (0.75)	0.050 (0.21)	-0.106 (0.63)	-0.039 (0.13)	-0.08 2.16

NOTE: Absolute value of t-statistics in parentheses. An asterisk denotes significance at 5 percent marginal significance level.  $R^2$  is the adjusted coefficient of determination, and DW is the Durbin-Watson test statistic.

<sup>1</sup>Each of the right-hand-side variables is the unexpected part of the announcement of a variable. The variables: M1 is the money stock; CPI is the Consumer Price Index; PPI is the Producer Price Index; U is the civilian unemployment rate; IP is industrial production; and TB is the trade balance.

<sup>2</sup>Reported coefficients are estimated coefficients times 100.

unexpected parts in the announcements over time. While the choice of a year is admittedly arbitrary, it is long enough that some precision in the regression coefficients is possible but short enough that it is unlikely to miss an estimable transitory change in the coefficients.<sup>23</sup>

The regression results are reported in table 2 for the change in the Treasury bill rate.<sup>24</sup> Based on a 5 percent marginal significance level, only unexpected money (UM1) has a statistically significant coefficient in the full-period regressions. This result does not mean, however, that other economic variables do not influence Treasury bill rate changes during the period. On the contrary, the annual regression results indicate that

unexpected unemployment (UU) is marginally statistically significant at the 5 percent level for 1983. It also appears that unexpected changes in the industrial production index (UIP) are associated with increases in the short-term interest rate in 1985 and 1986. In none of the annual regressions, however, do unexpected changes in the Consumer Price Index (UCPI), the Producer Price Index (UPPI) or the trade balance (UTB) have statistically significant coefficients.

The regressions using the change in the 30-year Treasury bond rate are presented in table 3. The regression for the full period again has a statistically significant estimated coefficient for the unexpected part of M1. The magnitude of

<sup>23</sup>It is possible, of course, that the estimated coefficients change with each announcement. Without the imposition of constraints on the way that the coefficients change, however, such a specification is not estimable. Our regression coefficients can be interpreted as estimates of the average coefficient in a given year.

<sup>24</sup>Again note that the estimation uses only unexpected changes in the variables. Since correlations between the expected and unexpected values reveal that the two series are uncorrelated, omitting the expected values does not bias the estimated regression coefficients.



Table 3

## Change in 30-year Treasury Bond Rate and Unexpected Part of Announcements

Period	Constant	UM1	UCPI	UPPI	UU	UIP	UTB <sup>1</sup>	$\bar{R}^2/DW$
1980-87	0.003 (0.68)	0.074 (5.54)*	0.092 (1.46)	0.088 (2.48)*	-0.052 (0.87)	0.027 (0.87)	-0.009 (0.74)	0.05 2.23
1980	-0.004 (0.27)	0.149 (4.57)*	0.120 (0.65)	0.226 (2.29)*	0.016 (0.10)	0.163 (1.87)	-0.180 (1.58)	0.24 2.06
1981	0.023 (1.26)	0.105 (2.30)*	0.152 (0.84)	0.315 (1.18)	-0.208 (0.76)	0.114 (0.79)	0.001 (0.04)	0.03 2.32
1982	-0.001 (0.09)	0.049 (1.14)	0.110 (0.67)	0.002 (0.01)	-0.071 (0.38)	-0.016 (0.26)	-0.011 (0.51)	-0.04 2.59
1983	-0.001 (0.08)	0.114 (4.32)*	-0.101 (0.89)	0.055 (0.97)	-0.171 (1.50)	0.018 (0.33)	-0.185 (1.64)	0.17 2.15
1984	-0.004 (0.34)	0.036 (0.93)	0.199 (1.03)	0.079 (0.87)	-0.113 (0.83)	-0.056 (0.69)	-0.076 (0.62)	-0.02 2.00
1985	0.003 (0.23)	0.015 (0.30)	-0.008 (0.02)	0.076 (0.86)	-0.064 (0.29)	0.151 (1.08)	-0.118 (0.59)	-0.05 2.12
1986	-0.001 (0.07)	-0.011 (0.25)	0.137 (0.70)	-0.019 (0.40)	0.035 (0.37)	0.116 (1.25)	0.095 (0.72)	-0.04 2.15
1987	0.014 (1.29)	-0.012 (0.49)	0.015 (0.11)	0.148 (1.43)	0.141 (0.89)	-0.223 (1.96)*	0.381 (1.91)	0.07 1.85

NOTE: Absolute value of t-statistics in parentheses. An asterisk denotes significance at 5 percent marginal significance level.

<sup>1</sup>Reported coefficients are estimated coefficients times 100.

the estimated coefficient is less than one-half that of the short-term Treasury bill rate, a result that is consistent with previous work.<sup>25</sup> In addition to money announcements, the full-period regression suggests that unexpected changes in the PPI have a positive and statistically significant effect on the change in the Treasury bond rate.

Except for 1980, however, the separate annual results provide little evidence that the unexpected changes in these economic variables have much effect on changes in the long-term interest rate. In the results for 1980, unexpected money and inflation measured by the PPI are statistically significant at the 5 percent level. The coefficient on industrial production is significant at the 5 percent level in 1987. Note, however, that the sign of this estimated coefficient (negative) is incorrect. The estimated coefficient for the unexpected part of the trade balance is significant at the 6 percent marginal significance level in 1987. Interestingly, while the coefficient

often is negative, it is positive for 1987. For the other years, the estimation results are consistent with the proposition that unexpected parts of announcements of variables besides money have little effect on the change in the 30-year rate.

### Stability Tests

An important aspect of the regression results in tables 2 and 3 is the variability in the estimated coefficients over time. For example, consider the magnitude of the estimated coefficients on unexpected money from 1980 to 1987 in table 2. Based on the annual regression results, the estimated coefficient peaks at 0.35 in 1981 and declines to essentially zero in 1987. This result is consistent with the hypothesis that unexpected changes in the money stock are associated with changes in interest rates early in the period but not recently.

<sup>25</sup>For example, see Cornell (1983).

To investigate whether the estimated coefficients from the various years are statistically different, two tests are conducted. One test determines whether the coefficients for each variable change over time. We test whether each variable's coefficients are equal from 1980 to 1987. The results of these tests, regardless of the interest rate used, are consistent with the hypothesis that only the coefficients on unexpected money vary across years. The F-statistic for unexpected money when the change in the Treasury bill rate is used is 4.46. The result using the Treasury bond rate is an F-statistic of 2.68. Both are statistically significant at less than the 1 percent marginal significance level.<sup>26</sup> The F-statistics for the remaining variables are insignificant: they almost never even exceed unity.<sup>27</sup>

While this test has reasonable power against the alternative hypothesis that the coefficients are nonzero and change over several of the years, it generally has low power against the alternative that a variable has a nonzero coefficient for a relatively short period such as one year. Consequently, testing the coefficients over single years is a useful additional test.

Testing the hypothesis that a coefficient in any single year is the same as in the remainder of the years provides at most marginal evidence of coefficient instability across the period.<sup>28</sup> Using a 5 percent marginal significance level, tests using the Treasury bill regressions indicate that the coefficient on the unexpected part of the trade balance in 1980 is statistically different from the coefficients in the rest of the period: the estimated t-statistic is  $-2.33$ .<sup>29</sup> With the exception of unexpected money, each of the other

coefficients for the Treasury bill rate is equal over time. Besides unexpected money, only the unexpected part of the industrial production index in 1980 has a coefficient for the Treasury bond rate that is statistically different from the remaining years ( $t = 2.30$ ).

These test results are largely consistent with the hypothesis that the response of interest rates to unexpected changes in the variables other than money are constant and equal to zero.

### *Rolling Regression Estimates*

Breaking the eight years into annual segments to estimate the changes in the coefficients over time may obscure changes that occur during the years. To investigate the evolution of the estimated coefficients, it is worthwhile to examine the coefficients in a relatively unrestricted manner. This can be done by estimating regressions that roll through the sample. Equation 1 is estimated for successive 12-month periods, adding a month and dropping a month as the estimation of the regression coefficients rolls through the full period.<sup>30</sup> The first 12-month period begins in February 1980 and ends in January 1981; the last sample ends with December 1987. While using a 12-month period for the rolling regressions still has an arbitrary element, the estimated coefficients for any 12-month period are readily available and can be examined.<sup>31</sup>

To show how the estimated coefficients have evolved over the period, the estimated coefficients for both the Treasury bill and Treasury bond rates are plotted in figure 1. In interpreting these plots, it is important to note that, be-

<sup>26</sup>The results from a standard F-test are consistent with the null hypothesis of overall coefficient stability. In this test, each variable including the constant is allowed to take different values for each year. This unrestricted equation is compared with the equation where all estimates are fixed for the full period. The calculated F-statistic for changes in the Treasury bill rate is 1.24. When the change in the Treasury bond rate is used, the F-statistic is 1.06. Both of these values are less than the 5 percent critical value. Such a test, however, may mask changes in one or two variables' coefficients. Given the number of variables and time periods, changes in the estimated coefficient for some variable can be swamped by the stability of the others.

<sup>27</sup>Using the change in the Treasury bill rate, the variables and corresponding F-statistic are: CPI (0.08); PPI (0.95); unemployment (0.64); industrial production (0.61); and trade balance (0.85). Using the change in the Treasury bond rate, the F-statistics are: CPI (0.25); PPI (1.08); unemployment (0.36); industrial production (1.24); and trade balance (0.98).

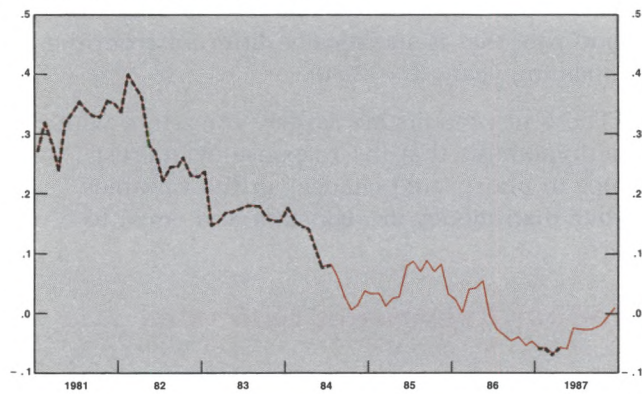
<sup>28</sup>This test is first run with the coefficients of all other variables allowed to be different, then with the coefficients of all the other variables besides money set equal for all of the years. In the text, we report the results with the coefficients of other variables besides money set equal to each other for all of the years. The results with other coefficients allowed to vary are little different than those discussed.

<sup>29</sup>Given the multiple tests across variables and years, there are good reasons to use a smaller significance level. If one desires an overall 5 percent significance level for all the tests combined, the correct significance level for testing the stability of the coefficients for each year and each variable is about one-tenth of 1 percent.

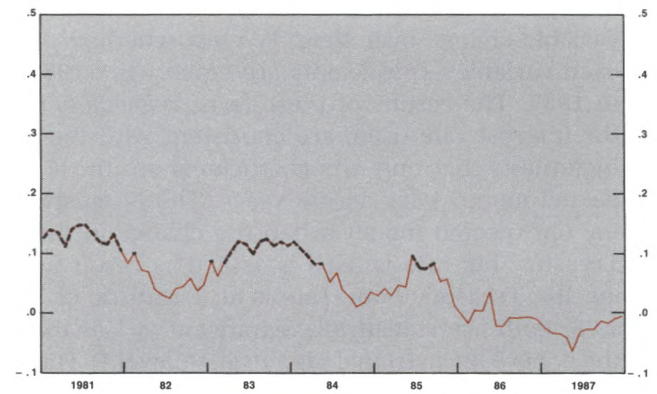
<sup>30</sup>Loeys (1985) examines the effects of unexpected money on interest rates in a similar manner.

<sup>31</sup>We also estimated the rolling regressions using successive 18-month periods. There are only minor changes in the results.

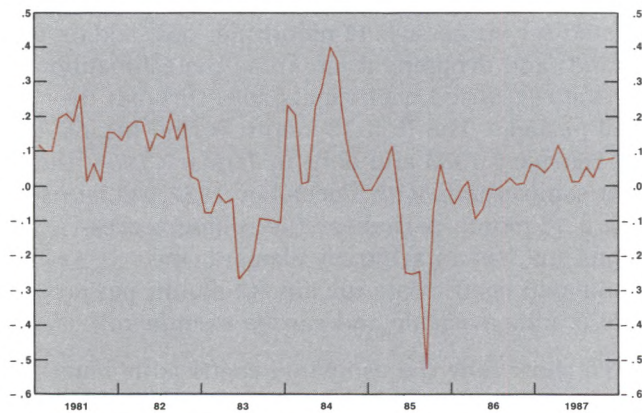
Figure 1  
**Panel A**  
 The Coefficients of the Unexpected Component of  
 M1 for the 3-Month Treasury Bill



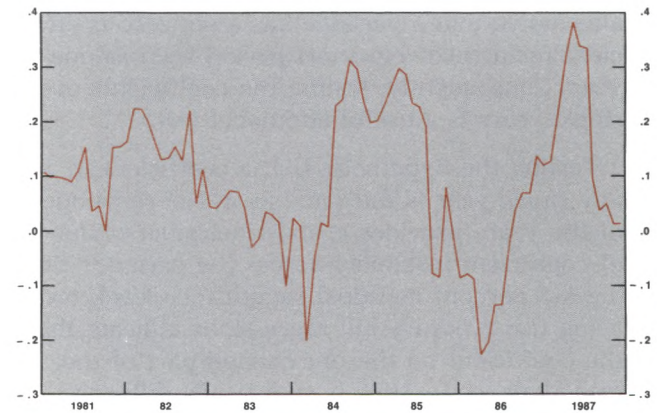
The Coefficients of the Unexpected Component of  
 M1 for the 30-Year Treasury Bond



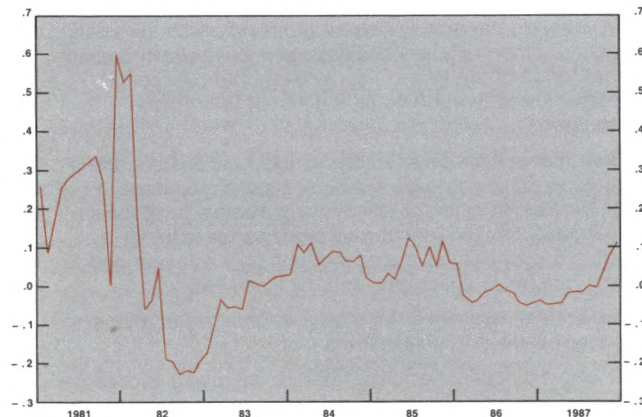
**Panel B**  
 The Coefficients of the Unexpected Component of  
 CPI for the 3-Month Treasury Bill



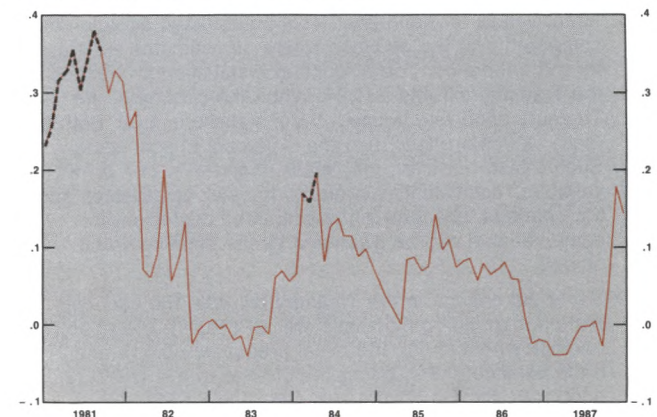
The Coefficients of the Unexpected Component of  
 CPI for the 30-Year Treasury Bond



**Panel C**  
 The Coefficients of the Unexpected Component of  
 PPI for the 3-Month Treasury Bill

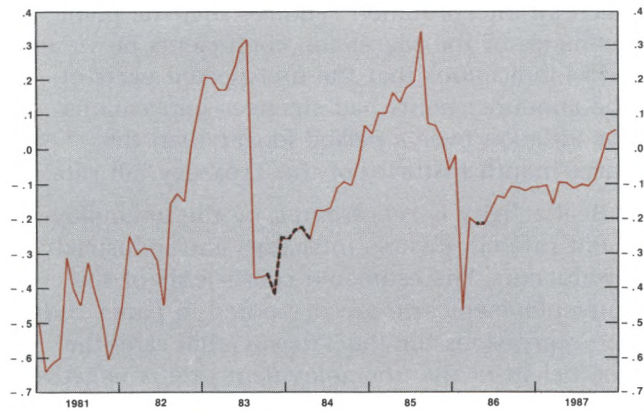


The Coefficients of the Unexpected Component of  
 PPI for the 30-Year Treasury Bond

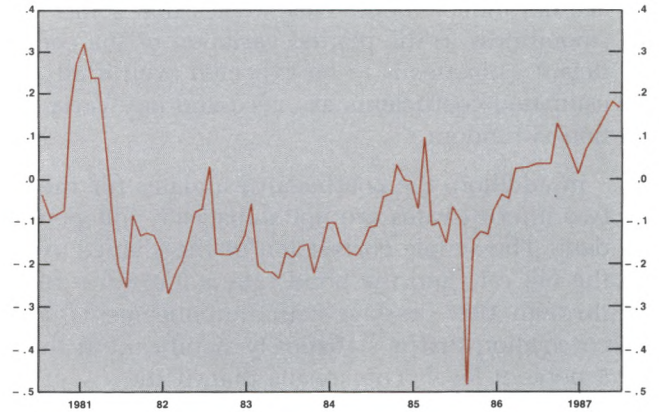


NOTE: A dashed line indicates significance at the 5 percent level.

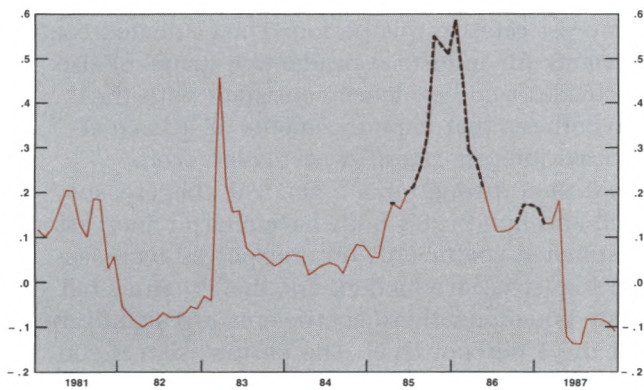
**Panel D**  
The Coefficients of the Unexpected Component of  
The Unemployment Rate for the Treasury Bill



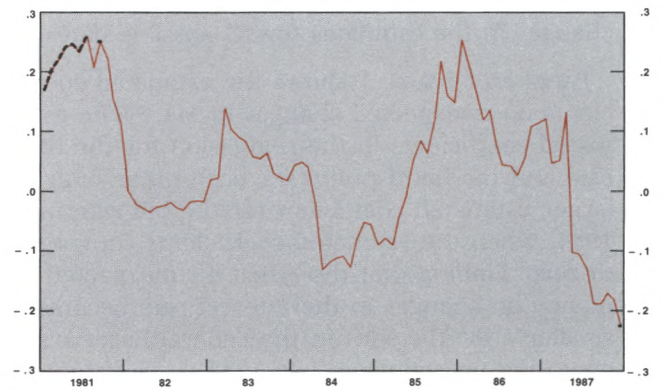
The Coefficients of the Unexpected Component of  
The Unemployment Rate for the Treasury Bond



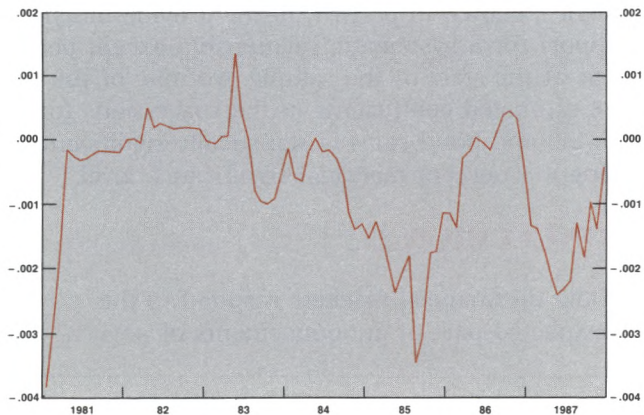
**Panel E**  
The Coefficients of the Unexpected Component of  
Industrial Production for the 3-Month Treasury Bill



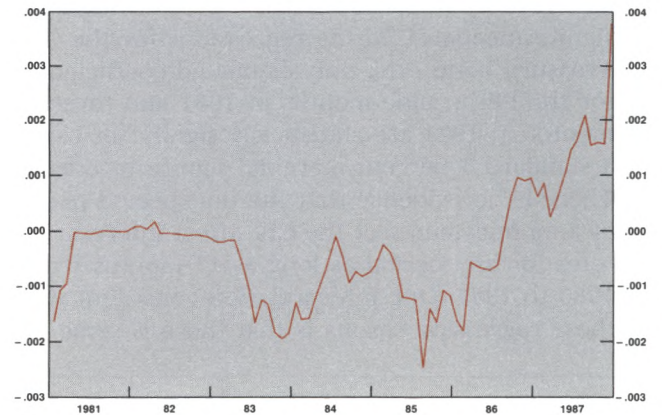
The Coefficients of the Unexpected Component of  
Industrial Production for the 30-Year Treasury Bond



**Panel F**  
The Coefficients of the Unexpected Component of  
The Trade Balance for the 3-Month Treasury Bill



The Coefficients of the Unexpected Component of  
The Trade Balance for the 30-Year Treasury Bond



cause common observations in regressions are separated by less than 12 months, the estimated regression coefficients within a 12-month period are not independent. This implies that some smoothness in the plotted variation of the coefficient estimates is to be expected even if all estimated coefficients are zero and any variation is random.

In addition, the coefficient estimates for the two interest rates are not statistically independent. The simple correlation of the change in the bill rate and the bond rate is 0.658 for 1980 through 1987 on days with announcements, a correlation that is statistically significant at the 5 percent level. This means that, if the estimated coefficient of industrial production, for instance, increases in the regression for the bill rate, the estimated coefficient of industrial production in the regression for the bond rate is likely to increase as well, even if the increase is due to random variation. Despite these caveats, these estimates are useful because they make it possible to examine the inter-year changes in the estimates for all possible dates.

Panel a of figure 1 shows the estimated coefficients on unexpected changes in M1.<sup>32</sup> The estimated coefficients in the regression for the bill rate and the bond rate track each other with a larger estimated coefficient for the bill rate until 1984, when the estimated coefficients converge to zero. Finding that the effect of unexpected money on changes in the interest rate becomes smaller after the shift in the Federal Reserve's operating procedure in late 1982 is consistent with previous work.<sup>33</sup>

Panels b and c show the estimated coefficients of unexpected increases in the inflation rate as measured by the CPI and the PPI. In the regressions for the Treasury bill rate, not one estimated coefficient is statistically significant for any 12-month period using a 5 percent marginal significance level. In the regressions for the Treasury bond rate, only estimated coefficients for the PPI in nine months in 1981 and three months in 1984 are statistically significant using a standard 5 percent marginal significance level. There is no evidence that the unexpected part of announcements of the CPI affect interest rates for any period as long as 12 months from 1980 to 1987. One interpretation consistent with these regression results is that there is some

evidence of a relationship between the unexpected part of inflation as measured by the Producer Price Index in 1980, but little afterwards. Such an interpretation requires that the point estimates of the regression coefficients be viewed as indications that the unexpected parts of the announcements had stronger implications for inflation over a period longer than the three-month maturity of the Treasury bill rate.

Real activity is represented by the unemployment rate (an inverse indicator) and industrial production. The estimated coefficients of the unemployment rate are presented in panel d. In the regressions for the Treasury bill rate, the coefficient of the unemployment rate is negative and statistically significant at the 5 percent marginal significance level during late 1983 and early 1984. While the estimated coefficient for the bond rate is not statistically significant during this period, the negative and smaller (in magnitude) coefficient is consistent with the hypothesis that the unexpected part of announcements of the unemployment rate affect interest rates in this period. The estimated coefficients for industrial production (panel e) also provides some evidence consistent with the hypothesis that announcements of it have affected interest rates. In particular, from mid-1985 through much of 1986, the Treasury bill and bond rates both have sharply increasing estimated coefficients on unexpected increases in industrial production. For the Treasury bill rate equations, these coefficients are significant at the 5 percent level. The positive sign is consistent with a rationalization in terms of monetary policy, with higher growth being followed by expectations of relatively contractionary monetary policy, and in terms of expected higher future growth signaling higher real interest rates.

Finally, the estimated coefficients for the trade balance, shown in panel f, never provide much support for a systematic relationship except perhaps at the start of the sample. Not one of the 168 estimated coefficients in the regressions for the bill and bond rates is statistically significant using a 5 percent marginal significance level.

## CONCLUSION

How do financial markets respond to the unexpected part of announcements of govern-

<sup>32</sup>Dashed lines denote statistical significance at standard 5 percent marginal significance level.

<sup>33</sup>See, for example, Hardouvelis (1987) and Hafer and Sheehan (1989).

ment statistics? Based on the evidence presented in this article, the answer is, very little. Using regression analysis, statistical tests of coefficient stability and rolling regressions to detect coefficient variability from 1980 to 1987, we find that only the unexpected changes in the money stock have a systematic effect on interest rates. Even then, it appears that the significant effects peter out by late 1982.

For none of the other variables examined do we find evidence of a reliable effect on interest rates over the period. This set of variables includes measures of inflation, real economic activity and foreign trade. Failing to find any systematic relationship between interest rate changes and these non-monetary variables has two implications. One is that explanations of the response of interest rates to monetary announcements that emphasize changes in economic agents' expectations of future inflation and real economic activity may be off the mark for 1980 through 1982. If these explanations were correct, such effects should be evident when inflation and real variables themselves are used. Our results, however, reveal little effect from the unemployment rate or industrial production. Theories that are premised on the response of interest rates to expected changes in monetary policy are more consistent with our empirical results.

The other implication concerns the effect on interest rates perceived by financial market analysts when government statistics are announced. We find no consistent response of interest rates, either short term or long term, to unexpected changes in the different non-monetary variables. We do find evidence consistent with the hypothesis that the unexpected parts of announcements of the Producer Price Index in 1980, the unemployment rate in 1983 and industrial production in 1980, 1985 and 1986 are associated with changes in interest rates. The relative infrequency of these significant effects can be interpreted in one of two ways. The first is that, of the 80 estimated annual coefficients, it is hardly surprising that five are statistically significant at the 5 percent marginal significance level. A conclusion that all of the coefficients are zero is therefore consistent with the results. The second is that, except for announcements of the money stock in the early 1980s, responses of interest rates to announcements are episodic, short-lived affairs.

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# Is America Being Sold Out?

**T**HE LAST time the U.S. current account balance was in surplus was in 1981. During the seven years 1982-88, U.S. deficits averaged over \$100 billion. Capital inflows from foreign investors have reduced the U.S. foreign investment position steadily from a net U.S. claim of \$141.1 billion at the end of 1981 to net foreign claims on the United States of \$368.2 billion at the end of 1987.

Much of the commentary on this reversal has presumed the loss of U.S. economic sovereignty, declining opportunities for American labor, and a reduction in the U.S. standard of living. In rebutting these concerns, analysts have generally concentrated on selected aspects of the phenomenon. For example, recent articles have focused on the relative pace of foreign direct investment, in particular, Japanese direct investment, while others have singled out the benefits of capital inflows for both American investors and labor<sup>1</sup>

This article takes a broader perspective to review the full range of concerns about foreign investment, both from a logical and an empirical vantage. The public concerns about the flow of foreign investment and its anxiety about the implications of the U.S. net international debtor

status are each addressed. We begin with an overview of recent public opinion polls about foreign investment in the United States, and then consider the data on foreign investment. The potential for a foreign takeover of the U.S. economy and the pattern of foreign investment in the United States relative to U.S. investment abroad are examined.

## **FOREIGN INVESTMENT IN THE UNITED STATES IN THE 1980s**

In assessing the implications of foreign investment in the United States during the 1980s, it is useful to examine three dimensions of the foreign capital inflows. First is the *perception* of foreign investment as reported by the media and recorded in public opinion polls. Since perceptions are often as important as facts, it is appropriate to begin with them. If there were no perceived threat, it is unlikely that any policy actions would be considered; certainly, the threat of foreign ownership of U.S. assets would not be an issue in the public forum. Second is the *pattern* of foreign investment. The concern seems to be chiefly that foreigners will obtain control of certain U.S. industries vital to

<sup>1</sup>Anderson (1988) focuses on direct investment misperceptions, Little (1988) discusses the relatively small magnitude of both direct and portfolio investment, Makin (1988b) discusses the Japanese investment patterns in the United States, Rosengreen (1988) discusses direct investment by foreigners and compared with U.S. foreign direct investment and Weidenbaum (1988) argues that capital inflows are beneficial. Francis (1988) recounts an interview with Milton Friedman in which he argues that the U.S. foreign

asset position is understated to the extent that he doubts the U.S. is a net debtor. Ulan and Dewald (1989) estimate adjustments to obtain a corrected U.S. net international investment balance. From a different vantage, Hwoko and Chediek (1988) describe the ruinous consequences following Argentine dictator Juan Peron's drive for "economic independence" through import substitution and restrictions on foreign investment.



national security, industries traditionally dominated by U.S. firms, or high-technology industries. Third is the reported *magnitude* of foreign investment. If the magnitude of such investment is negligible, there cannot be much threat to U.S. overall interests. If the magnitude is substantial, the inflow of foreign capital must be evaluated on its merits.

### **The Perception of Foreign Investment in the United States**

Opinion polls unambiguously reveal that the American public is concerned about increased foreign ownership of U.S. firms and real estate.<sup>2</sup> A poll by the Roper Organization in March 1988 found that 84 percent of the respondents thought that foreign companies buying more companies and real estate in America is not “a good idea for the U.S.” In the same poll, by a 49 percent to 45 percent plurality, respondents disapproved of new jobs for Americans in foreign-owned plants, and at least 72 percent thought that foreign companies’ investments should be restricted.<sup>3</sup> In May 1988, a CBS News/NewYork Times survey found that 51 percent of a national sample agreed that the “increase in foreign investment poses a threat to American economic independence.”<sup>4</sup> Similar findings were reported by other polling firms.<sup>5</sup>

Moreover, the uneasiness is not limited to Americans outside of the opinion-making elite. Last year, Sen. James Exon of Nebraska supported legislation “to give the Pentagon the right to veto” foreign takeovers of defense contractors; this provision was ultimately incorporated in the 1988 trade act. The political attractiveness of the issue is very strong:

Actions from Japanese land purchases in Hawaii to a British corporate takeover attempt in Pittsburgh fuel grass-roots worries. ‘The farther away you get from Washington,’ the greater the reaction ‘that America

should belong to Americans,’ says one antitakeover group official.<sup>6</sup>

The political furor and public uneasiness continue in early 1989. A controversial bill calling for greater disclosure by foreign investors was scheduled for a quick vote in the House of Representatives but was withdrawn by the Speaker of the House after an “explosion of protest in the Bush administration.”<sup>7</sup> In a survey for the Washington Post-ABC News Poll in mid-February 1989, “Forty-five percent said Japanese citizens should not be allowed to buy property in the United States, and eight of 10 said there should be a limit on how many U.S. companies the Japanese should be allowed to buy.”<sup>8</sup>

### **The Pattern of Foreign Investment in the United States in the 1980s**

There has been pronounced opposition to direct investment in the United States by foreigners, especially the Japanese. Direct investment is defined as a 10 percent or greater ownership share in a firm. Foreign direct investment in American firms has been the focus of the greatest unease. Such investment can take place either through stock purchases or the creation of new enterprises in the United States by foreigners, with or without U.S. partners. The seriousness of this concern is exemplified by excerpts from an editorial by Malcolm Forbes:

#### **BEFORE JAPAN BUYS TOO MUCH OF THE U.S.A.**

We must instantly legislate a presidentially appointed Board of Knowledgeables whose approval would be required before *any* foreign purchase of any significance would be allowed of *any* consequential U.S. company—regardless of size. . . .It’s one thing for the Japanese and Germans and others to buy U.S. government bonds to finance our huge trade imbalances with them. But it’s a

<sup>2</sup>For a comprehensive accounting of this view, see Tolchin and Tolchin (1988). Other briefer accounts, supporting in varying degrees the Tolchins’ concerns, are in Baer (1988), Burgess (1989), Fierman (1988), Jenkins (1988), Norton (1988), O’Reilly (1988), Skrzycki (1988), and “Mr. Greenspan on the Gas Tax” (1988). Even those who make their skepticism obvious—such as Friedman (1988), Kinsley (1988), Makin (1988a,b), “Buying into a Good Thing” (1988)—imply that the notion has received such frequent airing as to become conventional wisdom.

<sup>3</sup>Baer (1988), p.24.

<sup>4</sup>“Opinion Roundup” (1988).

<sup>5</sup>Hamilton, Frederick & Schneiders reported that “78 percent of Americans favor laws limiting foreign investment in

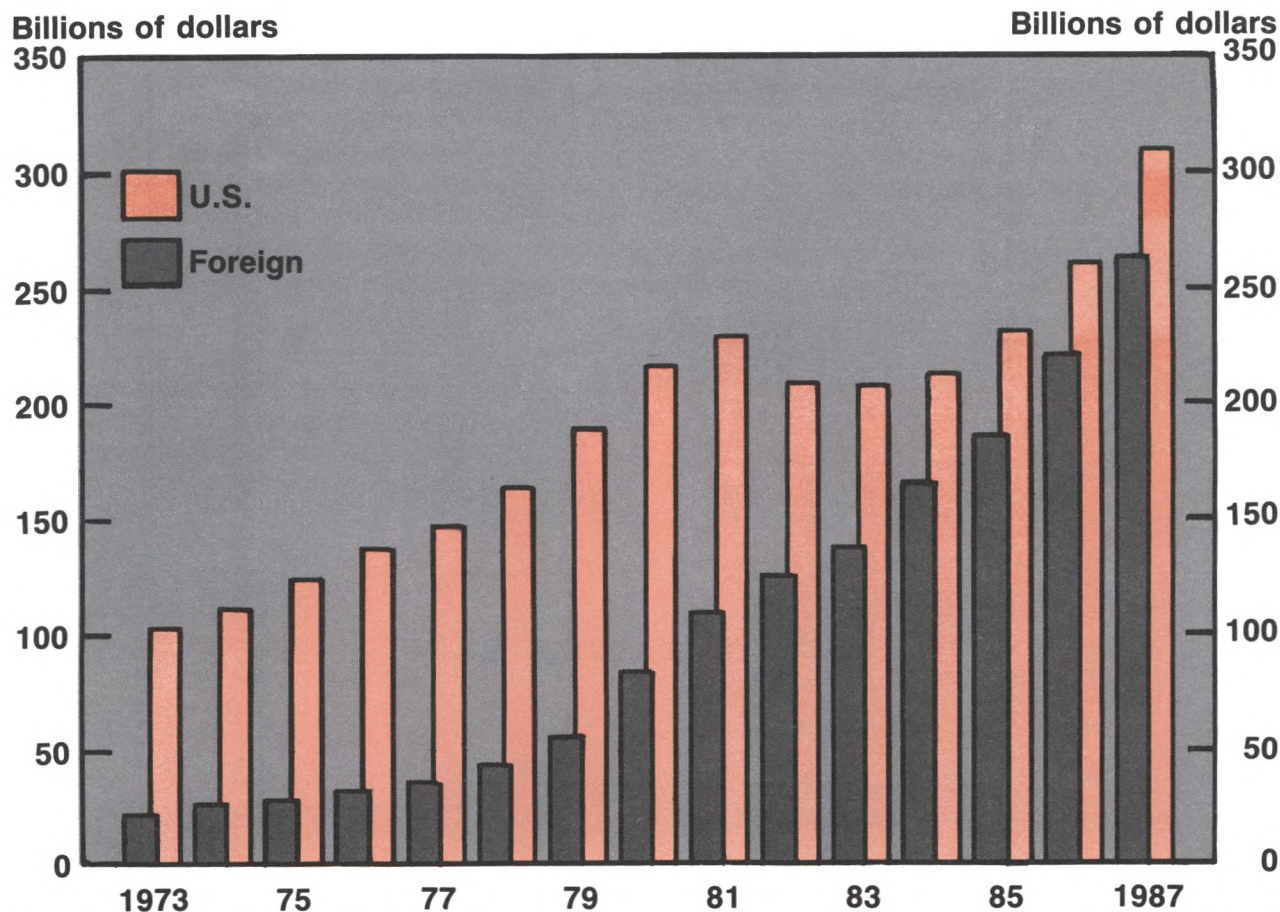
real estate and business” [Jenkins, p. 45] and Smick Medley & Associates found that “nearly 80 percent of Americans outside of the opinion-making elite would like to limit foreign buying, and 40 percent want to halt it altogether. ‘Joe America is nervous and suspicious,’ says the firm’s president, David Smick. ‘He is worried about losing control over his destiny.’” [Fierman, p.54]

<sup>6</sup>Jaroslovsky (1988).

<sup>7</sup>Birnbaum (1989).

<sup>8</sup>Morin (1989).

# Figure 1 U.S. vs. Foreign Direct Investment



whole and totally impermissible other thing for them to use their vast billions of dollars to buy great chunks of America's big businesses, or take over the high-tech, medical or other strategic, vital U.S. concerns.<sup>9</sup>

Figure 1 shows that since the advent of floating exchange rates in the early 1970s, foreign direct investment in the United States has grown faster than U.S. direct investment abroad—an annual growth rate of 18.7 percent vs. 7.6 percent. Consequently, the relative size of foreign direct investment has risen—from about 22 percent of U.S. foreign direct invest-

ment in 1975 to about 85 percent in 1987. Of the \$41.5 billion of direct U.S. investment by foreigners in 1987, nearly half, \$19.1 billion, was in U.S. manufacturing.

### *The Magnitude of Foreign Investment in the United States in the 1980s*

Table 1 shows the estimated composition of foreign investment in the United States and of U.S. investment abroad at the end of 1975 and 1980-87.<sup>10</sup> These data reveal that, since 1975,

<sup>9</sup>Forbes,(1988). Similar views are recounted in Makin (1988b) and expressed throughout Tolchin and Tolchin (1988).

<sup>10</sup>Note that the U.S. government gold stock reported in table 1 is vastly understated relative to its market value. In the table, the official U.S. government gold entry is computed

using an accounting price of \$42.22 per troy ounce. If its value were computed using a value closer to its market value in the 1980s, say \$400 per ounce, the entry in table 1 for U.S. official gold would be about \$100 billion rather than \$11 billion.

Table 1

**The Composition of Foreign Investment in the United States and U.S. Investment Abroad (billions of dollars)**

	1975	1980	1981	1982	1983	1984	1985	1986	1987
Foreign investment in the United States	\$220.9	\$500.8	\$578.7	\$688.0	\$784.4	\$829.6	\$1060.9	\$1340.7	\$1536.0
Official	86.9	176.1	180.4	189.1	194.5	199.3	202.6	241.7	283.1
U.S. Government securities	63.6	118.2	125.1	132.6	137.0	143.0	143.4	177.3	219.0
Private, nonbank	77.6	173.3	202.3	243.4	284.7	350.0	474.4	620.7	684.7
Direct investment	27.7	83.0	108.7	124.7	137.1	164.6	184.6	220.4	261.9
Private and non-U.S.- Treasury securities	45.7	74.1	75.1	93.0	113.8	127.3	206.2	308.8	344.4
U.S. Treasury securities	4.2	16.1	18.5	25.8	33.8	58.2	83.6	91.5	78.4
U.S. bank liabilities	42.5	121.1	165.4	228.0	278.3	312.2	354.5	451.6	539.4
Other	13.9	30.4	30.6	27.5	26.9	31.0	29.4	26.6	28.8
U.S. investment abroad	\$295.1	\$607.1	\$719.8	\$824.9	\$873.9	\$896.1	\$950.3	\$1071.4	\$1167.8
Official	16.2	26.8	30.1	34.0	33.7	34.9	43.2	48.5	45.8
Gold	11.6	11.2	11.2	11.1	11.1	11.1	11.1	11.1	11.1
Private, nonbank	159.0	278.0	291.7	283.2	291.0	300.6	343.1	392.8	455.6
Direct investment	124.0	215.4	228.4	207.8	207.2	211.5	230.2	259.6	308.9
Securities	34.9	62.6	63.4	75.5	83.8	89.1	112.8	133.2	146.7
U.S. bank claims	59.8	203.9	293.5	404.6	434.5	445.6	447.4	507.3	547.9
Other	18.3	34.7	35.8	28.6	35.1	30.0	29.0	33.3	30.1
Net foreign assets in the United States	-\$74.2	-\$106.3	-\$141.1	-\$136.9	-\$89.4	-\$3.5	\$110.7	\$269.2	\$368.2

SOURCE: Scholl (1988), table 2.

foreign assets in the United States have increased much faster than U.S. assets abroad. This pattern of faster foreign asset growth is even more pronounced if the comparison is made from 1981, the last year of an American trade surplus, to 1987. From a net claim on foreigners of \$141.1 billion, the United States has become the world's largest debtor, with estimated net liabilities to foreigners of \$368.2 billion. During this interval, foreign assets increased by 165 percent compared with 62 percent for U.S. assets abroad.

The disparity in accumulation is even greater for assets held by private investors, that is, total foreign investment less U.S. securities held by foreign governments and central banks. Over the seven years 1981-87, private foreign investment in the United States more than tripled, from \$398 billion to \$1253 billion. The bulk of these capital inflows have gone into foreign holdings of U.S. securities— corporate stocks and bonds and government notes and bonds— and liabilities of U.S. banks—deposits by foreigners. Together, these two asset categories account for about three-fourths of the increase in private foreign investment in the United States, \$643 billion of the \$855 billion total.

The size of the foreign claims raises another issue, the cost of servicing the net foreign indebtedness. Peter Drucker (1988) has called this "the looming transfer crisis":

...ours is the only major industrial country that has a significant *foreign* indebtedness, not only governmental but private as well, and that therefore has a significant foreign exchange requirement. By 1991 we will need close to \$1 billion to cover our foreign exchange remittances, about \$500 million for the federal debt. . . . And there is no way to earn that in our foreign transactions. No way. Even if we balance our trade, we won't have that much surplus.

Starkly put, Drucker believes that the accumulation of U.S. assets by foreigners will force the United States to repudiate its debts, either directly, indirectly by inflation or by reducing the nominal value of the dollar: "As long as we can knock down the dollar without domestic inflation, I think that is the best thing to hope for." Such a policy would be injurious not only

to foreign investors but to U.S. interests as well. To see why, consider why foreigners invest in the United States and how U.S. labor and investors each benefit from such investment.

## WHY DO FOREIGNERS INVEST IN THE UNITED STATES?

There are three reasons for foreign investment in the United States or for U.S. investment abroad: greater profit, lower risk and the trade deficit. The first, greater profit, is the fundamental reason, as it is for any other investment choice. The investor chooses one asset over another because it has a higher risk-adjusted rate of return. Both critics of foreign investment such as the Tolchins (1988) and defenders of unimpeded capital flows such as Makin (1988a,b) and Poole (1988) are agreed: Foreign investment is motivated primarily by profit.<sup>11</sup> Speaking of the capital flows from Japan and Europe to the United States, Poole observes that:

Two rate of return conditions are relevant. First, Japanese saving invested in the United States is in the interest of the U.S. if the rate of return we pay to the Japanese is less than the return we earn on the invested capital, and there is no evidence that this condition is not met. Second, Japanese investment in the United States is in the interest of Japan if the rate of return Japan receives in the United States is greater than the rate of return available in Japan. Given the declines in Japan's growth rate and investment share, and evidence that the rate of return in the Japanese equity and fixed income markets is extremely low, it is highly likely that both of these rate-of-return conditions were met from 1981 to 1985, and perhaps later. For Europe, it seems clear that the declining investment share is a supply-side problem; incentives to produce are too low because of high marginal tax rates and labor market rigidities. Europe also provides substantial subsidies to weak and inefficient enterprises. U.S. policies have, if anything, raised European growth in the 1980s by providing a large market for European exports. Thus, the two rate-of-return conditions discussed for Japan also apply to Europe.<sup>12</sup>

One important implication of Poole's discussion is that Drucker's concern about being able to finance the U.S. foreign obligations becomes moot.

<sup>11</sup>"Political leaders should remember that foreign investors are very anxious to invest in the United States, and that they invest primarily for market share and profits, and everything else is secondary." [Tolchin and Tolchin (1988),

p.271] See also Poole (1988), p.44.

<sup>12</sup>Poole (1988), pp.45-6.

The second motivation for foreign investment is to reduce the risks of wealth loss due to unforeseen exchange rate changes.<sup>13</sup> This proposition is simply an extension of the risk reduction principle of portfolio diversification to international alternatives. Portfolio diversification—spreading wealth across several assets rather than a single security—reduces losses due to unforeseen events.

Similarly, exchange rate risk can be hedged by holding several assets denominated in different currencies rather than all in a single currency. The investor's wealth is insured against rising or falling by the full amount of any unforeseen exchange rate change. A corollary of this is that multinational firms can reduce the unforeseen variability of their production costs and market sales by producing and selling in several countries rather than in a single one.

The third reason for foreign investment is that it accompanies trade deficits. Foreign investment induced by higher yields or portfolio diversification occurs whether or not international trade is in balance; however, trade deficits imply that net foreign investment *must* occur in the amount by which trade is in deficit.<sup>14</sup> Yet it would be incorrect to infer from this accounting identity that trade deficits cause foreign capital inflows. In other words, foreign investment is not undertaken simply to finance the trade deficit; indeed, it may well be that the capital inflows cause trade deficits:

The international accounts too, are more likely be driven from the capital side than the merchandise side. In this era of instant capital transactions, a year's worth of world trade amounts to only a

week's worth of capital flows. The U.S. trade deficit arose when U.S. banks stopped exporting capital to developing nations, and when, because of the Reagan tax cuts, the U.S. economy was the only growth opportunity in the world. These developments resulted in a tremendous net capital inflow; the deficit in merchandise trade was necessary to balance the equation.<sup>15</sup>

Thus, capital flows appear to be generated by investors' self-interested profit-seeking. There is broad agreement that, whatever other effects international capital flows may have on domestic economies, foreign investment makes investors and sellers of assets wealthier than they would be if their investment and sales were restricted to domestic assets and buyers. Nonetheless, this leaves open the issue of how labor is affected by international capital flows.

### **BENEFITS TO DOMESTIC LABOR OF FOREIGN INVESTMENT**

Labor and the owners of capital share the value added in production created by transforming raw materials into output. Capital is just a generic term for the tools, buildings, land, patents, copyrights, trademarks and goodwill that labor uses to convert one set of goods—raw materials—into another—finished output. The value of each factor of production in a market economy is its opportunity cost, that is, what the raw materials, labor or capital could produce in their most profitable alternative application.

In most cases, labor and capital are complementary, so that an increase in the quantity of one raises the productivity, hence, the value

<sup>13</sup>Anticipated changes in exchange rates are reflected in the differences between the rates of return on assets in different currencies. For example, if it is widely anticipated that the British pound sterling will decline by 5 percent in exchange value vs. the dollar in the coming year, then the interest rate on British securities will be 5 percent higher than the interest rate on U.S. securities of similar risk. This relation between interest and exchange rates is known as interest rate parity; for a discussion, see Koedijk and Ott (1987), pp. 5-7.

<sup>14</sup>Actually, the recorded capital inflows—the capital account balance—have been persistently smaller than the broadest measure of the trade deficits—the current account balance—throughout the 1980s. This error—the statistical discrepancy—has averaged over \$20 billion annually, which is between one-seventh and one-fifth of the current account deficit. For a review of the relation between the international trade and capital accounts and the statistical discrepancy, see Ott (1988), pp 3-13.

<sup>15</sup>Bartley (1988). See also Tatom (1987, 1989). Poole (1988), p. 42, points out that "the issue of causation is complex and should be discussed with care." Heller (1989), p. 2, notes that foreigners are financing attractive investments for which U.S. total saving is insufficient:

...the [domestic government] deficit is still substantial in relation to domestic savings and uses up funds that are needed for private sector investment. Thus far the US economy has enjoyed the confidence of foreign investors, preventing serious 'crowding-out' of the private sector in financial markets.

Wayne Angell, Heller's colleague on the Board of Governors of the Federal Reserve System, also has observed that the capital inflows are beneficial:

"I'm not irritated or upset about capital inflows into the United States. Capital inflows do tend to increase our productivity." "Capital Inflows Called Helpful" (1988)

of the services, of the other. For example, providing an auto mechanic or a carpenter with more tools increases the amount or quality of work they can accomplish; this increase in productivity leads to a rise in their wages, or, at the same wages, to an increase in the number of them employed.

Consequently, to the extent that foreign investment is an increment of capital that would otherwise not be available for labor to use, the foreign capital must unambiguously be beneficial to labor.<sup>16</sup> Equally true, the availability of foreign capital lowers the cost of capital to owners; this makes additions to plant and equipment cheaper, makes possible some investment projects that otherwise would not occur and raises the value of firms.<sup>17</sup> Thus, even if the foreign capital does not directly affect the ownership of the firm, it benefits labor and asset owners by lowering interest rates, the cost of capital.

This discussion can be summarized in five postulates about the expected gains and losses from the addition of foreign capital:

- (i) Labor gains as the incremental capital raises the productivity of labor, increasing the amount of labor that can be employed or the wages of those who are employed;
- (ii) Owners of firms—the shareholders—benefit by the lower interest rates implied by higher asset prices;
- (iii) Consumers gain as a result of the lower

prices of goods implied by the increased labor productivity;

- (iv) The profitability of financial intermediaries may decline since the value of their services in bringing borrowers and lenders together is inversely related to the supply of capital. Moreover, the entry of foreign financial intermediaries makes the industry more competitive, which also tends to reduce the rate return;
- (v) Savers may lose interest income as a result of lowered interest rates due to the greater capital availability. This loss is offset, to some extent, as they receive capital gains on their existing fixed-rate portfolio holdings for the same reason as in (ii).

Since foreign investment raises the amount of capital available, labor productivity rises as does the absolute income of labor. Labor is better off with more capital than with less, and the nationality of the investor is a matter of indifference to labor.<sup>18</sup>

## THE MYTHICAL THREAT OF WITHDRAWAL OF FOREIGN CAPITAL

In early 1989, the U.S. economy continues its longest peacetime expansion on record, so the dangers of foreign investment are posed as the potential calamity of an abrupt foreign withdrawal. This scenario was described by a

<sup>16</sup>Recent media discussions of worker views on foreign ownership of their firms have revealed a general absence of hostility by workers and their unions, emphasizing instead the benefits of the employment made possible by the capital inflow. Holusha (1989) quotes two automobile workers at the Nummi joint venture of Toyota and General Motors as follows:

"I can't honestly say I like it better [than when it was a G.M. plant], but I'm working and that's better."

and

"We got a second chance here, and we are trying to take advantage of it. Many people don't get a second chance."

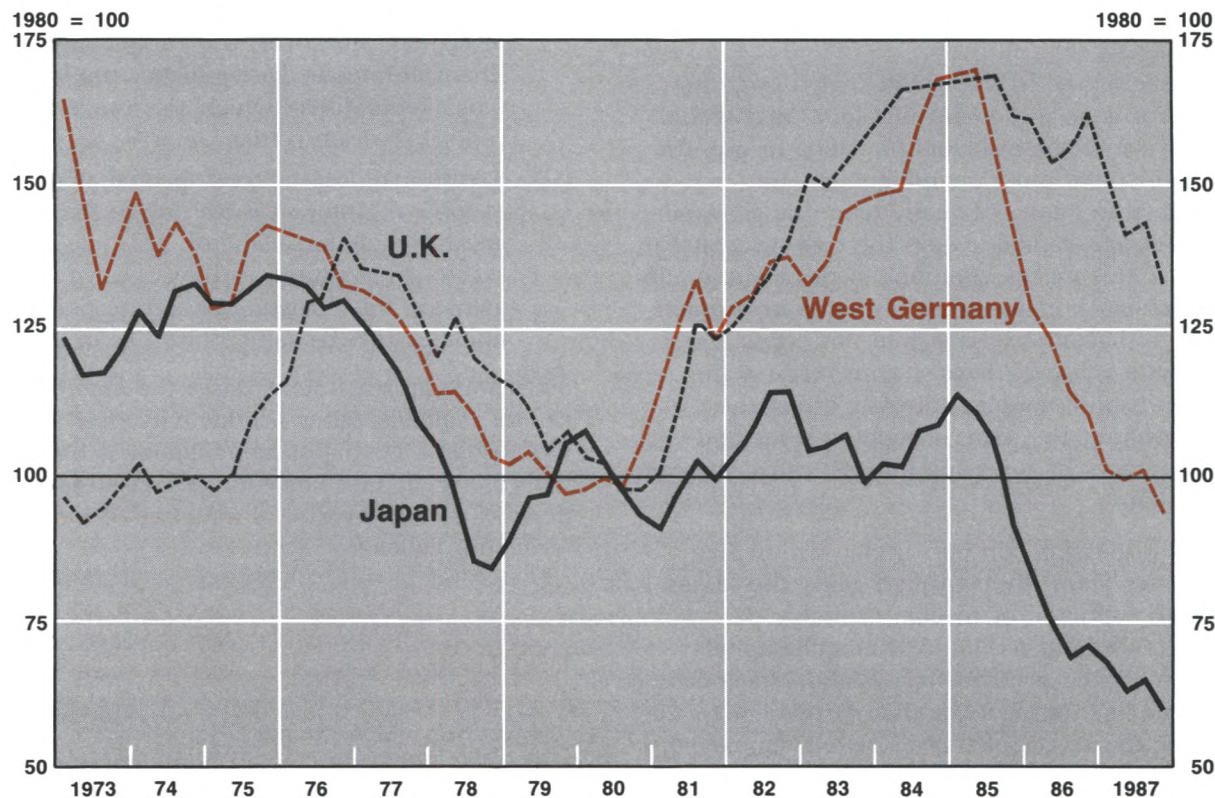
The Tolchins' (1988) single out Volkswagen of America as being "a notable exception to the anti-union flavor of many foreign owned companies." (p. 178) Ironically, the other foreign automakers castigated by the Tolchins continue operations and employment of labor in the United States, while Volkswagen ceased U.S. production in 1988.

<sup>17</sup>The elimination of restrictions on foreign ownership can raise the wealth of domestic asset owners, as recently illustrated in a policy change by Nestle, a Swiss corporation; see Dullforce (1988a). In late November 1988, Nestle announced that, henceforth, it would sell registered shares to any buyer, whether or not that buyer was a Swiss resident. As a result of the eradication of the distinction between its two types of common stock, registered (formerly restricted to residents) and bearer (available to

nonresidents), common shares of both types now sell for about the same price. Before the change, bearer shares had sold for about twice the price of registered shares. See Financial Times Market Staff (1988). Removing the restriction on foreign buyers' ability to buy the resident shares realized a 40 percent wealth gain for Swiss resident shareholders. Nestle reportedly makes up about 11 percent of the capitalized value of the Swiss stock market shares, and its decision may influence other Swiss corporations' equity policies. This change opens up the possibility of foreign ownership of Swiss corporations; apparently, Swiss Nestle stockholders are willing to bear this cost. The Governor of the Swiss National Bank also has argued that the market for financial assets in Switzerland must not discriminate on the nationality of the buyer if the country is to remain an important center for capital transactions; see Dullforce (1988c). Similar arguments are offered in a discussion of the European Community's eradication of capital restrictions by Greenhouse (1988).

<sup>18</sup>In the 1988 Presidential campaign, the Democratic candidate, Michael Dukakis, told a group of workers at a St. Louis automotive parts plant, "Maybe the Republican ticket wants our children to work for foreign owners....but that's not the kind of a future Lloyd Bentsen and I and Dick Gephardt and you want for America." The workers addressed by the candidate had been employed by an Italian corporation for 11 years. "Dukakis-Bentsen-Gephardt" (1988).

**Figure 2**  
**U.S. Dollar Exchange Rates vs. Japan, U.K.**  
**and West Germany**



prominent New York investment banker as follows:

The dollar will eventually fall, he notes, and when it does and interest rates decline in a period of recession, foreign investors would withdraw their portfolio investments, triggering a banking crisis. These foreign investors then could use their inflated portfolios to make direct investments of American industry at "bargain basement prices. . . . We will have financed our deficit by putting up permanent assets."<sup>19</sup>

This scenario entails the confluence of four events: a decline in the dollar's exchange value; a cyclical decline in U.S. interest rates; a withdrawal and subsequent re-entry of foreign investment; and a banking crisis induced by the

foreign withdrawal. Thus, to evaluate the dangers posed by foreign ownership of U.S. assets, one must investigate not just the likelihood of each of these events but their joint likelihood, including whether they are mutually consistent.

### ***Decline of the Dollar***

From its peak in February 1985, the exchange value of the dollar averaged against the principal industrial currencies has fallen more than 40 percent.<sup>20</sup> As shown in figure 2, it has fallen by about one-third against the pound, by almost one-half vs. the yen and by over two-fifths in terms of the Deutsche mark. Yet, there has been no sign of a widespread flight from

<sup>19</sup>Attributed to Felix Rohatyn, p.28, in Tolchin and Tolchin (1988); this scenario is repeated nearly verbatim on pp. 197-98 and again on p. 201. See also Baer (1988), Fierman (1988), Jenkins (1988), Makin (1988a,b) and Norton (1988).

<sup>20</sup>The trade-weighted exchange rate of the dollar against the other Group of Ten countries plus Switzerland hit a peak of 158.43 (1973 = 100.00) in February 1985; it was below 90.0 in late 1987 and has a value of 91.88 in January 1989, a 42 percent decline from its early 1985 peak.

dollar assets. Even the record stock-market crash of October 1987, when the dollar's exchange value was at its nadir, did not suffice to trigger a massive withdrawal of foreign capital.<sup>21</sup>

### **Cyclical Decline of U.S. Interest Rates**

Generally, differences in interest rates in one currency vs. another are just sufficient to offset the anticipated depreciation of the higher-interest currency vs. the lower-interest currency as reflected in their forward exchange rate.<sup>22</sup> While interest rates do decline in recessions, the benefit to an investor from selling U.S. assets and shifting to another currency at such times is limited by the likely state of other economies. The world's major economies are so economically integrated that periods of recession in the U.S. economy are generally also periods of recession in the other economies in which attractive substitute investments would be available. Consequently, to the extent that both interest rates and asset prices were to fall in the U.S. economy, the same pattern is likely to have occurred in the rest of the industrial economies as well, so a shift from U.S. to foreign assets would accrue no profit. If other economies' asset prices and interest rates had not fallen with those in the United States, then the depreciation of the dollar's exchange rate would obviate the benefit of such a withdrawal.

### **Withdrawal and Subsequent Re-entry of Foreign Investment**

Investors withdrawing their funds from U.S. assets must do it in two steps—first selling the asset and then using the cash (dollar) proceeds to buy another asset, either another U.S. asset or a foreign currency. An investor selling an asset from a portfolio is, by that action, buying something else—a stock, a bond, a piece of real estate, a quantity of money denominated in some currency.<sup>23</sup> When the dollar proceeds are exchanged for foreign currency, some other investors will acquire the original asset and the U.S. dollars. In the spirit of the scenario, if only domestic U.S. investors are buying the U.S. assets from the prior foreign owners, both a U.S. capital outflow and a sharply declining dollar exchange rate will occur. The capital outflow can only occur if the United States has a trade surplus.<sup>24</sup> In reality, massive withdrawals of foreign capital cannot occur in the short run. Prices and exchange rates adjust first; international payments flows adjust with a substantial lag. Nonetheless, if this unlikely abrupt swing from trade deficit to surplus were to occur because of the foreigners' panic sales, the assets would end up in U.S. investors' hands at considerably lower prices. If foreigners repurchased them shortly thereafter, the result would be increased prices and an appreciation of the exchange value of the dollar with the resulting profit accruing to domestic owners.

<sup>21</sup>In part, this is simply an illustration of the interconnectedness of the world's economies. All major stock market around the globe crashed together:

All major world markets declined substantially in that month [October 1987], which is itself an exceptional fact that contrasts with the usual modest correlations of returns across countries....The United States had the fifth *smallest* decline, i.e., the fifth best performance, in local currency units. However, because the dollar declined against most currencies, the U.S. performance restated in a common currency was only 11th out of 23....[A]n attempt was made to ascertain how much of October's crash could be ascribed to the normal response of each country's stock market to a worldwide market movement. A world market index was constructed and found to be statistically related to monthly returns in every country during the period from the beginning of 1981 up until the month before the crash. The magnitude of market response differs materially across countries. The response coefficient, or "beta" was *by far* the most statistically significant explanatory variable in the October crash. It swamped the influences of the institutional market characteristics. Roll (1989), pp.65-6

<sup>22</sup>This relation between interest rate differences and anticipated exchange rate changes (primarily due to inflation rate differences) is called covered interest parity (CIP). The evidence supporting the absence of profitable speculative opportunities due to CIP is overwhelming. While there is also evidence of risk premia in interest differentials, such evidence also suggests that these premia are a return for the cost of risk-bearing, not a pure profit. See Koedijk and Ott (1987).

<sup>23</sup>The scenario at this point makes a distinction between foreign investors' portfolio and direct investment: "...withdraw their portfolio investments...then could use their inflated portfolios to make direct investments at bargain basement prices..." This presumes a distinction between bond and stock prices which is inconsistent. According to the scenario, the dollar and all other U.S. asset prices fall, so it would be irrelevant where foreign investors' portfolios were initially invested. Moreover, since direct investment is simply a 10 percent or greater holding in a corporation, the distinction between "portfolio" and "direct investment" holdings of common shares is one of degree, not of kind.

<sup>24</sup>It is unlikely, but conceivable that a swap of U.S. assets for foreign assets could take place without any impact on the balance of payments; however, this would require that the assets exchange in exactly balanced total values, the value of U.S. assets sold equaling the value of foreign assets sold. In contrast, the scenario being reviewed postulates a declining dollar, suggesting that the U.S. assets are no longer as desirable as they were at their prior prices. Consequently, with falling U.S. asset prices and foreigners engaging in net sales, a capital outflow is implied. This can only occur if the trade balance is registering a surplus.



## Banking Crisis<sup>25</sup>

Here the scenario presumes that foreigners, having sold their portfolios, then convert their dollar deposits to nondollar currencies. To do so, they must buy these currencies from others who, in turn, end up holding dollar deposits. This would put downward pressure on the dollar's exchange rate and would be associated with a capital outflow from the United States. Such substantial withdrawals—even if replaced dollar for dollar in aggregate—would increase the uncertainty entailed in asset-liability management decisions at *individual* depository institutions.

In particular, this uncertainty would complicate the matching of the duration of assets and deposit liabilities. The likely response of depository institutions to these portfolio shifts would be an increase in their demand for reserves, reflected in a rise of the federal funds rate. Yet, the stress of an abrupt rise in deposit turnover—whether or not it is associated with a net outflow of funds from depository institutions—does not necessarily imply a banking crisis. Such an implication would require that the Federal Reserve take no action to accommodate an abrupt shift in the public's portfolio preferences. The Fed can and has accommodated such increases in the public's demand for liquidity and the rise in depository institutions' demand for reserves.<sup>26</sup>

## Overview of the Foreign Withdrawal Myth

In summary, the scenario is extremely unlikely to occur. It is internally inconsistent and depends on inept U.S. monetary policy actions and irrational investment behavior by both domestic and foreign investor. Since interest

rates are linked through integrated international capital markets, the presumed low U.S. interest rates and a depreciating dollar are inconsistent. Investors, U.S. resident and foreign, are unlikely to believe that the U.S. monetary authorities would be passive in the event of a U.S. banking crisis. They could profit by buying U.S. assets at prices temporarily depressed by any general foreign withdrawal and subsequently selling them back to other chagrined but wiser foreign investors. In short, rational expectations and the profit motive induce competitive behavior which nullifies the threat of widespread foreign capital withdrawal, the same profit motive that induced the foreign investment in the first place.<sup>27</sup>

## HAS FOREIGN DIRECT INVESTMENT CHALLENGED CONTROL OF DOMESTIC U.S. INDUSTRIES?

Misperceptions about the distribution of foreign ownership pervade discussions about foreign investment in the United States. First, as can be seen in table 1, most foreign investment is concentrated in portfolio and bank deposits. In 1987, foreigners held only about 17 percent of their U.S. assets in direct investment; if official assets are excluded, the share of direct investment rises to about 21 percent. In contrast, U.S. direct investment abroad is about 26 percent of the total or 27 percent of private investment. As the table shows, U.S. direct investment abroad exceeds foreign direct investment in the United States. Moreover, the excess of U.S. direct investment widened in 1987 to \$47 billion from \$39.2 billion at the end of 1986.

The acceleration of U.S. foreign direct investment beginning with 1985 is obvious in figure 1. U.S. foreign direct investment fell from 1981 to 1982 and was stagnant until 1985; during this

<sup>25</sup>A "banking crisis" can be defined as a widespread loss of confidence in the solvency of depository institutions resulting in runs on banks or abrupt rises in interest rates to deter withdrawals. From the public's point of view, such shifts in portfolio preferences away from deposits can be characterized as an increase in liquidity preference. Such a crisis could very well be precipitated by sharp declines in stock and bond prices if deposit holders feared that banks' direct losses on portfolio investments or indirect losses through loans secured by securities endangered their deposits.

<sup>26</sup>For example, by a combination of increased open market purchases of U.S. securities and the indication of greater accommodation through the discount window, the Fed averted a potential liquidity crisis in the U.S. financial system following the October 1987 stock market crash.

<sup>27</sup>Another interpretation of this scenario is that it is simple lobbying for restrictions on foreign buyers and foreign intermediaries. The scenario is intended to engender doubt about the benefits of unhindered foreign capital inflows. The policy implication contingent on finding the scenario credible would be to restrict U.S. investment by foreigners and foreign investment intermediaries. These restrictions would lower the supply of capital and raise interest rates and other costs of financing domestic investment and corporate restructuring. As a result, the services of domestic financial intermediaries would rise in value. In short, the argument is of a piece with all regulatory arguments for restrictions on entry or output—that the increased safety, purity or quality of the licensed practitioners justifies the reduced supply and higher cost. See Stigler (1971).

period, foreign direct investment in the United States accelerated. Since 1985, however, U.S. investment abroad has outpaced foreign direct investment in the United States. While there is a lively debate about why this resurgence of U.S. direct investment has occurred, most analysts argue that it reflects the tax reforms of 1986:

Nonresidential [U.S.] fixed investment rose substantially in 1983-84, but reached a peak in 1985 and then fell somewhat. The tax reform discussion, which began in earnest with the Treasury I tax proposal in November 1984, killed the investment boom. Further evidence for this view is that U.S. direct investment abroad rose substantially at the same time.<sup>28</sup>

The second misperception about foreign direct investment in the United States is the apparent belief that the Japanese are the principal foreign direct investors.<sup>29</sup> This notion is incorrect. As figure 3a indicates, Japanese direct investment in the United States ranks a distant third behind that of the British and the Dutch. In fact, the European Community holds about three-fifths of the foreign direct investment in the United States—\$157.7 billion of the \$261.9 billion in 1987—nearly five times the Japanese stake. Of the total investment, direct, portfolio and bank deposits, Burgess (1988) notes that “at the end of 1987, Europeans had holdings of \$785 billion, compared to Japan’s \$194 billion ...[of] assets of all kinds—wholly owned companies, stocks, bonds, bank deposits, real estate.”

The third misperception is that foreign direct investment is concentrated in the manufacturing sector. As shown in figure 3a and 3b, the share of U.S. direct investment by foreigners in manufacturing is just over one-third, 35 percent, slightly less than the 41 percent share of U.S. direct investment abroad in manufacturing. In terms of country shares, the Japanese have less than one-sixth of their U.S. direct investment in manufacturing. The top four areas of direct investment show substantial similarity. In

descending order, manufacturing, trade, petroleum and finance are the largest foreign direct investment areas in the United States, while manufacturing, petroleum, finance and wholesale are the largest U.S. direct investment areas abroad.

Considered at the level of individual firms, the Japanese record is even less obtrusive. Rosengren (1988) reports that Japan’s acquisition of 94 U.S. companies during 1978-87 ranked fifth compared with the 640 taken over by the British, 435 by the Canadians, 150 by the Germans and 113 by the French. Considering the year 1987, the Japanese tied for fifth place with the Germans at 15 acquisitions, well behind the pace of the British (78), the Canadians (28), the French (19), and the Australians (17). Rosengren argues that these company purchases tend to be reciprocal in two respects. First, the U.S. list of companies purchased has nearly the same country rank order as the foreign purchases in the United States, and the particular industries also were similar for the U.S. and foreign direct. Second, both U.S. and foreign firms tend to make acquisitions of firms in their own industries as a means of extending their markets.

The upshot of Rosengren’s study is that foreign acquisitions of U.S. firms have exhibited much the same patterns as U.S. acquisitions of foreign firms with a twist reflecting the increasing international integration of business: “[M]any of the foreign acquisitions are partnerships between foreign investors and U.S. banks and investment companies.”<sup>30</sup>

## IS THERE ANY CREDIBLE DANGER FROM FOREIGN CAPITAL?

Any credible threat from foreign investment must ultimately depend on the share of foreign

<sup>28</sup>Poole (1988), p. 46. See also Tatom (1987, 1989).

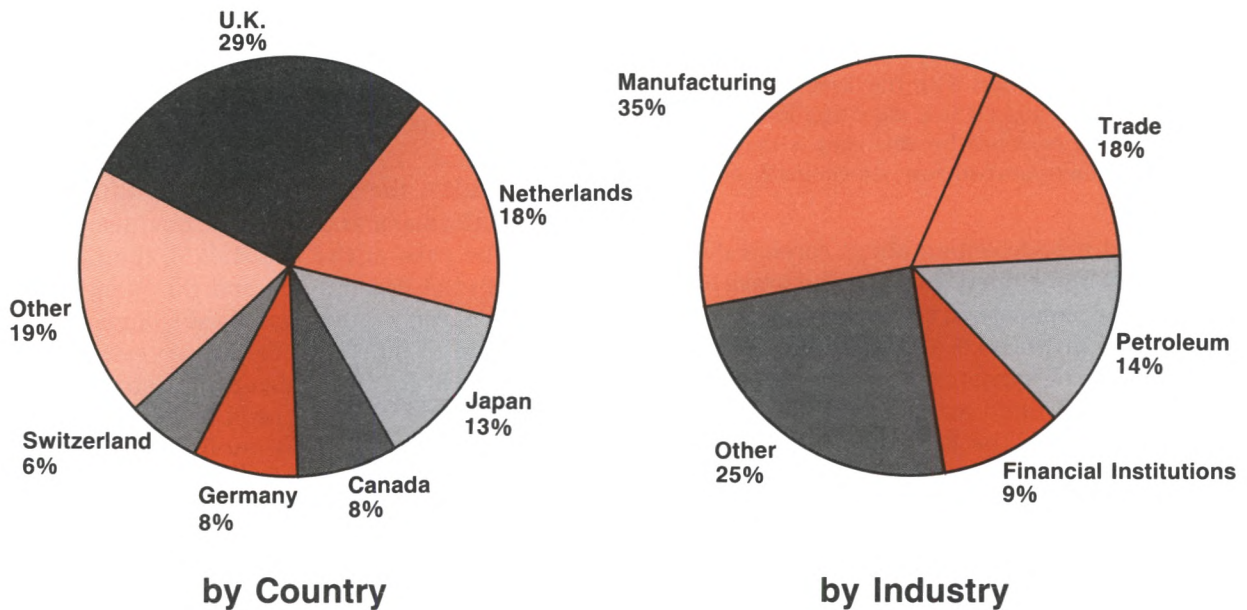
<sup>29</sup>For example, see O’Reilly (1988). This view also is implicit in the excerpt of the editorial by Malcolm Forbes (1988) on pages 48-49. Its inaccuracy is addressed in Makin (1988b) and Rosengren (1988).

<sup>30</sup>Rosengren (1988), p. 50, illustrates this with a clear example of the financial integration of takeovers:

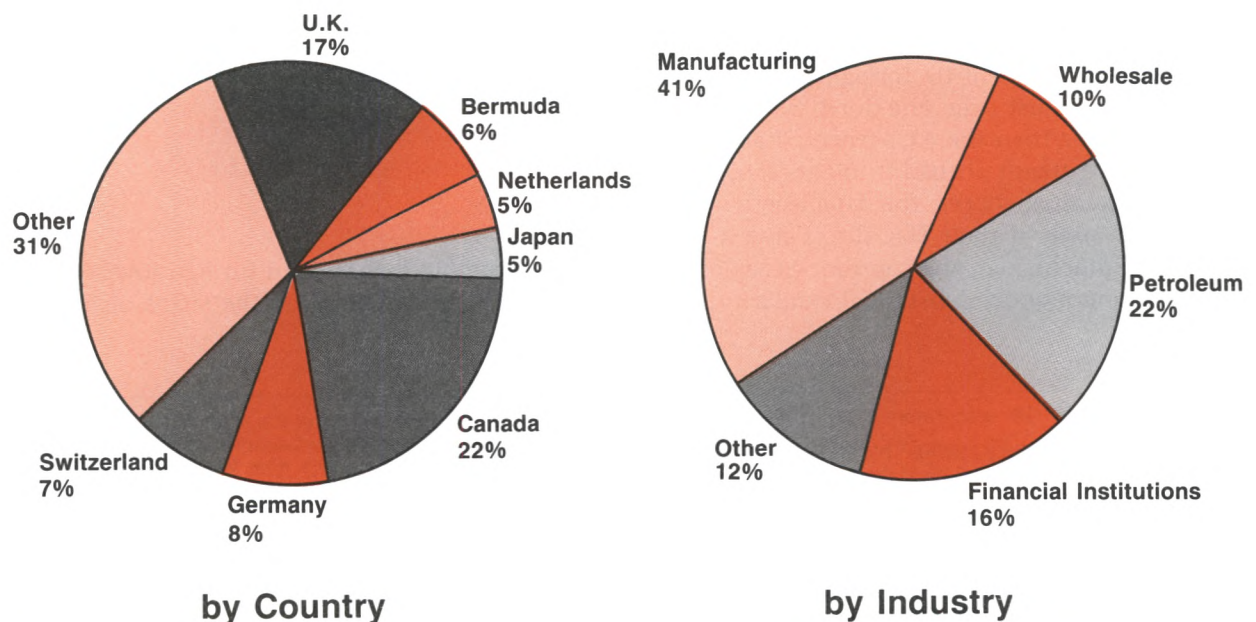
Classifying an acquisition as “foreign” can be misleading since the bulk of the purchase may be financed by a domestic com-

pany. Depending on how the deal is structured, those who provide the financing may have a substantial stake in the outcome of the acquisition. For example, when Beazer, a British company announced its \$1.85 billion hostile bid for Koppers, much of the financing was provided by a U.S. company, Shearson/American Express. Shearson/American Express not only provided \$500 million in debt financing, it also agreed to purchase 46 percent of equity.

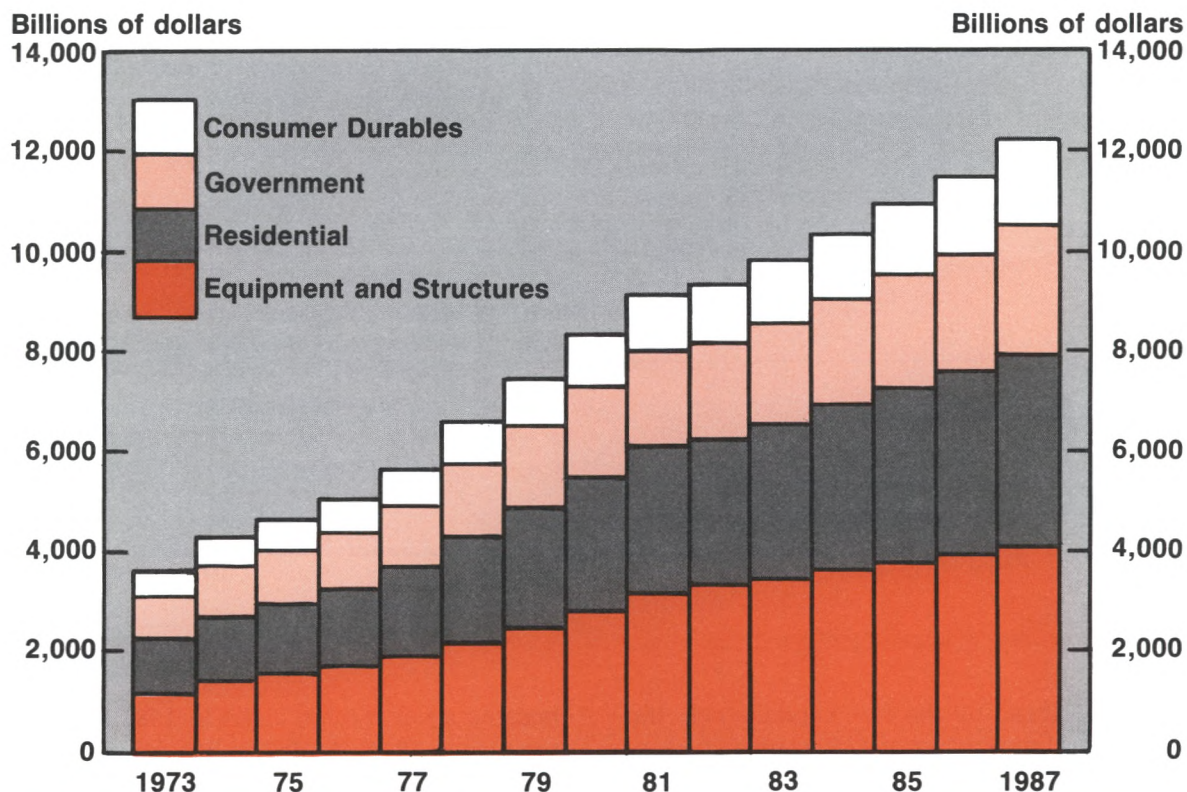
**Figure 3a**  
**Distribution of Foreign Direct Investment in the United States, (\$261.9 Billion), 1987**



**Figure 3b**  
**Distribution of U.S. Direct Investment Abroad, (\$308.8 Billion), 1987**



## Figure 4 U.S. Net Reproducible Fixed Capital Stock at Market Prices



ownership of the stock of U.S. assets. That is, a small proportional share of U.S. capital held by foreigners is sufficient to preclude the possibility that foreign investment in the United States is deleterious. In this section, we show that the foreign share of U.S. capital, current and prospective, is too small to support the critics' concern.

### *The Miniscule Share of Foreign Ownership of U.S. Capital*

The market value and the composition of the U.S. reproducible fixed net capital stock from 1973 to 1987 is shown in figure 4. From 1973, when its market value was \$3.6 trillion, it has grown to \$12.2 trillion at the end of 1987. During the period of large U.S. current account

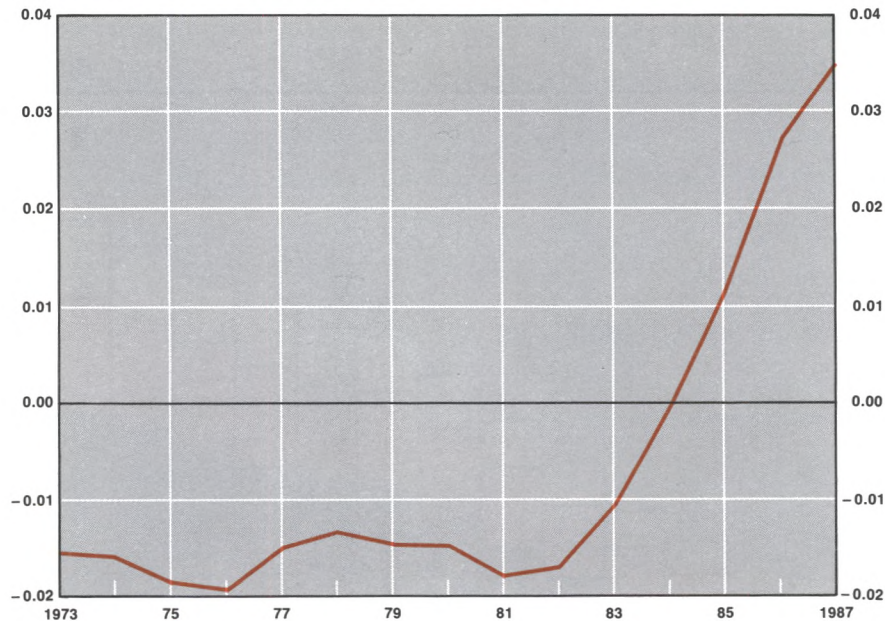
deficits beginning in 1982, its annual increase has averaged more than \$0.5 trillion—that is, more than five times the average capital inflow—an annual growth rate of about 5.5 percent. Its composition in 1987 was \$4.1 trillion of producers' plant and equipment, \$2.4 trillion of government capital, \$4.0 trillion of residential capital and \$1.7 trillion of consumer durable goods such as automobiles, household furnishings and equipment.<sup>31</sup> For purposes of this analysis, we will consider the share of the net U.S. reproducible tangible capital stock (less consumer durables) that the net foreign investment could command as collateral.

The composition of U.S. assets held abroad and foreign assets held in the United States are shown in table 1. Considered as a potential

<sup>31</sup>Government capital, valued at its current estimated replacement cost, consists of government buildings, plant and equipment used in government production and roads,

bridges, waterway improvements, etc. State and local governments hold about two-thirds of the public capital stock and the federal government one third.

Figure 5  
**Ratio of Net Foreign Assets to Net Reproducible  
 Capital Stock Excluding Consumer Durables**



claim collateralized by the U.S. capital stock, the estimated foreign holding of U.S. claims at year-end 1987, \$1.54 trillion, was about 12.5 percent of the U.S. reproducible capital stock and 14.6 percent of the nonconsumer capital stock. Considered as a claim on the producer capital stock, \$4.1 trillion, it amounted to a 37.4 percent claim. Subtracting estimated U.S. assets abroad at year-end 1987, \$1.17 trillion, from the foreign claims yields net foreign assets in the United States, \$0.37 trillion, so that the percentage foreign claim on the net U.S. reproducible nonconsumer capital stock at the end of 1987 was 3.5 percent.

In summary, the net current share of U.S. assets owned by foreigners is implausibly low to substantiate any potential cornering of U.S. asset markets. Even so, this leaves open the question of whether the trend of increasing foreign ownership poses any such likelihood.

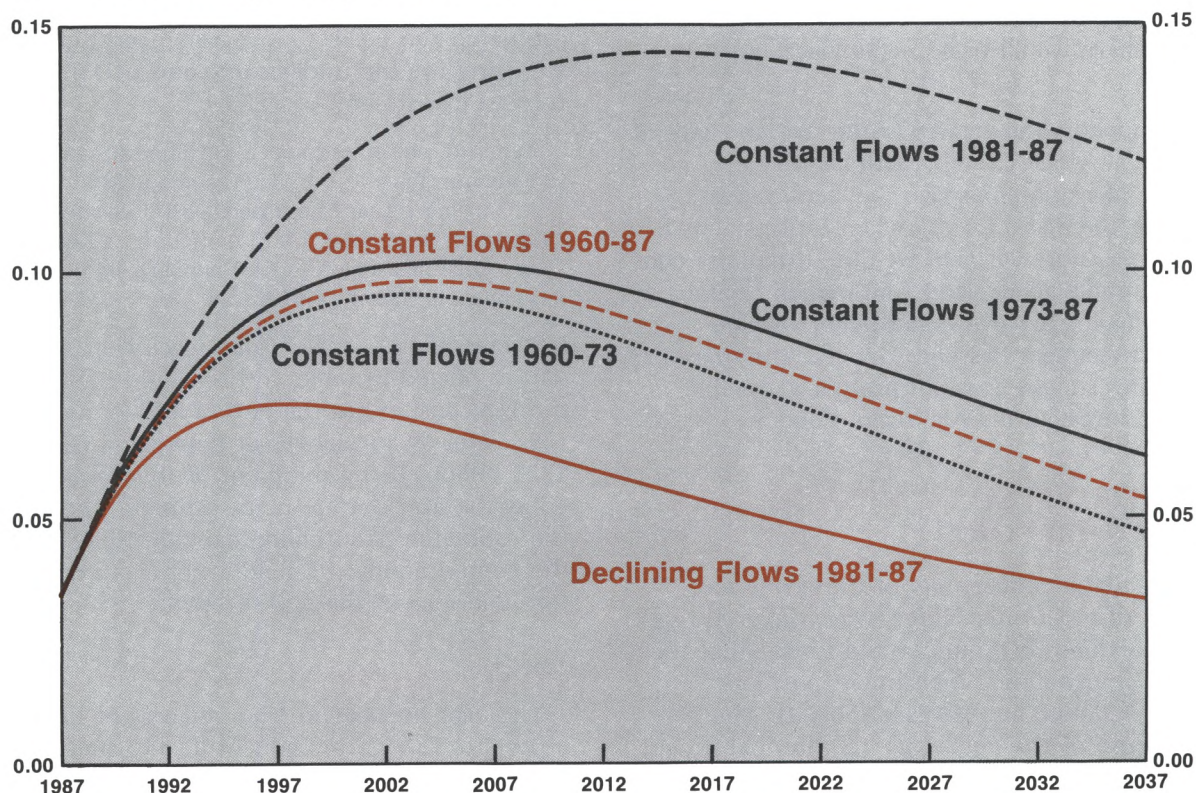
### ***Sustained Capital Inflows Are Insufficient to Threaten U.S. Economic Sovereignty***

The U.S. Commerce Department estimates that the U.S. international investment position

became a net foreign claim in 1985 for the first time since 1914, -\$110.7 billion (see table 1). Figure 5 shows this net foreign investment claim as a share of the net U.S. reproducible nonconsumer capital stock. Reflecting the U.S. trade deficits during the 1980s, the foreign claim has grown at an average of over \$80 billion per year since 1981. Since becoming a net claim, the foreign percentage claim has risen to 3.5 percent of this U.S. wealth measure.

Even if the capital inflows persisted indefinitely at their 1988 level of about \$120 billion, this need not result in an eventual foreign control of the U.S. economy in the sense of majority foreign ownership of U.S. nonconsumer assets. This is because the U.S. capital stock also is growing. If either the inflation of replacement prices of physical capital or real capital accumulation is fast enough, the share of foreign capital could rise for a period of years and then decline. The maximum the foreign share would attain and the time at which it would top out vary with the assumed rates of capital stock growth and the rate of capital price appreciation.

**Figure 6**  
**Foreign Share of Net U.S. Reproducible Capital**  
**Stock Excluding Consumer Durables Collateralized by**  
**Net Foreign Investment with Constant Capital Inflows**  
**and Declining Capital Inflows**



The U.S. capital stock grows each year by the amount by which gross investment in new buildings, roads, housing and industrial plant and equipment exceeds the scrappage and depreciation of the existing stock. The market value of this stock also rises with inflation. As was shown in chart 4, the estimated market value of the U.S. nonconsumer capital stock grew from \$7.9 trillion at the end of 1981 to \$10.5 trillion at the end of 1987. Over this period, the implicit annual rate of inflation of capital stock replacement cost has averaged

about 2.3 percent, and the annual growth of the real net stock (at 1982 prices) has averaged about 2.2 percent. The sum of these two effects in the 1980s has implied a nominal capital stock growth rate of 4.5 percent. Combining these recent trends, we can determine the long-term consequences of a continued capital inflow.<sup>32</sup>

As shown in figure 6, under these assumptions, which are most favorable to the threat scenario, the foreign share actually would rise to a maximum of 14.4 percent in the year 2015

<sup>32</sup>The period 1981-87 and the constant \$120 billion inflow are used in this discussion as they maximize the growth of and the peak share attained by foreign capital. More plausible rates are considered below. Nonetheless, the fact that even indefinitely sustained capital inflows of over \$100 billion would be insufficient to support any traumatic restructuring of the U.S. economy is consistent with Mussa's conjecture about surprisingly large equilibrium

U.S. current account deficits: As a result of the higher growth rate of the U.S. population, its relatively younger age distribution, the size of the U.S. economy and its attractive investment opportunities, "...we should have an equilibrium current account deficit of roughly one percent of our GNP." See Mussa (1985, p.146). In terms of the 1988 level of GNP of \$5 trillion, this would imply an equilibrium capital inflow of \$50 billion.

and then decline.<sup>33</sup> Since the assumed sustained capital inflow is probably larger than most analysts would assume, this is a worst-case scenario. For example, under growth and inflation rates averaged over the the full floating-rate era, 1973-87, the constant \$120 billion capital inflow would generate a peak share of 10.2 percent in 2004. Finally, if the capital inflow declines over the near future as it has since 1987, then the foreign share would peak in 1997 at about 7.3 percent.

Consequently, the growth of the foreign share of U.S. capital, while large by 20th century experience, does not approach the share necessary to corner the market. Even when expressed as a claim on a subset of U.S. wealth—excluding consumer durable goods, land, and human capital—and presuming an investment pattern which foreign investment has not exhibited, the share of foreign investment does not present a credible takeover threat to the American economy.

### IS THE UNITED STATES REALLY A NET DEBTOR?

Much of the concern about the economic security of the United States was triggered by the Department of Commerce estimate that the U.S. net international investment position became negative in 1985 (see table 1). The proximate cause of the declining U.S. net investment position is the U.S. current account deficits since 1981. There is no question that the U.S. international investment balance has declined as a result of the relatively faster foreign investment in the United States than U.S. investment abroad. In other words, there is no question that the net capital flows have been into the

United States. Conversely, there is a very real question whether the U.S. position has yet become negative. The primary basis for this skepticism is that direct investment is recorded at its historic cost, which understates the current market value by amounts that grow over the years.

Recently, Ulan and Dewald (1989) have estimated the net U.S. investment position [NIIP] adjusting for the understatement of U.S. direct foreign investment:

When direct investment is revalued to market, we estimate that the U.S. NIIP is about \$400 to \$600 billion more than the official NIIP indicates through the end of 1987, though, by all but the earnings measure, the NIIP is below its peak values of 1980 or 1981.<sup>34</sup>

In terms of the official Commerce Department data reported in table 1, this would imply that the U.S. position at the end of 1987 was a net U.S. claim on foreigners of between \$31 and \$231 billion. If the midpoint of this range is used as the appropriate point estimate, then given the estimated \$120 billion capital inflow in 1988, the United States still held a net claim on foreigners as of the end of 1988.

### CONCLUSION

The joint implication from analysis of the three aspects of foreign investment in the United States—the effects on labor and investors, the threat of withdrawal, and the relative size of the foreign claim—is that the capital inflows are beneficial. The capital inflows benefit labor and management, entrepreneurs and investors alike. Workers benefit from the greater abundance of tools; the increased capital raises labor's produc-

<sup>33</sup>The year  $t^*$  foreign share,  $s(t^*)$ , of the U.S. nominal non-consumer capital stock is the ratio of the sum of the initial foreign net holding, \$368.2 billion, of the nominal capital stock plus the integral of the annual capital inflow, \$120 billion, reduced by the rate of inflation of capital stock replacement cost, to the growing real capital stock whose 1987 value is \$10,514.3 billion:

$$s(t^*) = \frac{(\$368.2 + \$120 \int_0^{t^*} e^{-ut} dt)}{\$10,514.3 e^{ut}}$$

where  $s(t^*)$  = share of net U.S. nonconsumer capital collateralized against net foreign investment at end of year  $t^*$ ;

$u$  = implicit rate of inflation of net capital stock's replacement cost;

$g$  = growth rate of real net capital stock due to investment, foreign and domestic.

<sup>34</sup>Ulan and Dewald use three different methods to estimate the capital gains in the U.S. foreign direct investment and the foreign direct investment in the United States: stock price indexes, corporate earnings, investment goods price deflators. Their estimates based on the capitalization provide the largest estimate of the U.S. undervaluation and provide the clearest rebuttal of the transfer problem outlined by Drucker (1988). Their adjustments omit the U.S. gold stock, which would add about \$90 billion to the U.S. position as reported by the Commerce Department (see note 3 above); however, they also do not allow for a potential write-down of U.S. bank holdings of LDC debt which they report would reduce the U.S. investment position by about \$50 billion.

tivity and increases its employment or wages. Management benefits from the greater capital availability and lower interest rates; the capital inflows facilitate long-range planning, and the rise in labor productivity enhances management productivity as well. Entrepreneurs benefit from the lower interest rates due to a greater abundance of capital; this increases the range of profitable projects and new firm startups. And investors benefit since a more capital-abundant economy is a richer economy, regardless of who owns the capital.

The United States has imported capital throughout the 1980s, but far from signaling an economy in decline, such investment by foreigners is a measure of the economy's vigor. William Baumol aptly sums up this positive aspect of foreign capital inflows: "...relatively declining nations send their funds abroad because their decline makes it profitable to invest elsewhere."<sup>35</sup> Clearly, foreign investment in the United States does not signify the selling out of America.

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<sup>35</sup>"Buying into a Good Thing," ( 1988). Another economist, Jurg Niehans, expresses the idea in the context of net investment this way: "Countries are debtors if their invest-

ment opportunities are greater than their wealth and are creditors if their wealth exceeds their investment opportunities." Niehans (1984), p. 107



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*H. Robert Heller is a member of the Board of Governors of the Federal Reserve System. This paper, the third annual Homer Jones Memorial Lecture, was presented at the University of Missouri-St. Louis on April 6, 1989.*

# Money and the International Monetary System

**I** AM VERY HONORED to have been invited to deliver the annual Homer Jones memorial lecture. In deference to his memory, I believe it is appropriate that this lecture be concerned with some of the enduring themes that pervade thinking about money.

Many distinguished economists have pondered the role of money and prices and the question of whether it is more appropriate to organize our monetary affairs along national lines or to adhere to an international monetary standard. In arriving at an answer, they have addressed important aspects of freedom, liberty and sovereignty.

That the debate is still not settled definitively attests to the complexity of the topic. As a matter of fact, the current debate about the desirability of a common European monetary standard and about the formation of a European central bank has revived many of the old arguments.

My central theme today will be the role of money and monetary stability and the choice between a national monetary standard and an international one.

I have a personal reason for choosing this topic. For many years it has troubled me that some of my friends and colleagues view themselves as monetarists and analyze domestic policy from that perspective, while another

group of my friends maintains that fixed exchange rates are the glue that holds the world economy together. From the perspective of that group, the world would be a better place if we would only adopt a gold standard.

This division reminds me of the time when I set out on my first trip to Latin America. As I was leaving, an expert on the region told me: "Young man, as you travel from country to country in Latin America, you cannot fail to notice that half of the central bankers you encounter will advocate fixed exchange rates, while the other half see flexible exchange rates as the only solution to their country's problems. Pretty soon you will also learn that virtually all of them attended the University of Chicago. As far as I can tell, the only reason for their different convictions is that the first group studied in Chicago in a year when Harry Johnson and Robert Mundell taught the Monetary Workshop, while the second group took the course in a year when Milton Friedman was teaching it."

Eventually, I learned that the views of the two groups could be reconciled on the global level because there the conceptual and behavioral assumptions underlying the two approaches converge. If there were only one world economic and financial system, the debate about fixed versus flexible exchange rates would not have been joined in the first place. Unfortunately, that is not the world we live in.

But even for the world we live in, there is a surprisingly close association among the global level of international reserves (or the global monetary base), the world money supply and the world price level. That finding, however, does not answer the question of whether financial stability is best achieved by having individual nations manage their own monetary affairs in an independent, decentralized manner; by relying on a global monetary constraint to impose monetary discipline; or by seeking a workable compromise that we can all live with.

Clearly, I will not be able to do justice to all the complexities and nuances of the topic in such a limited span of time. Brevity may, however, allow me to bring some of the issues sharply into focus and to crystallize some of the arguments.

I will first consider the roles of money in the economy and then discuss some of the problems of defining monetary stability. I will then turn to the role of freedom in determining the ideal monetary system and finally present the rudiments of a workable monetary system that represents a viable compromise for our imperfect world.

## THE ROLES OF MONEY

Money enhances economic freedom. In the absence of money, we would still be free to make choices, but these choices would be costly, cumbersome and constrained.

To see how money enhances economic freedom, it is useful to remind ourselves that money fulfills several distinct roles: it serves as a unit of account, a medium of exchange and a store of value.

As a unit of account, money enhances freedom of choice by permitting price comparisons to be made more readily. It lowers information costs and thereby improves the choices available.

As a medium of exchange, money allows individuals to better exercise their freedom to acquire goods and services by lowering transaction costs. Without money, people could barter but this process would certainly be troublesome and expensive.

As a store of value, money permits people to exercise intertemporal choices by allowing them to accumulate funds and to spend them later.

One may even argue that money increases political freedom. Not only does money offer greater independence and freedom of decision making, but as a generally acceptable means of payment and store of value, it enables the individual to reject one political system and use his life savings to live somewhere else, under a different political regime.

Thus, it is not surprising that politically repressive regimes tend to provide their citizens with a money that has little or no international acceptability. Furthermore, they tend to punish those who try to enhance their freedom of choice and scope for independence by accumulating foreign currencies. Nor is it surprising that often, in times of extreme political suppression, gold has become an increasingly valuable treasure.

## MONEY AND THE PRICE LEVEL

Money can fill these various roles in an optimal fashion only if it is a *stable* unit of account, a *stable* means of exchange, and a *stable* store of value. In other words, money should provide a consistent yardstick, and that can be true only in a non-inflationary environment.

Unfortunately, the measurement of inflation itself poses not only conceptual, but also practical problems. If money itself is the yardstick, how can its value be defined in terms of something else? If the monetary unit, say the dollar, were to be defined in terms of gold, isn't gold then the yardstick? In that case, gold will at least perform as the unit of account while the dollar may serve as the means of exchange and the store of value.

The value of a national currency may also be defined or measured in terms of other national currencies. But obviously this definition cannot be used for all currencies: The "last" currency must be defined in terms of something else. There must be an ultimate yardstick. The Bretton Woods system solved this problem by defining the value of all currencies in terms of the dollar, and defining the dollar in terms of gold.

Within a country, the price level is typically the measuring rod for the value of its currency. However, the definition of the price level is not as unambiguous as it may seem at first sight. Most customary measures of the price level have the disadvantage of relying on weighted averages of transaction prices of current goods

and services. These are the familiar GNP deflators and the indices of producer prices and consumer prices. For instance, as a measure of the value of the stock of money, the GNP deflator is flawed. It is a concept that has meaning only for the prices of goods that are produced during a certain period — that is, a flow concept.

But how about the prices of assets such as commodities and real estate? Aren't they relevant when it comes to judging whether we are in an inflationary or a deflationary situation? It is arguably more appropriate to measure the value of money in terms of other assets because money itself is an asset. While a good case can be made for considering prices of tangible assets in assessing the value of money, matters become increasingly complex as we broaden the spectrum to include financial assets. One may also make a good case that stock prices are a convenient proxy for real asset values. But other influences, such as a change in management or changes in tax-law, may also influence the value of a stock.

Matters become even more complicated in the case of bonds. While they are an asset on one individual's balance sheet, they are a liability on someone else's balance sheet. Their value is also directly influenced by monetary policy, and it is easy to get into circular reasoning in that connection. Although bond prices do give useful information, it is probably better to consider that information separately from information conveyed by changes in real asset prices.

I conclude from this discussion that if we are interested in the stability of money as a unit of account, store of value and means of transaction, the appropriate indices for changes in the value of money should incorporate prices that reflect these functions. That is, asset prices, commodity prices and intermediate as well as final goods prices might appropriately be given attention in defining and measuring price stability and the value of money.

## **GOLD AS A MONETARY STANDARD**

Given the complexities of measuring the price level itself and of defining the value of money, it is not surprising that over the centuries peo-

ple, in seeking simplicity and expediency, have focused on gold as a universal constant that served as a practical unit of account, a medium of exchange and a store of value.

Gold has served as money over centuries of human history.<sup>1</sup> Moreover, many distinguished economists have advocated a gold standard at some point in their professional lives. But many of them have subsequently abandoned their beliefs that gold can serve as a national, let alone a global, money and have come to advocate alternative systems.

I argued earlier that money plays an important role in maintaining and enhancing economic and political freedom. To my mind, gold fails to meet this crucial test for a monetary standard. The two largest gold-producing countries in the world are the Soviet Union and South Africa; as key suppliers, they wield considerable influence over the market price of gold.

I view neither one as an economically or politically reliable and stable supplier. Thus, I would not entrust them with the power over our economic, financial and, indeed, political affairs that a move to a gold standard would entail. This objection seems to me so fundamental as to make further debate of the pros and cons of a gold standard unproductive and pointless. There is simply no reason why free, democratic nations should cede such an important part of their sovereignty into uncertain hands. Of course, everyone should be free to choose to hold gold, and to use it as a store of value or as a medium of exchange between willing individuals. Governments should neither fix the price of gold nor impede its private use.

## **FREEDOM AND THE MONETARY SYSTEM**

Choosing an international monetary system involves profound constitutional questions that affect a nation's sovereignty.

The deep desire to protect and foster human freedom unites the advocates of a national monetary rule and the proponents of an overarching international monetary standard. For simplicity's sake, I will refer to them as the

<sup>1</sup>I will avoid the interesting debate on silver and bimetallism and concentrate simply on gold.

monetarists and the internationalists. The two groups also distinguish themselves in their advocacy of flexible and fixed exchange rates respectively.

Both the monetarists and the internationalists hold the view that government should serve the people and that the role of government should be strictly limited. In the economic realm, both groups believe in price stability as the key objective of monetary policy. They also want to limit the role of government, and therefore advocate the adoption of "monetary constitutions" or predetermined rules for carrying out policy. In that, they are united against the interventionist view, which holds that active governmental decision making is a positive force that is needed to bring about economic stability, efficiency and welfare maximization.

But the monetarists and the internationalists adhere to different philosophical concepts about which monetary arrangements best protect human freedom. The monetarists believe that human freedom is protected best when governmental authority is exercised at the most decentralized level of government; the internationalists believe that a global monetary rule would minimize the chance of inappropriate interference by national governments by taking monetary decision making out of their hands. Thus, monetarists and internationalists tend to differ in their prescriptions for organizing the monetary system. In addition, different empirical judgments about the way the world works underlie the two approaches.

Monetarists argue that to preserve individual freedom, the power of the state should be limited. They claim that the only consistent way to accomplish this objective is to disperse governmental power through decentralization to the lowest level possible. National government should exercise only those powers that cannot be delegated to regional or local governmental units.

While monetarists believe that the power to create money and regulate its value should be exercised at the national level, they also believe that the authorities should be constrained by a domestic monetary growth rule.

From this belief it follows that the government should not be externally constrained. For the monetarists, preserving that independence is a key requirement of any international mone-

tary system. Consequently, the international monetary system should be constructed so that monetary decisions are taken at the lowest level of decentralization possible, namely, the nation. Flexible exchange rates are therefore advocated by the monetarists as a means of preserving the political and economic independence of the country. Under such a system, international policy coordination is not only unnecessary, it is even undesirable because it will inevitably infringe upon the freedom of the nation-state. Instead, flexible exchange rates are advocated as a buffer between countries.

In contrast, internationalists argue that individual economic freedom can be attained best in a system in which one common international currency is used throughout the world. In such a system, individuals are free from national economic and financial constraints and can maximize their welfare unhampered by national boundaries and political intrusions. They are at liberty to engage in transactions with anybody anywhere in the world. In the view of many internationalists, an international gold standard provides such a system, in which gold serves as the actual medium of exchange. Such a system eliminates the uncertainties imposed by fluctuations in exchange rates, and maximization of global welfare therefore becomes a genuine possibility.

The true internationalist sees the nation-state largely as a political construct that has only limited economic importance. A common global monetary standard will allow individuals to maximize their economic as well as their political welfare.

The two sides are united in their view that the preservation and enhancement of individual freedom are the ultimate and overarching goals of any social order. That is the ideal. They both wish to attain that ideal by minimizing the political and economic power of the state. Furthermore, they assume that competitive forces will bring about economic adjustment in a speedy and efficient manner.

The question is whether reality can approach this ideal view of the world, or whether the imperfections that still beset the world call for a compromise that may fall short of the ideal systems represented by pure monetarism or pure internationalism.

## A PRAGMATIC APPROACH

While at present important interpreting forces are shaping the global economy, I believe that the world is still an imperfect place. Economic conditions and the degree of economic integration vary around the globe. Relatively few true global markets exist, and the various national and regional markets are linked with differing degrees of perfection.

In other words, despite greater globalization the economic and financial world remains a patchwork. Some would argue that patchwork makes the world even more interesting and beautiful — and in a world with positive information costs, the one may be just as efficient as the other.

The problem confronting us is therefore one of constrained optimization and of the development of rules that will permit maximum freedom in the economic and political realm while taking into account the need for collective decision making in certain areas.

Nowhere is the need for such an accommodation more apparent than in the monetary sphere. Just as separate monies issued by individual persons would lose their usefulness, so would a global monetary standard not necessarily serve everyone best. The debate about the advantages and disadvantages associated with a common monetary standard and a central bank for Europe reveals the problems and the issues involved.

Let me set out what I consider to be some relevant considerations that should guide us in deciding what monetary system will serve us best.

First of all, the goal of monetary policy should be to provide a stable financial environment so that private decision makers can maximize their welfare. A stable monetary standard will help to minimize transaction costs and aid in rational economic decision making. Stability in this sense can be defined as the absence of any bias in decision making that would be induced by a tendency for the price level to vary systematically. This state of affairs will be reached when the change in the general price level is close enough to zero that economic agents can ignore it in their decision making.

Second, price stability is meaningful only in an economically and financially integrated area.

The world we live in does not yet represent such a market area. National borders, artificial or informal barriers to economic and financial flows, information barriers and the like, all contribute to a compartmentalization of the world economy.

Third, a common indicator, such as a global commodity basket, can provide a useful reference point for national and international policy makers. Not only is such a reference point helpful in introducing sensitive asset prices into the decision making process, but also it gives important information about the development of global inflationary or deflationary pressures. Indeed, the use of such an indicator of commodity prices was agreed upon at the Toronto summit meeting of the industrialized nations.

Fourth, more or less homogeneous economic and financial zones constitute the optimal domains for various monies or monetary standards. As economic and financial integration progresses and as the barriers between economic regions fall, the natural monetary domain also grows. At present, such progress is particularly pronounced in Europe, which is rapidly moving toward becoming an integrated economic and financial entity. As a consequence, talk about European monetary integration nowadays is more than theoretical speculation, and it may well move into the realm of reality in the not too distant future.

Fifth, it should be recognized that monetary integration has not only economic, but also political significance. The road to this common monetary standard can be the formation of a joint political decision-making body, the delegation of the monetary decisions to a common central bank, adoption of a commodity or gold standard or the formal or informal acceptance of a standard represented by another monetary authority. In the last case, the political underpinnings of that decision-making body must be sufficiently similar to the political beliefs and priorities of all participants to avert substantive conflicts.

As the global integration of economic and financial markets proceeds and as political interdependence increases, it stands to reason that monetary integration will increase as well.

In that connection it is important that progress in one area be accompanied by progress in the other areas. Just as it would be unrealis-

tic to expect rapid political integration, it is unrealistic to push monetary integration too far out in front. Time for adjustment and consensus formation must be permitted.

But as confidence in economic and financial integration grows and as political cooperation becomes an enduring reality, progress toward greater monetary integration will be made as well. That is, the monetary domains will tend to expand, and over time we will move closer to a global monetary standard.

What does all that imply for the real world that we live in?

In exploring that question, we must remember the lessons of history. Soon after the establishment of a government for the United States, the First Bank of the United States was founded, in 1789. Its charter was not renewed, and it was succeeded by the Second Bank of the United States, which ceased to exist in 1836. Why? Simply because the economic and political consensus in the young nation was too weak to support a uniform monetary policy. The interests of the merchants and traders of the East could not yet be reconciled with the priorities of the farmers and settlers of the South and West. Thus, the United States had to do without a central bank until the formation of the Federal Reserve System, only 75 years ago. Even then, the design of the System recognized the need to assure representation of the views of the various regions of the country, as well as those of the banking, commercial, industrial, agricultural and public interests.

On our own continent, we see an ever-increasing integration of the economic and financial affairs of the United States and Canada. The U.S. dollar is used widely in Canadian capital markets. It is also used as a medium of exchange and a store of value in much of Latin America. But clearly no political base is in place for monetary integration among the various countries of the American continent.

Matters have proceeded further in Europe, where the movement toward economic integration has been accompanied by the establishment of common administrative and political institutions. This development sets the stage for the debate about the desirability of establishing a central bank for Europe, which could issue a

common currency and administer a common monetary policy.

It is instructive to trace the development of the European Community because it illustrates the interdependence of economic, monetary and political integration. An economic beginning was made by the original six signatories to the Treaty of Rome, which established the European Economic Community. Gradually, other nations entered the economic union.

In the monetary sphere, Belgium and Luxembourg have long had a common currency. The common monetary arrangements of the European "snake" constituted essentially an experiment, but taught important lessons that were incorporated into the more formal European Monetary System. While the original members of the European Economic Community are now all participants in the European Monetary System, some of the countries that joined the Community later have not yet taken this step. Overall, progress has been gradual and sometimes marked by disappointments and setbacks.

All this has been accompanied by the establishment of common European political institutions and by the development of an administrative apparatus that has progressed from exercising coordinating functions to playing an important decision-making role. Thus, a growing economic and political consensus has been forged that may in due course serve as a foundation for a common European currency and a common monetary policy.

I have previously advocated the establishment of unitary exchange rates as an intermediate step that the Europeans might take. Under such an arrangement, all exchange rates would be aligned so that one German mark would equal one French franc, one British Pound, and so on. The institutional arrangements of the current European Monetary System (EMS) would be maintained. Under such a scheme, the various currencies would soon be accepted across the continent, and in effect a uniform means of exchange for the continent would be created. If the arrangement were successful, a full monetary union and European central bank might follow in due course.

The formation of a European currency area would undoubtedly have implications that

would transcend European borders. Already quite a few African countries peg their currencies to those of European countries, and it can be expected that these and possibly others would want to peg to a common European currency as well.

What may we conclude from this discussion?

One, the choice of a monetary standard and a monetary system involves important political choices and is rooted in basic ideas about how best to protect and preserve freedom. Those choices, then, must be made with great care.

A certain congruence among political, economic, financial and monetary arrangements is needed if such arrangements are to find public acceptance and if they are to be viable.

Two, as the world becomes more integrated, progress toward the establishment of broader monetary domains can also be made.

I believe that we are privileged to live in a time in which we are witness to considerable progress on all these fronts and in which we can participate in building a more integrated world, where economic and political decisions can be made with increasing freedom for all people.





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