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Robert D. Laurent

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Monetary policies in the early 1990s--reflections of the early 1930s

Robert D. Laurent*

The early 1990s saw an extended period of sluggish economic growth despite persistent attempts to stimulate the economy. This apparently unresponsive economy was quite unusual, leading most analysts to explanations relying on structural impediments unique to the period. This paper examines the period from the perspective of monetary policy, arguing that it bears strong similarity, qualitatively if not necessarily quantitatively, to the period of the early 1930s. Both were periods in which sharply falling short-term interest rates, historically wide interest rate term spreads, and strong growth in the narrow aggregates existed alongside weak economic growth. In both periods, these circumstances led many observers to conclude that monetary policy had been tried and found ineffective. However, decades after the early 1930s, a persuasive argument was made that the best indicator of monetary policy in that period was provided by the behavior of a broad monetary aggregate, and this indicated that monetary policy had been tight, not ineffective. Similarly, this paper argues that the best indicator of monetary policy in the early 1990s was again a broad aggregate (real M2), which has seldom predicted as well as it did during this period, indicating that monetary policy had once again been tight, not ineffective.

The paper presents a theoretical explanation of why shifts in demand are likely to make narrow aggregates particularly inappropriate indicators of monetary policy in periods of sharply changing short-term rates, such as the early 1930s and early 1990s. The paper further argues that the extremely weakened financial condition of depository institutions that characterized both periods was the fundamental underlying similarity that explains why sharply lower short-term rates and wide interest rate term spreads in only these two periods

were not accompanied by strong growth in either broad aggregates or the economy. Under such economic conditions, this required even lower short-term interest rates. The paper then argues that the existence of deposit insurance, by causing the manifestations of weakened depositories to appear in a much different guise in the early 1990s than in the early 1930s, helped camouflage the similarities of the more recent period to the early 1930s. This combination of the weakened condition of depositories and the influence of deposit insurance helps explain a number of economic anomalies in the early 1990s, including the distinct and pronounced economic fluctuations within the period and the unusual timing of the recession. A more detailed analysis further indicates that the entire period of weakness was not unusual, rather the term unusual should be applied primarily to an eleven-quarter segment that began in early 1990.

Finally, the paper argues that the extended period of sluggish behavior in the Japanese economy of the early 1990s, even as short-term rates were lowered to record levels, is also explained by the weakened condition of Japanese depositories. Indeed, the paper argues that the origins and extent of the weakness indicate that the Japanese episode was even more similar to the U.S. situation of the early 1930s than was the U.S. situation of the early 1990s. As in the two U.S. episodes, the paper argues that the very weak growth of a broad Japanese money measure (M2+CD) was a better indicator of monetary policy than interest rate and narrow money indicators of the time. The paper concludes that it is a particularly grievous error of monetary policy to use the level, or changes in the level, of short-term interest rates as indicators of monetary policy when depositories are in very weak financial condition. In these circumstances at least, broad aggregates are a much better indicator of monetary policy.

I. The early 1990s

The early 1990s witnessed unusual economic weakness. It was not unusual

because the episodes of actual economic decline were so severe. Three consecutive quarters of falling real GDP is not at all unusual in the post-World War II period, nor is the total decline of 1.6 percent in real GDP from the second quarter of 1990 through the first quarter of 1991 especially severe. Indeed, the cumulative decline in real GDP over the recession was actually less than the average decline of 2.4 percent experienced in the preceding six recessions. Rather, the period was unusual because of the length of time over which there was an absence of strong economic growth. Fifteen consecutive quarters (1989:Q1-92:Q3) with real GDP growth of less than 3.5 percent annually is, by far, the longest such span since 1947 when quarterly GDP data first became available.[1]

This weakness is even more unusual because it persisted despite actions by the Federal Reserve that would usually have stimulated the economy. Between April 1989 and September 1992, the Fed made 24 consecutive cuts in its target fed funds rate, reducing it by nearly 700 basis points to a level of 3.00 percent. As figure 1 shows, while there is one other episode (1974-75) when the funds rate was lowered by a comparable amount, the episode in the early 1990s also took the funds rate to its lowest level in thirty years. The figure indicates that the duration of the decline in the fed funds rate in the early 1990s is also exceptional. Fourteen consecutive quarters of declining federal funds rates is, by far, the longest period of declining fed funds rates over the entire period plotted.

The behavior of the funds rate in the early 1990s is unusual in still another respect. As figure 1 also shows, every previous recession since funds rate data first became available began with the funds rate either rising or close to its peak level. This suggests that the Fed was actively seeking to tighten policy at the time these recessions began. In contrast, the most recent recession began more than a year after the Fed had started to lower the fed funds rate (the NBER dates the cyclical peak at July 1990). This not only suggests

that this recession was not the result of intentional Fed actions, but again suggests that outside factors offset Fed moves that would otherwise have produced a stronger economy. Figure 1 provides further evidence of the extended weakness in the period, both directly from the plot of the logarithm of real GDP, and indirectly from the unusually long period over which the fed funds rate was lowered, even after the official trough of the recession.[2]

Figure 2 reveals another aspect of interest rate movements that was unusual. The reduction in short-term interest rates was accompanied by only a relatively minor decline in long-term rates. While the fed funds rate was lowered nearly 700 basis points between 1989:Q2 and 1992:Q4, the 10-year Treasury bond rate declined only about 200 basis points. As a consequence, the spread between the 10-year Treasury bond rate and the fed funds rate expanded to over 360 basis points, the widest level in the entire post-World War II period and most likely in all U.S. history. Typically, the wider the spread, the greater the expected subsequent growth in economic activity. Thus, the exceptionally wide spread in the early 1990s combined with generally weak economic activity is again unusual.

The early 1990s were also a period in which there was rapid growth in the narrower monetary aggregates measured in real terms. The real monetary base and real M1 grew at annual rates of 3.4 percent and 1.9 percent respectively between 1988:Q4 and 1992:Q3.[3] These growth rates are well above the average growth of 1.9 percent and 1.3 percent respectively over the entire period that data is available from the monetary authority. Rapid growth in the real monetary aggregates is generally associated with strong growth in the economy, so once again, the combination of rapid growth rates in real narrow monetary aggregates and the absence of strong growth in the economy is very unusual.

II. Similarity to the 1930s

The observations above indicate that the most unusual aspect of economic performance in the early 1990s was the combination of weak economic growth along with conditions one might ordinarily associate with stimulative monetary policy and strong economic growth. As already noted, the fifteen consecutive quarters of less than 3.5 percent annual GDP growth is unique over the period for which quarterly GDP data is available. It is likely that one would have to go back to the 1930's, and specifically the years from 1929 to 1933, to find such an extended period without at least one quarter of strong growth. While both periods lacked strong growth, it goes without saying that the magnitude of the decline in the early 1930s, a period commonly referred to as the Great Depression, dwarfed the weakness of the early 1990s. As just one indication, while real GDP declined 1.6 percent in the recession beginning in 1990, real net national product fell by more than one-third from 1929 to 1933.

Figure 3 shows that, like the early 1990s, a sharp fall in short-term rates was also a characteristic of the early 1930s. Monetary policy of this period did not focus on the fed funds rate because this interbank market for overnight funds was not well developed at the time, so figure 3 plots the overnight call rate on security loans. From a level of more than 8.5 percent in the third quarter of 1929, the rate declined to less than 1.0 percent in the second half of 1933. The focus of monetary policy in this earlier period was much more directed towards the discount rate. Over this same period, the discount rate was lowered from 6.0 percent to 2.0 percent, and in the interim had briefly gone as low as 1.5 percent. In the 1930s, as in the 1990s, the decline in short-term rates was not only large, but took rates to long-time lows. Indeed, both the call money rate and the discount rate were taken to lows that had not been seen before in U.S. history and, with the exception of the period of interest rate pegging from the late 1930s through World War II, have not been seen since.

Also similar to the early 1990s, the sharp decline in short-term rates in the 1930s was not matched by a decline in long-term rates. Between the third quarters of 1929 and 1933, while call money rates declined by more than 750 basis points, government bond rates declined by only 48 basis points to 3.20 percent. As can be seen in figure 3, this steeply widened the term spread. By 1933, the term spread was wider than it had been in at least 75 years.

Besides the similarity in interest rate behavior in the early 1930s, there was also rapid growth in a narrow monetary aggregate. Figure 4 plots the growth rate of the monetary base and a broad measure of money from 1925 to 1940. Both monetary aggregates showed weak growth from well before the depression until the third quarter of 1930. At that point, the growth rate in the two aggregates diverged sharply. From September 1930 through December 1933, the monetary base increased by 21.6 percent, or 6.2 percent a year. Over this same period, a broad aggregate including currency and total bank deposits fell by 31.7 percent, or 11.1 percent a year. Since prices were generally falling over this period, growth in the real monetary base was even greater than its nominal growth, likely about 12 percent to 17 percent a year.[4] This growth in the real monetary base is likely one of the highest in U.S. history over such an extended period.

Of all the similarities, perhaps the most important between the early 1990s and the early 1930s is the combination of sharply lowered short-term rates and weak economic performance.[5] Assuming, as the great majority of observers apparently do, that short-term rates are an indicator of monetary policy, then a very important conclusion emerges. Monetary policy in these two periods must have been ineffective, since short-term rates were lowered so sharply and to such low levels, yet the economy remained weak. In the 1930s this is exactly the conclusion that most observers drew, captured in the aphorism of the time that "you can't push on a string."

In the early 1990s, there was also a prevalent view that monetary policy

was ineffective against the factors dampening economic growth. From the viewpoint that looks at the level and movements of short-term interest rates as indicators of monetary policy, this seems reasonable, because the reduction of nearly 700 basis points in the fed funds rate to only 3.0 percent did not result in strong economic growth. Given the obvious attempts to stimulate the economy and the apparently recent vintage of the ineffectiveness of monetary policy, the most popular explanation in the early 1990s was the appearance of some new structural impediment. This impediment was most often identified as the large debt build-up of the 1980s,[6] leading to the conclusion that monetary policy would remain ineffective until the requisite debt restructuring was completed and the "excessive" debt eliminated.

The conclusion that monetary policy was ineffective in these two periods depends crucially on the assumption that the level, and movements in the level, of short-term interest rates are good indicators of monetary policy. It's clear that the monetary authority uses a short-term interest rate, the fed funds rate as a tool to implement monetary policy. It's also clearly true that a lower fed funds rate means a more stimulative posture for policy *under the same set of economic conditions*. But it does not necessarily follow that a lower fed funds rate guarantees an easier monetary policy under different economic conditions. There are other indicators of monetary policy for which there is substantial support, and which do not necessarily indicate that an easy, or more stimulative, monetary policy was implemented in these two periods and found ineffective. For example, money growth is probably the most prominent alternative in monetary theory to interest rates as an indicator of monetary policy. In this view the monetary authority may use movements in the short-term fed funds rate as a tool to implement monetary policy, but growth in money is a better indicator of the effect of monetary policy on future economic activity. Decades after the 1930s, the data presented in figure 4 were compiled, and a convincing argument made that a broad monetary aggregate was a better indicator of monetary policy than the behavior of interest rates, so that monetary policy in the early 1930s had been

tight, not ineffective.[7] This paper will make a similar argument for the early 1990s.

III - Money in the 1990s

Figure 5 shows the year-over-year behavior of three money measures for the period covered by money data published by the central bank. For most of the period, growth rates in all three money measures generally fluctuated together. Notice however, that since 1980, the behavior of the different money measures has varied considerably. For much of the early 1990s, the narrow measure of money (M1) experienced a high rate of growth, while the broader measures (M2 and M3) experienced their weakest growth in the more than thirty years plotted[8]. These differences were important because even among advocates of using money growth as indicators of monetary policy, there was some debate as to which of these sharply different money growth rates was a better indicator of monetary policy.[9]

Even a cursory retrospective suggests that the broad aggregates were better indicators over this period. The narrow aggregate (M1) grew at a much faster rate over most of this period than either M2 or M3 while, as noted earlier, the economy generally experienced slow growth. Even at that time, one might have suspected that the broad aggregates would be better indicators than the narrow aggregates since real M2 is included in the index of leading indicators, and the Fed chooses targets for M2 and M3 but not any of the narrow aggregates.

Theoretical considerations also suggest that the broader money measures are likely to be better indicators of monetary policy than narrow money measures, particularly in periods of sharp movements in short-term interest rates. Its advocates accord money a prominent role in monetary policy because changes in money are usually considered to be changes in supply impacting on an unchanged demand for money. In this view, for example, an increase in money represents an excess of money balances and leads to an increase in spending and economic

activity. However, if the change in money is produced (or matched) by a change in the quantity of money demanded by the public under current economic conditions, then the change in money balances does not represent an excess or deficiency and does not affect spending or economic activity. This makes it important to understand whether a change in a money measure might have been produced (or matched) by a change in the demand for that money measure.

Notice in figure 5, that M1 growth became quite erratic in the 1980s. It increased when short-term rates were falling (i.e. 1985-86 and 1989-92) and decreased when short-term rates were rising (i.e. 1987-88). A fall in short-term interest rates acts to lower the opportunity cost of holding transaction deposits, inducing holders of investment-type deposits (e.g. time deposits) to switch into transaction-type deposits (e.g. demand deposits or other checkable deposits). This shift in demand toward transaction-type deposits has the effect of raising M1. However since the increase in the supply of M1 was in response to increased demand, it does not increase economic activity, according to the above view. Notice, however, that the shift in demand to transaction-type deposits does not affect a broad aggregate that includes both transaction-type and investment-type deposits. For this reason, one would expect movements in the broader aggregates to be more insulated from these shifts in demand produced by interest rate movements, and hence provide both more accurate indicators of excesses or deficiencies in deposit balances and more accurate indicators of future spending and economic activity.

A shift in demand by the public, as just described, from investment-type deposits (which typically have no reserve requirements) to transaction-type deposits (which typically have reserve requirements) increases required reserves. Since the Fed conducts its day-to-day operations by targeting a level of the fed funds rate, it must increase reserves in response to this shift to prevent an increase in the funds rate. The data in figure 6 confirm that growth in the monetary base has tended to move with growth in M1 (the divergences that occur

primarily reflect differences between the growth rates of currency and transaction-type deposits). As mentioned earlier in footnote 7, some observers interpreted the strong growth of the monetary base in the early 1990s as an indication of a very expansionary monetary policy, but this strong growth is merely the consequence of the combination of a shift from non-reservable investment-type deposits into reservable transaction-type deposits (which raised M1) and the Fed's policy of targeting a fed funds rate.[10] If, as noted earlier, the increase in transaction-type deposits resulting from a shift in demand is not expansionary, then neither is the resulting expansion in reserves. So, neither rapid growth in the monetary base nor M1 indicate an expansionary monetary policy in this situation.

It is illuminating to examine the circumstances of the divergence between growth in the broader money measure and the monetary base in the early 1930s. As figure 4 showed, in the early 1930s there was a sharply higher growth in the monetary base relative to the broader aggregates. Just as in the early 1990s, the earlier divergence arose out of a shift in public preferences. The source and consequences of the 1930s shift in the public's money holding preferences were even clearer than in the early 1990s. A massive wave of bank failures caused the public to sharply shift its preferences from bank deposits to currency. This shift can be clearly seen in figure 4 beginning in late 1930. Given this increased desire for currency, the increase in the monetary base (where currency accounts for a much larger component than it does in broad money) was not indicative of an expansionary policy. But the shift in the composition of the monetary base from reserves to currency and the threat of possible future bank runs had the effect of inducing banks to sharply reduce the supply of bank credit, and thereby the supply of deposits and the broad aggregates. This supply effect, reducing the broad aggregates in the early 1930s, was indeed a sign of a tight monetary policy.

IV. Recent indicator performance

The discussion above argues that, from a monetary policy viewpoint, the early 1990s resemble the early 1930s. It argues that in both periods, broad monetary aggregates were likely to be better indicators of monetary policy than either short-term interest rates, interest rate term spreads, or narrow monetary aggregates. To test this view in the more recent period, four sets of predictive models (one for each of the categories above) were estimated. Each model was estimated by a standard regression using up to eight quarterly lagged values of the alternative indicator of monetary policy. Each model was tested by computing its accuracy in forecasting quarterly real GDP growth, using only the data that were available through the preceding quarter. So each quarterly forecast is somewhat akin to an ex-ante forecast.[11] The forecasts were run from the first quarter of 1964 through the third quarter of 1993.

The best model with the optimal lags from each category was selected based on its predictive performance over the entire period.[12] Table 1 lists the best variable in each category with its particular lag form and coefficients over the entire period, and gives in column 1 the average error for the forecasted change in the log of real GDP over the entire period from 1964:Q1 through 1993:Q3[13]. For example, the table indicates that the best model for short-term interest rates included the two- and seven-quarter lagged values of the fed funds rate.[14] The numbers in column 1 also indicate that, in order of performance, the models with the lowest errors in ex-ante forecasts over the entire period are the growth rate in real M2, the term spread between the 10-year Treasury bond and the fed funds rate, the level of the federal funds rate, and the growth rate in the real monetary base.[15]

The figures in column 1 of table 1 are based on an average measure of error over the entire period. The discussion in this paper is directed to the relative performance of various monetary policy indicators over the period of sluggish

economic growth in the early 1990s. In order to obtain evidence on this period, the average forecast error for each of the four models is computed for each time span of fifteen consecutive quarters, equal in duration to that of the period of sluggish economic growth in the early 1990s. These average errors are plotted in figure 7 using the middle quarter of each fifteen-quarter span. As the figure shows, the average errors in the four models tend to fluctuate together,[16] though there are substantial differences in their relative performance over time. The figure does confirm that the predictive performance of the real monetary base, the level of the fed funds rate, and the term spread between the 10-year bond rate and the fed funds rate deteriorated dramatically in the early 1990s both absolutely, and relative to the predictive performance of real M2. The vertical line in figure 7 indicates the average errors in each of the four models over exactly the 15 consecutive quarters of sluggish economic growth (i.e. the period centered on 1990:Q4) characterized by less than 3.5 percent annual growth in real GDP. These numbers are given in column 2 of Table 1. The figure also shows that real M2's margin of superiority over the other alternatives has never been greater than in the early 1990s.

It is perhaps not surprising that the data confirm that the predictive performance of the interest rate and narrow monetary indicators deteriorated so dramatically over this period. After all, the introductory description of the period emphasized its unusual nature--weak economic growth alongside sharply falling interest rates, wide interest rate term spreads, and strong growth in the narrow aggregates. What is probably more surprising however, is the performance of real M2. Figure 7 shows not only that real M2's relative margin of superiority over the other indicators was at an all-time high in this period, but that real M2's performance relative to its own past performance was exceptionally good. Contrary to popular opinion at the time that M2 was distorted, real M2 has seldom predicted real GDP growth as well as during the period of sluggish economic growth in the early 1990s.[17] This conclusion is not greatly influenced by the ex-ante nature of the forecasts. Columns 4 and 5 in table 1 give the

comparable ex-post forecast errors for the specific form of the equations lited in table 1.

Some observers may consider the data displayed in figure 7 the result of mere happenstance; a change in some structural condition (e.g. excessive debt levels) produced sluggish economic growth while some entirely unrelated factor (e.g. the runoff of CDs) simultaneously produced weak growth in the broad aggregates. There is, however, a very compelling piece of evidence that strongly supports the idea that broad money was a cause of the economic weakness of the period. An unusual aspect of the early 1990s was that it was characterized by a number of distinct and pronounced fluctuations in economic activity. This aspect led some to describe the period as including a "triple dip" that is somewhat hidden in the quarterly data. Figure 8 plots monthly data over the period for growth in industrial production alongside the growth in real M2 from three months earlier. There are at least two interesting aspects to the figure. First, it is clear that the timing of fluctuations in real M2 align very well with subsequent fluctuations in economic activity.[18] Second, the recession was actually the second dip in activity over this extended period of sluggish economic growth. Any of the alternative structural explanations for the period's economic weakness should explain as well as does real M2, the existence and timing of these pronounced economic fluctuations.

V. Condition of the banking system and deposit insurance

Even if the weak growth in broader money explains the extended weakness in economic activity in these two episodes some sixty years apart, a question remains. Why is it that such sharp cuts in short-term interest rates failed so uniquely and dramatically to produce stronger money and economic growth in these two episodes? The answer lies in a factor mentioned in the discussion of the public's shifting money demand in the 1930's, that is the fundamental similarity between the early 1930s and the early 1990s. The depositories (banks and

thrifts) that create money were under more financial pressure in the early 1990s, with more insolvent depositories closed in those years, than at any time since the 1930s. In addition, increased capital requirements and tighter regulation made even solvent depositories less willing to provide credit (and therefore create money) than would typically be the case under the same interest rate conditions. This pressure on the depositories had the effect of working in opposition to the stimulative thrust on money of lower short-term interest rates. The same reduction in the funds rate did not have as great an impact on money, and therefore economic activity, as it typically would.

In the early 1930s there were two clearly visible channels through which the financial pressures on banks acted to reduce deposits and money. As the value of bank assets declined, banks (even apparently solvent banks) sought to assuage the fears of depositors by increasing their capital relative to liabilities. This led to contractions in bank assets and reduced levels of deposits and money. In those cases where these actions failed to avoid insolvency and the institution was closed, a second channel operated. The closing of insolvent banks resulted in the further disappearance of deposits and money, as at least some former depositors were all too painfully aware.

In the early 1990s, the same two channels operated to reduce deposits and money, but the existence of deposit insurance sharply altered the way these channels manifested themselves. Depositors no longer feel the pain of closing an insolvent depository, rather the deposit insurance fund or the taxpayers feel the pain. As a consequence, depositors' fears no longer motivate increases in capital ratios, rather they now occur when regulators mandate them to protect insurance funds and taxpayers. No longer do insolvent institutions close when depositors run on the institution, now they close when regulators have available the funds to close the institution and decide that further forbearance will only increase the ultimate resolution cost. No longer does the depositor experience the contraction in deposits, rather investors voluntarily accept deposit

contraction by purchasing securities issued or sold to provide funds to the deposit insurance agency.[19] Deposit insurance has changed the timing, the initial point of impact of deposit contraction, and the ultimate burden of solvency pressures on depositories, but it has not changed the contractionary effects on deposits and money.

The role of regulatory decisions helps explain a number of apparent economic anomalies of the early 1990s. The series of fluctuations in real M2 and subsequent industrial production in figure 8 are in large part explained by the timing of regulatory policy actions. Specifically, the increased expenditure of funds by deposit insurance agencies (the RTC and the FDIC) in resolving depository institutions following the appropriation of funds in the fall of 1989, mid-1990, and mid-1991, changes in supervision, and the regulatory imposition of higher capital requirements help explain the fluctuations in money and the subsequent fluctuations in industrial production.[20] When combined with a monetary policy implemented on a day-to-day basis by pegging a target fed funds rate, these regulatory actions inadvertently helped construct a contractionary monetary policy.[21]

This view also helps explain the unusual timing of the recession in the early 1990s and gives a somewhat different view of the extended period of economic weakness in the early 1990s. Figure 9 plots the quarterly ex-ante forecasts of real GDP for each of the four models presented in table 1 along with actual GDP growth for a period encompassing the 15-quarter span of sluggish growth in the early 1990s. The Fed raised the funds rate through 1988 into the second quarter of 1989, after which the funds rate was lowered through year-end 1993. As the figure shows, all four models correctly forecast that real GDP growth would slow from early 1988 through the third quarter of 1989. The figure also shows that by the first quarter of 1990, all four models were forecasting at least some increase in real GDP growth, with the two monetary aggregate models forecasting a pronounced increase. Again, actual GDP followed the prediction

with growth increasing substantially through the first quarter of 1990. Thus, until the first quarter of 1990, the picture is not at all one of unusual weakness, but rather one in which the Fed engineers a slowdown in economic growth, without a recession, followed by an upturn--the desired soft landing of the time. This interpretation is further supported by the fact that the Fed did not reduce the funds rate for seven months from December 1989 until July 1990. It appeared at the time as though the slowdown had been followed by a sustainable upturn at the then existing level of short-term interest rates.

It is not until the second quarter of 1990 that weakness develops that could be termed unusual. At that point all the models, except the real M2 model, forecast a continued strong upturn in real GDP growth. For the remainder of the period, the real M2 model generally predicts much lower, and more accurate, real GDP growth. This pattern is reflected in each model's errors for just the last eleven quarters (1990:Q1-92:Q3) of the sluggish period. The statistics are given in columns 3 and 6 for ex-ante and ex-post forecasts, respectively. The statistics reflect that real M2 predicted about as well (very well indeed, as noted earlier) in the period after 1989 as before, but that the other models deteriorated very sharply after 1989--predicting stronger growth than the sluggish growth that actually occurred.

What explains this unusual weakness beginning in 1990? The analysis presented above suggests that it had its origins in the solvency problems depositories encountered from loan losses in the early 1980s. Had these loan losses occurred in a system without deposit insurance, as in the early 1930s, depositors' fears would have caused some depositories to build reserves and closed other depositories. These responses would have reduced money immediately. However, unlike the early 1930s, the presence of deposit insurance in the 1990s meant that even the deposit liabilities of institutions widely recognized as insolvent continued to circulate and fully function as money. The monetary policy consequences of the insolvencies were not felt until substantially later

when regulators closed insolvent depositories and increased capital requirements on surviving depositories. It was the expenditure of funds by depository insurance agencies along with the increase in capital requirements toward the end of 1989 as a result of the passage of FIRREA that, in combination with the Fed's day-to-day operating policy of pegging a target fed funds rate, explains the recession beginning in July 1990, more than a year after the peak in the fed funds rate.

If deposit insurance generally helped to camouflage the similarities between the early 1930s and the early 1990s, there was one respect in which it absolutely clarifies in the 1990s, a contentious issue of the 1930s. The absence of deposit insurance in the early 1930s allowed bank runs. As a result of the runs, banks in the 1930's sharply increased their demand for excess reserves in order to have on hand funds to pay for possible depositor withdrawals.[22] This sharp increase in excess reserves, along with the very low level of short-term interest rates, helped lend credibility to the view that monetary policy was ineffective during this period. Some argued that even if the Fed had tried more vigorously to increase the broad money stock, any increase in reserves would simply have gone into excess reserves without increasing the money stock.[23]

Whatever the merits of the argument in the early 1930s, it is clearly not credible in the early 1990s. By removing the risk of depository failure from depositors, deposit insurance has prevented any shift by the public from deposits into currency and the potential problems such a shift could create for depositories. In the early 1990s depositories were not worried about runs, thus they had no reason to increase excess reserves as banks did during the 1930s. In the early 1990s there was no more than a normal demand for excess reserves on the part of depositories, and so a further increase in reserves (or equivalently, a reduction in the fed funds rate) would certainly have increased both the narrow and broad money stock.

VI. The Japanese experience

Depository solvency pressures also explain the other major case of unusual national economic sluggishness in the early 1990s. As in the case of the U.S., the Japanese economic sluggishness of the period was not so much severe as it was extended. In the early 1990s, Japan suffered its longest post-war recession, and its economy experienced 11 consecutive quarters (1991:Q2 through 1993:Q4) of less than 3.5 percent annual real growth. By Japanese standards, this was extremely unusual. In the period previous to this since 1960, Japan never experienced more than two consecutive quarters of less than 3.5 percent annual growth. The sluggish growth was still more unusual because, as in the U.S., it occurred even as short-term interest rates were reduced very sharply. As figure 10 shows, the overnight call money rate was lowered from above 8 percent in early 1991 to a record low of less than 2.5 percent in late 1993. The official discount rate was lowered from 6.00 percent in the second quarter of 1991 to a record low of 1.75 percent in the third quarter of 1993. Figure 10 also shows that the reduction in short-term rates had the effect of producing a positive interest rate term-spread by early 1992. The same figure also shows that, again as in the U.S., despite this positive spread the accompanying rate of Japanese real GDP growth was very weak.

While low short-term interest rates and positive term-rate spreads in the early 1990s seemed inconsistent with the sluggish performance of the Japanese economy, figure 11 shows that Japanese broad money (M2+CD) growth over this period slowed dramatically, just as it did in the U.S. From more than 13 percent year-over-year growth in 1990, growth decelerated sharply to an all-time record low of a 0.6 percent decline in late 1992. Given the mild nature of the Japanese inflation of the period, growth in real M2+CD was not at record lows, but real broad aggregates (M2+CD) did register declines for much of this period. Figure 11 also shows that narrow money (M1) growth actually accelerated for part of this period and grew more rapidly than broad money over nearly the entire period of

sluggish growth. Again as in the U.S., this appeared to reflect a shift in demand in response to sharply lowered short-term rates, since the most rapid growth in M1 occurred in the period (early 1992) following the sharpest fall in short-term interest rates. Other research indicates that over a longer period (1985-1993), a broad monetary aggregate (M2+CD) performed very well as an indicator of monetary policy in predicting future economic growth compared to term-spreads, narrow aggregates, bank loans, and short-term interest rates.[24] The data plotted in figures 10 and 11 strongly suggest that, as in the U.S., growth in the Japanese broad monetary aggregates performed much better in the early 1990s than these other indicators.

The explanation of the weak growth in the Japanese broad aggregates, even as short-term rates were reduced to record low levels, was again the condition of depositories. While estimates of Japanese depository loan losses vary considerably, there is no disputing that the volume of nonperforming assets of depositories in the early 1990s reached unprecedented levels. This put depositories under extreme financial pressures at a time when, in addition, they were being pushed to satisfy higher capital requirements.[25] These pressures acted to offset the stimulative effects of lower short-term rates and meant that much lower rates were required to produce even average growth in the broad aggregates and economic activity.

While all three of these episodes (U.S. early 1930s, U.S. early 1990s, and Japan early 1990s) began with the monetary authority raising short-term interest rates, a closer examination of the motivation and impact of monetary policy actions suggests that the Japanese episode and the U.S. experience of the early 1930s were most similar. In neither the U.S. of the late 1920s or the Japan of the late 1980s was general price inflation a serious problem. Instead the relevant monetary authorities of these periods were primarily concerned about inflated asset prices in certain specific markets. Inflated stock prices were viewed as problems in both the U.S. of the late 1920s and the Japan of the late

1980s, along with very high real estate prices in the Japanese episode. It is ironic that while the experience of the latter part of these episodes led to a widespread view that monetary policy was ineffective, policy was clearly extremely effective when evaluated by the initial goal of reducing excessive asset prices. When measured by the value of the stock markets at their previous peak, the maximum decline in stock values, and the length of time until stock prices reattained their previous peak, monetary policy in these two episodes will likely be recorded as leading to the two greatest stock bear markets of the twentieth century.[26]

From one perspective, these results do not appear surprising. Unlike general price inflation which requires only disinflation for a solution, inflated asset prices requires actual deflation for a solution. If depositories have extended loans using these assets as collateral, or even more critically if they own the assets directly, then a solution to the problem of excessive asset prices must necessarily involve large loan losses and solvency problems for depositories. In circumstances of severe solvency problems for depositories, even large cuts in short-term interest rates to historically low levels may not produce strong expansion in the broad aggregates and economic activity. Even lower short-term rates may be required. So in these circumstances, it is a particularly grievous monetary policy mistake to use the level, or movements in the level, of short-term interest rates as an indicator of monetary policy. In these circumstances at least, the evidence--three major episodes of extended economic weakness in the twentieth century--overwhelmingly indicates that broad monetary aggregates are a much better indicator of monetary policy.

Conclusion

The analysis indicates that, from a monetary policy perspective, the early 1990s seems very unusual within the post-World War II era, and bears more qualitative, if not necessarily quantitative, similarities to the early 1930s.

e most apparent similarity is the absence of strong economic growth combined with sharply lower short-term interest rates, wide interest rate term spreads, and rapid growth in a narrow aggregate - usually characteristics of strong economic growth. If one believes that the level or movement of short-term interest rates are indicators of monetary policy, then it is easy to conclude that monetary policy was ineffective in both of these periods.

However, there are measures of broad money growth that can be interpreted as indicating that monetary policy was not as easy or ineffective as thought over these two periods. In both of these periods there was substantially weaker growth in the broader monetary aggregates than in the narrow aggregates. The paper argues that shifts in demand in these periods rendered the narrow monetary aggregates less reliable than the broader monetary aggregates as indicators of monetary policy. The paper proceeds to present evidence that over the early 1990s a broad monetary aggregate (real M2) not only predicted exceptionally well compared to short-term interest rates, interest rate term spreads, and narrow aggregates, but also relative to its own past performance. Contrary to the impression of the time, real M2 has seldom, if ever over the last 35 years, forecast real GDP as well as it did in the early 1990s.

This still leaves open the question of why such sharp reductions in short-term interest rates failed to stimulate broad money growth in only these episodes, some sixty years apart. The paper argues that the fundamental similarity between these two periods was the severe stress experienced by money-creating depositories. The closing of insolvent depositories, the increased regulatory pressure, and increased capital requirements, all combined to weaken the normal stimulative impact of a given cut in short-term interest rates. Achieving the same growth in the broad monetary aggregates required even sharper cuts in short-term interest rates in these circumstances. The paper also argues that the existence of deposit insurance in the more recent period is the most important difference between the more recent period and the 1930s. While deposit

insurance has not rescinded the contractionary impact of depository stress on broad money, it has caused the impact to manifest itself in much different ways than in the 1930s. The presence of deposit insurance in the early 1990s also makes it clear that monetary policy in this period could certainly have offset the weakness in broad money growth.

Finally, the paper looks at the situation of Japan in the early 1990s and argues that the extended weakness of the Japanese economy in this period, despite sharply lower short-term interest rates and positive interest rate term spreads, is once again due to the severe financial pressures felt by depository institutions in this period. Indeed, the paper argues that, considering its origins, the Japanese situation bears an even closer resemblance to the U.S. situation of the early 1930s. Once again, a broad monetary aggregate (M2+CD) appears to have served as a better indicator of monetary policy over this period than either interest rates or narrow monetary aggregate indicators.

The lesson for monetary policy is that it is a grievous error to use short-term interest rates as indicators of monetary policy when depositories are under severe financial pressure. In these cases at least, broad monetary aggregates are much better indicators of monetary policy.

Notes

* Senior Economist, Federal Reserve Bank of Chicago. The author has benefited from the comments of Hesna Genay, Jack Hervey, Phil Israilevich, George Kaufman, and Kathy Moran. The paper also benefited from a presentation in a seminar at the Chicago Fed, and the comments of Charles Evans, Ken Kuttner, Ellen Rissman, and Argia Sbordone. The views expressed in this paper are solely those of the author and do not necessarily represent the views of either those who have commented on the paper, the Federal Reserve Bank of Chicago, or the Federal Reserve System.

1. Actually, the highest annual growth rate was 3.52 percent. No other sequence of quarters with less than 3.5 percent growth comes close in duration. The next two longest sequences of quarters were both eight quarters long from 1973:Q2 through 1975:Q1, and from 1981:Q2 through 1983:Q1.

2. The behavior of the fed funds rate after the recession ending in March 1991 was very unusual. The average duration and magnitude of decline in the funds rate after the preceding six recessions was 2.5 months and 82 basis points, with the longest duration and maximum decline being 5 months and 189 basis points respectively. The decline after the trough of the 1991 recession lasted 21 months and was 320 basis points.

3. Data for the real monetary base and real M1 are obtained by using the Consumer Price Index as a deflator. Nominal growth in the narrow aggregates was also stronger than average in this period, though not as exceptionally strong as the narrow real aggregates.

4. Wholesale price data indicated that prices fell about 11 percent a year over this period, while consumer price data indicate that prices fell about 6 percent a year.

5. One aspect in which the two periods differed was in the level of real rates. As in most episodes when prices are declining, the level of real rates in the early 1930's were relatively high.

6. Other potential candidates for the structural impediment were particular components of debt such as state and local debt, the reduction in defense spending, the unwinding of excessive real estate values, and the reengineering and downsizing involved in corporate restructuring.

7. See Chapter 7, Friedman and Schwartz (1963).

8. Given the generally mild inflation of this period, the high nominal growth of M1 translated into an historically very high growth rate in real M1. It also meant that while nominal growth in the broader aggregates (M2 & M3) was at the lowest level over the period for which the Fed published money data, real growth in the broader aggregates was weak--but not at all-time lows.

9. For views of those who argued that the narrow aggregates (monetary base) indicated too stimulative a policy see Shadow Open Market Committee (1991), while in contrast Friedman (1992) advocates M2 as an indicator of a monetary policy that was too tight.

10. A fed funds targeting procedure essentially means that reserves are moved to match changes in required reserves to keep excess reserves constant.

11. It should be noted that the data used are the current revised data for each period, and so differ from the actual data that were available at the time.

12. Those models which were tested but not selected were real M1 growth (narrow aggregates), real M3 growth (broad aggregates), three-month Treasury bill rates (short-term interest rates), and the spread between the ten-year Treasury bond rate and the three-month Treasury bill rate and the spreads between the longest-term Treasury bond rate and both the three-month Treasury bill rate and the fed funds rate (interest rate term spreads). This procedure, and the results, generally follow closely those in Laurent (1988). The major difference, besides the additional data available now, is that this set of tests includes narrow aggregates (monetary base and M1) and does not include the real fed funds rate. As noted in the 1988 article piece, the results for the real fed funds rate as an indicator of monetary policy were particularly disappointing.

13. Though the equations in table 1 list the t-statistics for each equation based on ex-post estimation over the entire period, the decision on the best variable and lagged structure is based on the best one-quarter ahead iterative forecasts extending over the entire period. Table 2 shows the comparable numbers when up to eight lagged quarters of real GDP growth are also entered as explanatory variables. The conclusions of the paper are not changed.

14. As shown in the table, the coefficient on the two-quarter lagged fed funds rate has a negative coefficient of a larger magnitude than the positive coefficient on the seven-quarter lagged fed funds rate. Thus, though the lagged values of the fed funds rate are entered in levels, the form of the equation selected indicates that low and <u>falling</u> fed funds rates are most conducive to future real GDP growth.

15. There are two objections that may be raised to this use of real monetary aggregates as indicators of monetary policy. One is that the equations imply that there is an unlimited possible increase in real GDP merely by increasing real aggregate balances. Clearly this cannot be, and the use of these forms assumes the availability of resources that can increase output. Extensive and extended increases in real monetary aggregates would likely cause the models to forecast very poorly. A second objection is that while the monetary authority can control a nominal monetary aggregate, it cannot control a real monetary aggregate. So, using real monetary aggregates as indicators of monetary policy assumes a degree of control the monetary authority does not possess. The validity of this criticism is debatable, but even if one uses a variant of real M2 where control over nominal M2 is the equivalent of control over the real variant (e.g. current nominal M2 divided by last quarter's CPI index--and so translates control over the nominal aggregate into control over this variant of the real aggregate), essentially the same conclusions result. The entries in the second row of Table 1 in this case would be 6.744, 2.350, 2.880, 6.053, 2.339, and 2.526.

16. The fact that the errors fluctuate together suggests that some periods are simply more difficult to forecast than others. It appears that time spans of high volatility in real growth rates are more difficult to predict, though the difficulty does not appear to be proportional to the standard deviation of the growth rates within the period.

17. This statement can be quantified. There are 105 complete ex-ante fifteen-quarter spans over the period from 1964:Q1 to 1993:Q3. The fifteen-quarter span that covers exactly the period of sluggish growth, i.e. the span centered on 1990:Q4, ranks fifth out of the 105 spans in terms of lowest average error. In addition every one of the first six ranked spans includes at least one observation from the period of sluggish growth in the early 1990s. There are 116 complete ex-post spans, of which the span covering exactly the fifteen quarters of sluggish growth has the fourth lowest average error. In addition, the five

spans with the lowest errors all include at least one quarter from the period of sluggish growth in the early 1990s.

18. Though fluctuations in the two series align very well, there clearly is some increase in velocity as the period progresses. That is, the same rate of increase in real M2 corresponds to a greater rate of increase in industrial production later in the period.

19. For a description of how the expenditure of funds in resolving an insolvent institution reduces deposits, see Kasriel and Laurent (1992).

20. For a description of the changes in capital requirements, and estimates of the impact on banking system growth see Baer and McElravey (1993).

21. See Kasriel (1991), Kasriel and Laurent (1992), and Buchanan and Fand (1992).

22. Holdings of excess reserves increased from $34 million in September, 1929 to $6,646 million in December, 1940.

23. For one particularly prominent economist in the 1930's who held this view, see Currie (1934) and Steindl (1991). For evidence that this view was widely held see Tavlas (1994).

24. See Matsuoka (1993).

25. The resolution of insolvent institutions in Japan differed from that in the U.S. in that few institutions in Japan appear to have been directly closed and were instead merged with solvent institutions. The extent to which public funds were paid to the solvent partner are not clear.

26. The U.S. stock market in September 1929 and the Japanese stock market in December 1989 were, in standard valuation terms, the leading stock markets of their day. Even when the effect of extensive stock cross-ownership is taken into account, the valuation of the Japanese stock market in December, 1989 would still rank it second. The U.S. stock market of the 1930s declined a maximum of 84 percent (as measured by the S&P index) from its September 1929 peak to May 1932, while the Japanese market declined a maximum of 63 percent (as measured by the NIKKEI index) from its December 1989 peak to July 1992. The U.S. stock market did not reattain the level of its 1929 peak until September 1954. In November 1994, the Japanese market was still 52 percent below its 1989 peak.

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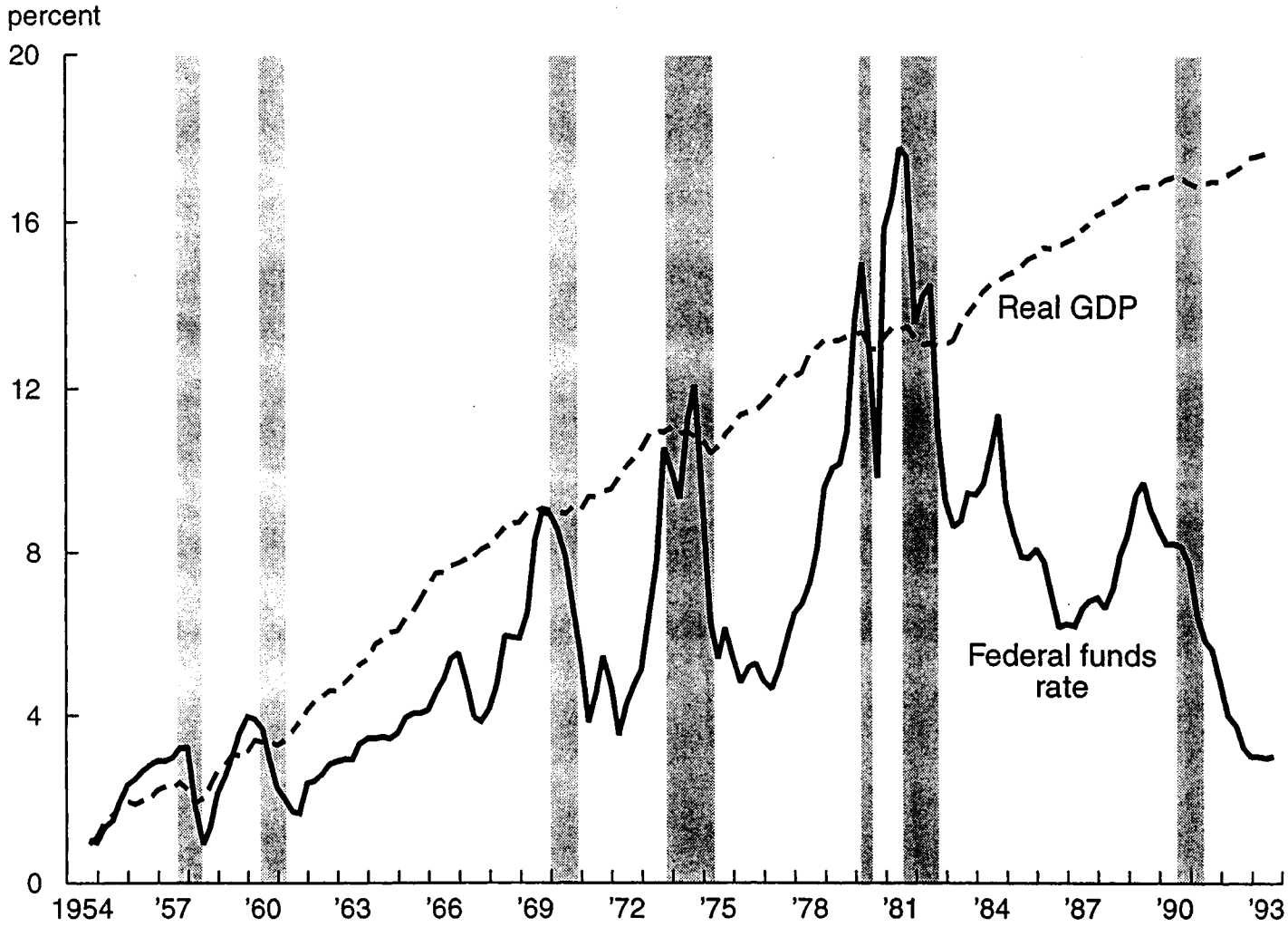
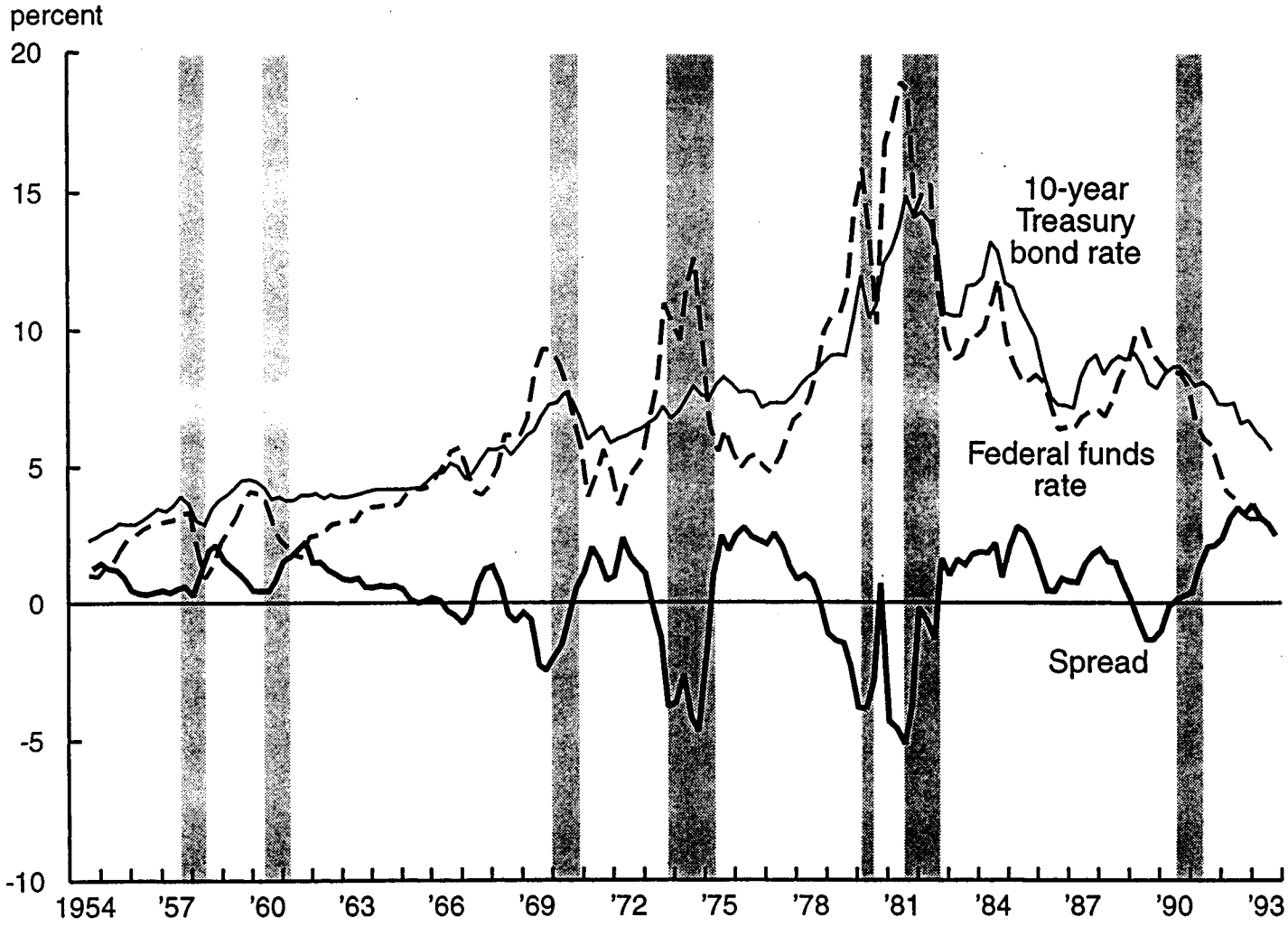
Figure 1
Real GDP and the federal funds rate (1954:Q3-93:Q3)



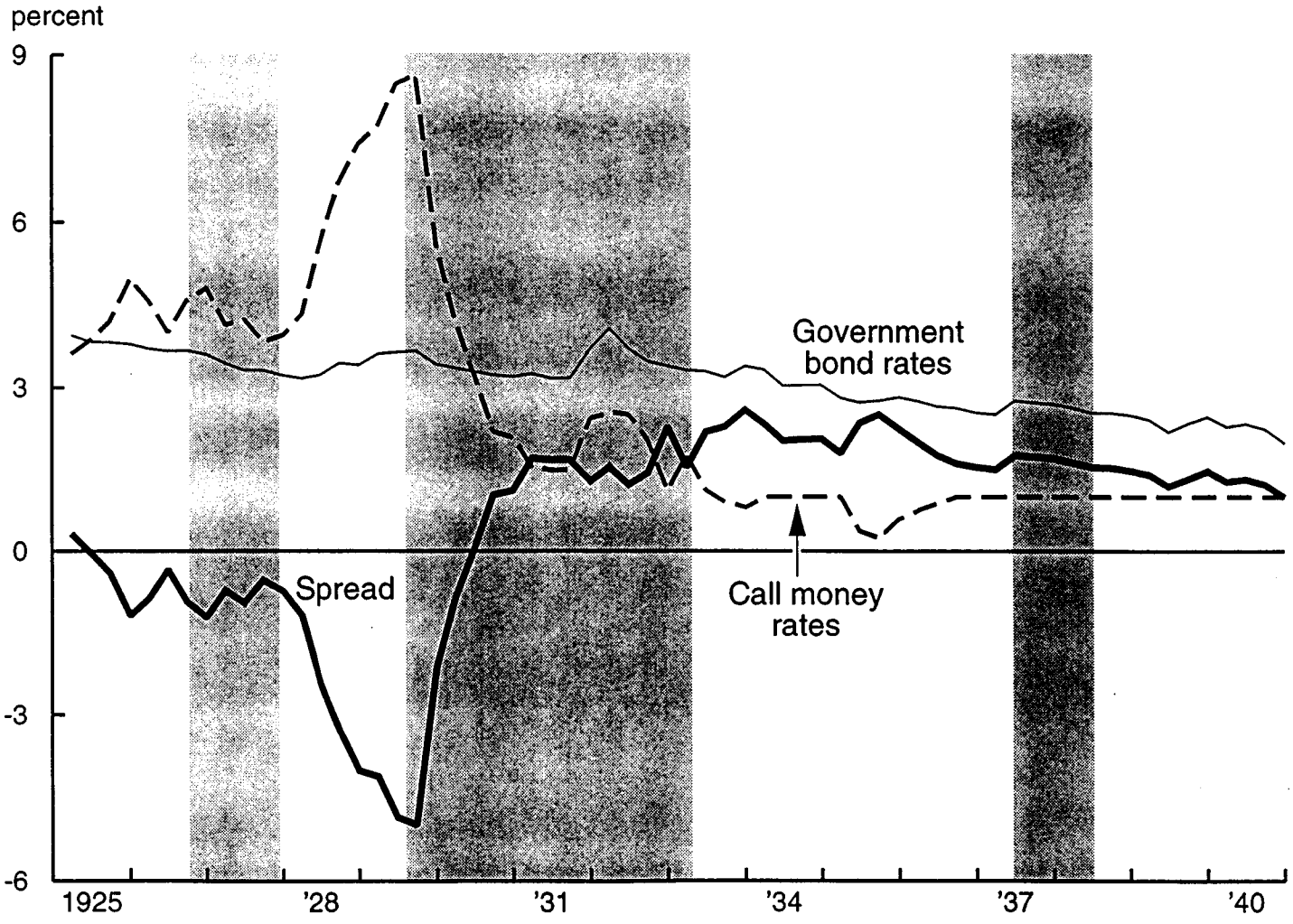
Note: GDP is plotted in natural logarithms scaled to match interest rates. Shaded areas indicate recessions.

Figure 2
The federal funds rate, 10-year Treasury bond rate, and the spread between the two rates (1954:Q3-93:Q3)



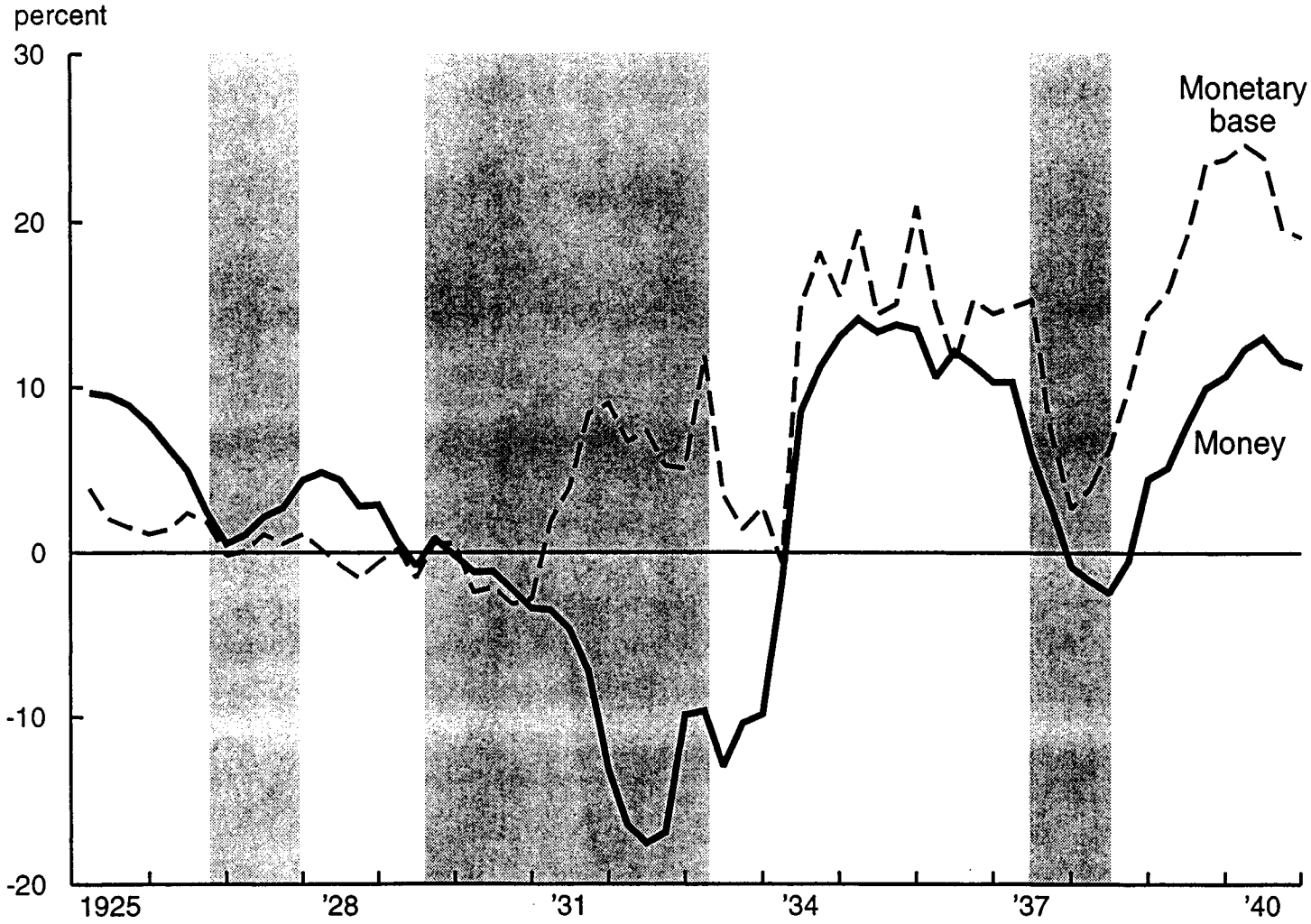
Note: Shaded areas indicate recessions.

Figure 3
Government bond rates, call money rates, and the spread between the two rates (1925:Q1-40:Q4)



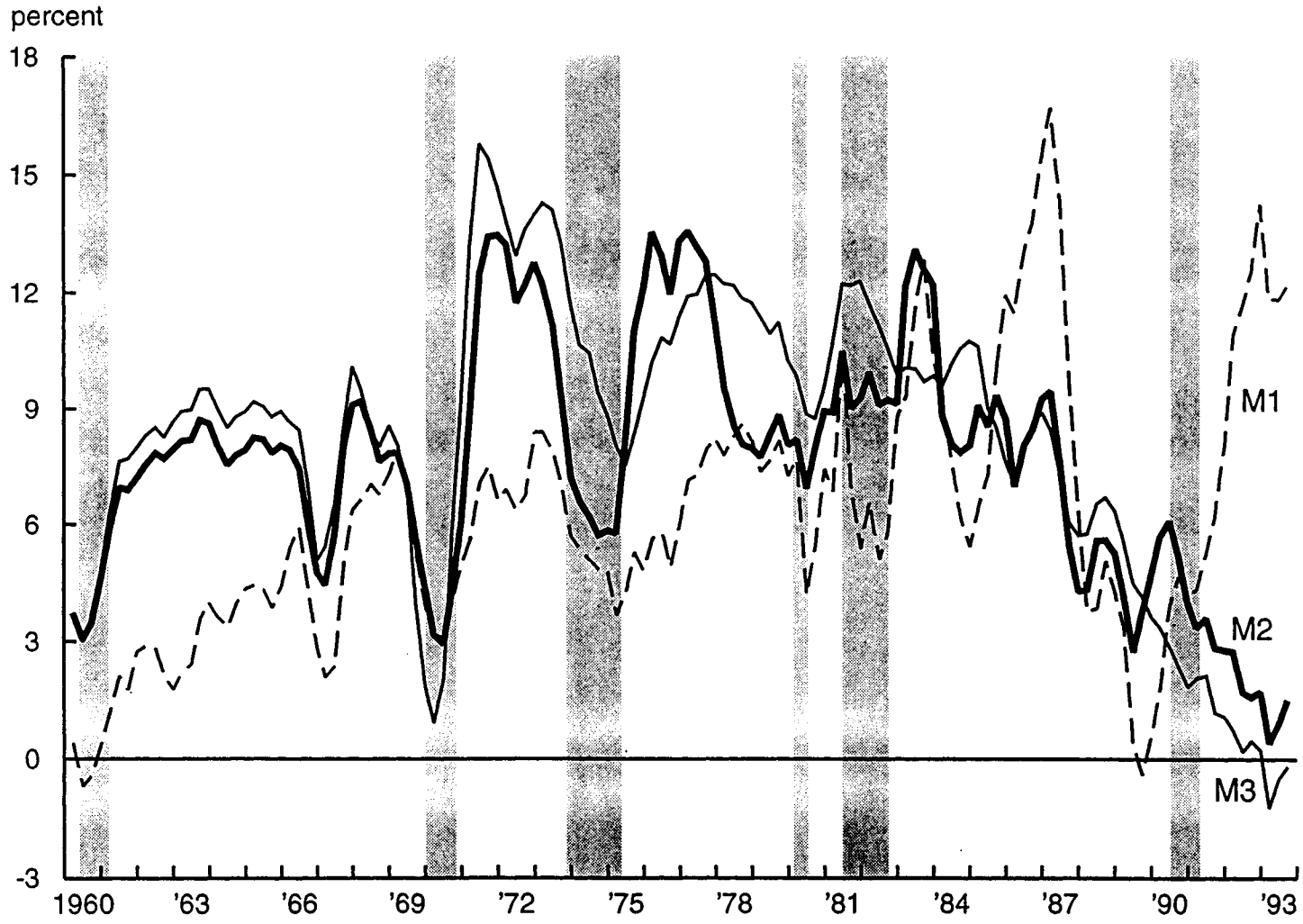
Note: Shaded areas indicate recessions.

Figure 4
Year-over-year growth in money and the monetary base (1925:Q1-40:Q4)



Note: Shaded areas indicate recessions.

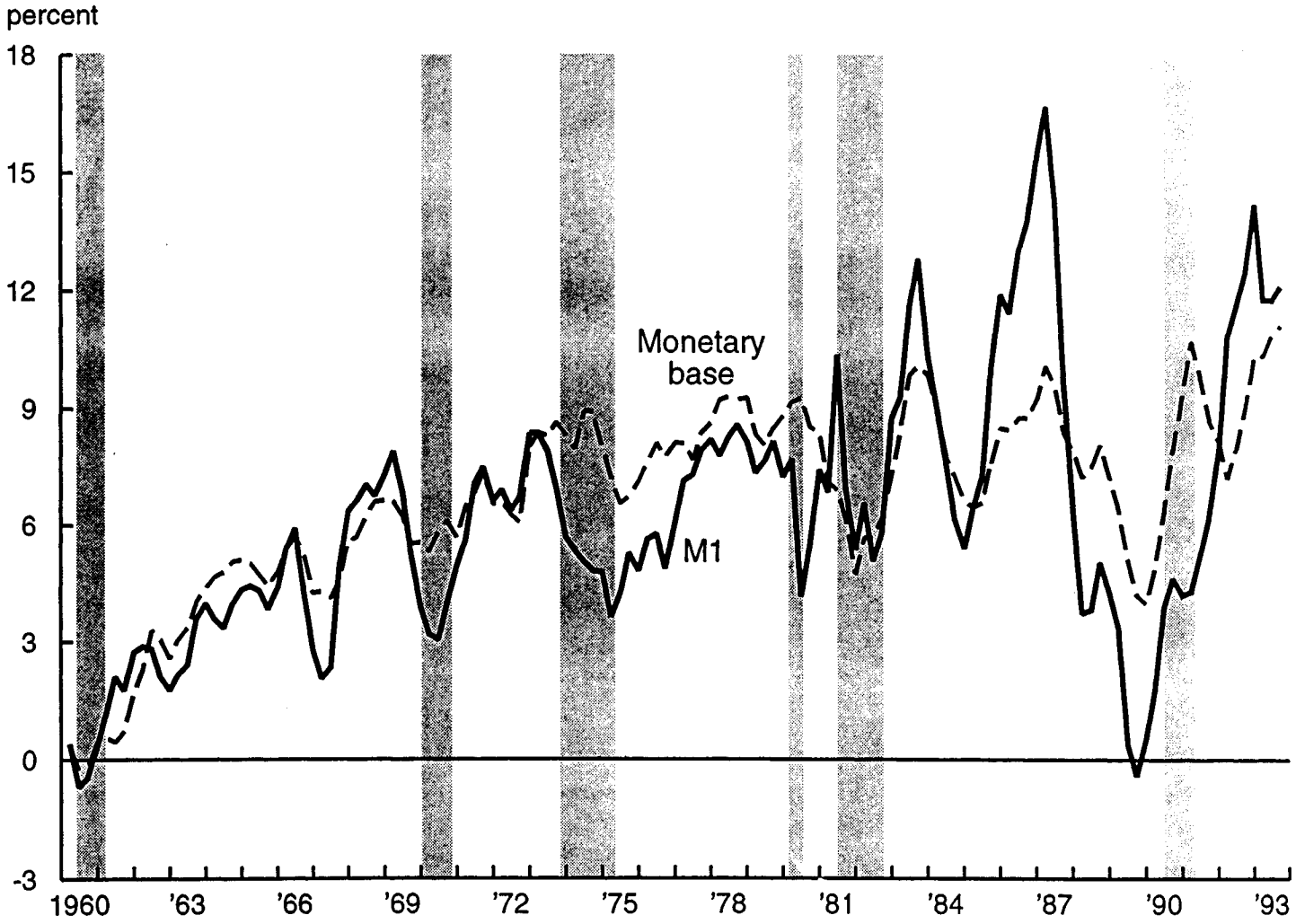
Figure 5
Year-over-year growth in M1, M2, and M3 (1960:Q1-93:Q3)



Note: Shaded areas indicate recessions.

Figure 6

Year-over-year growth in M1 and the monetary base (1960:Q1-93:Q3)

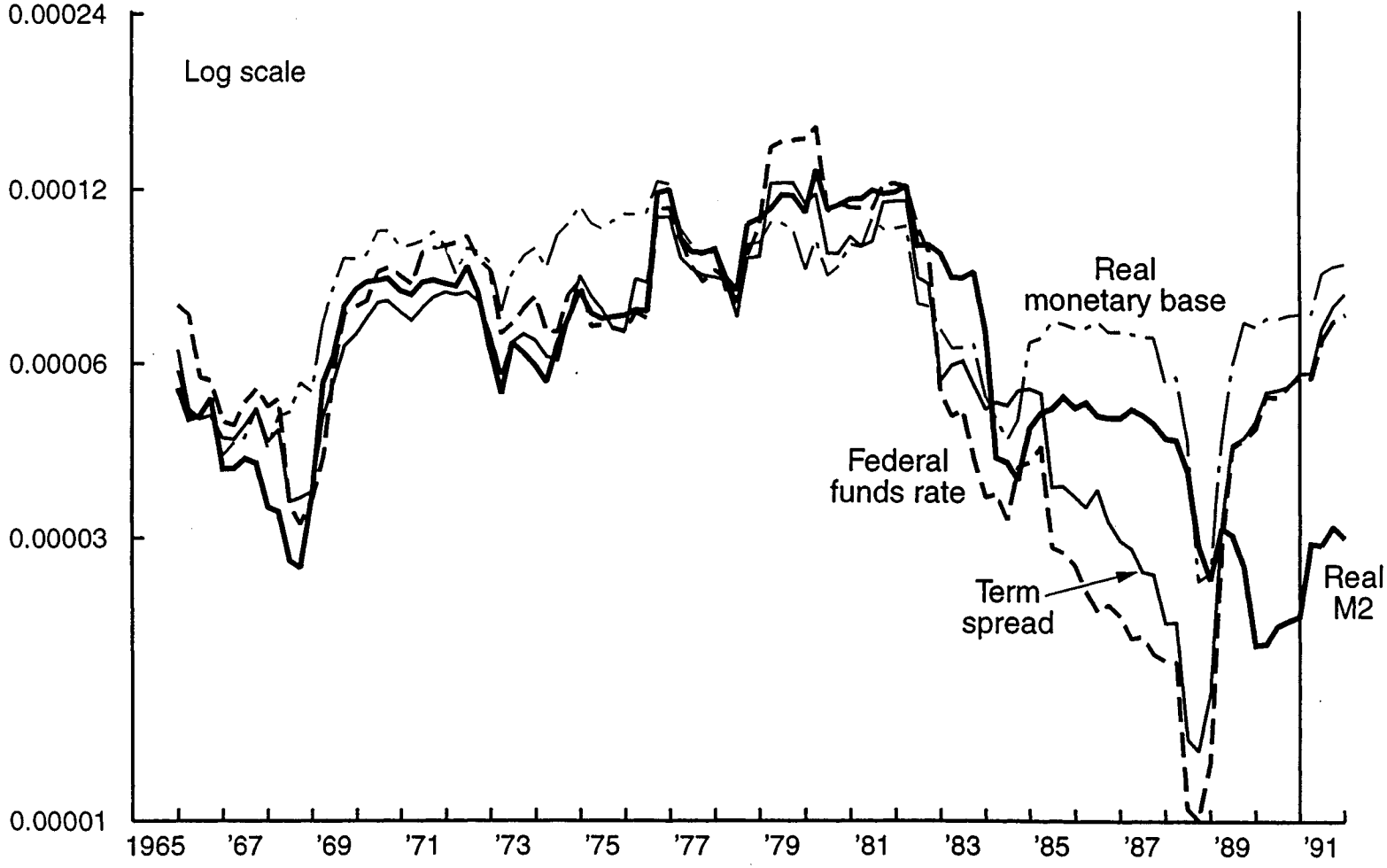


Note: Shaded areas indicate recessions.

Figure 7

Averaged ex-ante real-income error for four models over moving 15-quarter spans centered from 1965:Q4-91:Q4

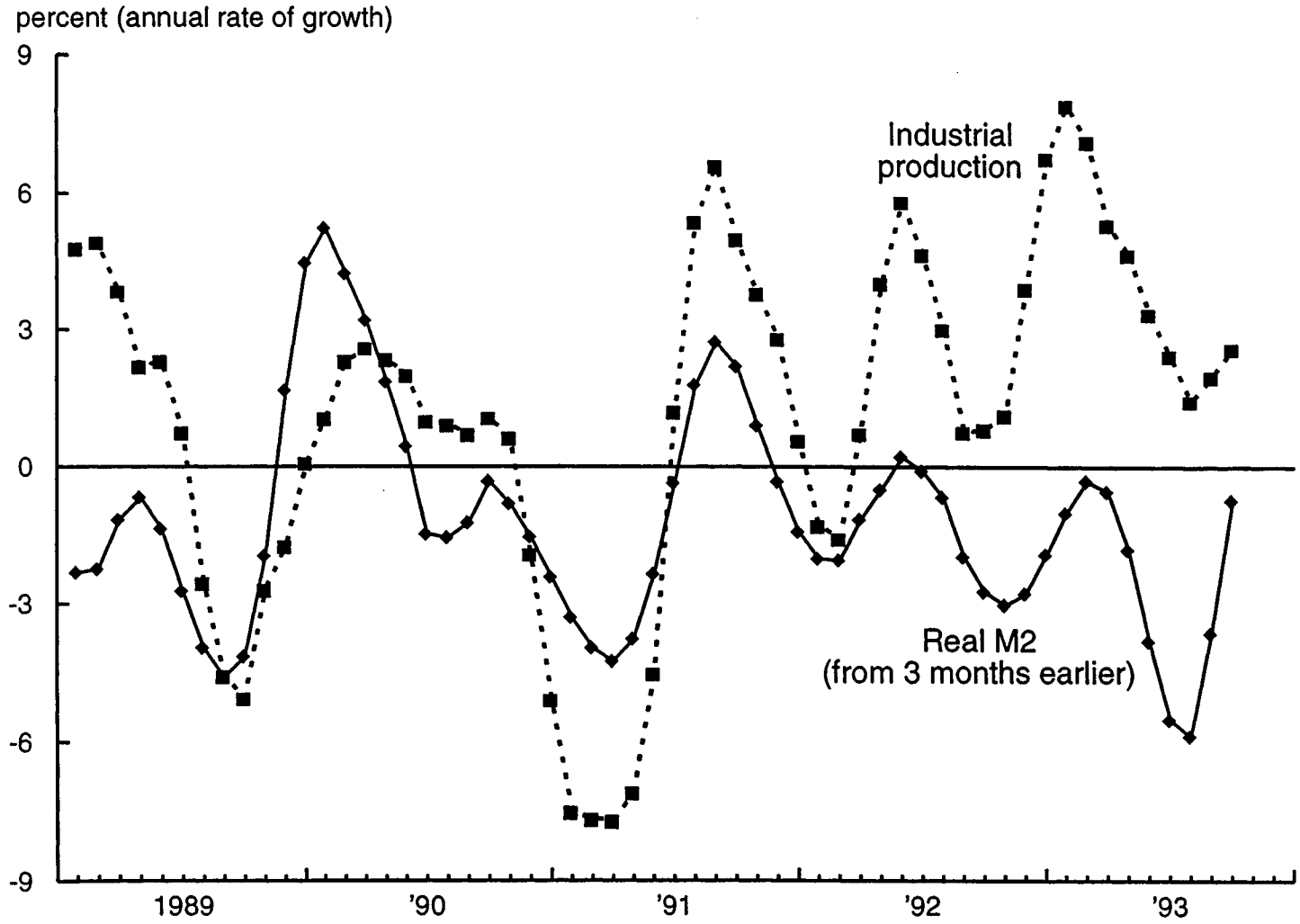
average squared error in change of log of real GDP



Note: Vertical line indicates average error over 15-quarter period centered on 1990:Q4.

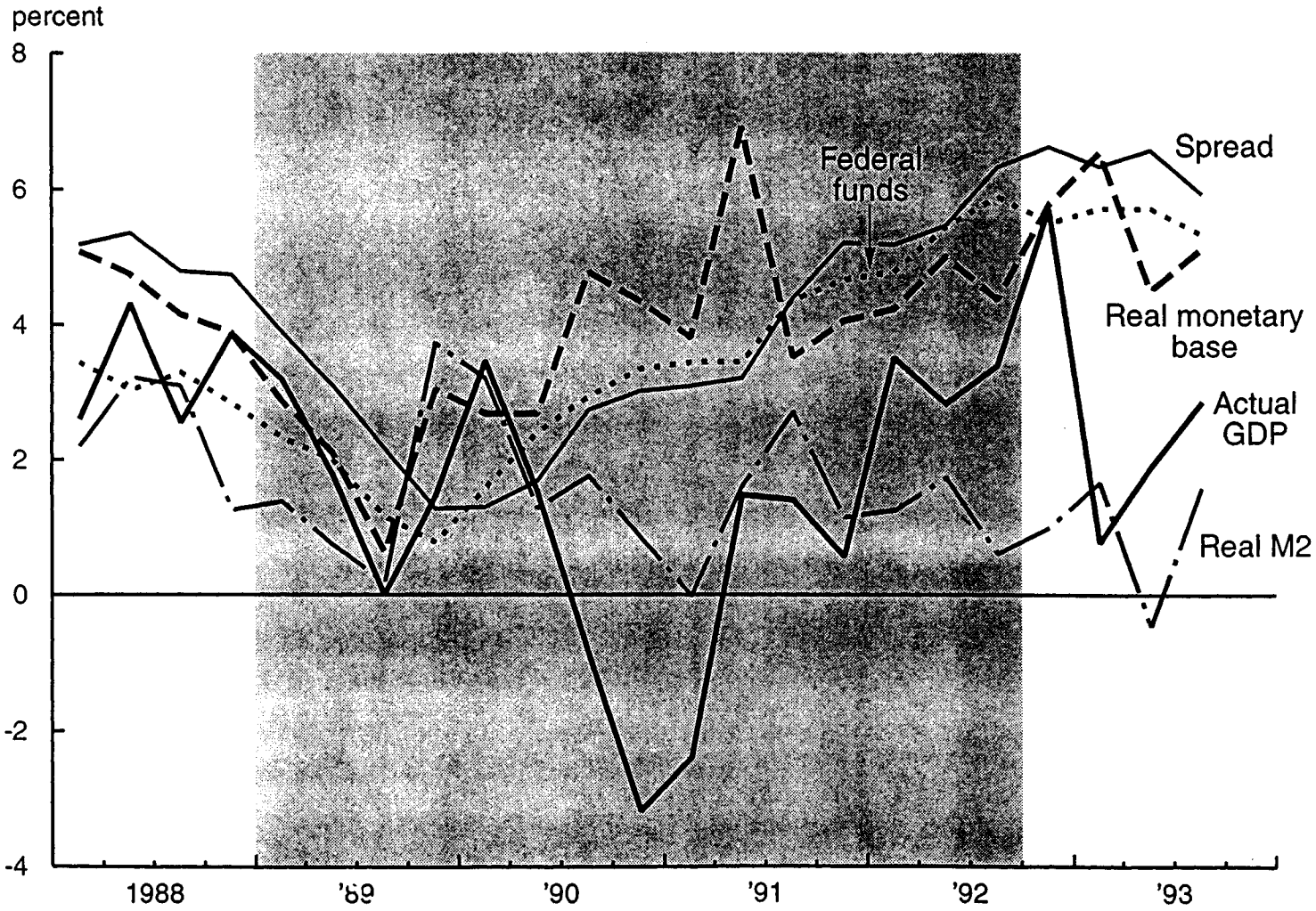
Figure 8

Growth in industrial production and earlier M2 (January 1989-September 1993)



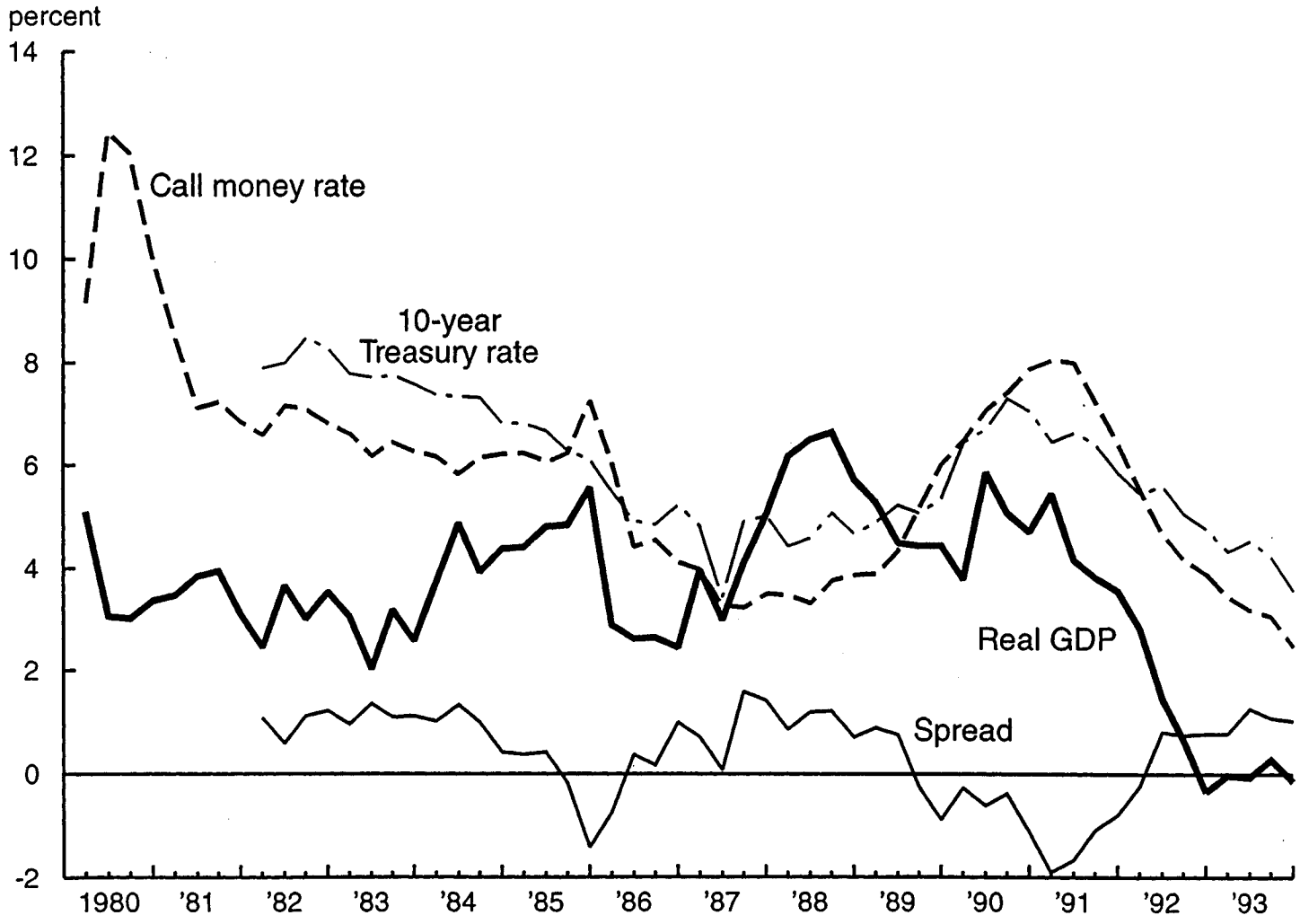
Note: Annual growth is based on 3-month average over preceding 3-month average.

Figure 9
Actual and forecasted growth in real GDP (1988:Q1-93:Q3)



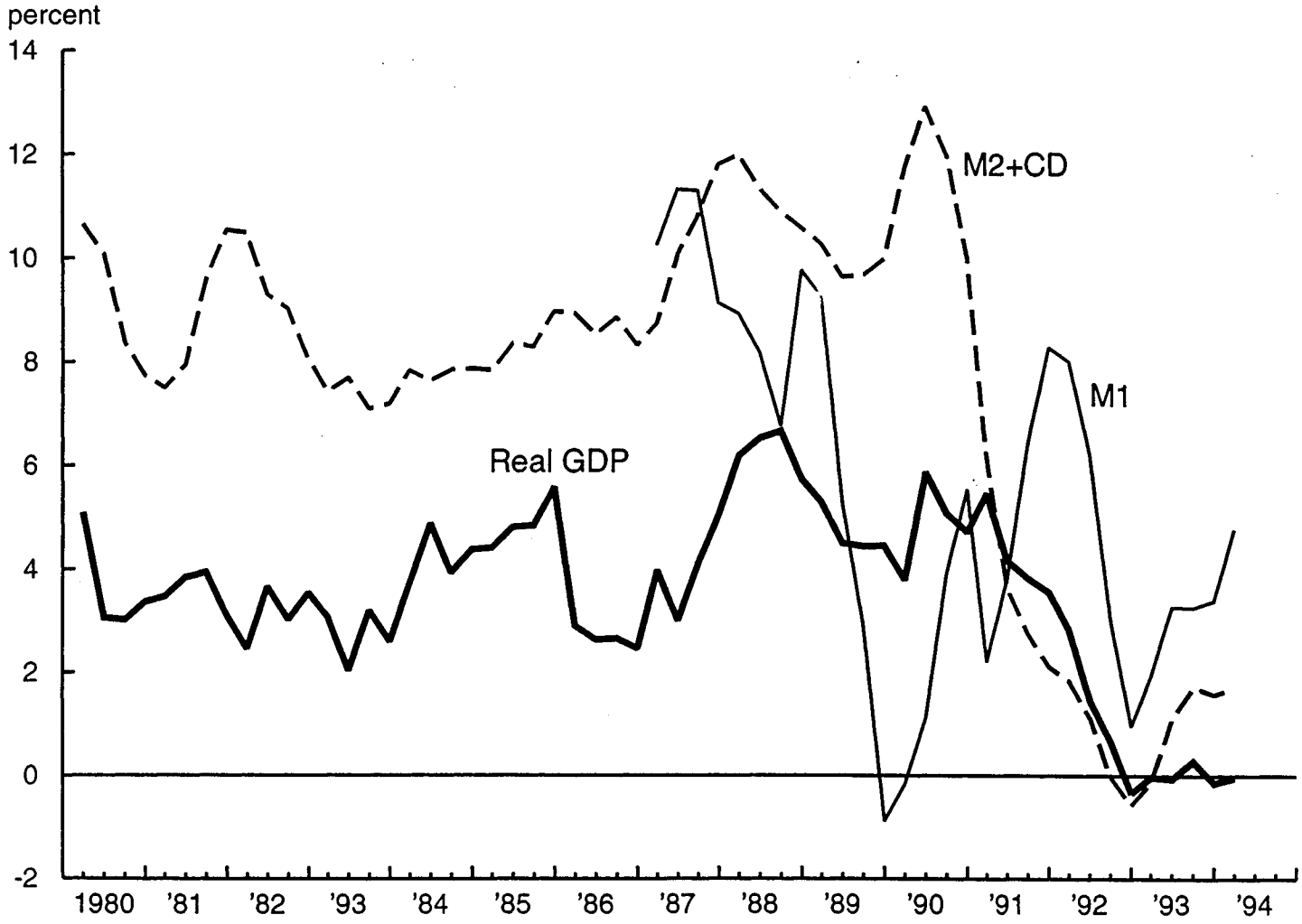
Note: Shaded area is period of sluggish economic growth.

Figure 10
Japanese interest rates, spreads, and real GDP growth (1980:Q1-93:Q4).



Notes: The spread is the difference between the 10-year Treasury rate and the call money rate (bond equivalent basis). Real GDP growth is measured year-over-year.

Figure 11
Japanese nominal money and real GDP growth (1980:Q1-94:Q1)



Note: Growth rates are year-over-year figures.

Table 1

Models and average squared errors in the change in the natural log of real GDP

(Actual errors are entries x 10^{-5})

Models Equations estimated on data from 1961:Q2 - 93:Q3	Average ex-ante squared error over 1964:Q1 - 93:Q3	15-quarter span 1989:Q1 - 92:Q3	11-quarter span 1990:Q1 - 92:Q3	Average ex-post squared error over 1961:Q2 - 93:Q3	15-quarter span 1989:Q1 - 92:Q3	11-quarter span 1990:Q1 - 92:Q3
	(1)	(2)	(3)	(4)	(5)	(6)
Narrow money						
$DLGDP_t = .00545 + .40697 * DLMB_{t-1}$ (6.482) (4.748) $R^2adj = .143$ see = .00844	7.872	7.438	9.972	7.018	6.106	8.179
Broad money						
$DLGDP_t = .00475 + .40057 * DLM2_{t-1}$ (6.158) (7.102) $R^2adj = .277$ see = .00775	6.618	2.253	2.554	5.920	2.242	2.558
Short-term rates						
$DLGDP_t = .01426 - .00181 * RFF_{t-2} + .00085 * RFF_{t-7}$ (8.735) (-7.212) (3.399) $R^2adj = .294$ see = .00767	7.046	5.775	7.727	5.741	4.964	6.611
Term spread						
$DLGDP_t = .00633 + .00250 * R10MFF_{t-2}$ (9.009) (6.876) $R^2adj = .264$ see = .00782	6.772	5.873	7.623	6.028	4.941	6.469

t = values in parenthesis.

DLGDP = change in the ln of real GDP.

DLMB = change in the ln of real monetary base.

DLM2 = change in the ln of real M2.

RFF = federal funds rate (bond equivalent basis).

R10MFF = spread between the 10-year Treasury bond yield and the fed funds rate.

t - # = values lagged # quarters.

Table 2

Models and average squared errors in the change in the natural log of real GDP including lagged GDP as an explanatory variable

(Actual errors are entries x 10^{-5})

Models Equations estimated on data from 1961:Q2 - 93:Q3	Average ex-ante squared error over 1964:Q1 - 93:Q3	15-quarter span 1989:Q1 - 92:Q3	11-quarter span 1990:Q1 - 92:Q3	Average ex-post squared error over 1961:Q2 - 93:Q3	15-quarter span 1989:Q1 - 92:Q3	11-quarter span 1990:Q1 - 92:Q3
	(1)	(2)	(3)	(4)	(5)	(6)
Narrow money						
$DLGDP_t = .00415 + .21636 * DLGDP_{t-1} + .34470 * DLMB_{t-1}$ (4.315) (2.611) (3.954) $R^2adj = .180$ see = .00826	7.690	5.523	7.415	6.661	4.130	5.548
Broad money						
$DLGDP_t = .00373 + .15411 * DLGDP_{t-2} + .38565 * DLM2_{t-1}$ (4.115) (2.086) (6.870) $R^2adj = .296$ see = .00765	6.573	2.095	2.399	5.724	2.066	2.383
Short-term rates						
$DLGDP_t = .01223 + .15087 * DLGDP_{t-6} - .00194 * RFF_{t-2} + .00112 * RFF_{t-7}$ (6.172) (1.785) (-7.478) (3.858) $R^2adj = .322$ see = .00760	7.007	5.548	7.432	5.599	4.797	6.406
Term spread						
$DLGDP_t = .00633 + .00250 * R10MFF_{t-2}$ (9.009) (6.876) $R^2adj = .264$ see = .00782	6.772	5.873	7.623	6.028	4.941	6.469
Lagged real GDP						
$DLGDP_t = .00510 + .30604 * DLGDP_{t-1}$ (5.180) (3.637) $R^2adj = .087$ see = .00872	8.296	3.022	3.534	7.481	2.782	3.311

t = values in parenthesis.

DLGDP = change in the ln of real GDP.

DLMB = change in the ln of real monetary base.

DLM2 = change in the ln of real M2.

RFF = federal funds rate (bond equivalent basis).

R10MFF = spread between the 10-year Treasury bond yield and the fed funds rate.

t - # = values lagged # quarters.

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