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REVIEW

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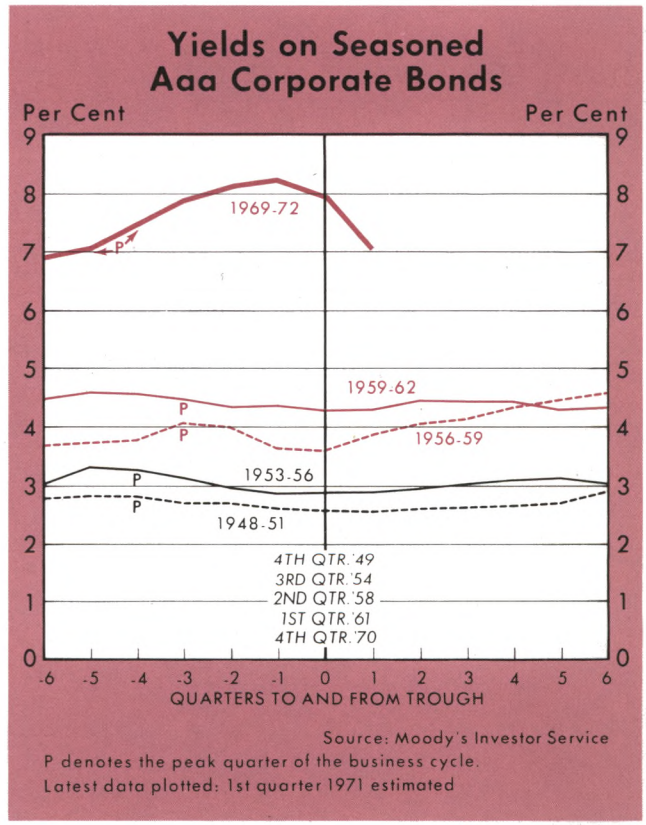
Capital Markets and Interest Rates in 1970

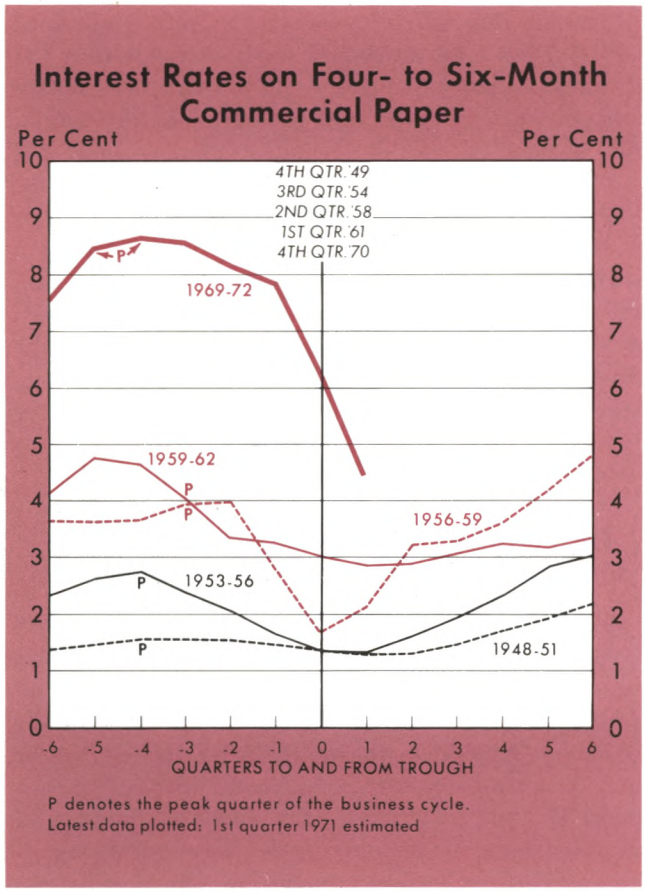
THE MOST SPECTACULAR fluctuations in marketable securities prices in the era since World War II have been encountered since early 1970. The markets for both common stocks and bonds staged large rallies between June 1970 and February 1971, after declining in the spring of last year. At their zenith in June, high-grade bond yields reached levels never before recorded in U. S. financial annals. Stock prices slumped to six-year lows in May. Capital market pessimism reached great extremes; some (though not all) observers foresaw a dearth of funds available for investment extending far into the decade. Lower interest rates and higher stock prices have doubtless caused revision of such views, although the pace of the market changes makes reappraisal of long-run financing prospects difficult. Beyond that, the 1970 experience raises questions about the causes of such gyrations and their effects on the economy.

Cyclical Variations in Interest Rates and Stock Prices

Among the unusual features of financial markets in 1970 was the delayed response of long-term interest rates to the business downturn. Whereas in previous postwar business slowdowns, peaks in bond yields occurred promptly after business peaks or even preceded them, three quarters elapsed after the business downturn in 1969 before long-term Treasury and corporate bond yields reached their peaks. Since then, the reductions in yields have been the greatest in amount of any comparable period since World War II. Seasoned corporate Aaa bonds, for example, declined from a peak of 8.6 per cent in the week ending June 26, 1970 to 7.1 per cent in the week ending March 5, 1971. Long-term U. S. government securities fell from a yield of 6.8 per cent to 5.9 per cent in the same span of time. In a recent reversal, yields, especially on corporate new issues, have risen and other long-term interest rates have stopped declining.



Short-term interest rates displayed more typical cyclical behavior, reaching highs at the beginning of 1970, a quarter after the downturn in business activity, then falling rapidly with only one temporary reversal throughout the year. The four- to six-month commercial paper rate, which was 9.08 per cent in the second week of January 1970, plummeted to 4.25 per cent by early March 1971. Three-month U. S. Treasury bill yields fell from 7.91 per cent to 3.35 per cent in the same period.



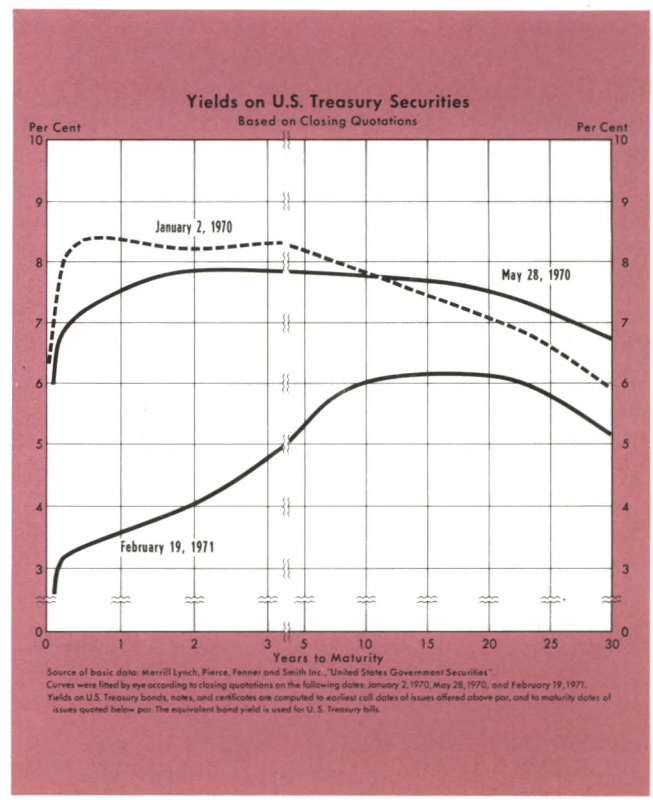
Stock prices underwent a broad retreat throughout 1969 and early 1970. In Spring 1970, retreat threatened to turn into rout for a brief interval, as stock prices fell by 23 per cent between April 1 and May 26. By the end of May, however, the market began to regain composure, and since then, stock prices have rebounded. The Standard and Poor's Index of 500 Stocks (1941-43 = 10), which reached a low of 69.29 on May 26, 1970, climbed to 97.56 by early March 1971.

Term Structure of Interest Rates

The accompanying chart depicts three "yield curves" (relationships between maturities of fixed interest-bearing obligations and their market yields) for U. S. obligations with maturities running from less than one year out to thirty years. The curves were observed at three different dates: January 2, 1970, May 28, 1970, and February 19, 1971. They are based on actual yields on these dates, but each curve has been smoothed to fill in gaps in maturity where no actual obligations are available.

In general, when interest rates undergo a rapid downward readjustment, as in the past fourteen months, both their average level and the term structure of interest rates are affected. It is typical for short-term rates to fall much more rapidly than long-term yields. For example, rates on U. S. Government obligations maturing in less than one year, which entered 1970 one percentage point above twenty-year U. S. bonds, were more than two percentage points below long-term bond yields by February 19, 1971. This is consistent with the assumption that the long-term bond yield is an average of a sequence of expected short-term yields. A decline in current short-term market rates would generally have only a small immediate effect in changing this long-term average.

As mentioned previously, short-term rates peaked several months before long-term rates. If the bond market had anticipated the general decline in interest rates, the decline should have been reflected initially (although mildly) in medium-term or longer-term interest rates. A related development was the whiplash action of the yield curve between January 2, 1970 and May 28, 1970 when yields fell in the shortest maturity ranges, while rising in the medium- and long-maturity segments. Usually, all segments of the yield curve move in the same direction simultaneously, with the short-term end moving more than the long-term end. This pattern did indeed quickly reassert itself by July 1970.



Inflation Expectations and Interest Rates

The expectations interpretation of the yield curve helps explain how some of the recent change in interest rates was transmitted through the maturity spectrum. Other considerations would explain how the general level of interest rates is determined. A factor which may have contributed greatly to the high levels of interest rates up to the 1970 peaks is anticipated inflation. Interest rates on new loans were adjusted upward to reflect the expected depreciation of the purchasing power of the dollar during the period of each loan. Since borrowers expect to repay loans in depreciated dollars, they were willing to offer higher interest rates. Lenders, on the other hand, were willing to accept such terms only because high interest rates include an inflation premium that compensates for the *expected* reduction in the value of the dollar.

In other words, what borrowers and lenders agree upon is a nominal or market interest rate (Rn) which, when the premium for the expected percentage rate of inflation (ΔP^e) is subtracted, leaves a net interest rate (Rr) that represents both an acceptable rate of return to the lender and cost to the borrower. This net return, after allowing for anticipated inflation, is what some economists have labelled the "real" rate of interest.[1] That is, the real rate, Rr, equals $Rn - \Delta P^e$.

This interpretation of interest rate movements has been incorporated in the interest rate equations of the St. Louis model.[2] It has also been employed in a related study of stock price determination.[3] These studies find that other factors influence real rates of interest, notably growth in the money stock (currency plus demand deposits) which exercises a short-lived negative effect (positive on stock prices), and growth in real output, which affects the real rate of interest positively with a lag over a longer time span (negative effect on stock prices). Corporate after-tax profits also have a positive impact, with a lag, on stock prices. Anticipated inflation, in the sense already described, has a powerful influence in these equations, tending to drive average stock prices down and interest rates up.[4]

Most of the rise in bond yields from 1965 until early 1970 can be attributed to the escalation in the inflation premium. It appears, however, that inflation anticipations (based on past price experience) cannot fully account for the high levels of interest rates (and low levels of stock prices) in the second and third quarters of 1970. Correspondingly, in the first quarter of 1971, the interest rate equations forecast only a mild decline in rates, by comparison with the declines which have already occurred. Stock price forecasts are below the current market average, although the direction of change is being correctly predicted. Either inflation fears are now subsiding more rapidly than these equations recognize, or some other factors are at work pulling interest rates down.

Other Possible Explanations for Recent Interest Rate and Stock Price Movements

Apart from anticipated inflation, other factors might have exercised an influence on nominal interest rates by altering the real rate of interest. Such factors include special disturbances affecting either the supply of money relative to the demand for money, or the flow of intended saving relative to intended investment. In addition, there might have been sudden or unusual shifts among sectors in their borrowing or lending patterns, causing temporary adjustment problems that could have been reflected in interest rates. Recent developments will be surveyed from each of these points of view.

Factors Affecting Demand for and Supply of Money and Near Monies

Rapid growth in monetary aggregates relative to growth in demand for them should exert downward pressure on interest rates – in the short run. The opposite short-run effect on rates occurs when the supply of monetary aggregates is growing less rapidly than their demand.

Monetary rates of change, both including and excluding net time deposits, reached lows in the latter half of 1969, and thereafter reversed the downtrends that began in 1968.[5] Business activity began to recede in the third or fourth quarter of 1969. This represents

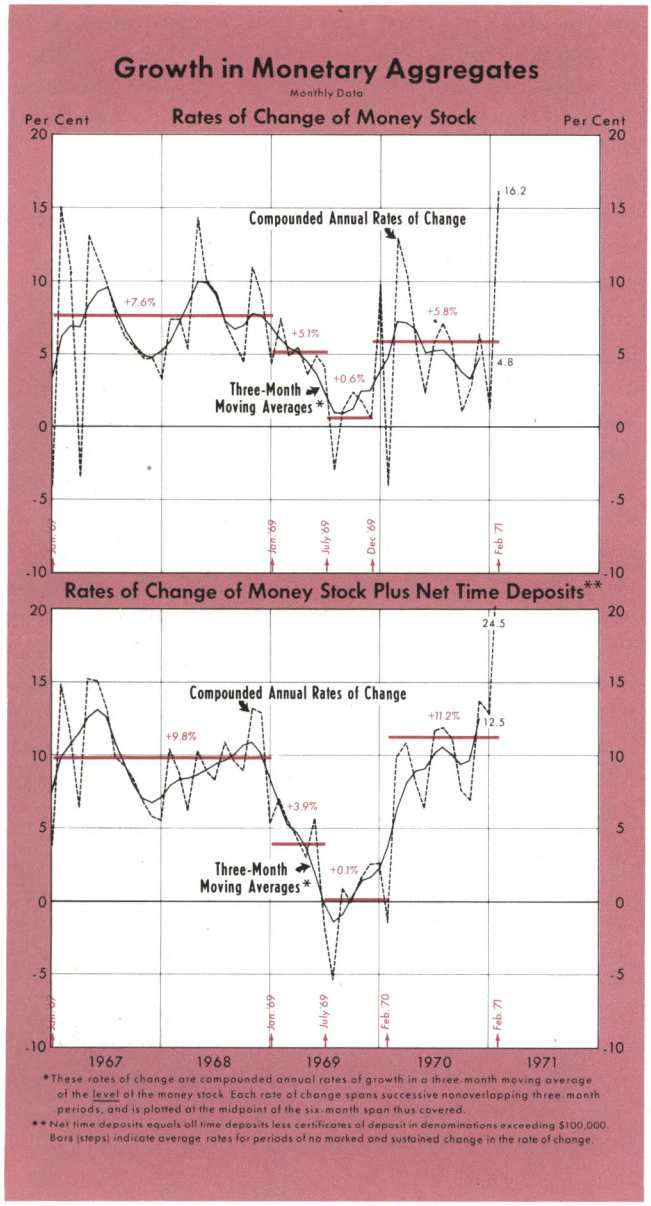
[1] "Interest Rates and Price Level Changes, 1952-69," this *Review* (December 1969), pp. 18-38.

[2] "A Monetarist Model for Economic Stabilization," this *Review* (April 1970), pp. 7-25.

[3] "Expectations, Money and the Stock Market," this *Review* (January 1971), pp. 16-31.

[4] The effect of anticipated inflation on stock prices runs counter to some interpretations of stocks as "hedges" against inflation. The findings suggest that expected corporate earnings do not fully adjust to anticipated price advances. Investors apparently regard common stocks typically as mixtures of fixed nominal income streams, like bonds, and earnings streams that escalate with inflation. For this reason, the average price of all common stocks cannot be viewed simply as the market valuation of real capital.

[5] Net time deposits are total time deposits less large denomination CD's. A similar statement could be made describing the rate of growth in money plus total time deposits, or even broader liquidity aggregates including savings and loan shares and mutual savings bank deposits.



a relatively early turnaround in comparison with monetary rates of change near previous postwar business cycle peaks.[6] Frequently the lowest rates of monetary growth have come several months after the business peak. Hence, the continued high level of interest rates in early 1970 cannot be attributed to sluggish increases in the monetary aggregates in the face of the business slowdown.

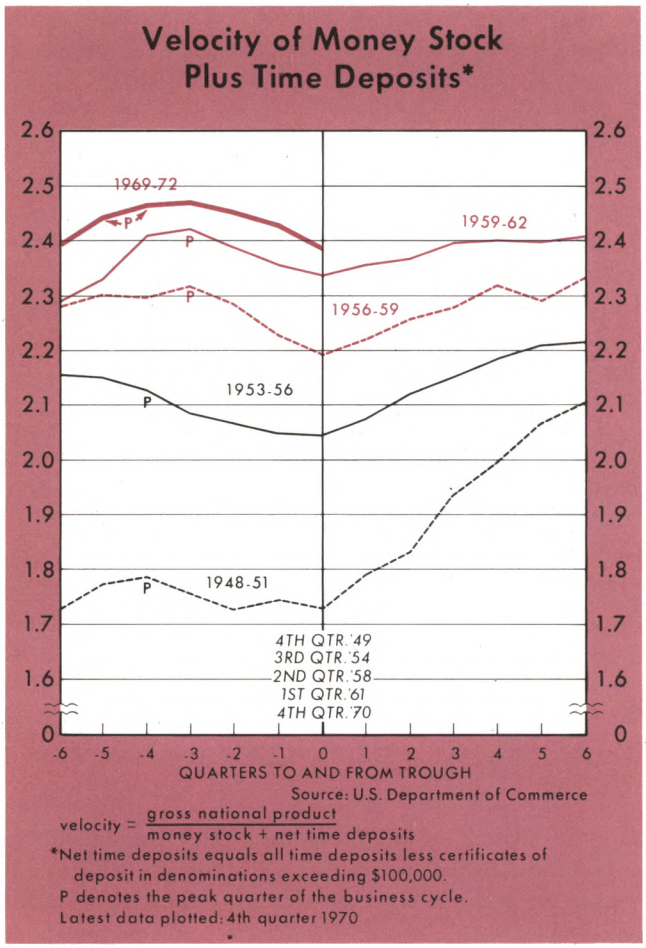
During the last half of 1970, when interest rates fell sharply, the large increase in negotiable CD's was a prominent feature of growth in monetary aggregates. Negotiable CD's grew from $13.2 billion in June 1970 to $27 billion in February 1971. Money supply plus all commercial bank time deposits increased at a 17.4 per cent annual rate in the same period. Upward interest adjustments on CD's (following suspension in June of Regulation Q interest ceilings on large CD's of less than 90 days maturity), combined with a declining trend of interest rates on competitive assets such as commercial paper, Eurodollars, and Treasury bills, made CD's more attractive for businesses to hold.

There has also been a very substantial increase in net time deposits at commercial banks and savings institutions. Between June 1970 and February 1971, these liquid assets grew by $43.1 billion. Over the same time span, money supply, defined as currency plus demand deposits, rose at a 5.7 per cent annual rate. In comparison with the turnarounds in previous periods of monetary expansion, the increased growth in the money stock relative to its low point in 1969 has been moderate, but the recovery in growth of money stock plus net time deposits has been rapid.

Some of this growth can be ascribed to "reintermediation" which occurs when interest rates decline on competing liquid assets. In addition, the decline in these interest rates, especially in recent months, has received a significant stimulus from expansionary monetary policy. For example, reserves of member banks have increased at an annual rate of 14.3 per cent since last June. The recent high rates of growth in the broader aggregate of money plus net time deposits reflect both the rapid expansion in bank reserves and the sharp decline in interest rates on marketable securities.

A useful, though crude, measure of the demand for money balances in relation to income is the "income velocity of money" – the ratio of income to money balances. This ratio is an indicator of the turnover rate of money balances in exchange for goods and services. The following chart shows the ratio of GNP to money plus "net time deposits" (commercial bank time deposits excluding large denomination CD's) in postwar business recessions. The amount of money balances demanded increases either more or less than proportionately with income or GNP. During much of the postwar period, the chart shows velocity to have risen with each successive business cycle, indicating a tendency for holders of money and net time deposits to increase their spending on goods and services faster than the growth in their liquid

[6]Centered rates of change of moving averages give somewhat different results than "step" rates of change. Both are shown in chart above. The "step" method is generally used in this Bank's reports. Changes in "steps" tend to be preceded by peaks and troughs in centered moving average rates of change.



balances.[7] However, during business slowdowns, velocity falls – monetary assets increase relative to GNP. This happened in each of the recessions of 1949, 1954, 1958, and 1961, and in 1970.

The decline in velocity during business slowdowns is typically associated with reductions in interest rates.[8] After the business trough is reached, interest rates rise and velocity tends to recover. If the contracyclical rise in long-term interest rates in early 1970 had been the result of a sudden rise in the demand for money plus net time deposits, we should be able to detect it in an abnormally sharp drop in velocity.[9] Similarly, the rapid decline in interest rates would be associated with an abnormally sharp rise in velocity – signifying a reduction in the demand for money plus net time deposits. The decrease in velocity during the 1970 business contraction was not unusual by comparison with postwar recessions. Nor has there been any evidence of an unusually sharp rise in velocity in recent months. Except for possibly the fourth quarter, one may rule out sudden changes in the demand for money plus net time deposits as a contributing factor to the abnormal behavior of interest rates since January 1970.[10]

The velocity of money plus net time deposits is perhaps too broad a measure, especially since it tends to consist very largely of liquid assets held by households, which exhibited none of the symptoms of a liquidity crisis in 1970. Some observers found such symptoms among business firms reacting to unfavorable financial developments in 1970. The failure of Penn Central Company sent liabilities of business failures upward in midyear. Corporate profits sagged for four quarters in a row beginning with third quarter 1969. Liquidity positions of nonfinancial corporations, by a variety of yardsticks, were stretched thinner in mid-1970 than in any previous postwar year. There is little evidence, however, that in 1970 a significant number of otherwise financially viable firms were forced to close for liquidity reasons alone.

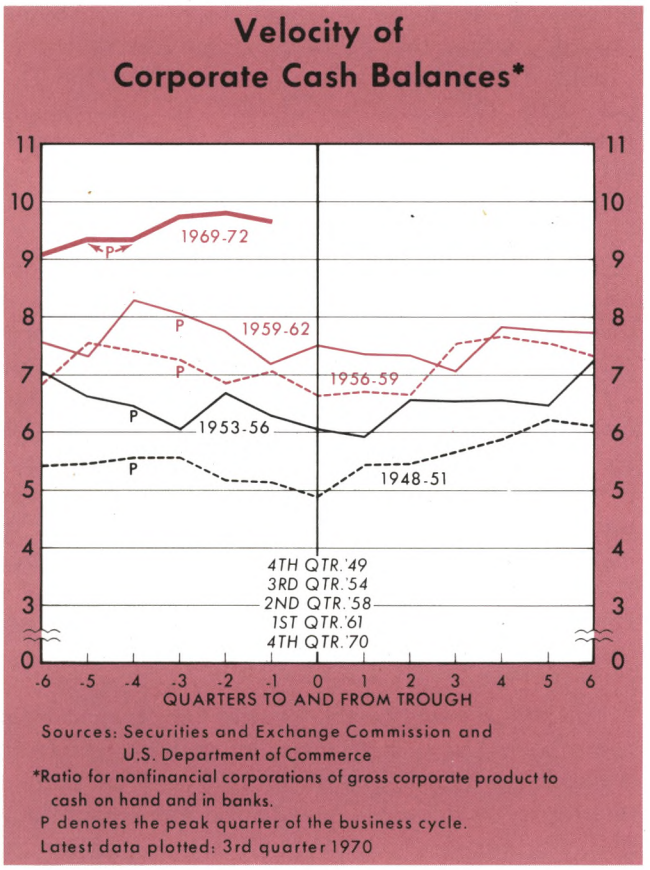
Velocity of nonfinancial corporate cash balances tends to decline during business contractions. The 1970 decline was delayed until three quarters after the fourth quarter 1969 turning point in business activity, but it is not clear whether this was a cause or a result of high interest rates. To be a cause of high interest rates, one must assume the rise in corporate velocity after the business peak was unintended, so that corporations were attempting to improve their liquidity positions. Much of what appears to be a decline during 1969 and early 1970 in corporate liquidity (rise in velocity) merely represents switching from negotiable CD's to commercial paper and government securities. Such shifts were a result of high interest rates (and regulatory interest ceilings on CD's), not a cause of high interest rates.

[7]The rise in velocity of money stock as conventionally defined has been greater than the rise in the velocity of money plus "net time deposits," especially in the last decade.

[8]The rise in velocity between successive post World War II business cycles is associated with (and may, in part, be due to) successive higher levels of interest rates.

[9]Assuming that unintended variations in velocity are of negligible importance.

[10]The General Motors strike of September-November, 1970 may have temporarily depressed the amount of money demanded in the fourth quarter of 1970 by reducing output and income below what it would have otherwise been. This response would not be fully reflected in velocity, if both income and demand for money declined and money stock were also reduced or permitted to grow less rapidly. Interest rates, therefore, could have been forced downward in the fourth quarter because of the effect of the strike. In the three months since the strike was settled, output growth has recovered from its strike-induced low, but interest rates have continued to fall. Other factors are evidently at work in reducing interest rates currently.



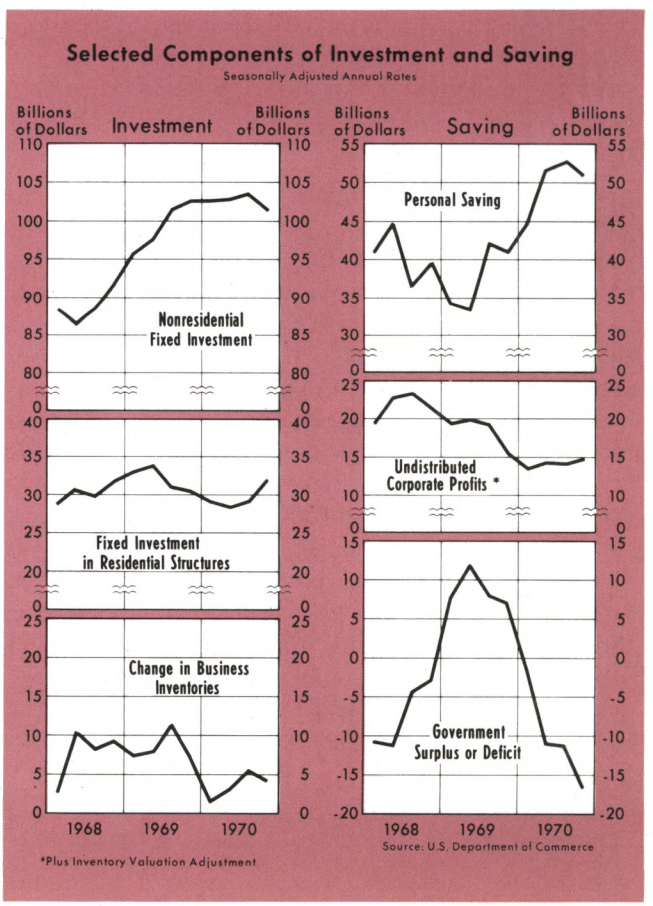
More recently, the velocity of corporate cash balances has declined, partly because of the reversal of previous movements out of CD's. Even so, corporate liquidity is not at present exceptionally high, nor has it improved rapidly by comparison with experience in previous business slowdowns. Hence, current downward pressures on interest rates do not appear to have their origin in greater liquidity of corporations.

Saving and Investment in a Business Slowdown

An excess of intended saving over intended investment tends to reduce interest rates, and conversely. There are practical difficulties, of course, in distinguishing intended from actual saving and investment. One technique for attempting this involves a decomposition of saving by sector and investment by category of expenditure, within the national income accounting framework. Saving is composed of three volatile components — personal saving, corporate undistributed profits (adjusted to remove inventory revaluation), and the net surplus of Federal and state and local governments. Investment consists of residential construction plus business expenditures on durable equipment, and structures, and inventory accumulation, shown in the accompanying chart.

Personal saving, measured in the national income accounts as disposable income minus consumption expenditures, excludes accumulation of consumer durables. It represents mainly liquid asset accumulation, net of additions to consumer debt. During the current business slump, this category of saving grew as a percentage of personal disposable income from 5.3 per cent in the second quarter of 1969 to a peak of 7.6 per cent in the third quarter of 1970, and declined slightly to 7.3 per cent in the fourth quarter. Taken by itself, the rise in personal saving has exerted a downward influence on interest rates since 1969.

In previous postwar recessions, the personal saving rate has shown no clear cyclical pattern; it has sometimes risen, sometimes declined. The cyclical variation in measured personal income around its expected growth path does not seem to exercise a substantial influence on the saving rate. Part of its behavior may reflect monetary growth itself, since high rates of liquid saving relative to income are likely to take the form of rapid accumulation of cash balances. A rise in price levels will reduce the purchasing power of liquid assets and might induce households to attempt to restore that purchasing power by increased liquid



saving. Sustained inflation, on the other hand, builds up anticipation of future price advances, which tends to discourage liquid saving. Higher interest rates on liquid assets, however, could compensate for anticipated inflation, and may have done so to some extent in recent years.

The rise in the personal saving rate that began in the third quarter of 1969 appears to coincide with more rapid monetary growth. Looking ahead, a substantial decline in personal saving rates could occur as a result of lower interest rates, slower monetary growth or reduced inflation, especially if anticipated inflation remains high.

Investment in dwellings is generally regarded as highly responsive to interest rate movements, rather than as a factor operating to exert strong pressure on interest rates, especially pressure of a procyclical nature. High and rising mortgage interest costs in 1969 and early 1970 were reflected in declining residential construction expenditures. Federal government support of housing programs may have moderated the decline. Since the second quarter, homebuilding expenditures have rebounded to an annual rate of $32 billion, less than $2 billion below their 1969 peak. Prospects for a continuation of this resurgence have been bolstered by the recent declines in long-term interest rates. These have enabled the Federal government to reduce FHA and VA ceiling mortgage loan rates to 7 per cent from the 8½ per cent level of December 1969.

Capital expenditure plans in the business sector were exceedingly bullish in the early stages of the economic slowdown. Initial anticipations called for plant and equipment outlays in 1970 to increase by more than 10 per cent over the previous year. Actual 1970 business capital spending was only 6.6 per cent greater than in 1969. As the chart (p. 7) shows, business spending on equipment and nonresidential structures turned down after the third quarter of 1970. Nevertheless, the early plant and equipment surveys for 1970 mirrored the upward thrust of fixed investment intentions at the outset of the 1969-70 slowdown. Coupled with declining profits, which reduced the ability of corporations to finance capital spending through retained earnings, the net pressure on interest rates of the corporate sector's intended saving and fixed investment was undoubtedly upward in early 1970.[11] Capital spending plans were revised downward later in the year and corporate profits improved, so that this pressure on interest rates was eased.[12] In the latest survey conducted by the Department of Commerce and SEC in January and February, business planned to increase its 1971 spending on plant and equipment by 4.3 per cent over the 1970 level.

An important sector affecting capital markets through flows of expenditures relative to receipts is the Federal Government. The Federal budget, on a national income accounts (NIA) basis, moved from a surplus at a $13.4 billion annual rate in the second quarter of 1969 to a $14.2 billion rate of deficit in the second quarter of 1970. An increase in the Federal net deficit usually occurs during business slowdowns due to reduced growth in tax revenues relative to expenditures. Expiration of the surtax, retroactive Federal pay increases, and increased social security benefits also contributed to the decrease in the net surplus in early 1970.

The strong swing by the Federal Government from a net "saver" to a net "dissaver" position, primarily between the fourth quarter of 1969 and the second quarter of 1970, coincides with the abnormally long lag in response of bond yields to a downturn in business activity. A continuing large government deficit may not elevate interest rates, but a rapid increase in the deficit, or decrease in the surplus, may exert temporary upward pressure on interest rates. The decline in long-term interest rates since midyear may therefore represent a return to their typical cyclical response as the Federal deficit passed its period of most rapid increase.[13]

The Federal deficit (national income accounts basis) increased somewhat in the fourth quarter of

[11]A $9.7 billion decline in inventory accumulation from the third quarter of 1969 to the first quarter of 1970 helped offset this pressure. In the second quarter, inventory change reversed direction, and by the fourth quarter was increasing at a $3.6 billion annual rate.

[12]It is conceivable that some or even most of the strength in early capital expenditure plans for 1970 reflected inflation anticipations. Expected productivity of additional plant and equipment might even have declined throughout 1970. Low and falling levels of capacity utilization suggest that the marginal productivity of new facilities may be decreasing; so also does the deceleration of growth in total real output in the economy, which began in early 1968. It can be argued that the rate of growth in total output is an approximation to the expected return on physical investment.

[13]The immediate impact of a sharp rise in the government deficit need not be concentrated in the maturity ranges in which new government debt is being issued. The effects might register most heavily in another sector, if simultaneously with heavy government borrowing in one maturity region, the private sector is retiring debt in that range and increasing its borrowing in some other maturity region. As discussed below, in 1970 corporations were retiring their short-term debt while increasing their long-term debt. At the same time the Federal government was borrowing heavily in the short-term end of the maturity range.

1970 to an estimated $15.3 billion annual rate. From this point, the NIA deficit is likely to decrease gradually as the economic recovery picks up momentum. The Administration projects a $15 billion NIA deficit in fiscal 1971, which would imply deficits averaging more than a $13 billion annual rate in the first two quarters in 1971. In fiscal 1972, which begins July 1, 1971, the NIA deficit is projected to decline to a $4.2 billion annual rate. Taking the national income accounts budget as an indicator, and assuming the accuracy of the Administration's projections, the Federal sectors' upward pressure on interest rates would seem to be easing.[14]

Disturbances in the Capital Markets

Sudden changes in asset and liability positions in various sectors, especially when they are related to alterations in the maturity structure of outstanding credit obligations, sometimes provide clues about the net direction of pressures on interest rates. It is not always easy to distinguish between autonomous and accommodating financial transactions, but when the changes are of extremely large magnitude, as some were in 1970, there may be less difficulty in discerning the sources of disturbances in credit markets.

Two features of 1970 capital markets are deserving of special mention. The first is the exceptionally sharp increase in long-term borrowing by nonfinancial corporations. Much of this reflected refinancing of short-run debt (bank loans primarily) carried over from 1969 and earlier, and did not represent a marked change in the rate of growth in total corporate debt. Lengthening of the maturity of corporate debt in 1970 may have eased the pressure of net government borrowing in short-term credit markets, while adding to weakness in long-term credit markets early in the year.

The dollar volume of new corporate securities issued (gross proceeds) continued at an unslackened rate throughout 1970, totaling more than $38 billion, only $8.6 billion of which were new stock issues. New issues in the first two months of 1971 were in excess of the corresponding months of 1970, and there are as yet no definite signs of a letup in long-term financing demands. The calendar of new corporate issues for March is extremely heavy. Since corporations have been reducing their short-term borrowing, particularly from banks, while adding to their short-term assets, especially CD's, it is evident that many corporations are striving to strengthen their liquidity positions.

The second notable feature was the extremely large rise in commercial banks' net lending, particularly in the third quarter. A major portion of this, of course, arose out of the retirement of commercial paper by banks' parent holding companies and its replacement by CD's. Bank credit expansion was $25.8 billion greater (annual rate) in the Summer quarter than in the Spring, after allowing for this. Almost $15.2 billion of this increase in bank credit was accounted for by loans to security dealers and brokers to finance acquisition of U. S. Government and other securities. An increase in the rate of acquisition by banks of U. S. Government securities accounted for another $8.2 billion (annual rate) of the bank credit increase. Commercial bank lending to business slowed in the third quarter and declined in the fourth. In the fourth quarter, banks became heavy net purchasers of municipal and Federal agency securities.

Long-term bond yields, which had generally declined in January, February, and March 1970, conforming to their cyclical pattern, rose again in April, May, and June. It appears that the sharp declines in the Spring, and the subsequent Summer rallies in bond and stock markets, gained strength from a massive shift in investment policy among securities dealers and brokers, from net liquidation of their positions in the second quarter to aggressive rebuilding in the third quarter. The reasons for this behavior may be traceable to special circumstances – the Cambodian incursion, the campus riots, and a series of failures, forced mergers and recapitalizations among brokerage firms. These events took their toll on the stock and bond markets in the Spring. Then the failure of Penn Central sent tremors through the bond and commercial paper markets in June. After the severe buffeting subsided, securities dealers regained confidence. The much discussed liquidity crisis of the Spring and early Summer of 1970 centered very largely in the fortunes of brokerage firms. It may account for a large part of the unusual cyclical response of bond yields. The effect on interest rates and stock prices, while possibly significant at that time, was short-lived.

Summary and Conclusions

Interest rates, particularly bond yields, remained near peak levels for an abnormally lengthy period in 1970 after the downturn in business activity. Several factors could have contributed to this long lag in response. These include (1) the persistence of infla-

[14]For an evaluation of the Administration's fiscal 1972 budget and 1971 economic plan, see "The 1971 National Economic Plan" in this *Review*, pp. 11-19.

tionary anticipations; (2) the sharp rise in the Federal deficit during fiscal 1970; (3) heavy long-term borrowing by corporations, coupled with exuberant capital expenditure programs early in the year; (4) the very gradual decline in real output growth, compared with previous postwar recessions; (5) the financial problems of securities dealers, which were reflected in net liquidation of their securities inventory positions in the Spring; and (6) special circumstances, such as the Cambodian incursion and campus rioting. The Penn Central crisis temporarily lifted interest rates in June.

After the mid-year turnaround in bond yields, all interest rates except yields on lower grade bonds went into a decline, which accelerated in the fourth quarter. In part, the fall in rates represented a return to their typical behavior during cyclical downswings in economic activity. The drop in long-term and short-term rates continued, however, in the first two months of 1971, following the low point of the business slowdown that was reached in the fourth quarter of 1969. In February, three-month Treasury bills yielded less than 4 per cent for the first time since 1967, and Aaa corporate bonds yielded less than 7 per cent for the first time since 1968.

Inasmuch as the high interest rates of the last few years may well have been largely a reflection of inflation anticipations, it is possible that we are now witnessing a dramatic de-escalation of these anticipations. A broader interpretation accepts such de-escalation as part of the story. It would, however, emphasize other forces exerting downward pressure on interest rates and upward pressure on common stock prices in recent months. These include (1) an improved financial outlook among securities firms; (2) the automobile strike in the fourth quarter; and (3) reduced business optimism regarding rates of return on physical investment (reflected in conservative 1971 plant and equipment spending plans and sluggish short-term business borrowing). An expansive monetary policy, especially as displayed in the broader monetary aggregates, also may have played a major role in the recent bond and stock market rallies.

The 1971 National Economic Plan

by KEITH M. CARLSON

THE FEDERAL BUDGET, the *Economic Report of the President*, and the *Annual Report of the Council of Economic Advisers* were presented recently to Congress and the public.[1] These three documents represent the Administration's national economic plan for the eighteen-month period ending June 30, 1972. Targets for total spending (GNP), output, prices, and unemployment are presented along with a proposed Federal budget program presumably consistent with these goals. Underlying the statement of targets and the Federal budget plan is an assumption regarding the course of monetary actions by the Federal Reserve System.

Specific targets for the U. S. economy are set forth by the Council of Economic Advisers (CEA) in their *Annual Report*.[2] These goals, stated with reference to second quarter 1972, consist of a reduction in the unemployment rate to near 4.5 per cent of the labor force and a reduction of the inflation rate, as measured by the GNP deflator, to near a 3 per cent annual rate. An 11 to 12 per cent annual rate of increase of total spending (nominal GNP) from fourth quarter 1970 to second quarter 1972 is proposed as a means of achieving these targets. To realize this advance of total spending, the CEA recommends an 8 per cent annual rate of increase in Federal expenditures and a continuation of the 5 to 6 per cent rate of monetary expansion which prevailed in 1970.

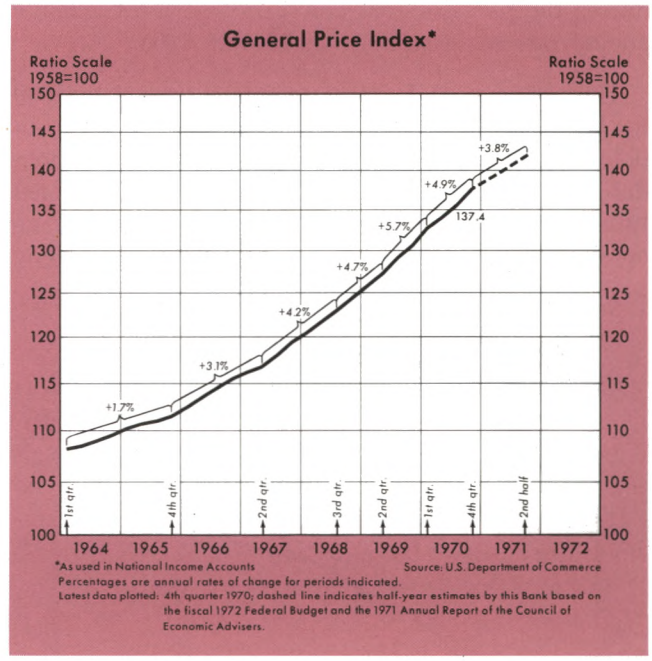
This article evaluates the Administration's national economic plan with the aid of a methodology developed at this Bank. The 1970 economic plan is compared with actual developments for purposes of obtaining some perspective on stabilization plans and realizations. Then, the 1971 economic plan is examined in terms of feasibility and internal consistency. The St. Louis model is used to evaluate the Administration's plan, thus any conclusions necessarily reflect the particular characteristics of that methodology.

[1]*The Budget of the United States Government, Fiscal Year Ending June 30, 1972* (Government Printing Office, 1971), and *Economic Report of the President,* together with *The Annual Report of the Council of Economic Advisers* (Government Printing Office, 1971).

[2]1971 CEA *Report,* p. 78.

Stabilization Actions and Economic Developments in 1970

The recent *Economic Report of the President* described 1970 as a year of transition, when the U. S. economy paid for the excesses of 1966 through 1968. The general level of prices rose 5.3 per cent from fourth quarter 1969 to fourth quarter 1970,



compared with a 5 per cent advance in the previous year, and unemployment rose from 3.6 per cent of the labor force in fourth quarter 1969 to 5.9 per cent a year later. Total spending increased at a moderate 4 per cent rate in the first half of the year, then stepped up to a 7 per cent rate in the second half (after allowance for the depressing influence of the auto strike in the fourth quarter).[3] The faster advance of total spending in the second half of the year was fostered by more rapid monetary expansion and increased growth of Federal spending beginning in early 1970.

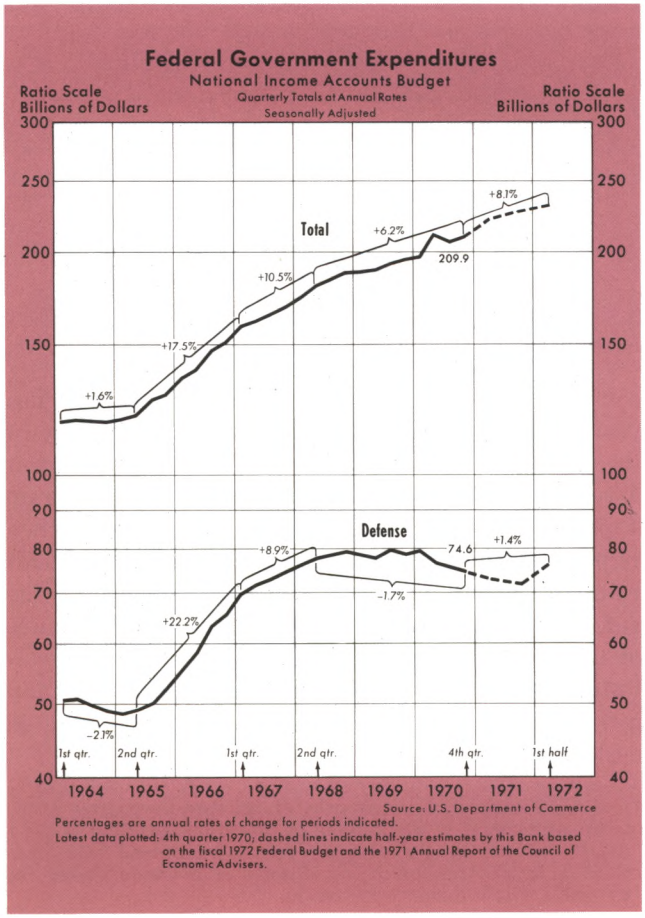
[3]The CEA estimated the impact of the fourth quarter strike to be approximately $14 billion, or that total spending (GNP) would have risen at about a 7 per cent annual rate from third to fourth quarter in the absence of the auto strike. See the 1971 CEA *Report,* pp. 34-36.

Fiscal Actions

Federal budget actions were moderately stimulative in 1970, as Federal expenditures rose somewhat faster than during the previous year. Accelerated growth of Federal expenditures, along with expiration of the 10 per cent tax surcharge, resulted in a slight net fiscal stimulus during 1970.

Expenditures – Federal spending in 1970 was dominated by developments in the second quarter. Effective in April, but retroactive to January 1, social security benefits were increased at a $4.3 billion annual rate, and Federal employee compensation was raised at a $2.5 billion annual rate. The 7.1 per cent increase in Federal spending during the year ending fourth quarter 1970 compared with a 4.6 per cent rise during the previous year and a 13.4 per cent average annual rate of increase from 1965 to 1968.

The advance of Federal spending from late 1969 to late 1970 reflected a 5.3 per cent decline in defense spending and a 16 per cent rise in nondefense spending. Defense spending had changed little in 1969, after increasing at a 15 per cent average annual rate from 1965 to 1968. Nondefense spending had advanced 8.4 per cent in 1969 following a 12.4 per cent average rate of increase from 1965 to 1968.



Receipts – The major actions affecting budget revenues were the two-step elimination of the 10 per cent tax surcharge originally imposed July 1, 1968, and some net tax relief as a result of the Tax Reform Act of 1969. Expiration of the surcharge decreased Federal receipts by an estimated $8.3 billion. This action, along with sluggish growth in economic activity, resulted in a $9 billion dollar decline in Federal receipts from fourth quarter 1969 to fourth quarter 1970.

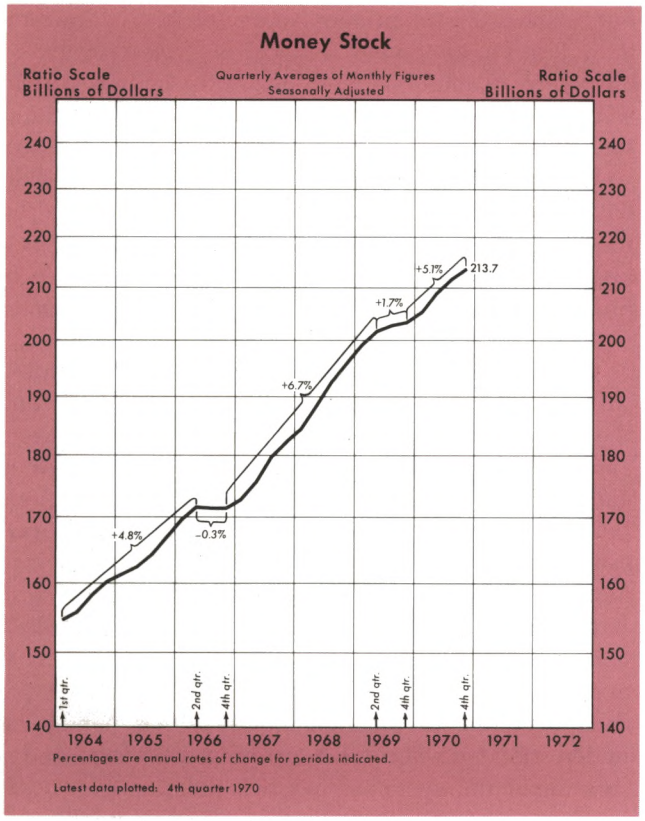
Surplus/deficit position – The combination of accelerated Federal spending, lower effective tax rates for personal and corporate income, and a reduced rate of advance of total spending in the economy, resulted in a shift of the national income accounts (NIA) budget from a $7.2 billion annual rate of surplus in the second half of 1969 to a $14 billion rate of deficit in the second half of 1970.

The $21 billion shift of budget position, as measured by the NIA budget, tends to overstate the extent of stimulus provided by the Federal budget. A substantial portion of the 1969 to 1970 shift from surplus to a deficit reflects the slowdown of the economy and is thereby misleading as a measure of discretionary fiscal action. Standardizing the estimates of expenditures and receipts on a high-employment basis provides a method of more accurately measuring the extent to which discretionary Federal budget actions were taken. On a high-employment basis, as estimated by this Bank, the NIA budget moved from a $10 billion annual rate of surplus in the second half of 1969 to a $7 billion rate in the second half of 1970.[4] By comparison, this measure of the Federal budget averaged a $7.2 billion rate of deficit from 1966 to 1968.

Monetary Actions

Monetary actions in 1970 were quite expansive compared with the previous year, but according to most measures were less stimulative than in 1967 and 1968. The money stock increased 5.1 per cent during the year ending fourth quarter 1970, compared with 3.8 per cent in the previous year and a 7 per cent average rate of increase in 1967 and 1968.

[4]Estimates of the high-employment budget are prepared by this Bank and are published in our quarterly release, "Federal Budget Trends." These estimates differ slightly from those published in the 1971 CEA *Report*, pp. 24 and 73. For further discussion of the high-employment budget concept, see the 1971 CEA *Report*, pp. 70-74.



Evaluation of Last Year's National Economic Plan

The CEA *Report* of a year ago projected a 5.7 per cent increase in total spending (GNP) for calendar 1970 over 1969.[5] The subsequent actual increase was 4.8 per cent, or, after adjusting for the effects of the auto strike in the fourth quarter, 5.2 per cent. The CEA anticipated a slow advance of total spending in the first half followed by a quickened pace in the second half. Apparently this pattern was realized, though an accurate assessment is clouded by the strike developments late in the year.

The CEA error of $7.6 billion in projecting the growth of GNP from 1969 to 1970 was not large, considering that about $3.5 billion was attributable to the auto strike. A comparison of the actual changes in the components of GNP with the CEA projections (Table I) indicates the primary source of error was overestimation of business fixed investment and of inventory accumulation. This type of forecasting error is common when the pace of economic activity is slowing; business investment plans typically are scaled back at such times. The other source of error, which partly offset the error in the investment projection,

[5]1970 CEA *Report*, Chapter 2.

Table I

Projected and Actual Changes in Total Spending (GNP) and Components — 1969 to 1970

(Billions of Dollars)

	CEA Projection	Actual	Error
Personal consumption	$40.0	$39.2	$0.8
Business fixed investment	7.9	3.3	4.6
Business inventories	—0.9	—5.0	4.1
Residential construction	—2.2	—2.3	0.1
Federal purchases	—4.5	—1.6	—2.9
State and local purchases	11.5	10.1	1.4
Net exports	0.9	1.7	—0.8
Total spending (GNP)	52.7	45.1	7.6
		(48.6) *	(4.1) *

*Excluding effect of auto strike, CEA estimate.

was underestimation of the growth of Federal purchases of goods and services.

Added relevance for stabilization policy is provided by the CEA projections of real product, prices and unemployment. Table II shows that the CEA projected an increase in real product from 1969 to 1970 of 1.2 per cent, a 4.4 per cent rise in the price level, and a rise in the unemployment rate of .8 per cent. Despite considerable success in projecting the growth in total spending, the CEA failed to anticipate the continued strength of inflation and the extent of sluggish growth in real product and employment.

Table II

Projected and Actual Changes in Spending, Output, Prices and Unemployment — 1969 to 1970

(Per Cent)

	CEA Projection	Actual	Error
Total spending (GNP)	5.7%	4.8%	0.9%
Real product	1.2	—0.4	1.6
Prices	4.4	5.3	—0.9
Unemployment rate	0.8	1.4	—0.6

Stabilization plans vs. realizations — To evaluate the 1970 CEA projections and determine underlying sources of error, it is useful to compare monetary and fiscal plans with realizations. Table III gives planned and actual changes in the NIA budget from 1969 to 1970 on both an actual and a high-employment basis. From the standpoint of fiscal plans, the high-employment budget is more relevant. On this basis, expenditures increased $4.5 billion more in 1970 than planned. Combined with a quite accurate projection of high-employment receipts, the change in net position

Table III

Planned and Actual Changes in Federal Budgets — 1969 to 1970

(Billions of Dollars)

	Budget Plan	Actual	Error
NIA receipts	$—0.6	$—5.4	$ 4.8
NIA expenditures	9.6	15.0	—5.4
NIA surplus or deficit	—10.2	—20.4	10.2
High-employment receipts	11.0	10.4	0.6
High-employment expenditures	8.7	13.2	—4.5
High-employment surplus or deficit	2.3	—2.8	5.1

Note: Federal budget plans for 1970 were given in the quarterly release, "Federal Budget Trends," prepared by this Bank, February 20, 1970.

turned out to be a slight stimulus compared with plans for slight restraint. This error in fiscal planning is not large, however, compared with some in the past.

The CEA assumption about monetary actions in 1970 was not specific in terms of a growth rate of the money stock, though a rate about mid-way between the 1967-68 rate and the rate in the second half of 1969, or about 4.5 per cent, was implied.[6] Money actually grew 5.1 per cent from fourth quarter 1969 to fourth quarter 1970. Consequently the CEA projection of monetary growth was quite accurate.

Analysis based on St. Louis model — To better understand the significance of the difference between projected and actual changes in key economic variables from 1969 to 1970, some alternative simulations with the St. Louis methodology are examined.[7] Four cases are considered: estimates based on (1) changes in money and expenditures as assumed by the CEA in February 1970; (2) perfect anticipation of changes in Federal expenditures, but not money; (3) perfect anticipation of changes in money, but not Federal expenditures; and (4) perfect anticipation of both money and expenditures.

Examination of Table IV suggests that the CEA was quite accurate in their total spending projection, mainly because they assumed an acceleration in the rate of monetary expansion in 1970. Federal expenditures advanced somewhat more rapidly than planned, but this was not the primary source of error, according to St. Louis methodology. In fact, the projections based on policy assumptions were closer to the actual than were the projections based on perfect knowledge about the course of these policy actions. Realized monetary and fiscal actions implied that the projections should have been low rather than high. As a result, based on the St. Louis methodology, the CEA error in projecting total spending reflected factors other than errors in projecting the course of monetary and fiscal actions.

Though the CEA error in projecting total spending was not large, there were larger errors in projecting the division of total spending growth between prices and real product. Table IV shows prices, real product, and unemployment as projected and realized. Real product growth from calendar 1969 to 1970 was overestimated by the CEA, a projection of a 1.2 per cent increase, compared with no change in actual output (excluding the effect of the fourth quarter strike). Unemployment was forecast to rise to a 4.3 per cent average for the year, but turned out to be 4.9 per cent. The rate of inflation, on the other hand, was underestimated. The CEA in early 1970 expected a substantial improvement in price inflation over 1969, projecting a 4.4 per cent increase. Prices actually rose 5.3 per cent from calendar 1969 to 1970.

Table IV shows that the projections for prices, output, and unemployment based on St. Louis methodology were more accurate than the CEA's projec-

Table IV

Projected Changes in Spending, Output, Prices and Unemployment — 1969 to 1970

	Total Spending		Real Product	Prices	Unemployment Rate
	Billions of Dollars	Per Cent	Per Cent	Per Cent	Per Cent
CEA Projection (2/2/70)	$52.7	5.7%	1.2%	4.4%	0.8%
Actual*	48.6*	5.2*	0.0*	5.2*	1.4*
St. Louis Model Projections					
1) with changes in money and Government spending based on CEA assumptions	52.5	5.6	0.6	5.0	1.3
2) with changes in Government spending perfectly perceived but not changes in money	56.0	6.0	1.0	5.0	1.2
3) with changes in money perfectly perceived but not changes in Government spending	53.1	5.7	0.7	5.0	1.3
4) with both changes in money and Government spending perfectly perceived	56.6	6.1	1.0	5.0	1.2

*Excluding effect of auto strike, CEA estimate.

[6] 1970 CEA *Report*, p. 60.

[7] "A Monetarist Model for Economic Stabilization," this *Review* (April 1970), pp. 7-25.

tions. Again, the St. Louis projections were more accurate when based on policy plans than when calculated with policy realizations. Nevertheless, despite the error in projecting total spending, the St. Louis methodology forecast prices to rise 5 per cent from 1969 to 1970, or only slightly less than realized. Due to the slow short-run response of prices to monetary and fiscal actions in the St. Louis model, these price projections were relatively insensitive to the difference between policy plans and realizations.

St. Louis model projections of real product growth were in error by about the same amount as the CEA. By past projection experience, neither of the projections for real product, by the CEA or by the St. Louis methodology, were in substantial error. The differences between the projections by the CEA and St. Louis of real product translated into larger discrepancies in the projection of unemployment. The CEA correctly foresaw the rise in unemployment but underestimated its magnitude. The St. Louis model forecast the rise with considerable accuracy, even with a projection of real product growth similar to that by the CEA.

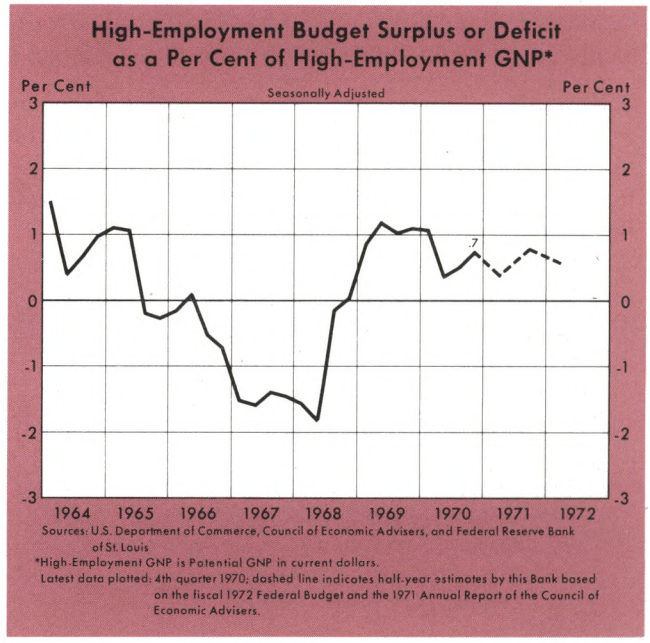
Summary – The CEA projected quite closely the growth of total spending, even though they underestimated the rise in Federal purchases from 1969 to 1970 by $3 billion. Their errors were significant, however, with respect to projections of inflation and unemployment. The magnitude of these errors was typical of most forecasts, including those of large econometric models. As indicated in the 1971 CEA *Annual Report,* the inflation proved to be much more stubborn than anticipated. As a result, all of the advance in total spending manifested itself in price increases, and output did not grow at all, resulting in a much sharper rise in unemployment than anticipated. The St. Louis model, which has built into it a very slow price response, also underestimated the rate of inflation. For this one year, however, it came closer than the CEA in its projection of inflation and unemployment, despite the fact that the St. Louis model did not do as well in projecting the change in total spending.

Economic Goals and Policy Plans for 1971

The Administration has set targets of 4.5 per cent unemployment and a 3 per cent rate of inflation by second quarter 1972. To achieve these goals, a 9 per cent advance of total spending from calendar 1970 to 1971 has been projected. This section summarizes the Federal Budget program for calendar 1971, and then evaluates the Administration's plan with the aid of the St. Louis methodology.

Federal Budget Program for Calendar 1971

The budget plan for calendar 1971 calls for a surplus in the high-employment (NIA) budget of $6.5 billion, as estimated by this Bank.[8] A surplus of this magnitude would be about the same as in 1970. When compared with calendar 1969, the budget plan appears slightly more expansionary, but compared with the 1966 to 1968 period, when the high-employment budget was substantially in deficit, the budget for calendar 1971 appears much less expansionary.



Expenditures – The budget plan projects an 8.4 per cent increase in Federal expenditures from calendar 1970 to calendar 1971. This increase would be up slightly from the 6.6 per cent rise in 1969 and 1970, but much less than the 14 per cent average rate of advance in Federal spending from 1965 to 1968. The 1971 increase in Federal expenditures translates into about a 1 per cent advance in real terms, compared with a 1.3 per cent decrease in real terms in 1970.

Defense spending is projected to decline about 5 per cent in calendar 1971, compared with a 3 per cent decline in 1970 and a 1 per cent increase in 1969. The average annual rate of advance from 1965 to 1968 was a very rapid 16 per cent. Estimates for 1971 apparently reflect declines in Vietnam spending,

[8]The Administration's budget program is discussed as it relates to calendar 1971 rather than fiscal 1972, with estimates for calendar 1971 prepared by this Bank. Furthermore, to be consistent with the GNP accounts, which represent the framework in which the CEA projections are made, the Federal sector of the national income accounts (NIA budget), rather than the unified budget, is used to summarize Federal budget plans. For a summary of the budget program on a fiscal year basis, along with rate-of-change triangles, see the quarterly release of this Bank, "Federal Budget Trends," February 1971.

though no figures are given in the budget as to their magnitude.

Federal spending on civilian programs, that is, nondefense spending, is planned to rise 16.5 per cent from calendar 1970 to 1971. This increase would follow increases of 15 per cent in 1970 and 9 per cent in 1969. From 1965 to 1968, nondefense spending rose at a 12 per cent average annual rate. 1971 expenditures for nondefense purposes reflect proposed increases in social security benefits and a pay raise for Federal employees, both effective January 1, and an increase in grants-in-aid to state and local governments (general revenue-sharing), effective October 1.

Receipts – Federal receipts on a national income accounts basis are projected to rise $18 billion from calendar 1970 to 1971, or by 9 per cent. This projection is closely associated with the assumption about the growth of total spending (GNP).

Table V

Planned Changes in Federal Receipts—1970 to 1971

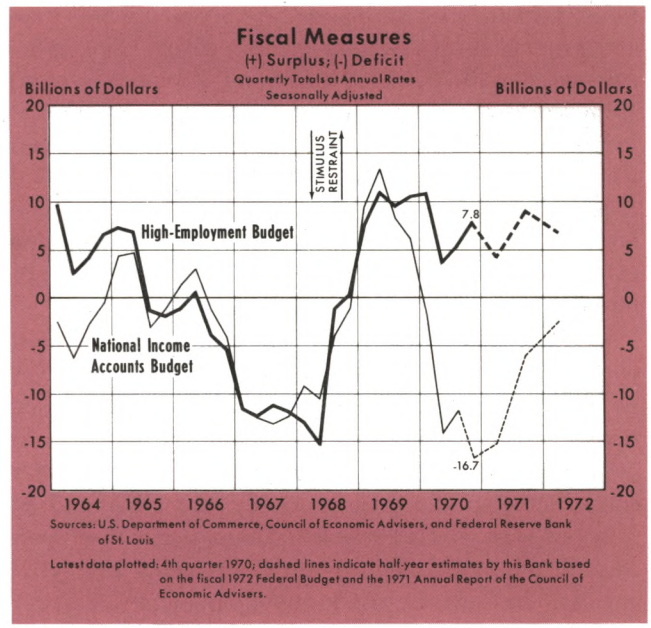
National Income Accounts Budget

(Billions of Dollars)

Change in total receipts	$17.8
Change due to growth	19.6
Change due to tax rate changes	—1.8
Personal tax and nontax receipts	—5.3
Corporate profits tax accruals	—2.6
Indirect business tax and nontax accruals	0.2
Contributions of social insurance	5.9

Table V shows the sources of increased receipts for 1971. Changes in tax policy include (1) the scheduled increase in social security taxes, which was effective January 1, (2) a proposed expansion of the base for social security taxes, from $7,800 to $9,000, (3) continuing the effects of the Tax Reform Act of 1969, and (4) the effect of liberalized depreciation allowances, tending to reduce receipts. The combined effect of these tax changes is expected to decrease receipts by $1.8 billion in 1971. All of the expected increase in receipts reflects the rapid expansion of economic activity projected by the Administration.

Surplus/deficit position – The NIA budget is projected to be in deficit by $10.6 billion in calendar 1971, compared with a deficit of $11.1 billion in 1970. Since the NIA budget is influenced to a considerable extent by the pace of economic activity, it is useful to estimate receipts and expenditures on a high-employment basis. By eliminating the effects of deviations in real economic activity from high-employment, budget plans can be assessed more accurately in terms of their economic impact.



On a high-employment basis, the planned NIA budget indicates a $6.5 billion surplus for calendar 1971. This estimate is about the same as for 1970, indicating no change in the degree of fiscal stimulus from 1970 to 1971.

The Federal budget program for calendar 1971 appears to contain about the same amount of stimulus as did the program in 1970. Whether the impact of such a program will turn out to be essentially unchanged from 1970 depends largely upon Congressional action as well as the lag structure of economic reaction. Developments in Southeast Asia and domestic demands for Government programs are of vital importance in determining the actual course of Federal spending.

Evaluation of 1971 National Economic Plan

Using the St. Louis methodology, two questions are considered in the evaluation of the 1971 economic plan of the Administration: (1) whether the price and unemployment goals are consistent with the projected increase in total spending; and (2) whether the projected increase in total spending is consistent with proposed stabilization policies.

Feasibility of total spending goal – Table VI shows the results for the St. Louis model for four different combinations of policies:

(1) an increase of Federal spending as proposed in the budget and an expansion of the money stock at a 6 per cent annual rate;

Table VI

Projected Changes in Total Spending (GNP) — 1970 to 1972

	1970 to 1971		1971 to 1972	
	Billions of Dollars	Per Cent Increase	Billions of Dollars	Per Cent Increase
CEA Projection (2/2/71)	$88.2	9.0%	$120.9	11.4%
St. Louis Model Projections				
1) with 6 per cent money growth and Government spending based on fiscal 1972 budget (CEA policy assumptions)	67.6	6.9	77.9	7.5
2) with 8 per cent money growth and Government spending based on fiscal 1972 budget	74.4	7.6	99.5	9.5
3) with 6 per cent money growth and accelerated Government spending	71.4	7.3	81.9	7.8
4) with 8 per cent money growth and accelerated Government spending	78.2	8.0	103.5	9.8

(2) an increase of Federal spending as proposed and a faster 8 per cent rate of expansion of the money stock;

(3) a faster increase of Federal spending than proposed and a 6 per cent rate of expansion of the money stock; and

(4) both a faster increase of Federal spending than proposed and an 8 per cent rate of expansion of the money stock.

According to the St. Louis methodology (Table VI), the planned policies would not yield a growth in total spending of 9 per cent in 1971. Since the model is subject to error, the question arises whether this discrepancy is within the range of possible error. For this purpose, the model was used to forecast one year ahead, quarter by quarter from 1966 through 1970. The largest error in prediction of total spending was $8 billion, or substantially less than the $20 billion discrepancy between the CEA projection and the St. Louis model projection based on their policy assumptions.[9] The possibility of error in the St. Louis model cannot be ruled out, but it seems most likely that continuation of monetary and fiscal stimulus in 1971 of roughly the same magnitude as we had in 1970 will not foster a sharp acceleration in growth of total spending in 1971. Because the monetary and fiscal restraint of 1968 and 1969 is fading into the past, total spending is projected to advance more rapidly in 1971 than in 1970, but not markedly so.

[9]These forecasts were based on estimation of the total spending equation for a sample period through 1966, then 1967, etc., and using actual money and expenditures to generate the forecasts outside of the sample period. Perhaps more relevant for the current situation is the performance of the model around business cycle turning points. Within the sample period of 1953 to 1970, the average error for the four-quarter period following business cycle troughs was $5.3 billion, or 1 per cent of GNP in the four-quarter period ending with the trough quarter.

To determine if some other combination of policies might not yield the targeted growth of total spending, the impact of alternative policy assumptions was examined with the St. Louis methodology. Table VI suggests that the combination of more expansionary monetary *and* fiscal actions yields a total spending projection closer to the CEA's, but it still falls short by a substantial amount.

Implications of CEA total spending goal — The 1970 economic plan was in error primarily with respect to its distribution of total spending change between prices and real product. To assess the implications of the St. Louis methodology for real product, prices, and unemployment, the CEA projections of total spending were assumed for the St. Louis model. Without concern for how the total spending is going to be achieved, Table VII shows the implied paths for real product, prices, and unemployment.[10]

According to these estimates based on the St. Louis model, real product would rise about 4 per cent from calendar 1970 to calendar 1971, compared with the CEA projection of 4.6 per cent. As a result, the St. Louis model suggests unemployment would average 5.5 per cent in calendar 1971, or slightly above the CEA projection of 5.3 per cent. Furthermore, the St. Louis model indicates that the CEA projection of total spending would lead to a 4.9 per cent advance of prices in 1971, compared with the CEA estimate of 4.2 per cent.

The difference between the CEA projections and those based on the St. Louis methodology becomes more evident when examined with reference to 1972. The CEA projections imply that real product would continue its strong advance in 1972, rising 7.7 per cent above 1971, and push the unemployment rate down to a 4.4 per cent average for the year. The St. Louis model also indicates a rapid increase of real product, but at a slower 6 per cent rate of advance. Unemployment would be reduced for 1972 to 5.1 per cent of the labor force. In sharp contrast with the CEA projection of a 3.4 per cent increase in prices in 1972, the St. Louis model shows a 5.2 per cent increase.

[10]Given the proposed Federal budget program, the St. Louis model indicates that a 12 per cent rate of increase in money beginning in first quarter 1971 would be required to achieve the CEA projection of a 9 per cent increase in GNP in calendar 1971.

Table VII

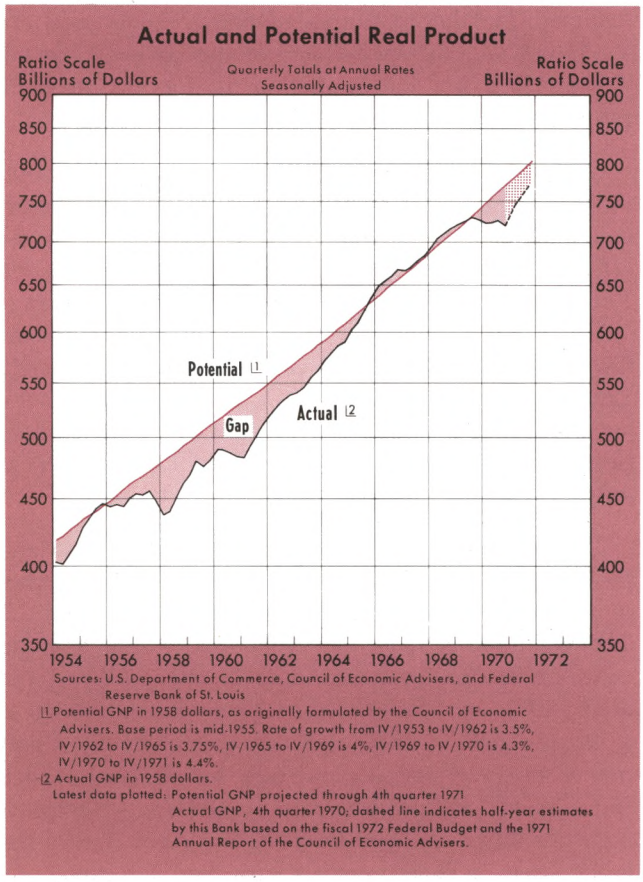
Projected Changes in Spending, Output, Prices and Unemployment — 1970 to 1972

(Per Cent*)

	1971					1972				
	I	II	III	IV	Year	I	II	III	IV	Year
CEA Projection (2/2/71)**										
Total Spending	13.0%	11.5%	11.8%	11.3%	9.0%	11.7%	11.2%	11.0%	10.5%	11.4%
Real Product	9.4	6.8	7.7	7.3	4.6	8.0	7.8	7.7	7.5	7.7
Prices	3.2	4.4	3.8	3.7	4.2	3.4	3.1	3.1	2.8	3.4
Unemployment Rate	5.7	5.5	5.2	4.9	5.3	4.7	4.5	4.2	4.0	4.4
St. Louis Model Projections										
1) with CEA total spending assumption										
Total Spending	13.0	11.5	11.8	11.3	9.0	11.7	11.2	11.0	10.5	11.4
Real Product	8.5	6.1	6.3	5.9	3.9	6.2	5.9	5.8	5.5	6.0
Prices	4.1	5.1	5.2	5.2	4.9	5.2	5.1	5.0	4.9	5.2
Unemployment Rate	5.6	5.6	5.5	5.4	5.5	5.3	5.1	5.0	4.9	5.1
2) with 6 per cent money growth and Government spending based on fiscal 1972 budget (CEA policy assumptions)										
Total Spending	11.1	6.4	9.1	7.2	6.9	6.9	8.1	7.3	7.0	7.5
Real Product	7.6	2.0	4.7	3.0	2.5	2.9	4.4	3.7	3.7	3.5
Prices	3.2	4.3	4.2	4.1	4.3	3.9	3.7	3.4	3.2	3.8
Unemployment Rate	5.6	5.8	5.9	5.9	5.8	6.0	6.1	6.1	6.1	6.1

*Per cent changes for total spending, output and prices are at compounded annual rates; unemployment rates are levels.

**Quarterly pattern estimated by this Bank based on the *1971 Annual Report of the Council of Economic Advisers* and amplifying statements by the CEA.



In summary, introducing the CEA projection of total spending into the St. Louis model leads to the conclusion that such a policy of rapid spending growth would provide slight gains in reducing unemployment. However, such gains would be at the cost of no gains in the battle against inflation.

Summary

The Administration has forecast that the U. S. economy in 1971 will attain reductions of unemployment and inflation simultaneously. To achieve these goals, a rapid expansion of total spending has been proposed. According to methodology developed at this Bank, the projected increase in total spending is not consistent with the policy actions proposed by the Administration. A much slower increase is more likely.

Furthermore, when the targeted increase of total spending is accepted (which is only possible in the St. Louis model with a very rapid acceleration of monetary and/or fiscal stimulus), the goals for unemployment and prices also appear too optimistic. Our model suggests that such a policy of rapid spending growth would lower unemployment, but inflation would continue unabated.

The nation is faced with a serious dilemma, but a search for quick and easy solutions may be self-defeating. The current inflation developed persistently over a substantial period of time. For this reason the current problem defies a fast and smooth adjustment to high employment with price stability. Monetary actions consisting of a 5 to 6 per cent annual rate of growth in money, and fiscal actions consisting of an 8 per cent annual rate of advance in Federal expenditures, appear to be consistent with an orderly, but slow, return to a viable high-employment path. The post World War II economic experience does not indicate that the present unemployment-inflation dilemma can be solved as quickly as the CEA has suggested.

An Appendix to this article is on the next page.

APPENDIX

ALTERNATIVE BUDGET CONCEPTS

All references to the Federal budget in the preceding article are in terms of the national income accounts budget. This appendix discusses three budget concepts to provide the reader with an understanding of their interrelations.

Unified Budget

The unified budget was adopted as the Government's basic planning document in January 1968, replacing both the administrative and consolidated cash budgets. Expenditures and receipts are recorded on a cash basis (when the checks are issued or the payment received). This budget will be presented on an accrual basis after accounting procedures are revised. Net transactions of trust funds are included in this budget. All lending activities of the Government as well as certain Government-sponsored agencies are described in the unified budget, but only certain direct loans are included in the figures for total outlays (expenditures plus net lending). (For a complete discussion of Federal lending activities see "Special Analysis E" in *Special Analyses: Budget of the U. S. Government, Fiscal Year 1972).*

The unified budget is presented to Congress for approval by the President in January or February of every year, for the fiscal year ending June 30, eighteen months hence. Also included are revised figures for the current fiscal year ending approximately six months later. The Office of Management and Budget normally revises the budget figures for the coming fiscal years in the spring and fall of every year. The current data are published by the Treasury Department on a monthly basis.

National Income Accounts Budget

The national income accounts (NIA) budget presents the receipts and expenditures of the Federal Government as an integrated part of the economy, as represented by the national income and product accounts. The major differences between the NIA budget and the unified budget are: (1) the NIA budget excludes all lending transactions; (2) tax receipts in the NIA budget are, in general, recorded on an accrual basis (corporate income taxes are accrued when the income is earned rather than when the Government receives payment, and personal income taxes, most of which are withheld from earnings or paid on a quarterly basis, are recorded when the taxpayer makes payment); (3) on the expenditure side, defense purchases are recorded when the items are received by the Government rather than when they are produced or paid for.

The NIA budget is developed in conjunction with the rest of the national income accounts by the Department of Commerce. It is published on a quarterly basis, seasonally adjusted at annual rates. ("Special Analysis A" in the fiscal 1972 budget contains a more detailed description of the reconciliation of the unified budget with the NIA budget.)

High-Employment Budget

The high-employment budget is based on the NIA budget; however, it is adjusted to remove the effects of the level of economic activity on the NIA budget. For example, during a recession NIA receipts will tend to fall in response to lower levels of income, and NIA expenditures for unemployment benefits will rise. The resulting move toward deficit in the NIA budget, however, implies expansionary policies when, in fact, the opposite might be occurring.

The high-employment budget reflects primarily discretionary changes in fiscal policy, such as a change in the tax rate structure or a change in the pattern of expenditures. The high-employment budget estimates published by this Bank are based on potential gross national product as defined by the Council of Economic Advisers. In their 1970 *Annual Report,* the CEA defined potential GNP as the output of the economy at a 3.8 per cent unemployment rate. Income shares and tax rates, estimated at high-employment levels, are applied to potential GNP in current dollars to arrive at the high-employment budget data. Such data are not published regularly by any Government agency. Estimates prepared by this Bank are published in the quarterly release, "Federal Budget Trends."

The Implementation Problem of Monetary Policy

by ALBERT E. BURGER

During the last two decades, there has been considerable controversy regarding the appropriate method of implementing monetary policy. One approach emphasizes market interest rates; the other, monetary aggregates. This article sets forth the basic issues underlying this controversy. It demonstrates the manner in which the market interest rate approach can lead to perverse monetary actions; whereas the monetary aggregate approach reduces the likelihood of such a result.

DECIDING UPON an ultimate objective for monetary policy, such as a more rapid increase in employment or a reduction in inflation, is only one part of monetary policy. The policymakers must also implement such a policy decision. A considerable amount of study has been devoted to this problem, resulting in numerous technical papers, several conferences, and some rather sharp differences of opinion among economists about the best way to implement policy decisions. This article explains this problem in a simplified form and highlights some of the areas of disagreement.

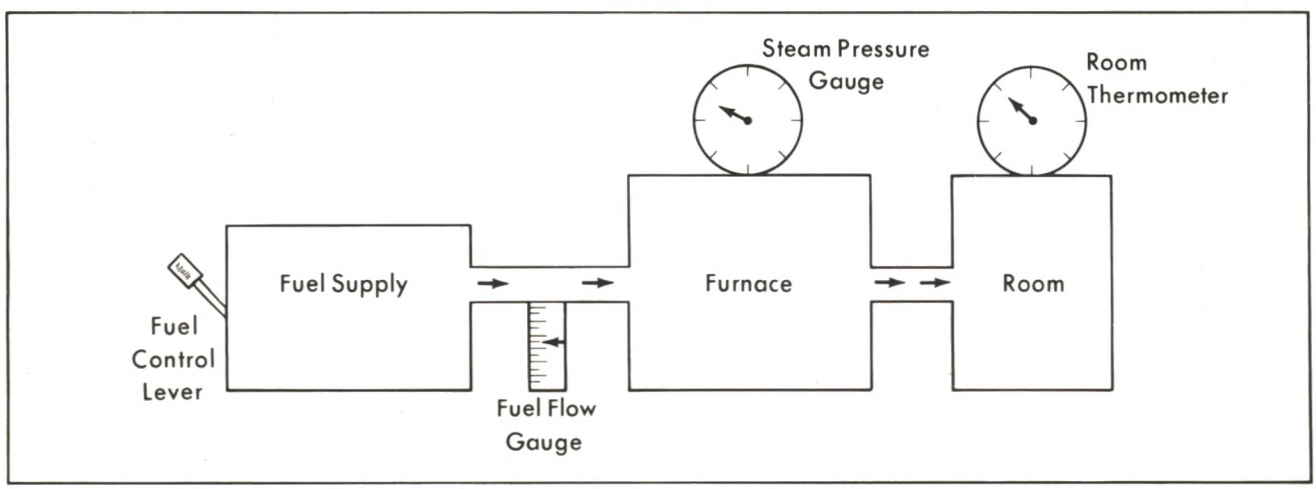
First, the implementation problem is outlined. The use of indicators and operational targets as an aid in implementing policy is then discussed. Next, two hypotheses about the way in which the Federal Reserve's policy actions are transmitted through the economic system are presented. Finally, this framework is used to illustrate how alternative policy prescriptions can develop.

The Implementation Problem

The monetary policy process consists of two broad phases. The policymakers must first decide upon the movements they desire to achieve in their ultimate policy objectives such as prices, output, and employment. Second, they must decide how to manipulate policy instruments such as open market operations, reserve requirements, and the discount rate to achieve these desired effects on their ultimate objectives. This is the implementation phase of policy.

To analyze the implementation problem we shall use the physical analogy of heating a room with a steam furnace. First, let us set up the heating system, as shown in Exhibit 1. Our policymaker is Mr. Homeowner. His policy problem is to maintain the temperature in his house at a comfortable level. He uses his room thermometer to give him a measurement of whether the room temperature is moving in the direction he desires (the room is getting hotter or colder). The means by which he implements a decision to change the room temperature is to adjust the fuel control lever. If, for example, he wants the room temperature to rise, he adjusts the fuel control level to increase the flow of fuel to the furnace. He then judges whether he has correctly adjusted the fuel lever by watching the room thermometer. He knows there is a lag between the time he adjusts the fuel control lever and when the room temperature begins to rise. Taking this lag into account, if the reading on the room thermometer does not rise sufficiently, he would again adjust the fuel control lever.

Exhibit I



It is worth emphasizing that the goal of Mr. Homeowner is a comfortable room temperature, not some reading on the thermometer. The thermometer is only a device that helps him to monitor the heating process.

However, let us assume that Mr. Homeowner has an old furnace, and he is not confident that it works exactly the way the manufacturer claims it should. He installs two intermediate gauges to help him in his control process; a fuel flow gauge to monitor the flow of fuel between the fuel supply and the furnace, and a steam pressure gauge on the furnace to monitor the operation of the furnace. For example, the fuel flow gauge helps the homeowner check for leaks in the fuel line. If this gauge registers a leak, then the homeowner knows that the fuel flow must be increased to maintain the same heat from the furnace.

Monetary Policy

Now let us convert this discussion into an analogy with the implementation problem of monetary policy. The fuel control lever becomes the policy instruments of the Federal Reserve; open market operations, reserve requirements, and the discount rate. The furnace becomes the financial system, and the room becomes the real sector of the economy. Mr. Homeowner becomes the Federal Open Market Committee, and the policy objective becomes something such as employment, prices, and real output, instead of room temperature. The room thermometer becomes a measuring instrument such as the unemployment rate, consumer price index, and GNP in constant prices.

Monetary policy implementation would be much easier if there were complete information about the way in which policy instruments, financial variables, and real variables are interrelated. It would only involve manipulating the policy instruments in a way that would have a known and desired effect on the levels and rates of change of the ultimate objectives of monetary policy. Just as our homeowner, with complete information about how his furnace operates, would know where to set the fuel control lever to get the desired room temperature, the policymakers would know how close, by manipulating the policy instruments, they could come to achieving their desired ultimate policy objectives. There would be no possibility of a "slip twixt cup and lip." The policy instruments could simply be set at definite values, and the desired goals of policy would be achieved subject to any constraints.

Indicators and Operational Targets

The indicator-operational target approach is a pragmatic method of improving the implementation of monetary policy. It starts with the fact that no one has perfect information about the way policy actions filter through the economy, are modified by other factors, and ultimately influence real output, prices, and employment. Economic research, however, has provided some theoretical and empirical information about these linkages. The indicator-operational target approach attempts to employ this information to guide the process by which policy is implemented.

Policymakers are concerned with two major questions when implementing policy. First, what effects are monetary influences exerting on the ultimate policy objectives? Are monetary influences exerting a more, a less, or an unchanged expansionary influence on the future rates of change of prices and employment? An indicator provides information about this question. Second, policymakers want to know how they should manipulate their policy instruments to insure that monetary influences are modified to continue exerting the effect desired by the policymakers. An operational target provides a method for answering this second question.

Indicators

A monetary policy indicator is an economic variable that provides information about the current thrust of the financial sector, including Federal Reserve actions, on future movements in the ultimate policy objectives. Empirical evidence confirms that the effect of monetary policy actions on the ultimate policy objectives is distributed over time. Hence, the Federal Reserve cannot accurately judge the degree of "ease" or "restraint" its current policy actions are exerting on the ultimate objectives of policy by looking directly at measuring instruments such as the consumer price index and the unemployment rate. Current changes in the ultimate objectives primarily reflect the effects of policy actions taken in previous periods.

A further point must be clarified. Policymakers do not need an indicator to tell them their current *intent* of policy. They know what they intend to accomplish with their policy actions.[1] Policymakers

[1]Since the intent of current policy is not made public until about 90 days after the FOMC Meeting in the "Record of Policy Actions of the FOMC" appearing in the Federal Reserve *Bulletin*, a measure of policy intent may be of interest to market participants. However, this is a different problem from the one with which this article is concerned.

want information about the influence their past policy actions are exerting on the future course of the economy.

The choice of an indicator involves choosing some financial variable that consistently provides reliable information about the current influence of the financial sector, including Federal Reserve actions, on future economic activity. In general terms, this requires that the following relationship holds between the indicator and the ultimate policy objectives:

> A change in the magnitude of the indicator is followed by a predictable change in the magnitude of the ultimate objectives of monetary policy.

An economic variable that meets the above criterion can serve as a "scale" that permits policy advisers to make meaningful statements about the relative effects of different policy actions on the ultimate policy objectives. It provides a means of relative comparision of different sets of policy actions; not necessarily an absolute means of comparison.

The usefulness of an indicator hinges on whether or not it consistently supplies reliable information to the policymakers. If at times the ultimate policy objectives move in a direction opposite to the direction predicted using a given indicator, then in such instances the indicator provides false information to the policymakers about the thrust of their policy actions on the ultimate objectives of monetary policy.

Operational Targets

An operational target for monetary policy is an economic variable the Federal Reserve attempts to control directly in its day-to-day money market operations. Following each Federal Open Market Committee (FOMC) meeting, the Committee issues a directive to the New York Federal Reserve Bank. The day-to-day implementation of open market operations is carried out by the Trading Desk at the New York Bank. In general, these directives have traditionally been worded in broad terms such as:

> . . . maintain the prevailing firm conditions in the money and short-term credit markets.

Although the directive may appear to be worded in somewhat ambiguous terms, the Trading Desk does not randomly buy and sell securities. It chooses some financial variable or variables to control and aims its day-to-day operations in the money market at controlling this operational target. The operational target, to be of greatest usefulness, should satisfy three basic criteria as follows:

(1) The Federal Reserve should be able to accurately measure the magnitude of the operational target over very short periods of time.

(2) The Federal Reserve should be able to control the operational target by manipulating policy instruments. In a very short period of time, the Federal Reserve should be able to offset any other factors acting to change the magnitude of the operational target.

(3) Changes in the magnitude of the operational target over an intermediate period of time should dominate changes in the magnitude of the economic variable chosen as an indicator.

The question may arise as to why the concept of an operational target has to be introduced once an indicator is chosen. Why cannot the Federal Reserve aim day-to-day operations directly at the indicator? The necessity for the introduction of operational targets, like indicators, arises basically from the lack of perfect information. At a minimum, the Trading Desk must have some means of evaluating whether its day-to-day operations in the money market are in accord with the intent expressed by the Federal Open Market Committee. To maximize the effectiveness of its daily operations in the money market, the Federal Reserve needs accurate information regarding the influence of these actions. In the short-run many other factors usually influence the movement of intermediate variables such as the money stock and interest rates. If these intermediate variables are used as operational targets, then the short-run influence of other factors frequently causes these variables to transmit misleading information to the policymakers about the effect their day-to-day policy actions are exerting on the intermediate-term movements of the indicator variables.

In our furnace analogy, the operational target becomes the fuel supply. An indicator is a gauge set in the process by which monetary policy actions are transmitted to the real sector of the economy. Usually the indicator is "attached" to the financial sector. It gives the Federal Reserve a reading on how much of the fuel they are supplying (through open market operations, reserve requirements and the discount rate) is being converted into energy to drive the economy.

Two Hypotheses

The lack of complete information about the way policy actions are transmitted to ultimate objectives

requires the formulation of proposed explanations (hypotheses) about the process. A person's choice of an indicator and an operational target usually depends upon his hypothesis about the way policy actions are transmitted through the financial sector into the real sector. Disagreement among economists as to the appropriate choice of an indicator and operational target is basically a disagreement as to the correct representation of the monetary policy transmission mechanism.[2]

Two frequently used hypotheses about the transmission process of monetary policy, the Market Interest Rate Hypothesis and the Money Supply Hypothesis, are compared in Exhibit II. The policy instruments and ultimate objectives available to policymakers are the same regardless of whether they use one of these hypotheses or any other hypothesis about the transmission process. There may be differences between advocates of the two hypotheses, however, concerning the relative importance of different policy instruments and ultimate objectives.[3]

In the Market Interest Rate Hypothesis, the indicator is market interest rates. An economic variable such as free reserves (referred to as net borrowed reserves when borrowings exceed excess reserves) is generally chosen as the operational target. In a broader context, free reserves can be viewed as a substitute for a number of short-term money market factors, such as the Federal funds rate, "tone and feel of the market," and the Treasury bill rate. In the Money Supply Hypothesis, the indicator is the growth rate of the money stock (currency plus demand deposits of the nonbank public). The operational target is the net source base, total source base, or monetary base, as computed by the St. Louis Federal Reserve Bank.[4]

Exhibit II

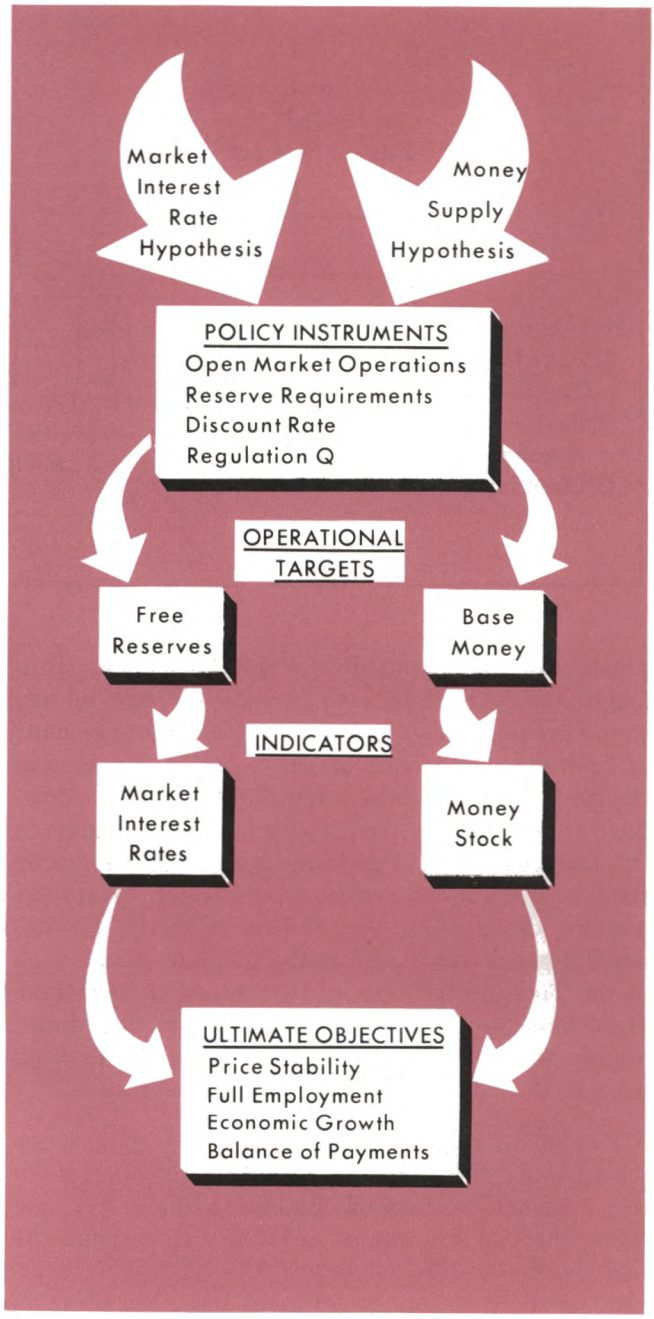


Exhibit III illustrates the analogy between the heating system and the monetary policy mechanism. The Federal Reserve looks at a wide range of data, including the unemployment rate, consumer and wholesale price indexes, and real GNP to evaluate what is happening to employment, prices, and real output. The Federal Reserve then adjusts open market operations, reserve requirements, or the discount rate to achieve its objectives with respect to employment,

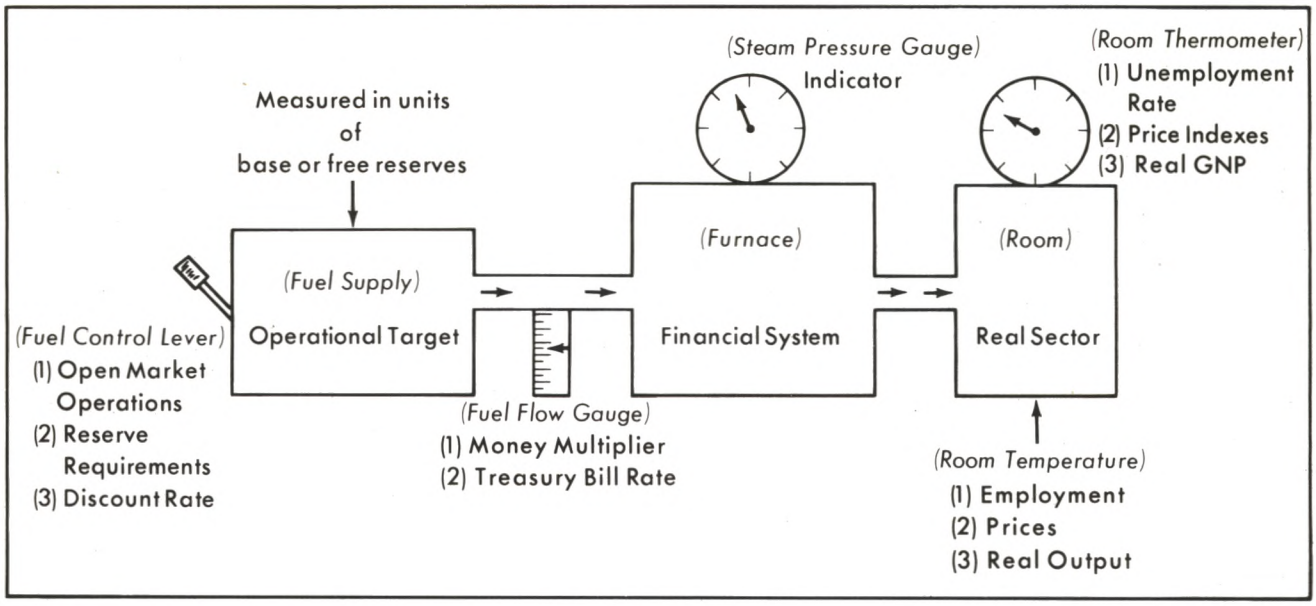
[2]In some cases, individuals may accept an economic variable, such as money, as an indicator based solely on empirical evidence, and still not accept a hypothesis in which money plays a key role in determining economic activity.

[3]For example, many supporters of the Money Supply Hypothesis have traditionally placed more reliance on open market operations and advocated very limited use of the other policy instruments, particularly Regulation Q.

[4]Increases in Federal Reserve credit (holdings of securities, discounts and advances, and float), the gold stock, and Treasury currency outstanding increase the stock of source base. Increases in Treasury deposits at the Federal Reserve, Treasury cash holdings, and other deposits and other Federal Reserve accounts decrease the stock of source base.

The net source base is total source base *net* of member bank borrowings. The monetary base is total source base adjusted for reserve requirement changes. See Leonall C. Andersen and Jerry L. Jordan, "The Monetary Base – Explanations and Analytical Use," this *Review* (August 1968), pp. 7-14.

Exhibit III



prices, and real output. By altering the policy instruments, the Federal Reserve changes the flow of fuel to the economy. The fuel supply is measured in units of base money or units of free reserves. To analyze the future effect of these actions on the real economy, the Federal Reserve then would look at its gauge on the financial sector, either the growth of the money stock or the level of market interest rates. To further monitor the process, the Federal Reserve may use another gauge, equivalent to the fuel flow gauge, such as the Treasury bill rate for the Market Interest Rate Hypothesis or the money multiplier for the Money Supply Hypothesis.[5] This type of gauge signals leakages in the flow of fuel to the financial system.

Examining Exhibit II and Exhibit III, we can see where some differences of opinion might arise about the influence of Federal Reserve actions. For one thing, the two hypotheses in Exhibit II measure the fuel supply by different means. One viewpoint measures the flow of fuel in terms of base, the other in terms of free reserves. Under the Money Supply Hypothesis, the Federal Reserve is supplying more fuel if the growth rate of the base increases. The Market Interest Rate Hypothesis takes an increase in the level of free reserves as a measure of an acceleration in the flow of fuel.

A second area of disagreement can develop about the manner in which the flow of fuel from the Federal Reserve is converted into a flow of total spending. Supporters of the Money Supply Hypothesis contend that an increased flow of base money into the financial sector is converted into an increased growth of the money stock, which results in an increased flow of total spending, influencing employment, prices, and real output. The alternative view is that an increased level of free reserves is converted in the financial sector into lower market interest rates, which result in an increased flow of total spending and hence real variables are influenced. In our analogy, this question may be phrased, "how is fuel converted into energy that drives the economy?"

Supporters of the two hypotheses are monitoring the progress of policy by different gauges, where the gauges are attached to the same part of the process. Since the growth of the money stock and market interest rates frequently move in the same directions, substantial divergences of opinion often arise regarding the correct policy action to take to achieve the same ultimate objective.

For example, suppose that the supporters of the Market Interest Rate Hypothesis look at their indicator (the gauge on the financial system) and

[5]The money multiplier summarizes the influence on the money supply process of all those factors other than changes in the base. By monitoring the movements of the components of the multiplier, the Federal Reserve could determine the effects of any given growth of base on the growth of the money stock. For example, an increase in the public's desired holdings of currency relative to demand deposits would decrease the growth of money associated with any given growth of base. This would be a "leakage" between the fuel supply and the furnace. By increasing the flow of base, the Federal Reserve could offset this influence on the money supply process.

observe that market rates are rising. If they desire no change in the influence of policy, they may conclude that the flow of fuel to the financial sector will not be converted into enough energy (low market rates) to maintain the rate of growth of real output and employment they desire. Hence, they would advise that policy instruments be used to raise the level of free reserves (pump in more fuel).

However, let us assume that the supporters of the Money Supply Hypothesis look at their indicator and observe that the growth rate of money is accelerating. They conclude that the fuel being supplied by Federal Reserve actions would be converted into a progressively more rapid flow of total spending, and they advise that the policy instruments should be used to slow the growth of the base (pump in fuel at a slower rate).

At this point a substantial divergence of opinion about the reason for the change in market interest rates arises between the supporters of the two hypotheses. This difference of analysis has important implications for the conduct of monetary policy. The supporters of the Market Interest Rate Hypothesis contend that Federal Reserve policy actions are dominating the movements in interest rates and that the rise in market rates will result in a slowdown in the real economic activity. The supporters of the Money Supply Hypothesis, however, contend that changes in the public's demand for credit are dominating movements in market interest rates and that Federal Reserve actions through their influence on total spending are influencing the public's demand for credit. In terms of our analogy, the Money Supply Hypothesis asserts that the market interest rate indicator is not insulated from developments in the real sector. As the real sector heats up (employment, real output, and prices rise), this influences the readings on the market interest rate indicator.

To analyze the importance of this difference of analysis, we shall first discuss the interdependence of free reserves and the base. Then the implications for monetary policy of this interdependence are examined. *In the following presentation, the net source base is used, and hereafter when the terms "base money" or "base" are used, they will refer to net source base.* The same results may be derived by using the monetary base or source base.

Interdependence

Free reserves are calculated by subtracting member bank borrowings from member bank excess reserves. One of the components of the source base on the *uses* side of the balance sheet is member bank excess reserves. The net source base is obtained by subtracting member bank borrowings from the source base. Therefore, the components of the net source base may be combined so that free reserves is one of the uses of the net source base.[6] If the Federal Reserve alters the level of free reserves, and if currency held by the public and vault cash in nonmember banks are held constant, the net source base is changed in the same direction. Free reserves and the net source base are not independent of each other. Actions taken by the Federal Reserve to alter or maintain the existing value of one of these operational targets exert an influence on the other.

To analyze the importance of this interdependence, the bank credit market is introduced. Supply and demand conditions in this market are specified as follows:

$aB = S$ = commercial banks' supply schedule for bank credit
D = public's demand schedule for bank credit

The equilibrium condition for the bank credit market is given as:

$$S = D$$

(Amount of credit banks are willing to supply = amount of bank credit demanded by the public).

In the above expression, (a) denotes the bank credit multiplier, which is the connecting link between the amount of net source base (B) and the amount of credit banks are willing to extend.[7]

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[6]In this article, the net source base is denoted by B. Generally this concept is denoted as B^a. The superscript has been removed to avoid any confusion that might arise when the bank's credit supply curve is specified later.

The net source base is defined in the following manner:

$$B = R^m - A + V + C^p$$

where: R^m = member bank reserves = $R^r + R^e$
V = vault cash holdings of nonmember banks
A = member bank borrowings from the Federal Reserve Banks
C^p = currency held by the nonbank public
R^e = excess reserves of member banks
R^r = required reserves of member banks

Free reserves (R^f) are defined as follows:

$$R^f = R^e - A$$

The relationship between the net source base and free reserves can be expressed as follows:

$$B = (R^e - A) + R^r + C^p + V = R^f + R^r + C^p + V$$

[7]The money multiplier and bank credit multiplier summarize all those factors, other than changes in the net source base, that affect the money supply process. When the monetary base is used, the influence of reserve requirement changes and member bank borrowings are included in movements in

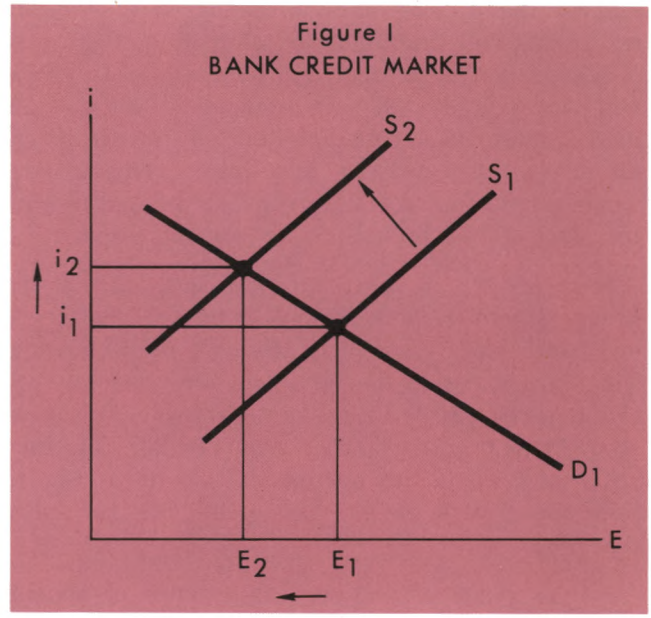
Both the bank credit multiplier, and hence the amount of credit banks are willing to extend, and the public's demand for bank credit are dependent upon the bank credit market interest rate.

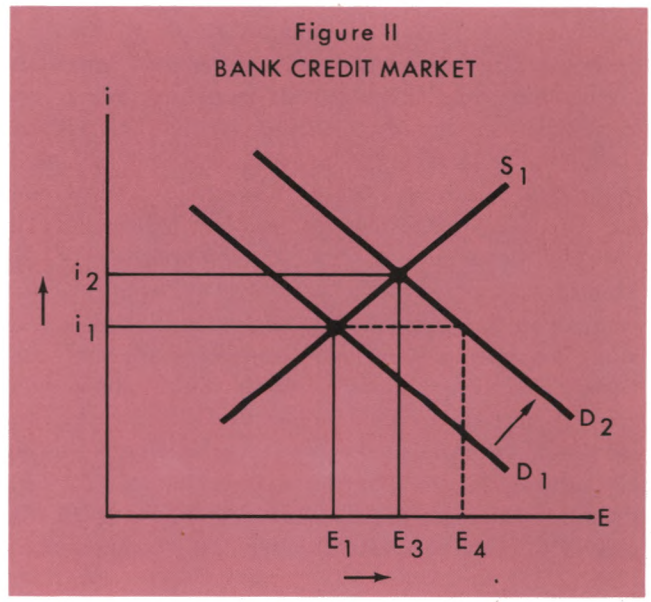
The public's demand for bank credit and the bank's credit supply also depend upon a number of other factors. For example, the public's demand for credit depends upon the expected rate of return on real capital and upon price expectations. The banks' supply of credit depends upon the amount and rate of growth of the net source base. In our following illustrations, these factors would appear as shifts in the supply and demand schedules.

A rise in market interest rates could result from either a shift in the credit supply curve, or a shift in the credit demand curve, or some combination of the two. The effect of a shift in the credit supply curve is shown in Figure I. The credit supply curve shifts from S_1 to S_2 and, in the resulting adjustment process, the interest rate rises to i_2 and bank credit outstanding falls to E_2.

Now let us look at an alternative explanation for the rise in market rates. Suppose that the rise in rates was due to a shift in the public's demand for credit. This appears as a shift to the right of the public's demand curve from D_1 to D_2, as shown in Figure II.

At the market interest rate (i_1), the quantity of bank credit demanded by the public (E_4) exceeds the amount of credit the banks are willing to supply (E_1), given the stock of base and the value of the bank credit multiplier. If the Federal Reserve System does not increase the growth rate of the net source base in response to the rise in interest rates, but permits market interest rates to adjust to clear the credit market, the interest rate rises toward i_2. As the yields on loans and securities rise, the amount of credit banks are willing to supply rises; banks reduce their excess reserves, increase borrowings from Federal Reserve Banks, and raise the yields they offer to attract time deposits.[8] The new equilibrium quantity of bank credit demanded and supplied is E_3.





The policymakers do not observe these supply and demand curves shifting up and down: all they observe is the increase in the reading on the market interest rate indicator. If the policymakers believe

the base, instead of in the multiplier. The money multiplier associated with the net source base is:

$$m^1 = \frac{1+k}{(r-b)\ (1+t+d)+k}$$

k and d, respectively, are the ratios of currency held by the public and U.S. Government deposits at commercial banks to the demand deposit component of the money stock.

r, b, and t, respectively, are the ratios of bank reserves, member bank borrowings, and time deposits to commercial bank deposit liabilities (excluding interbank deposits).

The reserve ratio, (through the dependence of banks' derived excess reserves), the borrowing ratio and the time deposit ratio are all dependent upon credit market interest rates.

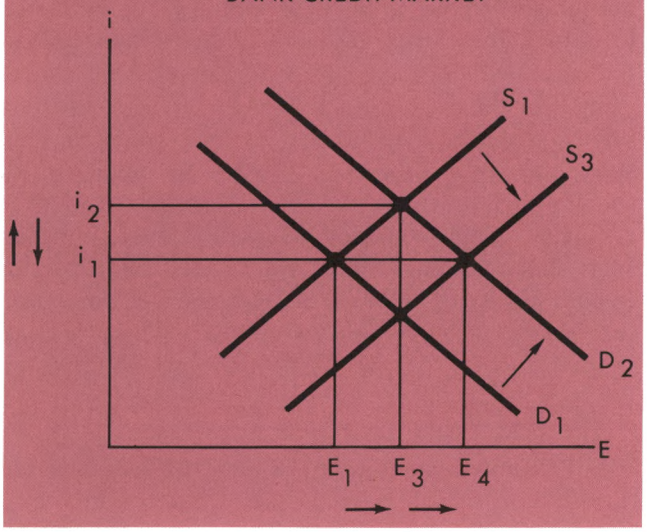
For an illustration of the derivation of a money multiplier, see Jerry L. Jordan, "Elements of Money Stock Determination," this *Review* (October 1969) pp. 10-19.

[8]Whether bank credit increases or decreases depends upon the relationship between Regulation Q ceiling rates and the yields banks offer on time deposits. If banks are already at Regulation Q ceilings, then an increase in the public's demand for credit resulting in a rise in market interest rates may lead to disintermediation and a decrease in bank credit.

the rise in market rates to i_2 represents a leftward shift (decrease) in the credit supply curve, as in Figure I, and they desire no change in the influence of policy, they may now increase their purchases of securities to raise the level of free reserves. This policy action, according to the Market Interest Rate Hypothesis, would shift the credit supply curve to the right, from S_2 back toward S_1, and market yields would decline from i_2 back toward i_1.

If, however, the rise in rates resulted from a rightward shift of the public's demand for credit (as shown in Figure II), then to prevent market interest rates rising to i_2, the Federal Reserve must expand the net source base enough to shift the banks' credit supply curve to S_3, as shown in Figure III. At a market interest rate of i_1, banks are now willing to supply a larger amount (E_4) of credit. Under these conditions, the operational policy of raising free reserves, which accelerates the growth of the base, results in a more rapid expansion of bank credit and money than would result in the situations illustrated by Figures I and II.

Figure III
BANK CREDIT MARKET



Supporters of the Money Supply Hypothesis assert that Federal Reserve actions shifting the credit supply curve would be self-defeating, if the rise in market rates reflected a shift in the public's demand curve. In a situation such as that illustrated by Figure III, the money stock expands very rapidly. The Money Supply Hypothesis predicts that market rates would only temporarily remain at i_1. As the feedback effect of the rise in the money stock on total spending is reflected in the public's demand for credit (shifting the demand curve further to the right), the Federal Reserve would again have to increase the net source base to maintain the market yield at i_1. Under these conditions, changes in the base are determined by shifts in the public's demand for bank credit via the reaction of the monetary authorities. This implies that the Federal Reserve would give up its control over the money supply process. Total spending would rise at a progressively more rapid rate and interest rates would increase.

Implementing Policy Under Different Economic Conditions

This section illustrates how alternative policy prescriptions can arise in response to changing economic conditions. Two different sets of conditions are specified, and the monetary policymakers are assumed to make a policy decision based upon this information.

Condition 1

State of the economy: The economy is operating at full employment. An increasing proportion of total spending is reflected in rising prices. Commercial banks have raised their offering rates on time deposits to Regulation Q ceiling rates.

Policy decision: Policymakers shift the focus of their attention from real output and employment to achieving stable prices.[9]

Using the Market Interest Rate Hypothesis, policymakers reason that interest rates must be pushed higher to slow total spending and bring aggregate demand in line with the productive capacity of the economy. Consequently, they adopt an operating strategy designed to raise market rates. This involves using policy instruments to reduce the level of free reserves. The Trading Desk is instructed to "pursue open market operations with a view to obtaining tighter money market conditions." The result of these open market actions is to decrease the growth rate of the base, which results in a slowing in the rate of expansion of the money stock.

As market interest rates continue to rise, banks can no longer compete for time deposits and disintermediation begins. Consequently, the amount of earning assets banks can hold declines. In restructuring their portfolios, banks attempt first to reduce their holdings of lowest-yielding assets. The time sequence of this process would probably be declines in their holdings of short-term Government securities first,

[9]This shift in focus of attention does not mean the policymakers now ignore the growth rate of real output and employment. The ability of the policymakers to achieve a price objective is conditioned by the influence of their policy actions on real output and employment.

followed by declines in holdings of municipal securities. As long as possible, banks try to reduce holdings of securities in order to continue to acquire business loans.[10]

The impact in the credit market is a sharp decline in the prices of municipal bonds and Government securities. Cries of a liquidity crisis, or "credit crunch" may arise in the financial community. Other financial intermediaries such as savings and loan associations are also affected by the rapidly rising interest rates. Added to the outcry from the securities markets may be the asserted danger of some possible failures of savings and loan associations. The economists who use market interest rates and other financial market conditions as their indicators might warn, in terms of our furnace analogy, that "there is too much pressure and the furnace is going to blow up!"

The scenario outlined in this stage corresponds, in rough form, to monetary policy in 1966. In late 1965 and early 1966, monetary policymakers moved to a more restrictive monetary policy aimed at reducing the "emergence of inflationary pressures." During the summer of 1966 the Federal Reserve pursued a progressively more restrictive policy. As market interest rates rose above Regulation Q ceiling rates, the Board of Governors did not raise Regulation Q ceiling rates. As funds flowed out of banks and nonbank savings institutions, these institutions faced a new and costly period of portfolio adjustment. The result of these policies culminated in August 1966 in a relatively short-lived liquidity crisis, called the "Credit Crunch of 1966."[11]

Under such conditions, the Federal Reserve policymakers face a very difficult decision. Using interest rates as indicators, the information transmitted to them is that they are following very restrictive policies. Slower growth of bank credit, and other information transmitted to them directly from financial markets and the financial intermediaries, reinforce this view. The correct operating strategy now appears to be to reverse quickly open market operations, and "ease the pressures in the financial markets."[12]

[10]The rise in the share of loans in bank assets during periods when banks must reduce the total volume or growth rate of bank credit also reflects the long-run profitability of bank-customer relations. See Edward J. Kane and Burton G. Malkiel, "Bank Portfolio Allocation, Deposit Variability, and the Availability Doctrine," *Quarterly Journal of Economics* (February 1965), pp. 113-34.

[11]See Albert E. Burger, "A Historical Analysis of the Credit Crunch of 1966," this *Review* (September 1969), pp. 13-30.

[12]It should also be noted that the Federal Reserve does not make policy decisions in a vacuum. At such times the Federal Reserve may be under considerable public or government pressure to ease its policy.

If the money stock is being used as an indicator, the reduced growth rate of money resulting from the slowing in the rate of increase of the base also signals that the policymakers have begun to exert a less expansionary influence on the ultimate policy objectives. However, the supporters of the Money Supply Hypothesis would argue that the sharp rise in credit market interest rates and the "above average liquidity pressures in the financial market" do not necessarily signal the desirability of a significant reversal of operating strategy. The key elements of a less expansionary monetary policy are a reduced expansion of demand deposits and bank credit. This is the necessary preliminary to the desired policy objectives of reduced aggregate demand and hence a reduced rate of increase of prices.

An analysis based on the Money Supply Hypothesis agrees that a continued operational policy of restricting the growth rate of the base would, in the short-run, lead to higher levels of market interest rates. Over the intermediate-term, however, the resulting slower growth of the money stock would exert a dampening influence on total spending. The slowdown in total spending would exercise a dampening influence on the upward pressures on prices and also lead to a reduction in the demand for credit. Hence, pursuing such an operational target would, according to this hypothesis, lead to lower market interest rates and the desired ultimate policy objective of lower prices.

Condition 2

Let us now assume that the policymakers have engaged in a set of policy actions that resulted in a slowing of economic activity. This permits an analysis of the implications of different methods of implementing policy in a cyclical downturn.

State of the economy: The growth rate of real output has been reduced well below its long-run potential. The level of unemployment has risen above 5 per cent.

Policy decision: Pursue a monetary policy that results in an increased growth rate of real output and hence a decreased level of unemployment.

In an economic downturn, if the Federal Reserve uses market interest rates as its indicator, it might conclude that the falling market rates signal monetary policy has become "easier" than previously. This interpretation depends upon the condition that the decrease in interest rates is resulting from a shift in the credit supply curve. If the decrease in interest rates reflects a decrease in the *demand* for credit,

then Federal Reserve policy may be "tighter" than previously. The fall in interest rates raises the banks' desired excess reserve ratio which operates to reduce the money multiplier. Also, if the downturn has been preceded by a "crunch" in the financial markets, this may also operate to raise banks' desired excess reserve ratio. If during the "crunch" the Federal Reserve exercised relatively strict administration of the discount window, this factor would lower the banks' desired ratio of borrowings to deposits. Therefore, the decline in the growth rate of money, resulting from a slower growth of the base, is reinforced by the fall in market interest rates.[13] Hence, the monetary aggregates transmit the opposite information, that policy actions are having more of a restrictive effect on the future movements of real output, employment and prices.

A rise in the member banks' desired holdings of excess reserves, and a decrease in their borrowings from Federal Reserve banks, result in a rise in the level of free reserves. Under these conditions, to reduce the operational target of free reserves below its previous level, the Federal Reserve must engage in an even more aggressive policy of open market sales. The result is an even more rapid decrease in the net source base, and hence a further downward impetus on the money supply process.

This stage might be labeled the "Let us turn it around" stage. As our previous discussion implies, the choice of an indicator and an operational target have important implications for the ability of the Federal Reserve to turn the economy around to a renewed period of expansion in the time period desired by the policymakers. To briefly outline the problems that might arise, let us assume that the policymakers decide that to achieve their ultimate objectives the money stock should increase at a more rapid rate.

However, although policymakers accept the growth rate of the money stock as their indicator, let us assume that policy is still implemented using the operational target of the Market Interest Rate Hypothesis. When judging the impact of day-to-day open market operations on the growth rate of money, the Trading Desk uses free reserves or, with equivalent results, the Federal funds rate. The growth rate of money is used to gauge the extent to which Federal Reserve actions are being converted into energy that will drive the economy upward. However, the flow of fuel is measured in free reserve units instead of in units of base.

[13]The reader may refer to footnote 7, page 25, to see how these factors would lower the money multiplier.

Under the economic conditions set forth for this stage, the equilibrium level of free reserves would be expected to rise and the Federal funds rate would fall. If the monetary authorities are guided in their open market operations by either of these operational targets, they may be reluctant to pursue an aggressive policy of open market purchases. Therefore, the growth of the base may be slower than what is required to achieve the desired growth rate of the money stock.

The policymaker's failure to achieve some publicly announced growth rate of money *does not mean* that the Federal Reserve cannot control money. The failure to reach the desired monetary growth path may result from using an inappropriate operational target. As shown earlier, if the Federal Reserve tries to resist market-determined movements of interest rates, without taking adequate account of the influence of of these actions on the growth rate of the base, policymakers may not be able to achieve the growth of money they desire. The Federal Reserve can continue to use open market operations to smooth short-run pressures in the financial markets arising from situations such as Treasury financings or a Cambodian Crisis. However, to control the growth rate of the money stock, it must consider the effect of these actions on the growth of the base, which dominates the intermediate-term growth rate of the money stock.[14] Empirical evidence has been presented that, by combining information about the past movements of money multiplier with a base operational target, the Federal Reserve can exercise reasonably close control over the intermediate-term growth rate of the money stock.[15]

Summary

This paper has presented a simplified explanation of the implementation problem of monetary policy. The actual implementation process is somewhat more complicated. For example, we assumed that the Federal Reserve had only one ultimate objective. In an actual situation its ability to achieve stable prices will be constrained by the effect that its policy actions have on employment. In our furnace analogy, this would be a case where the homeowner is concerned not only with the room temperature, but also with the relative humidity in the room. The speed with which the homeowner can increase the room

[14]For a further discussion of this point, see Allan Meltzer, "Controlling Money," this *Review* (May 1969) pp. 16-24.

[15]Lionel Kalish, "A Study of Money Stock Control," *Journal of Finance* (September 1970), pp. 761-776.

temperature to a comfortable level and still maintain a tolerable level of humidity is dependent upon a number of conditions under which the process is carried out (initial conditions), such as the outside temperature. Likewise, the ability of the Federal Reserve to influence prices while maintaining a "tolerable" level of employment will depend upon initial conditions, such as price expectations, the price and employment response of producers to a decrease in total spending, and the structure of the labor market.

Monetary policy at present and in the foreseeable future must be implemented under conditions of less than perfect information about the structural relationships linking the economy together. The indicator-operational target method uses existing knowledge to achieve efficient implementation of policy. This article has shown that the correct choice of an indicator, and an operating strategy for controlling that indicator, are important problems. If the Federal Reserve follows an indicator that is providing false information, then this can have severe consequences for prices and employment.

Movements of market interest rates and the growth rate of the money stock frequently give conflicting information about the thrust of monetary policy. The possibility of conflict between proponents of these two indicators is greatest at times when it is most important that the Federal Reserve accurately assess the thrust of monetary policy actions. The operational strategy used to influence the level of market interest rates affects the relative expansionary or contractionary influences the Federal Reserve is exerting on the money supply process. If the Federal Reserve attempts to offset changes in levels of market interest rates that result from shifts in the public's demand for credit, then the growth rate of the base becomes endogenously determined. Under these conditions, the growth of the money stock reinforces expansions or contractions in total spending and hence movements in prices and employment.

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