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Monetary Growth and Business Cycles

Part I: The Theoretical and Historical Perspective

By Bryon Higgins

History clearly shows that the pattern of economic growth in the United States has been uneven. Periods of economic expansion frequently have been interrupted by business contractions of varying length and severity. Despite extensive investigation of the sources of economic instability, however, economists disagree about the relative importance of various factors that have contributed to the cyclical nature of economic growth.

There is particularly sharp disagreement among economists regarding the extent to which changes in the rate of monetary growth are responsible for cyclical variations in income, employment, and inflation. Monetarists contend that changes in the rate of monetary growth are the primary factor accounting for economic instability. Consequently, they recommend that monetary policy be directed toward maintaining steady growth in the money supply. Nonmonetarists, on the other hand, believe that monetary growth is only one of several important determinants of aggregate economic performance. Thus, nonmonetarists advocate a flexible approach to monetary policy, believing that the appropriate rate of monetary growth depends on the numerous nonmonetary factors influencing the course of the economy.

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The relationship between monetary growth and business cycles is discussed in this article. In the first section, factors contributing to the historical association between monetary growth and business cycles are analyzed, and the cyclical pattern of monetary growth is documented for three historical periods spanning over 100 years. The monetarist interpretation of this evidence is presented in the second section, and the policy implications of this interpretation are discussed. In the third section, nonmonetarist objections to the monetary explanation of business cycles are outlined. A nonmonetarist theory of business cycles and its policy implications are also examined. A summary and conclusions are presented in the final section.

MONEY AND BUSINESS CYCLES: THE HISTORICAL PERSPECTIVE

Monetary growth in the United States has exhibited a distinct cyclical pattern, generally increasing during economic expansions and declining during economic downturns. This basic pattern has persisted for more than a century despite major changes in economic and financial institutions. The pattern characterized the period from **1867** through **1913**, i.e., before the Federal Reserve System was established. Moreover, the pattern **continued** in the period from **1914** through **1951**, after the System was organized but before the proper function of a central bank was fully developed.

Finally, the characteristic relationship between monetary growth and business cycles persisted during the period from **1952** through **1978**, when the role of an independent monetary authority was generally understood. In each of the three periods, the institutional economic and policy factors that determined the cyclical behavior of monetary growth differed substantially. These factors are discussed for each period in the remainder of this section, and the relationship between monetary growth and business cycles is identified in some detail.

The Pre-Federal Reserve Era: 1867-1913

For most of the period from **1867** to **1913**, movements in the U.S. money stock were importantly affected by gold flows resulting from surpluses or deficits in the international balance of payments. This relationship resulted from the adoption in **1879** of a strict monetary gold standard in which gold and currency were freely convertible. Under this type of monetary arrangement, gold inflows associated with balance of payments surpluses led to increases in bank reserves and the money supply, and gold **outflows** accompanying balance of payments deficits led to decreases in bank reserves and the money supply.

In addition to international gold flows, however, movements in the U.S. money supply before **1914** were strongly influenced by internal currency drains associated with banking panics. When the public became apprehensive about financial conditions and the soundness of the banking system, the ensuing panic resulted in a widespread attempt to withdraw currency from banks. Because there was no central bank or any other mechanism under the National Banking System for expanding bank reserves in the short run, banks were frequently unable to obtain sufficient cash to meet their depositors' demand for currency and were forced to

liquidate assets or to suspend operation. Internal currency drains, therefore, often resulted in a wave of bank failures and a cumulative decline in the money stock, which were often accompanied by a sharp contraction in economic activity. Thus, in the pre-Federal Reserve era, banking panics played a major role in determining the behavior of the money stock as well as the relationship between monetary growth and business cycles.

The Early Years of the Federal Reserve System: 1914-51

In the period from **1914** to **1951**, the money supply was, in principle, determined by the monetary policy actions of the Federal Reserve. By expanding or contracting its loans to member banks and its holdings of Government securities, the Federal Reserve could offset the impact of gold and currency flows on bank reserves and could thereby influence the behavior of the money supply.

The Federal Reserve's monetary policy from **1914** to **1951** was strongly influenced by major economic and social upheavals and the System's inexperience in using the tools of monetary management to deal with them. During the first and last parts of the period, Federal Reserve policy and monetary growth were determined primarily by the U.S. Treasury's need to finance large deficits associated with World War I and World War II. In the period between the two world wars, the Federal Reserve's lack of experience resulted in monetary policy actions that were sometimes inappropriate. In both **1920** and **1936-37**, for example, the Federal Reserve responded to the threat of inflation by taking policy actions that contributed to abrupt declines in the money supply and the level of economic activity. From **1929** to **1933**, moreover, the Federal Reserve failed to alleviate a prolonged decline in the money stock

by offsetting the currency drains associated with the banking panics during the Great Depression.

The Post-Accord Era: 1952-78

Deliberate policy actions by the Federal Reserve have been a major factor determining the cyclical pattern of monetary growth since 1952. In 1951, an agreement between the Federal Reserve and the Treasury ended the Federal Reserve's policy of accommodating Treasury financing requirements. This agreement, which is commonly referred to as the Accord, has been widely interpreted both within the Federal Reserve System and by outside observers as formal recognition of the desirability of an independent monetary policy. Moreover, by 1952, the Federal Reserve's understanding of financial management had progressed to the point where monetary policy tools could be used effectively to achieve policy objectives.

Since 1952, a major objective of the Federal Reserve's monetary policy has been to moderate cyclical fluctuations in the growth of money and credit. The Federal Reserve has, for example, taken actions to restrain monetary growth when sustained periods of economic expansion threatened to produce accelerating inflation and has eased monetary restraint when the economy appeared weak.

The Average Cyclical Pattern of Monetary Growth

Despite the diversity in the factors that determined behavior of the money stock, the cyclical pattern of monetary growth in the three periods was generally similar. Chart 1 shows the average quarterly M2 growth rates in the vicinity of cyclical peaks in economic activity for each of the three historical periods. Chart 2 shows the average cyclical pattern of **M1**

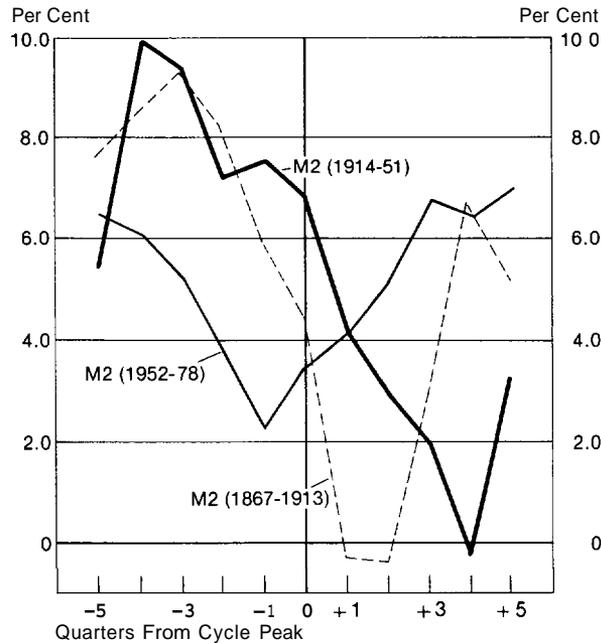
growth only for the 1914-51 and 1952-78 periods, since reliable data on **M1** are not available prior to 1914.¹ The charts show that, in each period, monetary growth rates declined before a cyclical peak in economic activity and increased thereafter.

The pattern of M2 growth for the eight business cycles between 1914 and 1951 was quite similar to the pattern established during the 12 business cycles between 1867 and 1913. In both periods, M2 growth reached a maximum rate of almost 10 per cent a few quarters before the cyclical peak in economic activity and declined sharply for several quarters thereafter. M2 growth began to increase rapidly following a period of negative growth soon after the onset of a recession. The general cyclical behavior of **M1** from 1914 to 1951 was quite similar to the behavior of M2, although the variability in growth rates was somewhat less for **M1** than for M2.

The general characteristics of monetary growth in the vicinity of the five business cycle peaks between 1952 and 1978 are similar to those in earlier periods, but the precise timing and magnitude of cyclical changes in the rate of monetary growth were somewhat different in the 1952-78 period. For both **M1** and M2, the cyclical variability in growth rates has only been about one-half as great in the post-Accord period as in the earlier two periods. Since 1952, moreover, monetary growth has accelerated before, rather than after, the onset of a recession. The relatively mild character of recessions in the past three decades may be related to the earlier reversal of the downward trend in monetary growth rates and the reduced variability of monetary growth. To the extent that the increased independence and expertise

¹ **M1** consists of demand deposits and currency held by the nonbank public. **M2** includes time and savings deposits at commercial banks in addition to **M1** assets.

**Chart 1
CYCLICAL PATTERN OF M2 GROWTH**



of the Federal Reserve have been responsible for the alteration in the cyclical pattern of monetary growth since 1952, therefore, monetary policy has contributed to economic stability in the post-Accord period.

THE MONETARY THEORY OF BUSINESS CYCLES

Some analysts have interpreted the historical relationship between money and business cycles as strong evidence that changes in the rate of monetary growth are the primary determinant of cyclical variations in employment, income, and inflation. Monetarists argue that monetary growth is a largely independent factor accounting for economic fluctuations rather than a passive reaction to those fluctuations.

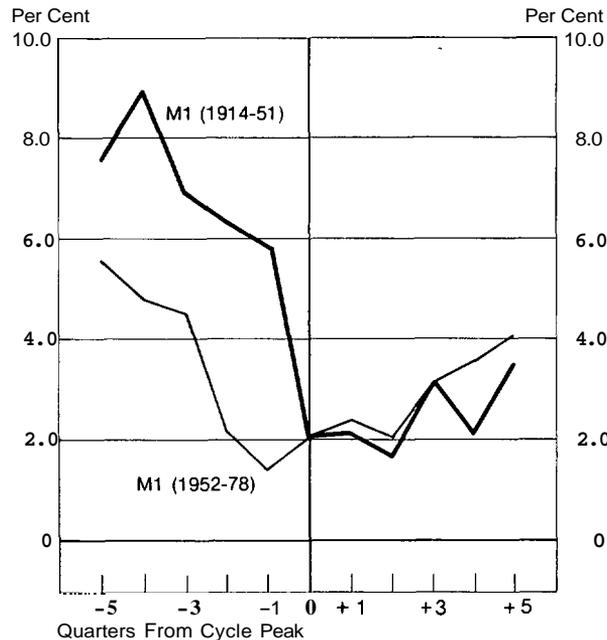
The Monetarist Interpretation of the Historical Evidence

After extensive investigation of the historical circumstances surrounding business cycles in the United States, Milton **Friedman** and Anna Jacobson Schwartz, whose view of the relation between monetary growth and business cycles is shared by many other monetarists, concluded that:

Appreciable changes in the rate of growth of the money stock are a necessary and sufficient condition for appreciable changes in the rate of growth of money **income**.²

Friedman and Schwartz rely on three basic types of evidence to support the monetary

Chart 2
CYCLICAL PATTERN OF M1 GROWTH



explanation of business cycles—the pervasive influence of money on other economic variables, the persistence of the association between monetary growth and business cycles during periods with different institutional arrangements, and the observed timing relationship between changes in the rate of monetary growth and changes in other economic variables.

The Pervasive Influence of Money. Friedman and Schwartz point out that money, unlike many other economic variables that exhibit a

cyclical pattern of growth, is generally believed to influence a wide variety of important economic aggregates. Although growth in many economic variables conforms to the general business cycle, the cyclical behavior of most of these variables can best be explained as resulting from fluctuations in the overall level of economic activity rather than playing an important independent role in causing those fluctuations. The production of pins, for example, may be closely associated with the general level of economic activity, but pin production is generally thought to have a negligible effect in determining the course of the economy. Money, on the other hand, plays a major role in most economic theories that attempt to explain aggregate economic relationships.

The Persistence of the Relationship Between

² Friedman and Schwartz, "Money and Business Cycles," *Review of Economics and Statistics*, February 1963, p. 53. For a more detailed exposition of Friedman and Schwartz's view, see Milton Friedman and Anna Jacobson Schwartz, *A Monetary History of the United States, 1867-1960* (Princeton, N.J.: Princeton University Press, 1963).

Money and the Business Cycles. The second type of evidence cited by **Friedman** and **Schwartz** in support of the monetary theory of business cycles is the persistence of the relationship between monetary growth and cyclical fluctuations in business activity. Moreover, the relationship has remained essentially the same despite major changes in economic and financial institutions. Changes in monetary growth have been produced in some periods by external factors, such as the discovery of new sources of gold, and in other periods, by conscious policy decisions, such as increases in discount rates or reserve requirements. In each case, however, appreciable changes in the rate of monetary growth have been accompanied by appreciable changes in other aggregate economic variables. **Friedman** and **Schwartz** interpret the apparent stability of the relationship between monetary growth and business cycles under a variety of circumstances as the single most convincing type of evidence in support of a monetary explanation of business cycles.

The Timing of the Relationship. Changes in the rate of growth of the money supply generally precede changes in economic activity and inflation. **Friedman** and **Schwartz** argue that this temporal pattern supports the view that the association between monetary growth and business cycles primarily reflects the independent influence of money on the rest of the economy. If the cyclical pattern of monetary growth were merely a reflex reaction to developments in the rest of the economy, **Friedman** and **Schwartz** argue, one would expect changes in the growth rate of money to follow rather than precede changes in other important economic variables. Since this has not been the observed historical pattern, **Friedman** and **Schwartz** conclude that monetary growth exerts a largely independent influence in determining cyclical variations in employment, income, and inflation.

Policy Implications of the Monetary Theory of Business Cycles

Monetarists believe that monetary policy actions are transmitted to the economy primarily through changes in the rate of monetary growth. They observe, for example, that recessions since 1914 have typically been preceded by restrictive Federal Reserve actions that resulted in a slowdown in monetary growth. Major economic contractions could have been averted, these analysts argue, if the Federal Reserve had taken actions to prevent the reductions in monetary growth. Indeed, many monetarists argue that the Federal Reserve could control aggregate spending by controlling the rate of growth in the money supply. They advocate, therefore, that the Federal Reserve adopt policy procedures designed to ensure relatively constant growth in the money supply, thereby alleviating inflationary pressures during economic expansions and preventing large reductions in output and employment during economic contractions.

Monetarists also consider the rate of monetary growth to be the best indicator of the impact of monetary policy. They believe that growth in the money supply is a more reliable measure of the effects of Federal Reserve actions than are movements in interest rates or changes in credit conditions. Since monetarists base their forecasts of the future course of the economy almost solely on current and past growth rates of one or more monetary aggregates, they interpret a substantial reduction in monetary growth as an indication that an economic downturn is imminent.

THE KEYNESIAN THEORY OF BUSINESS CYCLES

Friedman and **Schwartz's** interpretation of the relationship between monetary growth and

business cycles has elicited dissenting views from nonmonetarists.³ These economists, who are sometimes referred to as Keynesians, stress the importance of nonmonetary factors in explaining the cyclical behavior of income, employment, and prices. Keynesians recommend that the Federal Reserve consider the behavior of a wide range of monetary and non-monetary variables in formulating monetary policy.

The Keynesian View of the Monetary Theory of Business Cycles

Nonmonetarists have expressed doubt about the plausibility of a theory that assigns monetary growth the primary role in explaining business cycles as well as the validity of the empirical evidence offered in support of that theory. These analysts maintain that there are numerous economic variables other than money that have pervasive and systematic effects on the economy. Some of these, such as fiscal policy and interest rates, are important explanatory variables in Keynesian economic theories. Thus, nonmonetarists question whether appeal to economic theory justifies exclusive reliance on monetary growth in explaining business cycles. Nonmonetarists also doubt that the empirical evidence marshaled by **Friedman** and **Schwartz** fully supports the monetary explanation of business cycles. Demonstration that monetary growth exerted a largely independent influence on the economy in certain specific instances does not necessarily imply that monetary growth has not been primarily a passive reaction to underlying economic forces in other instances.⁴ Moreover, the timing of monetary

changes relative to changes in other economic variables does not indicate which are the causes and which are the effects. Changes in monetary growth might precede changes in the economy even if money exerted no independent influence.⁵ For all of these reasons, nonmonetarists have been reluctant to accept the monetary explanation of business cycles expounded by **Friedman** and **Schwartz** and have developed an alternative interpretation of economic fluctuations.

The Keynesian Interpretation of Business Cycles

Keynesians assign an important role to investment spending in explaining economic

⁴ It is quite plausible, for example, that both the rapid monetary expansion and the high inflation during World War I and World War II resulted from the large increases in Government spending. If so, monetary growth and inflation during those periods were both by-products of economic mobilization for the war efforts.

⁵ There are two basic reasons why this might be so. First, a spurious lag can be introduced by comparing the timing relationship between changes in the growth rate of one variable and changes in the level of another variable, since changes in growth rates always precede changes in levels for any variable exhibiting cyclical behavior. For example, a decline in the rate of growth of the money supply would precede a decline in the level of economic activity even if the levels of both variables change simultaneously. Secondly, when the monetary authorities react passively by providing whatever amount of money the public desires to hold at current values of income, wealth, and interest rates, the money stock is determined primarily by demand forces. In this case, changes in the growth rate of money could precede changes in both the level and growth rate of economic activity if the changes in monetary growth were responses to changes in the quantity of money demanded resulting from anticipation of future changes in income or expenditures. Even if the resulting changes in the money stock had no impact on the economy, changes in the growth rate of money would be observed to occur before changes in the level of business activity. Thus, it is necessary to know the determinants of the demand for and supply of money and their interaction with other economic variables if timing relationships are to be taken as indications of causality. For a more complete discussion of this point, see James **Tobin**, "Money and Income: Post Hoc Ergo Propter Hoc?" *Quarterly Journal of Economics*, May 1970.

³ See, for example, James **Tobin**, "The Monetary Interpretation of History," *American Economic Review*, June 1965. Also, see Comments by Hyman P. **Minsky** and Arthur Okun accompanying **Friedman** and **Schwartz's**, "Money and Business Cycles."

fluctuations.⁶ Investment spending—defined broadly to include household expenditures for housing, automobiles, and durable goods in addition to business expenditures for plant, equipment, and inventories—is the most volatile component of aggregate demand. A precipitous drop in investment spending is typically associated with a recession, and a boom in investment spending generally accompanies an economic expansion. Moreover, a change in investment spending has a magnified effect on the economy because income generated in the production of investment goods gives rise to increased consumption expenditure, which in turn generates additional income that can be spent by its recipients. Relatively small changes in investment spending can, through this multiplier process, have a major impact on aggregate income, employment, and prices.

Keynesians evaluate the impact of monetary policy by analyzing its effects on various types of investment spending.⁷ Monetary policy actions affect investment spending by influencing the cost and availability of credit, total wealth, and monetary growth. The level of interest rates plays a particularly critical role in the Keynesian theory of economic fluctuations because it measures the cost of obtaining funds to finance investment spending. Since the real money supply—that is, the money supply adjusted for changes in the price level—is an important determinant of the level of interest rates in the Keynesian framework, Keynesians focus on the behavior of the real money supply when analyzing the impact of monetary growth

on the future course of the economy. For a given inflation rate, monetary growth that is insufficient to satisfy the public's demand for real money balances causes an increase in interest rates, which can choke off investment spending and lead to a cumulative decline in economic activity. Thus, Keynesians consider interest rates, growth in the real money supply, fiscal policy, and numerous other factors important determinants of cyclical **fluctuations** in the economy.

Policy Implications of the Keynesian Theory of Business Cycles

Keynesians reject the view that constant growth in the money supply is the most effective means of promoting economic stability. If the public's demand for money changes over time, for example, a 4 per cent growth rate of money could exert a more expansionary impact on the economy in one period than does a 6 per cent growth rate in another period. Moreover, Keynesians argue, the appropriate rate of monetary growth depends on fiscal policy and other economic conditions. Fiscal policy, like investment spending, has a multiplier effect on the economy and is believed by Keynesians to be a powerful policy tool to moderate economic fluctuations. The adverse effects on the economy of an autonomous decline in investment spending, for example, can be offset either by an increase in government spending and a tax cut or by a more expansionary monetary policy. Thus, Keynesians believe that both monetary and fiscal policies can be used to promote economic stability but doubt that a constant rate of monetary growth is the most desirable monetary policy in all circumstances.

In the Keynesian framework, there is no single financial variable that serves as an adequate indicator of monetary policy in all circumstances. Interest rates and growth in the

⁶ See, for example, Paul Samuelson, *Economics*, McGraw-Hill, Inc., any edition, for a simple exposition of the role of investment spending in the Keynesian theory of income determination.

⁷ See, for example, Warren L. Smith, "A Neo-Keynesian View of Monetary Policy," in *Controlling Monetary Aggregates*. Federal Reserve Bank of Boston, 1969.

real money supply, however, are generally considered by Keynesians to be among the important gauges of the effects of Federal Reserve policy. Keynesians interpret a decline in the growth rate of the real money supply, especially if accompanied by higher interest rates, as one of several factors that could result in an economic downturn.

CONCLUSION

Historical evidence clearly indicates that there has been a close association between monetary growth and business cycles in the United States. Empirical evidence of this association, when interpreted in light of alternative theories of how the economic system functions, gives rise to very different policy recommendations, however. On the one hand, monetarists believe that the historical relationship between money and business cycles is strong evidence that substantial changes in the rate of monetary growth are the principal cause of economic instability. They recommend, therefore, that the Federal Reserve maintain steady growth in the money supply in

order to avoid major fluctuations in the economy. Keynesians, on the other hand, do not believe that a cyclical pattern of monetary growth in the past necessarily indicates that steady monetary growth would ensure increased economic stability in the future. A persistent question confronting the Federal Reserve, therefore, is whether economic stabilization is better served by steady growth in the money supply or by a more flexible approach that takes account of a wider variety of information.

Accurate interpretation of the significance of changes in the rate of monetary growth has assumed increased importance in recent months. Some analysts have pointed to the apparent continuation of economic strength as evidence that the recent decline in monetary growth may be a temporary aberration with limited economic significance. Other analysts point out, however, that the recent decline in the rate of monetary growth is similar to the monetary decelerations that have been associated with recessions in the past. This issue will be explored in the following article: Monetary Growth and Business Cycles, Part II: The Relationship Between Monetary Decelerations and Recessions.

Monetary Growth and Business Cycles

Part II: The Relationship Between Monetary Decelerations and Recessions

By *Bryon Higgins*

A major policy issue confronting the Federal Reserve in recent years has been how to reduce the rate of monetary growth, and thereby ease inflationary pressures, without incurring undue risk of recession. In this regard, G. William Miller, Chairman of the Board of Governors of the Federal Reserve System, has pointed out that "any deceleration in monetary growth rates has to be undertaken with caution" if a recession is to be averted.¹

Such caution is warranted because of the historical relationship between monetary growth and business cycles. Based on this historical relationship, some analysts have concluded that the recent slowdown in monetary growth is similar to the monetary decelerations that typically accompany recessions. This conclusion appears to be consistent with the monetary theory of business cycles, which implies that there is a one-to-one relationship between "significant" decelerations in monetary growth and recessions.² However, while monetary decelerations have been associated with recessions in the United States for over a century, there has been considerable variation in the magnitude and timing of declines in the rate of monetary growth in the vicinity of recessions. Analysis of

the implication of monetary deceleration for recession, therefore, requires detailed examination of the characteristics of the current and past decelerations.

This article examines the historical relationship between monetary growth and business cycles since 1952 and develops a method for measuring the degree of monetary deceleration that has been associated with recessions. The first section presents a preliminary overview of the linkage between monetary decelerations and recessions since 1952. A method for determining the degree of monetary deceleration is presented in the second section. In the third section, this method is used to evaluate the extent to which historical evidence since 1952 is consistent with the view that there is a one-to-one relationship between monetary deceleration and recessions. The final section analyzes the degree of monetary deceleration in recent months and the possibility of recession

¹ Statement before the Committee on Banking, Housing and Urban Affairs, U.S. Senate, April 25, 1978.

² The meaning of "significant" decelerations in this context is intended to indicate in a general way that the monetary decelerations under consideration are major, meaningful declines in the rate of monetary growth likely to have a substantial impact on other economic variables. Thus, the term "significant" deceleration is merely used for expositional convenience in this article to distinguish between alternative magnitudes of declines in monetary growth rather than to indicate that the classification of monetary decelerations is based on formal rules of statistical inference.

under alternative assumptions about the rate of monetary growth over the next year.

THE RELATIONSHIP BETWEEN MONETARY DECELERATIONS AND RECESSIONS: 1952-77

The monetary theory of business cycles implies that there is a one-to-one relationship between recessions and "significant" decelerations in monetary growth. This theory implies, in other words, that historical experience is consistent with the following two propositions:¹

- 1) recessions are always accompanied by a "significant" deceleration in monetary growth; and
- 2) "significant" decelerations in monetary growth are always accompanied by recessions.

The first proposition states that recessions never occur in the absence of "significant" deceleration in monetary growth, while the second proposition states that "significant" decelerations never occur in the absence of recessions.

The pattern of monetary growth since 1952 is generally consistent with the view that recessions are always accompanied by "significant" decelerations in monetary growth.⁴ The

³ Historical experience consistent with these two propositions can be considered verification of the monetary theory of business cycles only in the sense that one cannot reject this theory on the basis of empirical evidence. It is possible that the same historical evidence could be consistent with alternative theories in which money has little or no independent influence on the economy. See, for example, James Tobin, "Money and Income: Post Hoc Ergo Propter Hoc?" *Quarterly Journal of Economics*, Vol. 27, No. 2, May 1970.

⁴ The year 1952 was chosen as the beginning of the period to be analyzed primarily because it appears that the Federal Reserve-Treasury Accord in 1951 changed the cyclical pattern of monetary growth. See "Monetary Growth and Business Cycles, Part I:"

relationship between monetary deceleration and recession is depicted in Charts 1 and 2 for the period from 1952 to the present. Chart 1 shows the quarterly growth rate of nominal and real, or price-adjusted, values of the narrowly defined money supply, **M1**, which is composed of currency and demand deposits held by the nonbank public.⁵ Chart 2 shows the quarterly growth rate of nominal and real values of the more broadly defined money supply, **M2**, which includes **M1** plus most time and savings deposits at commercial banks. The charts show that each of the five recessions since 1952, which are shown on the charts by shaded areas, have been accompanied by a substantial decline in the quarterly growth rates of each of the monetary measures.⁶

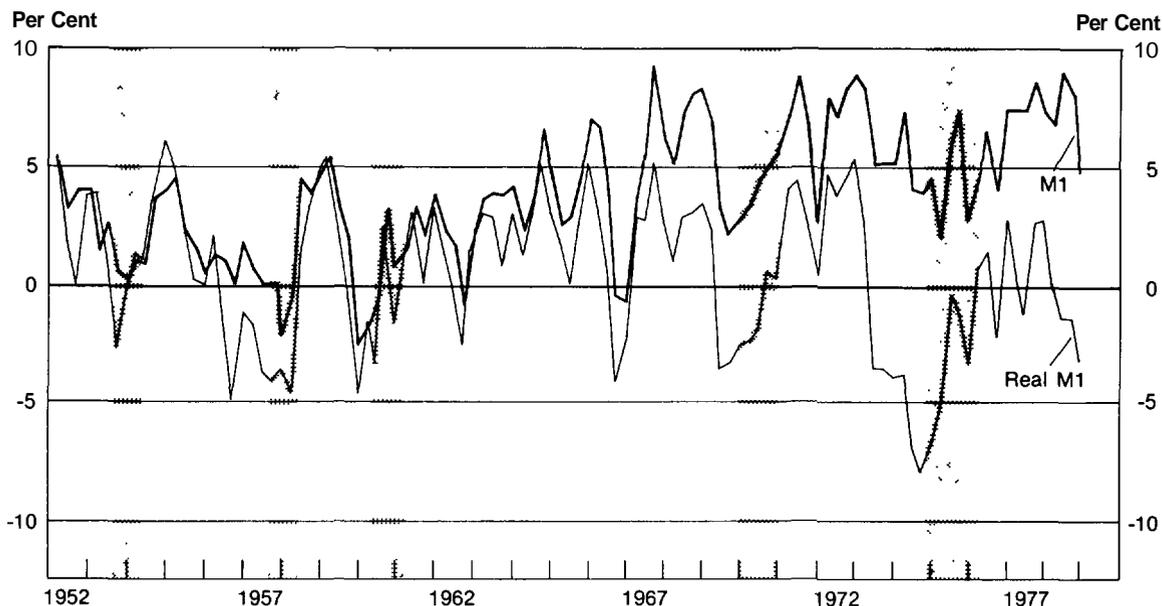
The historical evidence since 1952, however, does not seem to support the view that

⁵ Growth rates were computed by taking the percentage changes in the quarterly averages of monthly data on the various monetary aggregates. The real values of **M1** and **M2** were found by dividing **M1** and **M2** values by the consumer price index. Reported values of **M1** since November 1978 were adjusted to include a portion of the funds in automatic transfer accounts. This adjustment was made so that the recent **M1** data would be more nearly comparable with **M1** data before the introduction of automatic transfers.

The behavior of real **M1** and real **M2** are included in the analysis primarily because of the important role assigned to the real money supply in some economic theories. In addition, growth in real **M2** is one of the components of the index of leading economic indicators constructed by the National Bureau of Economic Research.

⁶ The definition and timing of recessions provided by the National Bureau of Economic Research (NBER) is adopted in this study. The NBER identifies a recession when the behavior of a variety of economic variables indicates a prolonged and pervasive decline in aggregate economic activity. There have been several instances in the period since 1952 when there were pronounced reductions in economic growth not severe enough to be classified as recessions by the NBER. The economic slowdown in 1966-67 is classified by some analysts as a "mini recession." There is no attempt in this study to analyze the relationship between monetary decelerations and economic slowdowns other than those classified as recessions by the NBER.

Chart 1
GROWTH OF NOMINAL AND REAL M1: 1952-PRESENT
 (Seasonally Adjusted Annual Rates)



"significant" monetary deceleration is always accompanied by a recession. There were several instances between 1952 and 1978 when declines in the quarterly growth rates of the various monetary measures were not associated with a recession. Moreover, the characteristics of at least one of these decelerations, that in 1966-67, were similar in many respects to the decelerations that were associated with recessions—i.e., the growth rates of all four monetary measures declined substantially and the declines persisted for several quarters.

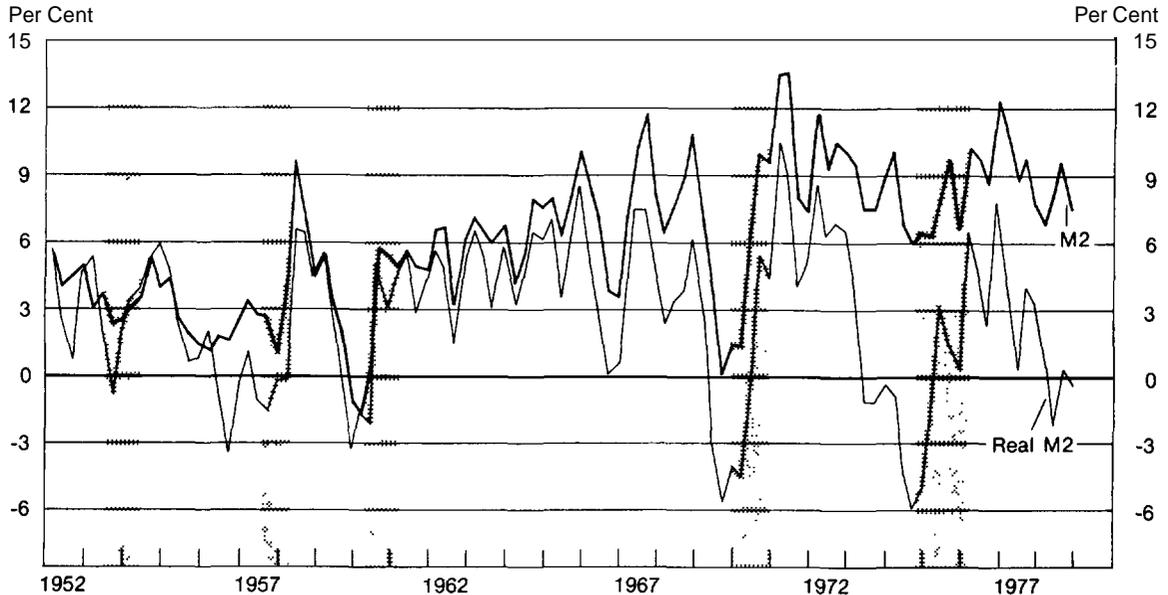
The occurrence of monetary decelerations that are not accompanied by recessions casts doubt on the validity of the proposition that "significant" monetary decelerations are always accompanied by recessions. However, conclusions regarding the validity of this proposition require a precise measure of the degree of monetary deceleration. The quarterly growth

rates shown in Charts 1 and 2 are inadequate for this purpose because the variability in the magnitude and timing of declines in these rates makes it difficult to determine which monetary decelerations should be classified as significant. A better measure of the degree of monetary deceleration is developed in the following section.

MEASURING THE DEGREE OF MONETARY DECELERATION

A useful measure of the degree of monetary deceleration should have several characteristics. First, it should be insensitive to temporary aberrations in monetary growth rates.' Second, it should incorporate the effects of both the duration and the sharpness of declining monetary growth rates. This is because the

Chart 2
GROWTH OF NOMINAL AND REAL M2: 1952-PRESENT
 (Seasonally Adjusted Annual Rates)



impact of monetary deceleration on the economy may depend both on the sharpness and the duration of decelerating monetary growth. Finally, a measure of the degree of monetary deceleration should provide useful information for monetary policy analysis and decisions.

⁷ The volatility of short-run growth rates may be less important than longer run trends when analyzing the impact of monetary growth on the economy for two reasons. First, some of the short-run variability in monetary growth rates may be spurious in the sense that it results from errors in measuring and seasonally adjusting the underlying data. Second, independent evidence suggests that short-run variability in monetary growth has little impact on the course of the economy. See, for example, E. Gerald Corrigan, "Income Stabilization and Short-Run Variability of Money," Federal Reserve Bank of New York *Monthly Review*, April 1973.

Poole's Procedure for Measuring the Degree of Monetary Deceleration

A procedure developed by William Poole for measuring the degree of monetary deceleration fulfills two of the three desirable criteria listed **above**.⁸ Poole's procedure is based on comparison of the actual level of the money supply with the level that would have resulted if monetary growth had continued at an established trend rate. Because the comparison is based on levels of the money supply, it allows for the cumulative impact of declining monetary growth. The trend rate of monetary

⁸ William Poole, "The Relationship of Monetary Decelerations to Business Cycle Peaks: Another Look at the Evidence," *Journal of Finance*, Vol. 30, No. 3, June 1975.

growth was estimated over a two-year period and extrapolated several months ahead, thereby minimizing the effects of temporary variations in monetary growth on the estimated degree of monetary **deceleration**.⁹

Poole's procedure does not provide useful information for the conduct of monetary policy, however. Poole used the peak rate of monetary growth in the economic expansion preceding a recession to define the trend rate that serves as the basis of comparison for the subsequent deceleration. This method for defining trends implies that monetary growth cannot fall below the highest growth rate previously attained, except for a brief period, without being associated with a recession. Thus, Poole's procedure for identifying the degree of monetary deceleration implies that any attempt by the Federal Reserve to lower the rate of monetary growth below the peak trend rate will inevitably result in a recession.

An Alternative for Measuring the Degree of Monetary Deceleration

The procedure proposed by Poole for determining the degree of monetary deceleration can be amended to fulfill all three of the desirable criteria outlined above. The method used in this study for defining monetary deceleration is, like Poole's, based on

⁹ Poole inferred the two-year trend growth rates of **M1** and **M2** in a given month from regressions of the logarithms of **M1** and **M2** on time over the current and preceding 24 months. The trend growth rate estimated in this way was extrapolated from the average level of the money supply over the period defining the maximum trend growth rate. Comparison of the actual levels of the money supply in subsequent months to the levels corresponding to the extrapolated peak trend growth rate led Poole to conclude that there was nearly a one-to-one relationship between the timing of business cycle peaks and significant monetary decelerations, which were defined as the money stock falling below its maximum 24-month growth trend by 3 to 4 per cent.

comparison of the actual level of the money supply to the level that would have resulted if monetary growth had continued at an established trend **rate**.¹⁰ However, in this study, unlike the Poole study, the trend rate is defined as the annualized growth rate over the two-year period ending one year before the date in **question**.¹¹ This trend growth rate is then extrapolated 12 months ahead to determine the hypothetical level of the money supply that would have resulted from continuation of the two-year trend growth rate for an additional **year**.¹²

The ratio of the actual level of the money supply, symbolized by (**A**), to the level, (**E**), corresponding to the extrapolated trend growth rate is the measure of monetary deceleration used in this study. This **A/E** ratio for a given month measures the degree to which monetary growth over the year ending in that month exceeded or fell short of monetary growth in the preceding two-year period." For example, the **A/E** ratio for **M2** in December **1978** was **.980**.

¹⁰ Unlike Poole's study, the consistency of timing relationships between monetary decelerations and business cycle peaks was not used in this study as a criterion for judging alternative methods of measuring the degree of monetary decelerations. It has been shown that evidence on the timing relationship between monetary decelerations and recessions does not indicate conclusively whether money has a significant independent influence on the economy. See James **Tobin**, "Money and Income:"

¹¹ Growth rates were computed by taking the changes in the logarithms of three-month moving averages centered on the month in question.

¹² **A/E** ratios, defined subsequently, were also computed for five-year trend growth rates extrapolated 6, 12, and 24 months ahead and for two-year trend growth rates extrapolated 6 and 24 months ahead. The two-year trend extrapolated 12 months ahead was chosen because it produced the most consistent results.

¹³ The **A/E** ratios computed in this way are equal to $(1 + R_A)/(1 + R_T)$, where **R_A** is the rate of monetary growth in the year preceding the month in question and **R_T** is the corresponding two-year trend growth rate. Indeed, any analysis based on alternative levels of the money supply can be recast in terms of the corresponding growth rates.

The value of A used to compute this ratio is \$875.3 billion, which was the actual level of the money supply in December 1978.¹⁴ The corresponding value of E is \$893.4 billion, which is the hypothetical level of M2 in December 1978 that would have resulted if the 9.8 per cent M2 growth rate from December 1975 to December 1977 had continued for an additional year. Thus, the A/E ratio of .980 is equal to \$875.3 billion/\$893.4 billion.

Deceleration of monetary growth always yields an A/E ratio less than one. In other words, the actual level, A, of the money supply is only a fraction of what it would have been, E, if the two-year trend rate had continued for an additional year. Moreover, the A/E ratio is below one by an amount that is proportional to the degree of the associated decline in monetary growth. Thus, it is possible to rank the degree of monetary deceleration by the numerical value of the corresponding A/E ratios.

The use of A/E ratios to analyze the relationship between monetary growth and business cycles is similar in many respects to the procedures employed by Friedman and Schwartz and by Poole.¹⁵ One of the weak-

nesses of this approach is the inherent difficulty in formulating empirical tests to validate the results, which are based solely on observed historical relationships between two variables and do not reflect any formal theory of the linkage between those variables. Because of this lack of statistical basis, the degree of confidence in the results cannot be precisely specified. Thus, the inferences based on this type of analysis must be interpreted with care. Nevertheless, the A/E ratios employed in this study do serve as a useful measure of the degree of monetary deceleration and thereby allow analysis of the relationship between monetary growth and business cycles.

THE RELATIONSHIP BETWEEN MONETARY DECELERATIONS AND RECESSION: 1952-77

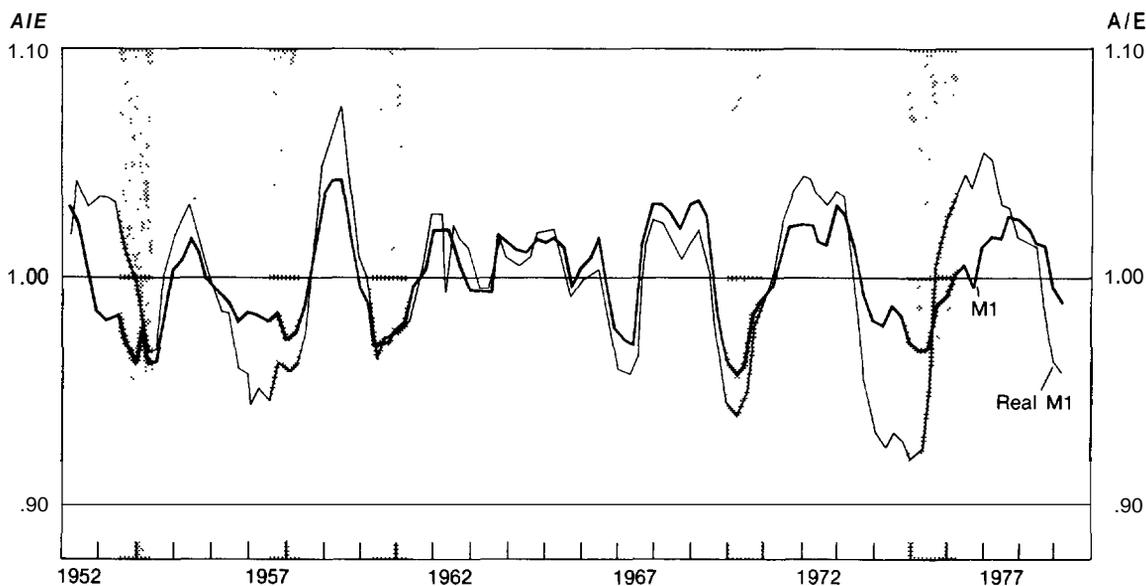
Charts 3 and 4 show the A/E ratios for real and nominal values of M1 and M2 for the period since 1952. The general cyclical pattern of the A/E ratios conforms closely to the cyclical pattern of quarterly rates of monetary growth, rising during economic expansions and declining in the vicinity of recessions. The A/E ratios for all four monetary measures fell below one in the vicinity of each of the five recessions since 1952, which are shown in the charts by shaded areas.

The A/E ratios can be used to determine whether there is a one-to-one relationship between "significant" monetary decelerations and recessions. Such a one-to-one relationship would hold if there is some degree of monetary deceleration—which may be defined as a "significant" deceleration—that always accompanies recessions and if this same "significant" degree of monetary deceleration is always accompanied by a recession. The degree of monetary deceleration can be measured by the values of the corresponding A/E ratios—the lower are the A/E ratios, the more pronounced

¹⁴ This is an average of the M2 levels in November, December, and January. All of the A/E ratios were computed using three-month centered moving averages for the A values.

¹⁵ Milton Friedman and Anna Jacobson Schwartz, "Money and Business Cycles," *Review of Economics and Statistics*, February 1963; and William Poole, "The Relationship . . .," *loc. cit.* There are, of course, numerous other procedures that could be employed to analyze the relationship between monetary deceleration and recessions. For example, a structural or single-equation econometric model of the economy could be employed to infer the effects of monetary deceleration on other economic variables. See Bryon Higgins and V. Vance Roley, "Monetary Policy and Economic Performance: Evidence from Single Equation Models," Federal Reserve Bank of Kansas City *Economic Review*, January 1979, for a discussion of the potential usefulness of various types of econometric models to evaluate the effects of monetary growth on the economy.

Chart 3
A/E RATIOS FOR REAL AND NOMINAL M1: 1952-PRESENT



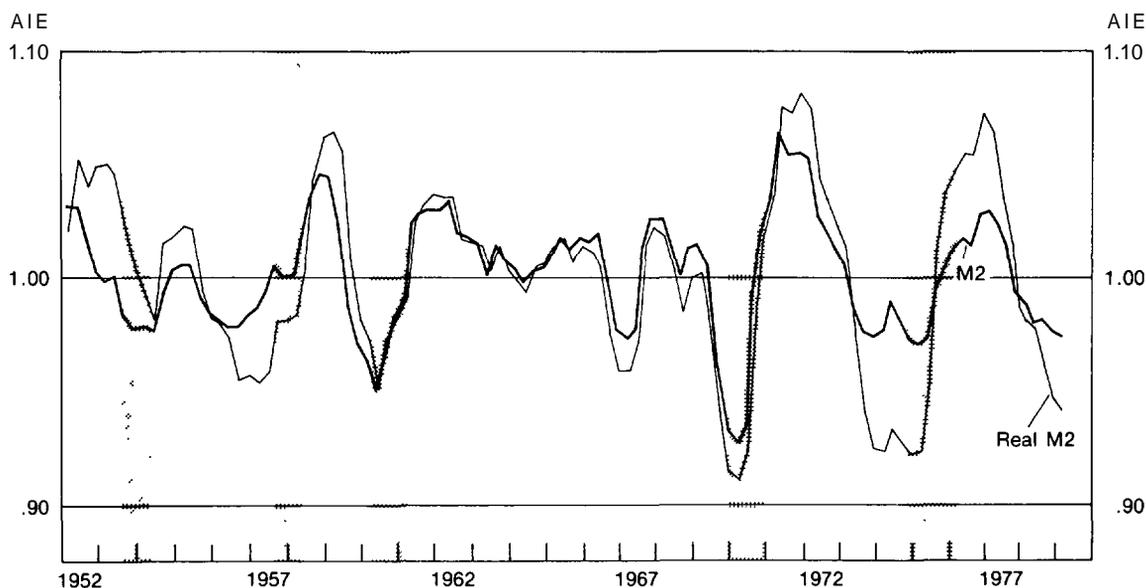
is the associated monetary deceleration. Thus, the degree of monetary deceleration in various periods can be ranked according to the minimum values of the A/E ratios that occurred in those periods. For example, Charts 3 and 4 show that the most pronounced monetary deceleration since 1952 occurred in 1969-70. In the 1969-70 period, the A/E ratio for **M1** fell to **.960** and the A/E ratio for **M2** fell to **.930**, both of which were lower than in any other period of monetary deceleration from 1952 to 1977.

Analysis of the A/E ratios from 1952 to 1977 does not support the proposition that there is a one-to-one relationship between "significant" monetary decelerations and recessions. Since 1952, no particular degree of monetary deceleration has always accompanied and been accompanied by a recession. As measured by the minimum A/E ratios for **M1** and **M2**, for example, the degree of monetary deceleration

was more pronounced in 1966-67 than in 1956-58, although the 1966-67 deceleration was not accompanied by a recession and the 1956-58 deceleration was accompanied by a recession. The historical evidence indicates, therefore, that the same degree of monetary deceleration that is accompanied by a recession in one instance may not be accompanied by a recession in another instance. As a consequence, there is not a one-to-one correspondence between recessions and any particular degree of monetary deceleration.

Although there is not a perfect correspondence between recessions and the degree of monetary deceleration, historical evidence indicates that a fairly close relationship has existed between recessions and the degree of monetary deceleration since 1952. This relationship can be analyzed by identifying the characteristics of different degrees of monetary

Chart 4
A/E RATIOS FOR REAL AND NOMINAL M2: 1952-PRESENT



deceleration. Monetary deceleration may be characterized as mild, appreciable, or severe, depending on the minimum value of the corresponding A/E ratios.¹⁶

Mild deceleration in monetary growth is characterized by minimum A/E ratios between .99 and 1.00 for one or more of the monetary measures. The four mild decelerations in

monetary growth between 1952 and 1977 occurred in 1962-63, 1964, 1965, and 1976. (See Table 1.) Since recessions did not occur in any of these periods, mild monetary deceleration has never been accompanied by a recession.

Appreciable deceleration in monetary growth is characterized by minimum A/E ratios that fall predominantly in the following ranges:"

- 1) .962 to .990 for M1,
- 2) .964 to .990 for M2,
- 3) .944 to .990 for real M1, and
- 4) .942 to .990 for real M2.

The four appreciable decelerations in monetary growth in the period from 1952 to 1977

¹⁶ The classification scheme used to distinguish alternative degrees of monetary deceleration is used only for expositional convenience in describing the relationship between monetary deceleration and recessions. Economic theory and more formal empirical tests indicate that the relationship between monetary growth and other economic variables is "continuous" in the sense that slightly greater declines in monetary growth have slightly larger effects on the economy. To some extent, therefore, the discreet cutoff points used to classify alternative degrees of monetary deceleration are artificial. For descriptive purposes, however, it is useful to categorize the different degrees of monetary deceleration by the minimum A/E ratios.

¹⁷ The basis for these ranges is explained in footnote 18.

occurred in 1953-54, 1956-58, 1960-61, and 1966-67. The first three of these decelerations were associated with recessions but the deceleration in 1966-67 was not. Thus, appreciable deceleration in monetary growth has sometimes, although not always, been accompanied by recessions.

Severe deceleration in monetary growth is characterized by two or more of the A/E ratios below the following critical values—.962 for M1, .964 for M2, .944 for real M1, and .942 for real M2.¹⁸ Because the two severe monetary decelerations since 1952, which occurred in 1969-70 and 1973-75, were both associated with recessions, severe deceleration and monetary growth has always been accompanied by a recession.

In summary, the historical evidence since 1952 does not indicate that there is a one-to-one relationship between recessions and any particular degree of monetary deceleration. There is no degree of monetary deceleration

¹⁸ The definition of severe monetary deceleration is intended to reflect only those declines in monetary growth that were significantly more severe than that in 1966-67. Since the deceleration in 1966-67 was not accompanied by a recession, it is important to differentiate clearly the degree of deceleration in 1966-67 from the degree that is consistent with the view that some degree of monetary deceleration is always associated with a recession. In determining the differential between A/E ratios that is significant enough to justify a distinction between alternative degrees of monetary deceleration, it is important to take account of the magnitude of variability in the A/E ratios over time, which is an indication of the statistical error likely to be associated with calculations based on the A/E ratios. For this purpose, the standard deviation of the A/E ratios from 1952-78 was used to distinguish monetary decelerations that are significantly different in degree from the 1966-67 deceleration. Specifically the cutoff values (SD_i) of the A/E ratios that distinguish appreciable from severe monetary decelerations were computed for each monetary measure as:

$$SD_i = (A/E)_i^* - .5(\sigma_i)$$

where $(A/E)_i^*$ is the minimum value of the A/E ratio for the i-th monetary measure in the 1966-67 period, and σ_i is the standard deviation in the A/E ratio for the i-th monetary measure in the period since 1952.

Table 1
MEASURES OF THE DEGREE
OF MONETARY DECELERATION

Periods of Monetary Deceleration	Minimum A/E Ratios For:			
	M1	M2	Real M1	Real M2
1953-54"	.965	.979	.970	.984
1956-58"	.978	.980†	.984	.958
1960-61*	.965	.952	.966	.953
1962-63	.996	—‡	.996	—
1964	—	.999	—	.996
1965	.998	—	.993	—
1966-67	.971	.976	.960	.961
1969-70"	.960	.930	.940	.912
1973-75*	.968	.972	.923	.924
1976	.995	—	—	—

"Monetary decelerations that were associated with a recession.

†The period of deceleration in M2 growth ended before the beginning of the recession in September 1957, and the minimum A/E ratio for M2 occurred in June 1956. Because deceleration in the growth of all of the other monetary measures continued into the recession, however, it is reasonable to interpret the deceleration of M2 growth in 1956 as being associated with the subsequent recession.

‡Minimum A/E ratios are reported only for monetary measures whose growth rates decelerated in the period.

that has always both accompanied and been accompanied by recessions. In this sense, historical evidence does not support the monetary theory of business cycles. Historical evidence does indicate, however, that the likelihood of recession increases with the degree of monetary deceleration. In the period from 1952 to 1977, mild decelerations in monetary growth were never accompanied by recessions, appreciable decelerations were sometimes accompanied by recessions, and severe decelerations were always accompanied by recessions. Thus, historical evidence supports the view that there is a definite relationship between monetary deceleration and recession.

THE CURRENT DECELERATION IN MONETARY GROWTH

Monetary growth has slowed substantially in recent months, leading some analysts to question whether the current economic expansion will continue through the end of the year. The annualized growth rate of **M1** in the six months ending in February 1979 was 1.0 per cent, compared with a high of 8.7 per cent in the six months ending in September 1978. Part of the rapid decline in **M1** growth in the past few months reflects shifts out of demand deposits into automatic transfer accounts, which were introduced in November 1978.¹⁹ These shifts make comparisons of the current deceleration of **M1** growth with previous decelerations somewhat misleading. In the analysis that follows, therefore, the **M1** growth rates used for the period since November 1978 were computed by estimating the path of **M1** that would have occurred in the absence of automatic transfer accounts.²⁰ On this basis, **M1** has grown at an annual rate of 2.3 per cent in the last six months, still down substantially from the relatively high growth rates of 1978. Similarly, the growth rate of **M2** in the past six months, which is assumed not to have been influenced by the existence of automatic transfer accounts,

¹⁹ For an analysis of the impact of automatic transfer accounts on monetary growth, see Scott Winningham, "Automatic Transfers and Monetary Policy," Federal Reserve Bank of Kansas City *Economic Review*, November 1978.

²⁰ It was assumed that one-half of all funds in automatic transfer accounts were transferred from demand deposits. On this basis the following amounts were added to the monthly levels of **M1** to adjust for the impact of automatic transfers: (adjustment in billions of dollars) Nov. 1978, 0.7; Dec. 1978, 1.5; Jan. 1979, 2.1; Feb. 1979, 2.5; Mar. 1979, 2.9. For a more complete analysis of the sources of funds in automatic transfer accounts, see Bank Administration Institute, *Automatic Transfer Service, Nov. 1, 1978-Dec. 15, 1978—A Research Summary*. February 1979.

was 4.6 per cent, compared with a peak rate of 11.7 per cent for the six months ending in January 1977. The deceleration in **M1** and **M2** growth rates, combined with continued high inflation, has resulted in absolute declines in real **M1** and real **M2**.

Several observers have argued that the recent deceleration in monetary growth is similar to decelerations that have been associated with recessions in the past. To determine whether this conclusion is warranted, the characteristics of the current decline in monetary growth are analyzed within the framework developed in preceding sections.

Analysis of the A/E ratios for real and nominal values of **M1** and **M2** indicates that the current degree of monetary deceleration should be characterized as appreciable. The current values of the A/E ratios are well below the level characterizing mild monetary deceleration, which has never been associated with a recession since 1952, although not yet low enough to indicate a severe monetary deceleration, which has always been accompanied by a recession.²¹ Thus, the current degree of monetary deceleration is in the intermediate range that has sometimes, although not always, been accompanied by a recession.

Continued sluggishness in monetary growth, however, would result in further declines in the A/E ratios and would place the current monetary deceleration in the severe category that has always been accompanied by recessions in the period since 1952. Table 2 shows the minimum A/E ratios in the upcoming year—from February 1979 to February 1980—that would result from alter-

²¹ The values of the A/E ratios in February 1979 were: .986 for **M1**, .975 for **M2**, .953 for real **M1**, and .942 for real **M2**.

Table 2
THE PROSPECTIVE DEGREE
OF MONETARY DECELERATION

Alternative M1 and M2 Growth Rates in Per Cent	Minimum A/E Ratios From February 1979 to February 1980 for:			
	M1*	M2	Real M1*	Real M2
4	.951	.945	.938	.932
5	.957	.951	.943	.937
6	.963	.957	.948	.942†
7	.968	.962	.953	.942†
8	.973	.967	.953†	.942†
9	.978	.972	.953†	.942†

*The A/E ratios do not reflect any adjustment to growth rates of real and nominal M1 to take account of the effects of automatic transfer accounts.

†Indicates that the minimum occurs before April 1979.

native M1 and M2 growth rates.²² The figures in the table suggest that an M1 growth rate of more than 5 per cent—less an adjustment to account for the effects of automatic transfer accounts on the growth of M1—and an M2 growth rate of more than 7 per cent over the period from February 1979 to February 1980 would be required to prevent the current decline in monetary growth from becoming a severe monetary deceleration.²³ Lower monetary growth rates would lead to A/E ratios

²² The hypothetical levels of real M1 and real M2 were computed under the assumption that the consumer price index increases at a steady annual rate of 8.4 per cent from February 1979 to March 1980.

²³ It is estimated that the growth rate of M1 may be reduced by as much as 3 percentage points over the next year as a result of the shift out of demand deposits into automatic transfer accounts. If so, measured M1 growth well under 5 per cent over the next year may not indicate that monetary deceleration is severe. The behavior of M2 may, therefore, be a better measure of the degree of monetary deceleration in the upcoming year.

below the critical values that have always been associated with recessions in the 1952-77 period.

Inferences based on comparison of the current degree of monetary deceleration with past decelerations must be interpreted with caution, however. First, it is difficult to determine from the observed relationship between monetary decelerations and recessions which were the causes and which were the effects. There is no consensus among economists regarding the degree to which the historical relationship between monetary growth and business cycles results from the independent influence of monetary growth on the economy. Most observers believe, however, that monetary growth does have some independent influence on the course of the economy.

Caution also must be exercised when interpreting the implication of historical experience for the future association between monetary decelerations and recessions. Economic relationships that held in the past may not continue to hold in the future if the economic environment changes substantially. The behavior of monetary growth in recent years seems to have departed from the behavior that would have been expected from past relationships, indicating that a change in the economic environment may have occurred.²⁴ The anomalous behavior of monetary growth in the current economic expansion may be due in part to the accelerated pace of financial innovation. If so, the recent introduction of money market CD's, automatic transfer accounts, and other new financial assets may cause a departure from past relationships that makes it difficult to

²⁴ See Bryon Higgins, "Velocity: Money's Second Dimension," Federal Reserve Bank of Kansas City *Economic Review*, June 1978, for a more detailed discussion of the anomalous behavior of monetary growth in the current economic expansion.

interpret the economic significance of declines in monetary growth rates. Moreover, the anomalous behavior of monetary growth in recent years can only be partly explained by the introduction of new types of financial assets. To some extent, the reason for this behavior remains a mystery. Any analysis of the relationship between monetary decelerations and recessions, therefore, is subject to considerable uncertainty.

CONCLUSIONS

There has been a fairly close relationship between declines in monetary growth and recessions. The historical evidence since 1952 indicates that recessions have always been accompanied by deceleration in monetary growth but that monetary deceleration has not always been associated with a recession. A procedure was developed in this study for determining the relationship between recessions and alternative degrees of monetary deceleration. The rules developed by using this procedure to analyze monetary decelerations since

1952 indicate that the recent declines in monetary growth rates have already resulted in an appreciable monetary deceleration of the type that has sometimes, although not always, been associated with recessions. An acceleration in monetary growth would be required in upcoming months to prevent the recent declines in monetary growth from becoming a severe monetary deceleration of the type that has always been accompanied by recession since 1952.

The usefulness of analyzing the past association between monetary decelerations and recessions is limited somewhat by the difficulty in determining causal relationships and by the potential effects of financial innovation on the association in the future. Despite these limitations, however, comparison of the relative degrees of monetary deceleration associated with recessions in the past does provide useful information on the relationship between monetary growth and business cycles. This information may be useful to policymakers in assessing the implications for the economy of the recent and prospective behavior of the monetary aggregates.
