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REVIEW

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1973 – A Year of Inflation

by NORMAN N. BOWSHER

A MAJOR setback in the struggle against inflation was suffered during 1973. Average prices, as measured by the GNP price deflator, rose at a 6.8 percent annual rate over the first three quarters of the year. From 1965 to 1972 prices rose at an average 4 percent rate. Fiscal developments became less expansive in 1973, interest rates rose markedly, and the growth rate of the monetary base slowed slightly. Nevertheless, price stability remains an elusive goal in view of the strongly imbedded expectations of continuing inflation.

At the beginning of 1973, many observers felt that the pace of inflation might accelerate from the 3.2 percent annual rate experienced from early 1971 to late 1972, but few, if any, were able to forecast the severity of the 1973 inflation. The President's Council of Economic Advisers was quite optimistic, actually anticipating a moderate decline in the rate of price increases in the course of 1973.[1] More typical of price expectations as the year began was the sentiment expressed in the last sentence of an article which appeared in this *Review* last December: ". . . as 1973 begins, it appears to most forecasters that inflationary pressures may mount during the year."[2]

The explosion in prices that actually occurred during 1973 was startling, even to those anticipating an acceleration in price markups. In fact, many of the strong influences on prices during the year could have been only partially anticipated as the year began. Examples include: the price effects of reduced output of some feed and food crops abroad; the devaluation of the dollar in February and the subsequent additional slide in the dollar's value in international markets; the inflations in Europe and Japan; price controls which made it expedient to reduce livestock production and shut down food processing plants while demand for food was rising; and the energy crisis.

A listing of such special influences on individual prices gives an exaggerated impression of the effect of these irregular developments on the trend of average prices. Without denying the substantial impact of unusual demand and supply factors on individual prices, it appears that the previous trend of economic activity and stabilization actions taken earlier have nonetheless been the major influences on price developments in 1973. In this review of 1973, discussion is first devoted to these earlier developments. Then, after examining economic developments of 1973, an outlook for 1974 is presented.

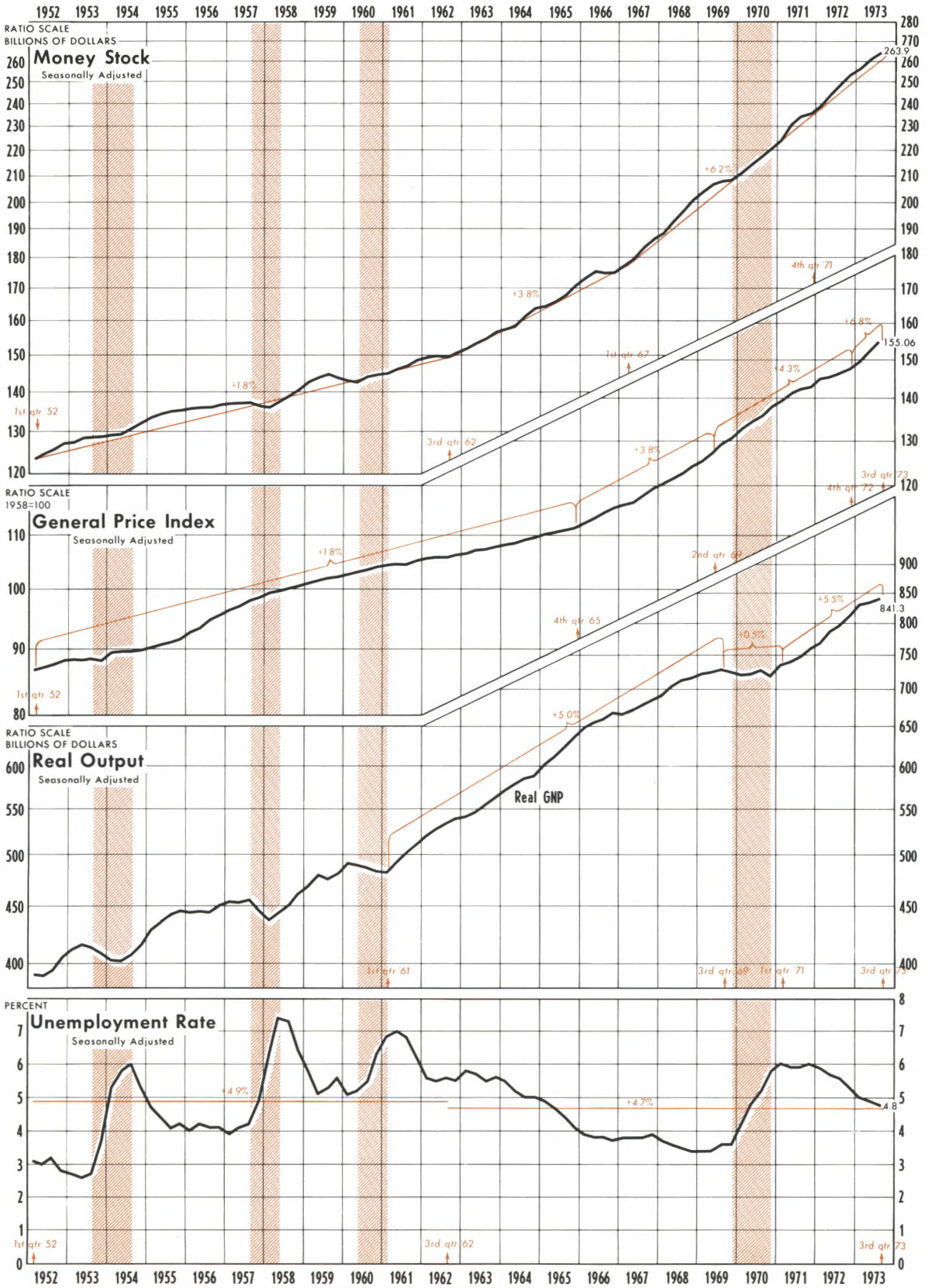
Framework of Analysis

The approach used in this discussion follows a prominent view which holds that changes in the growth rate of money have important effects on spending, prices, production, and employment. According to this view the trend growth of money over

[1] *Economic Report of the President,* January 1973, page 82.

[2] Norman N. Bowsher, "1972 – A Year of Rapid Economic Expansion," this *Review* (December 1972), p. 10.

Influence of Money on Prices, Output and Unemployment



Shaded areas represent periods of business recessionss as defined by the National Bureau of Economic Research.

Latest data plotted: 3rd Quarter

extended periods, say four years or longer, has a dominant effect on the trend of prices. Marked changes in the growth rate of money around this trend, lasting about three quarters or more, have effects on production and employment; but once a trend growth of money is fully reflected in prices, the production and employment effects vanish.

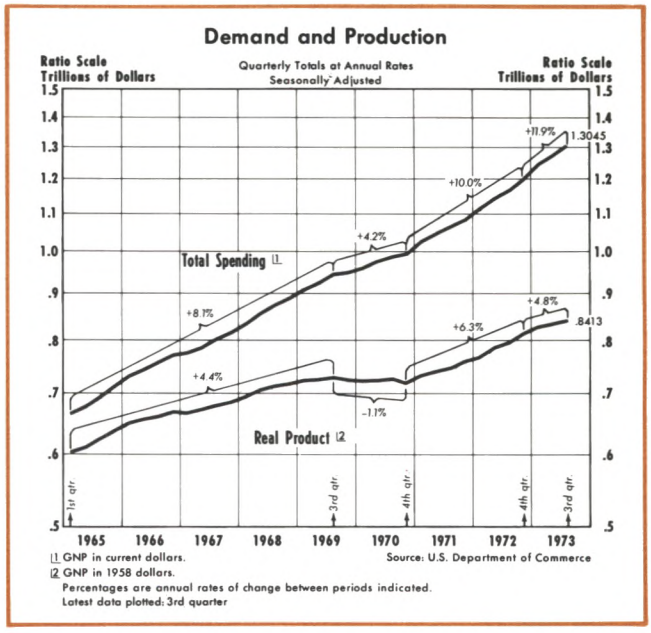
This monetary approach does not neglect the role of Federal budget developments, however. Changes in Government spending, in particular, have transitory effects on total spending in the economy for several quarters. These effects tend to be positive initially, and then are reversed as a crowding-out effect of the financing of Government expenditures results in reduction in private outlays.[3] In addition, Government taxing and spending actions can alter the allocation of income, affect long-term economic growth rates, and influence monetary growth rates.

Background

The last economic recession in this country extended from late 1969 to late 1970. From the third quarter of 1969 to the end of 1970, real output declined moderately and the unemployment rate rose. However, the recession was mild, especially when adjusted for the adverse effects of a large auto strike late in 1970. Total spending on goods and services continued to rise throughout this period at a 4 percent annual rate, or at approximately the same pace as the long-run expansion of productive capacity. The acceleration of inflation was halted, and progress was made toward price stability. During 1971, forces generating recovery appeared to be dominant. Nevertheless, it was felt by policymakers that the economy should be strongly stimulated in an effort to obtain more production and a higher level of employment within a relatively brief period.

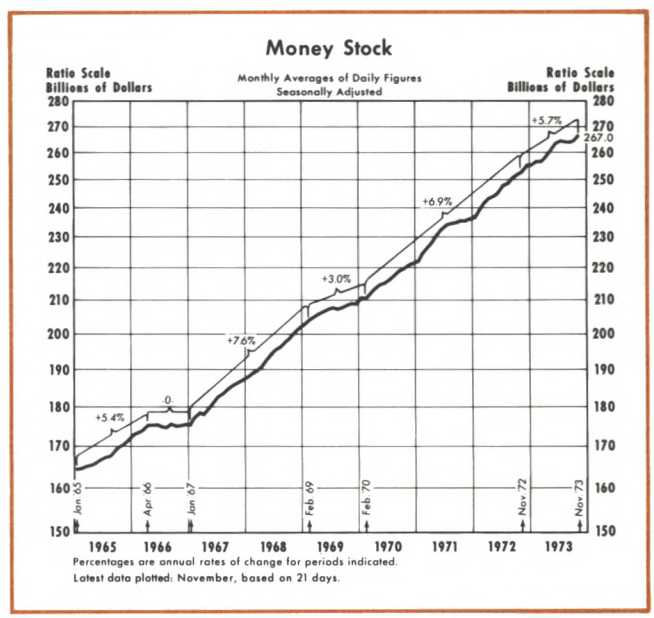
During and following the 1970 recession, fiscal actions were more expansive in an effort to stimulate economic activity. Taxes were reduced through tax reform, cuts in excise tax rates, increases in personal tax exemptions, and restoration of an investment tax credit. Government expenditures rose at an 11 percent annual rate from early 1970 to late 1972. The high-employment budget of the Government (which attempts to abstract from the influence of actual economic activity on the realized surplus or deficit) moved from a $12 billion surplus in calendar year 1969 to a $3 billion deficit in 1972.

[3]Roger W. Spencer and William P. Yohe, "The 'Crowding Out' of Private Expenditures by Fiscal Policy Actions", this *Review* (October 1970).



Monetary developments also became much more stimulative in the 1970-72 period. Growth in the money stock, which had averaged 3 percent from early 1969 to early 1970, accelerated to an average 7 percent rate from early 1970 to the end of 1972. By comparison, the trend growth of money from 1957 to 1965, when prices were relatively stable, was at an average 2.5 percent rate, and in the inflationary period of 1965 to 1968 money rose at an average 5.2 percent pace.

Reflecting the more expansive monetary and fiscal actions, total spending on goods and services accelerated markedly after 1970. Gross national product,



which rose at a 4.2 percent annual rate from the fall of 1969 to the end of 1970, climbed 9.3 percent in 1971 and 10.6 percent in 1972. During this period the rate of inflation continued to slow as a result of the delayed effects of the monetary and fiscal discipline in 1969, in addition to the initial impact of the controls on wages and prices which began with the freeze in August 1971. Prices, as measured by the GNP deflator, slowed to a 3.2 percent pace from early 1971 to late 1972 from a 6 percent pace in late 1969-early 1970.

With spending rising rapidly and the rate of inflation moderating, production, employment, and real income expanded markedly. From the last quarter of 1970 to the last quarter of 1972, total real output, for example, rose at a rapid 6.3 percent annual rate, after having declined slightly, on balance, in the previous five quarters.

Resource utilization became more intense with production rising at a much faster pace than capacity. Although some plants and workers remained unemployed, producers began finding it more difficult to obtain the resources desired for further rapid expansion. In the final months of 1972, indications of a renewal of expansionary forces were becoming evident. Despite Phase II wage and price controls, consumer prices rose at a 4.2 percent annual rate from June 1972 to January 1973, up from a 3 percent rate of increase in the first half of 1972.

Economic Activity in 1973

As the year began, the upward momentum of spending, production, and employment was strong. Stabilization actions of the Government, which usually operate with some lag, had been unusually expansive throughout 1972. The volume of unused resources was not large and was being reduced steadily. In short, strong demands for goods and services were beginning to press against limited supplies, a situation conducive to an inflationary surge.

Economic activity continued to expand at a very brisk pace during much of 1973. Total spending rose at an even faster pace in the first three quarters than it did in 1971 or 1972. Production and employment, although strongly stimulated by a vigorous demand, increased at less rapid rates as the year progressed reflecting, in part, capacity constraints. Prices, as a result, rose sharply, and for some items, where the upward trend of prices was delayed by Government controls, shortages developed.

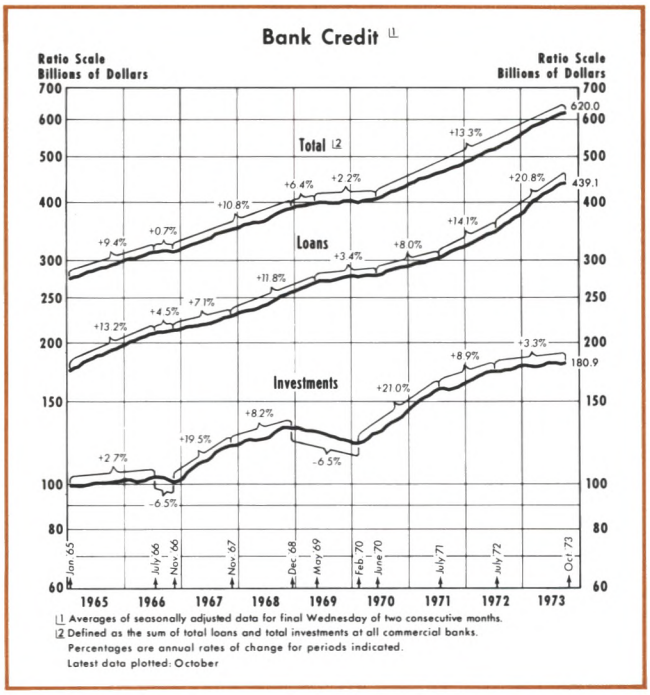
Spending – Total spending on goods and services expanded at an 11.9 percent compounded annual rate in the first three quarters of 1973. In 1972, total spending rose 10.6 percent, and in 1971 it increased 9.3 percent. By comparison, the trend growth of spending (1957 to 1971) before the recent surge was at a 6.4 percent pace.

Market forces allocated the marked gains in aggregate spending across nearly every sector of the economy. The distribution of spending was also influenced to a degree by nonmarket constraints such as interest rate ceilings, other price controls, and subsidies.

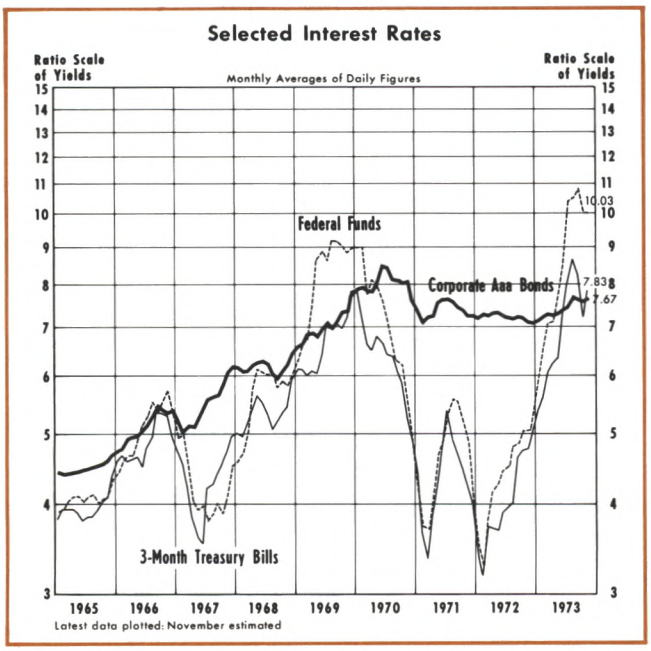
Consumers increased their outlays substantially during 1973. For a brief period during the summer the hectic pace of buying meat and home freezers verged on a scare-buying panic. Expenditures on automobiles and other durable goods rose at an 11 percent rate in the first three quarters of 1973, and spending on nondurable goods and services expanded at a 12 percent pace. Business investment increased at a 9 percent rate, and Government purchases of goods and services rose at a 10 percent annual rate. The nation had net exports of goods and services to foreigners in the first three quarters of 1973, following net imports in the previous year. This change in our net foreign position reflected both a more realistic pricing of the dollar in foreign exchange markets and a sharp increase in worldwide demand for U.S. farm and food products.

Some slowing in the rate of spending growth developed in the late summer and fall of this year. In the first seven months of 1973, for example, total retail sales rose at a 15 percent annual rate. From July to October, these sales increased at only a 5.5 percent rate.

Credit – Growth in spending, as is usually the case, was accompanied by a rise in credit outstanding. Total commercial bank credit expanded at a 15 percent annual rate in the first ten months of 1973. By comparison, commercial bank credit rose at a trend rate of 7.9 percent from 1957 to 1972. Mortgage credit extended by savings and loan associations increased at a 16 percent rate in the first eight months of 1973, while loans and securities of mutual savings banks grew at an 8 percent pace. Business advances, real estate loans, consumer credit, and Government indebtedness (including agencies) all expanded substantially. After mid-year, however, growth in real estate loans slowed as competition for a limited supply of funds intensified.



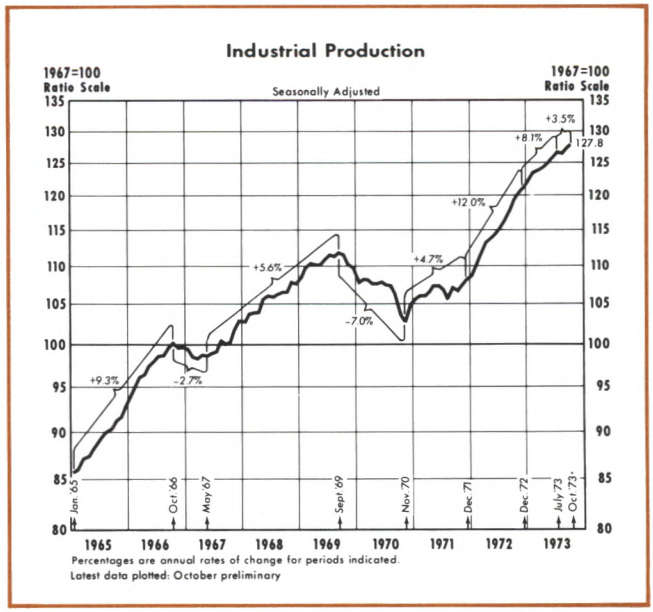
Reflecting the sharply expanded demand for credit pressing against a limited supply of funds from saving and from bank credit creation, the cost of credit, particularly for short-term funds, rose markedly in the first eight or nine months of 1973. In addition, there were fewer institutional obstacles distorting normal credit flows than there were in the 1969-1970 episode. For example, ceiling rates on large CDs were lifted, the rates that thrift institutions could pay to attract savings were raised, and some state usury laws were relaxed. While interest rates may have been bid higher than they would have otherwise, the severe wrenching of a "credit crunch" was avoided.[4]



Yields on three-month Treasury bills moved up from about 5 percent in December 1972 to an average 8.67 percent in August 1973. The previous monthly peak in bill rates was 7.87 percent in January 1970. The announced rate on bank loans to prime business customers jumped (in a series of steps) from 6 percent in December 1972 to a level of 10 percent in late September and early October 1973, surpassing the previous all-time high of 8.5 percent in late 1969-early 1970. Interest rates on mortgages and long-term bonds also rose in this period, but since credit demands were largely focused on short-term obligations, the increase was much less dramatic.

Production – In contrast to the acceleration in the rise in spending, the rate of production growth slowed during the first ten months of 1973. Industrial production, which rose 12 percent in 1972, increased at an 8 percent annual rate in the first seven months of 1973 and at a 3.5 percent rate since July. A major factor in the slowdown was economic capacity limitations, which were adversely affected by a diminished outlook for profits resulting from price controls and environmental laws.

Total new construction, which rose 14 percent in 1972, increased at a 9 percent rate in the first four months of 1973, and has changed little since April.

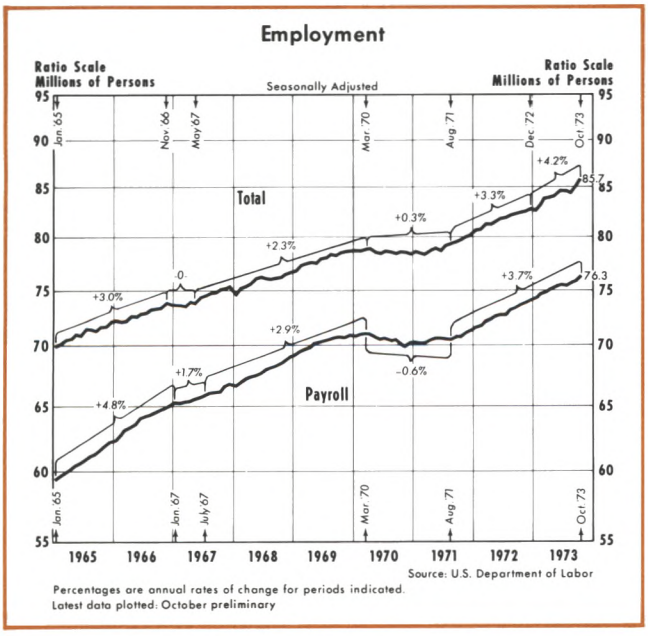


[4]The term "credit crunch" is used to refer to a period of financial stress wherein rapidly changing supply and demand forces, in combination with nonmarket interest rate regulations, sharply alter the flow of credit away from normal channels.

The trend since April reflects moderate declines in residential and Government outlays largely offset by expansion in commercial and "other" construction.

The growth rate in the real output of all goods and services (GNP in constant prices) also moderated during the year. After expanding 7 percent during 1972, it rose at a 5.5 percent annual rate in the first half of 1973 and at a 3.4 percent rate in the third quarter. However, the average 4.8 percent rate of growth during 1973 has been greater than the estimated long-run growth in productive capacity and hence more rapid than can be sustained over an extended period, given current growth rates in labor, capital, and technology.

Employment – Job opportunities were plentiful during the year. Total civilian employment expanded at a rapid 4.2 percent annual rate in the first ten months of 1973. This compares with the 1.6 percent trend growth in employment from 1957 to 1972. Even with the rapid rise in employment, some firms reported having difficulties obtaining employees at current wage rates, and as a result production growth was hampered at a time when demand for goods and services was expanding rapidly.



The unemployment rate among all civilian workers, which averaged 5.9 percent in 1971 and 5.6 percent in 1972, fell to an average of 4.9 percent in the first ten months of 1973. Among heads of households, unemployment was 3.7 percent in 1971, 3.3 percent in 1972, and 2.9 in the first ten months of 1973. Of those unemployed in 1973, over half had been seeking employment for less than a month.

As is frequently the case in periods of economic ebullience, efficiency of labor improved only slightly in 1973. In the first three quarters of the year, output per man-hour increased at a 1.5 percent annual rate. By sharp contrast, in 1971 the gain was 4.7 percent, and in 1972 it was 5 percent.

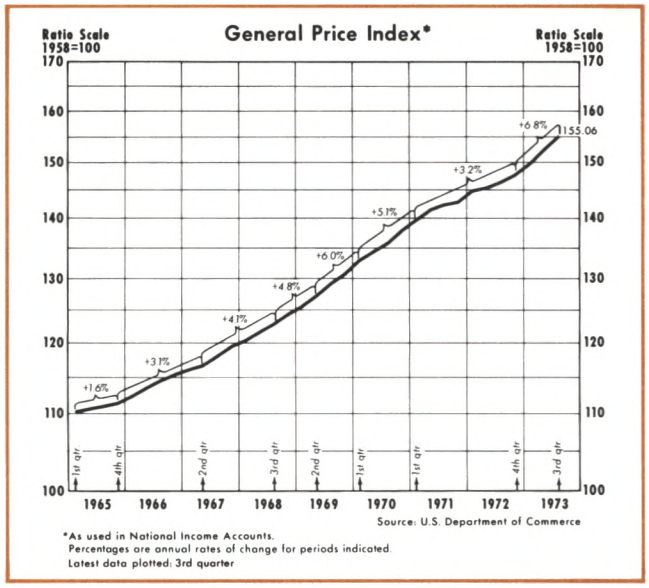
The reduced growth in labor output per hour was an important factor in the 6.7 percent increase in unit labor costs in 1973; this was up from a 2.3 percent rate in the two previous years. Another factor contributing to the jump in unit labor costs was that wages and other compensation rose at an 8.3 percent rate in the first three quarters of 1973, compared with increases averaging 7.3 percent in the two preceding years.

Income – Together with greater sales, production, and employment, incomes have been rising at a relatively rapid rate; however, most of the gains have been eroded by sharp increases in consumer prices. Total personal income rose at a 10.3 percent annual rate in the first ten months of 1973. By comparison, such income rose 10.2 percent in 1972 and 7.9 percent in 1971. After adjustment for changes in consumer prices, real personal income grew at a 1.3 percent pace in 1973 as against an average 5.5 percent pace in the two previous years.

Corporate profits recovered sharply during the year, but remained low relative to the mid-1960s when the inflation was first developing. In the first three quarters of 1973 corporate profits after taxes rose at a 26 percent annual rate, even though they turned down slightly in the third quarter. In the third quarter, profits were 5.5 percent of gross national product compared with 6.5 percent in the 1964-66 period. On the other hand, compensation of employees was 61 percent of GNP in the third quarter compared with 58 percent in 1964-66.

Prices – Most analysts agree that inflation has been a serious, if not the most serious, economic problem of the nation.[5] The inflation, which began back in the mid-1960s, was stronger in 1973 than in any of the previous years. Average prices, as measured by the GNP deflator, rose at a 6.8 percent annual rate in the first three quarters of 1973. This surpasses the previous peak of 6 percent, registered in the late 1969-early 1970 period.

[5]At its annual meeting in September 1973, the National Association of Business Economists were polled on what they considered the primary economic problem for the coming year, and 63 percent listed inflation. Government controls, the second most serious problem, received 14 percent of the vote.

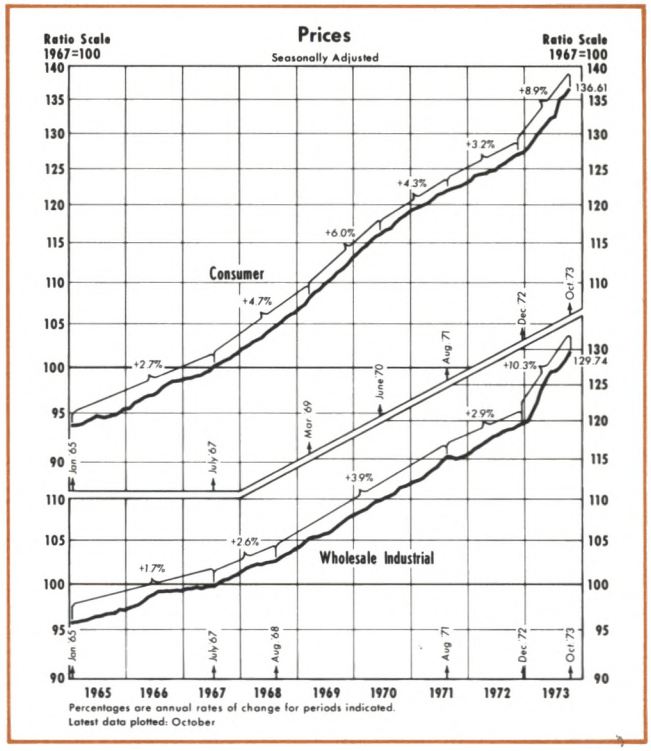


The inflation surge in 1973 occurred despite a Phase III system of price controls, a price freeze in the summer, and a Phase IV controls program which, in general, permitted only a "pass-through" of the dollar amount of higher costs. The sharp rise in prices reflected a number of factors. The chief upward force on prices resulted from a strong demand for goods and services, which was nurtured by the expansive monetary and fiscal developments of 1971 and 1972.

Some individual prices responded to cost-push forces generated by previous excesses. This was particularly true after both the expiration of Phase II controls in January and the devaluation of the dollar in early 1973. Then, too, there were bad weather conditions during the harvest period last year, a vigorous foreign demand for food, lumber, and other commodities, and an energy shortage at current prices.

Consumer prices rose at an 8.9 percent annual rate in the first ten months of 1973. By comparison, consumer prices rose at a 4.1 percent rate from 1965 to 1972, and at a 1.4 percent rate from 1953 to 1965. Since the rise this year was greater than the amount permitted to be paid employees under the controls programs, most individuals relying on wages and salaries as their primary source of income found that they had less real buying power at the end of the year than at the beginning. Similarly, most people owning savings accounts and bonds had the privilege of paying income taxes on interest "earnings" which didn't even maintain the purchasing power of the principal.

Wholesale prices rose even more sharply than consumer prices in 1973. In the first ten months of the



year, wholesale quotations were up at a 17 percent annual rate, compared with a 3 percent trend rate from 1965 to 1972, and an 0.8 percent pace from 1953 to 1965. Prices of industrial commodities rose at a 10 percent rate, and those of farm products and processed foods and feeds jumped at a 33 percent rate, on balance, in the first ten months of 1973.

Controls held back increases in the prices of some items for a time as evidenced by a number of shortages and interruptions to production as businessmen found it undesirable to produce at a loss or at the mandated profit margins. Over time prices have tended to move toward their equilibrium levels, and so the net effect of controls in the longer run seems to be less clear. Any contribution of controls toward lower prices, however, should be viewed in light of losses in output, the freedom of choice sacrificed, reduced incentives, quality deterioration, distorted resource allocation, and administrative costs.

Fiscal Developments

Fiscal actions taken before the start of the year had a major influence on economic activity during 1973. Actions taken in 1973 probably played a role also, particularly on economic developments late in the year.

Taxing and expenditure actions by the Federal Government in 1971 and 1972 probably had a tem-

porary direct expansionary effect on the economy, and may have had some indirect effect by influencing a faster pace of monetary expansion. Early in 1973 fiscal actions had a moderately stimulative impact, but later in the year actions became less expansionary.

Growth in Federal expenditures has been at a rapid 9.2 percent average annual rate since early 1970, according to the national income accounts budget. By comparison, from early 1967 to early 1970, Government expenditures rose at a more moderate 7 percent annual rate, despite large military spending for Vietnam. National defense outlays have declined since early 1970, reflecting the withdrawal from Vietnam and a changing of national priorities. On the other hand, social programs and other nondefense spending have been expanded at a rapid 15.1 percent average annual rate since early 1970.

Efforts to restrain the Government's spending growth had some effect during 1973, but the public's desire for more and more Government spending was difficult to resist. Since the last half of 1972, growth of total Government spending has been at a 7.8 percent annual rate, down from a 9.6 percent rate in the two previous years.

Government tax receipts have risen rapidly in recent years with the expansion in individual and corporate incomes, but the rise has been slowed somewhat by reductions in tax rates. Most significant were the Tax Reform Act of 1969, which had some effects in lowering tax receipts in later years, and the Revenue Act of 1971. In the latter instance, personal tax exemptions were increased, excise taxes on automobiles were eliminated, and a tax credit on investment was reinstated.

Not only did fiscal developments become more stimulative from 1970 through 1972, but the timing of some of the fiscal stimulus may have been shifted from 1972 to 1973 by an overwithholding of 1972 tax payments, which were refunded during 1973. This overwithholding, estimated to amount to about $9 billion, acted to restrain economic activity in 1972 but to stimulate it during 1973, particularly in the first half of the year. The overwithholding resulted from a change in the income-tax withholding tables incorporated in the tax law effective January 1, 1972. The change was designed to correct a previous underwithholding for certain taxpayers.

The high-employment budget, a widely used summary measure of fiscal impact, became progressively more expansive from 1969 through 1972. In calendar 1969, the budget was $11.8 billion in surplus. Reflecting larger increases in expenditures than in receipts, the surplus declined to $8 billion in 1970 and to $2.2 billion in 1971. In 1972, the budget turned into deficit by $3.1 billion. In the first quarter of 1973, the deficit was at an annual rate of $2.8 billion, but in the second and third quarters surpluses were again recorded, estimated at an average $5 billion rate.

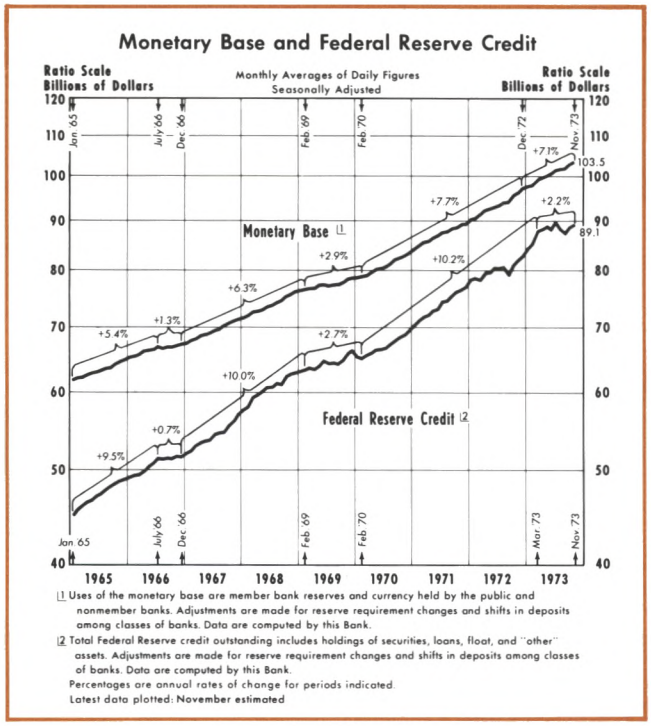
Monetary Developments

As stated above, monetary developments became progressively more expansive, on a year-to-year basis, from 1969 through 1972. Indications are that in 1973 monetary growth has been only slightly less than in 1972. During 1969 (from fourth quarter 1968 to fourth quarter 1969) the money stock of the nation — demand deposits and currency — increased 4.2 percent. In 1970 money increased 5.7 percent, in 1971 it went up 6.9 percent, and in 1972 it rose 7.4 percent. Published data show that from the fourth quarter of 1972 until the three months ending November 1973, money expanded at a 5 percent annual rate.[6] However, data available on nonmember bank deposits indicate that when the next benchmark revision is made, the data will show that money grew at a faster rate during the year.

Published data show that money plus net time deposits in commercial banks, a broader measure that some analysts find useful, rose at a 7.8 percent annual rate in the first eleven months of 1973. In 1972, this aggregate grew 10.6 percent and in 1971 it went up 11.5 percent. As with the data for the narrowly-defined money stock, forthcoming revisions are likely to raise, on balance, the 1973 growth rate of this aggregate. Total loans and investments of commercial banks rose at a 14.6 percent annual rate in the eleven months of 1973, after increasing 14.7 percent in 1972 and 11.5 percent in 1971.

The monetary base, the sources of which include Federal Reserve credit and the monetary gold stock, among other items, increased at an average 7.7 percent rate from early 1970 to the end of 1972 and at a 7.1 percent rate in the first eleven months of 1973. Growth of money fluctuated more than the base in 1973 because other uses of base (that is, time deposits and Treasury deposits) and the mix of money between demand deposits and currency, operated to

[6]November 1973 figures for money and money plus net time deposits are based on available data for the first 21 days of that month.



cause short-run fluctuations in the money stock. Over longer periods, the multiplier relationship between the base and money has usually been relatively stable.

Outlook

The upward momentum of spending, production, and incomes remains strong as 1973 comes to an end. However, signs of slowing have begun to appear in recent months. For example, growth in retail sales has moderated, credit demands have lessened, and short-term interest rates have moved down from their peaks. The composite index of twelve leading indicators of business activity, which rose at a 14.4 percent annual rate in the first half of 1973, increased at a 1.5 percent rate from June to September. Both monetary and fiscal actions have been slightly less expansionary, and the influence of these developments are usually observed only after some delay.

The "standard" forecast for 1974 is for continued increases in spending, production, and incomes, but at reduced rates from those in 1973. Some "cooling" in the economy from the pace which was causing intensified inflation is desirable. Barring major cutbacks resulting from the "energy crisis," and assuming that the Federal budget continues to be at near balance and that money growth is at a moderate rate, the economic slowdown should not turn into a recession.

A mild economic adjustment, however, means that progress in reducing the rate of inflation is likely to be slow. Many people are basing their actions on the belief that prices will continue to rise, and in addition, many contracts are based on an expected inflation. Then, too, because of controls, information costs, inertia, and other forces causing lags in establishing prices, a number of prices are currently below anticipated long-run equilibrium levels. As some prices move up, the natural forces of the market exert upward pressure on other prices. Most forecasts of price behavior for 1974 are in the 4 to 6 percent range of increase. Policies designed to bring less inflation within a one-year span would likely be accompanied by a downturn in output and employment.

Conclusions

The current inflation began in the mid-1960s in response to increased expenditures for the Vietnam war, a rapid acceleration in the implementation of social programs, and the methods by which these activities were financed. The inflation has been costly, and, to the distress of many, it has been stronger in 1973 than in any other year since it began.

Given the strongly imbedded inflation, it serves no purpose to pretend that there is a quick, easy, or costless cure to the economic disarray. Inflationary expectations were built up gradually over a number of years, as time after time those who failed to anticipate the inflation in their economic decisions sustained losses. These experiences probably will not be quickly forgotten.

On two occasions, in 1966-67 and in 1969-70, vigorous efforts were made to attack the basic causes of inflation by monetary and fiscal restraint. There were costs in terms of foregone production and employment. In each period, the tempo of economic activity slowed in response to the initial withdrawal of monetary and fiscal stimulus. Substantial progress was made in combatting inflation, and after a brief period, the economy resumed expansion at the estimated maximum sustainable rate. However, in both recovery periods stabilization emphasis shifted to the goal of obtaining a faster expansion, and the benefits of the previous periods of policy moderation were lost. After about two years the rate of inflation in each case became even more intense than it was prior to the adoption of restrictive policies.

Beginning in August of 1971, another approach to restraining inflation was attempted. Advocates believed that by implementing direct controls on prices, less inflation without the adverse effects of lost pro-

duction could be attained. The program appeared to have some initial success under the freeze, but experience both in this country and in others indicates that controls are not likely to hold back prices for long. Controls do not remove the basic economic forces which cause inflation, but are only an attempt to restrain the symptoms.

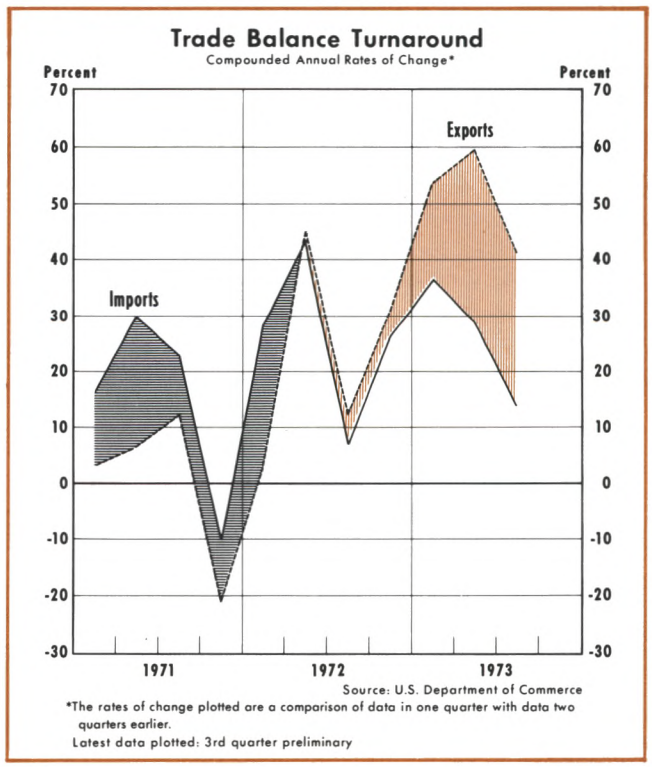
During 1973, a third effort at resisting the basic causes of inflation has been initiated. Monetary and fiscal actions have become somewhat less expansive. Success in substantially reducing inflation may involve greater costs now, in terms of lost production, than would have been required in the 1966-67 and 1969-70 periods, since the current inflation is stronger and more firmly imbedded. If withdrawal of stimulus is slow, production should continue to grow, but at a slower pace for perhaps a year before returning to a long-run maximum sustainable pace. Under these conditions, inflation should gradually dissipate over a period of about four or five years, assuming that policies are not changed again to achieve a more rapid, but unsustainable, expansion. Developments in 1974 will be crucial in determining whether this effort to resist inflation will be successful.

U.S. BALANCE-OF-PAYMENTS DEVELOPMENTS DURING 1973*

The U.S. international economic situation in 1973 was dominated by movement toward surplus in the trade balance.[1] Other major events which transpired during the year were the following: massive short-term capital outflows in January and February, dollar devaluation on February 12, the subsequent floating of major currencies against the dollar followed by continued dollar depreciation until early July, and then a strengthening in the international price of the dollar. Since the physical quantities of both exports and imports respond only slowly to exchange rate alterations, the U.S. trade balance was probably only marginally affected by the 1973 dollar depreciation. However, the currency price changes may exert a stronger influence on this balance in 1974.

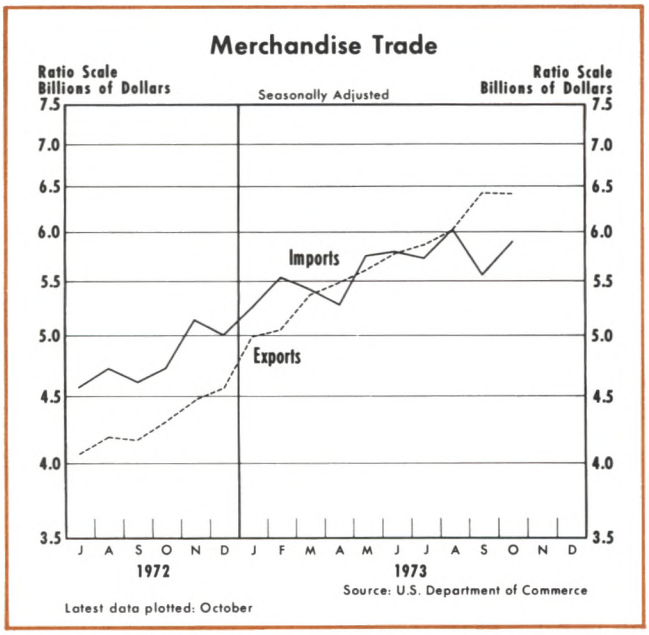
Trade Balance

The devaluation of the dollar in December 1971 apparently started to influence the quantities of exports and imports in mid-1972 when it became apparent that the rate of increase of U.S. purchases of imports declined, and the rate of increase of foreign purchases of U.S. exports increased. This reversal of trends is illustrated in the accompanying chart. During 1973 the reversal in the rates of increase in U.S. exports and imports became more pronounced as a number of factors reinforced the effects of the initial



*This section was written by Hans H. Helbling.

[1]For an interpretation of balance-of-payments terminology, see John Pippinger, "Balance of Payments Deficits: Measurement and Interpretation", this *Review* (November 1973).



dollar devaluation. Such additional factors include: differences in the rates of inflation here and abroad, international differences in business activity, strong demand for raw materials, and special factors such as poor harvests abroad.

On balance, from January to October 1973 the trade balance was in surplus by $0.8 billion at an annual rate. This compares to annual deficits of $2.7 billion in 1971 and $6.9 billion in 1972.

During the first ten months of 1973 the recorded value of U.S. exports increased by 42 percent, while the recorded value of U.S. imports increased by only 24 percent.[2] In fact, exports were absolutely greater than imports in April, July, September, and October. Although the April and July surpluses were between $100 million and $200 million, the September surplus was a substantial $873 million, and the October surplus amounted to $527 million.

During 1973 the rates of increase of agricultural commodity exports and petroleum product imports significantly exceeded the rates of increase of total exports and imports. Exports of agricultural products increased at a rate of 86 percent during the first eight months of 1973, compared to a 39 percent rate of increase in total exports in the same period.[3] For comparison, agricultural exports increased by 22 percent in 1972 and by 7 percent in 1971.

[2]Percentage increases are measured in relation to the same period a year earlier, unless stated otherwise.

[3]Data for agricultural exports and petroleum imports were available only for the first eight months of 1973. Data for physical quantities of exports and imports were available only for the first half of 1973.

Petroleum imports reached a rate of increase of 58 percent for the first eight months of 1973, compared to total imports which grew by only 24 percent during this period. Petroleum imports grew persistently from a 29 percent rate of increase in 1972 and, apart from possible embargoes, could be expected to increase as domestic oil consumption continues to exceed domestic production.

The physical quantity of our exports was 21 percent greater during the first half of 1973 than in the second half of 1972. From the second half of 1971 to the first half of 1972, this rate of increase was 11 percent. The quantity of imports, on the other hand, was 7 percent greater during the first half of 1973 than in the second half of 1972. From the second half of 1971 to the first half of 1972 this rate of increase was 12 percent.

Basic Balance

The basic balance, which encompasses merchandise trade, services, unilateral transfers, and long-term capital flows, was in deficit by $3.5 billion during the first half of 1973.[4] This compares to a deficit of $9.8 billion for 1972. However, during the third quarter of 1973 this balance was probably in surplus by as much as $4 billion.[5] It follows, then, that the basic deficit for the first three quarters of 1973 would be about $1 billion. This reduction is largely caused by the movement of the U.S. trade balance into surplus, but also reflects increased receipts by U.S. corporations and individuals of investment income from abroad.[6] Despite increased foreign direct investment expenditures in the United States, there were somewhat larger outflows of net long-term capital from the United States during the first half of 1973, as compared to 1972. Moreover, foreign purchases of U.S. securities declined during the second quarter.

During the third quarter, however, foreign purchases of U.S. securities have increased again. If such purchases continue, and the trade balance continues in surplus, the U.S. basic balance should approach equilibrium or perhaps even move into surplus for the year as a whole.

[4]All balance-of-payments figures are reported as seasonally adjusted annual rates.

[5]This estimate is based on preliminary U.S. Department of Commerce data for the third quarter which indicates that net foreign purchases of U.S. securities amounted to $4.9 billion and bank reported long-term capital inflows amounted to $1.3 billion.

[6]The increased receipts from investment income is partly related to the dollar depreciation which has the effect of increasing the dollar value of a given amount of foreign-currency denominated earnings.

Net Liquidity and Official Settlements Balances

The net liquidity balance includes, in addition to the basic balance, private and official short-term capital flows and errors and omissions. This balance was in deficit by $26.6 billion in the first quarter and $6.4 billion in the second quarter. For the third quarter, however, a surplus of $4.2 billion developed, the first surplus since the fourth quarter of 1969. This compares to deficits of $22 billion and $13.9 billion for 1971 and 1972, respectively.

The official settlements balance registered a deficit of $42 billion for the first quarter, and surpluses of $1.5 billion and $8.6 billion for the second and third quarters, respectively.[7] This balance was also in continuous deficit since the fourth quarter of 1969, reaching $29.8 billion in 1971 and $10.3 billion in 1972.

The extreme deficits in these two balances in the first quarter reflect massive short-term capital outflows preceding the February dollar devaluation. The second quarter reduction in the net liquidity deficit and the surplus in the official settlements balance, as well as the third quarter surpluses in both balances, were probably related to the floating of major currencies against the dollar. This floating had the effect of equilibrating private supply and demand for dollars which, therefore, eliminated both the incentives for large-scale dollar outflows from the United States and the accrual of dollar balances on the part of foreign central banks. Moreover, the differential between U.S. interest rates and Eurodollar interest rates narrowed and led to an increase in borrowing on the part of U.S. banks from foreign banks.

These factors explain the net short-term dollar inflows during the second quarter amounting to $4.6 billion, and third quarter inflows which were probably also large. This compares to net outflows of short-term capital amounting to $38.6 billion during the first quarter. The rising dollar exchange rate and reductions of dollar holdings on the part of foreign central banks may be an indication that both the net liquidity and the official settlements balances will record surpluses in the fourth quarter of 1973.

[7]The difference between these two balance-of-payments concepts is the treatment of liquid private capital flows. These flows are included in the official settlements balance but not in the net liquidity balance. Thus during the first quarter of 1973 the net liquidity deficit was less than the official settlements balance by the amount of liquid private capital outflows. Because liquid private capital inflows exceeded the net liquidity deficit during the second quarter of 1973, an official settlements surplus resulted.

Dollar Exchange Rate

After the February 12 devaluation, the dollar continued to depreciate in foreign exchange markets. By July 6, the depreciation amounted to 21.2 percent on a trade-weighted basis, compared to 15.2 percent immediately after February 12.[8] However, in light of the improved price competitiveness of U.S. products in world markets, and the movement toward equilibrium in the basic international transactions of the United States, the continuing dollar depreciation was puzzling to both U.S. and foreign observers.

Following a meeting at the Bank for International Settlements (BIS) in early July, representatives of the major central banks decided to implement, if deemed appropriate, an earlier agreement regarding exchange market intervention to "maintain orderly markets." Furthermore, the U.S. Treasury approved the drawing on swap lines to finance U.S. exchange market intervention, and the Federal Reserve System announced an increase in the swap network from $11.7 billion to $18 billion.[9] Although intervention by both the U.S. and foreign central banks remained minimal in amount, the dollar price in terms of foreign currencies began to stabilize.

This halting of the dollar price decline apparently reflected official willingness to intervene in foreign exchange markets as well as recognition that equilibrium in the basic international transactions of the United States was imminent. Finally, on October 25 the international price of the dollar began to increase sharply. This probably reflected the large September trade surplus and the recognition that oil shortages would affect Europe and Japan more than the United States. By November 27 the trade-weighted depreciation of the dollar, at 15.3 percent, was virtually the same as immediately after the February dollar devaluation.

Summary

Considerably improved price competitiveness for U.S. products in world markets, aided by the reduction in the international price of the dollar, resulted in

[8]The trade-weighted dollar depreciation is measured by changes in the values of 11 major currencies relative to exchange rates prevailing in May 1971, weighted by trade shares with the United States.

[9]Swap lines are short-term reciprocal lines of credit between the Federal Reserve System and 14 major foreign central banks plus the Bank for International Settlements. The Federal Reserve System, in effect, can borrow foreign currency in order to purchase dollars in the foreign exchange market.

a small trade surplus so far this year. This trade surplus dominated movements in other components of the balance of payments and generated movement toward equilibrium in the basic balance.

The balance of payments during 1973, as measured by the net liquidity and the official settlements concept, was in deficit as large net short-term capital outflows occurred prior to the dollar devaluation of February 12.

There are two factors which augur for substantially smaller deficits in the net liquidity balance and perhaps surpluses in the official settlements balance in the future: 1) the currency realignment of February 1973 reduced the international price of the dollar substantially; 2) eventual equilibrium in the basic balance of payments and the absence of expectations of further capital gains in other currencies should promote confidence in the dollar as an international asset. Both factors should remove the incentives for dollar outflows from the United States and may be conducive for further reflows of dollars to the United States. However, these developments may be affected by increased costs of U.S. imports of oil.

Prospects for 1974 suggest a slowdown in economic activity in the United States. But, the very restrictive monetary policies of major foreign countries in recent months will also lead to economic slowdowns abroad. This may have the effect of reducing U.S. import demand as well as foreign demand for our exports. However, due to the increased price competitiveness of U.S. goods in world markets, a complete reversal of recently established export and import trends is not likely to materialize.

A Comparative Static Analysis of Some Monetarist Propositions

by ROBERT H. RASCHE

Robert H. Rasche is Associate Professor of Economics at Michigan State University, East Lansing, Michigan. During the 1971-72 academic year, Professor Rasche was a visiting scholar at the Federal Reserve Bank of St. Louis. The following paper evolved out of discussions and seminars with the staff of this Bank during his visit. The paper is presented in order to foster further discussion of those propositions generally associated with the monetarist framework of analysis.

> The element of time is a chief cause of those difficulties in economic investigation which make it necessary for man with his limited powers to go step by step; breaking up a complex question, studying one bit at a time, and at last combining his partial solutions into a more or less complete solution of the whole riddle. In breaking it up, he segregates those disturbing causes, whose wanderings happen to be inconvenient, for the time in a pound called *Ceteris Paribus.*
>
> — Alfred Marshall

The typical textbook approach to macroeconomic analysis is almost completely barren with respect to what has become characterized as the "monetarist position" on the effects of monetary and fiscal policy actions. These propositions might be summarized as follows:

(1) the long-run impact of monetary actions is on nominal variables, such as nominal GNP, the general price level, and nominal interest rates;

(2) long-run movements in real economic variables, such as output and employment, are little influenced, if at all, by monetary actions;

(3) in the short run, actions of the central bank exert an impact on both real and nominal variables;

(4) fiscal actions have little lasting influence on nominal GNP, but can affect short-run movements in output and employment; and

(5) Government expenditures financed by taxes or borrowing from the public tend to crowd out, over a fairly short period of time, an equal amount of private expenditures.[1]

It would seem that a static analytic framework could be developed which could shed some light on the theoretical underpinnings of monetarism, although the mode of analysis is obviously insufficient to cope with the dynamic propositions which are associated with this school. Unfortunately the literature is extremely scarce. Milton Friedman has set forth a static framework, and alleges that the differences between monetarists and post-Keynesians have to do with assumptions about price (and wage) behavior. Monetarism, he alleges, assumes that the aggregate price level is determined in such a way as to clear all markets in the long run. For the short run, he alleges that neither the monetarist nor the fiscalist has a satisfactory theory of the response of real output and the general price level to monetary shocks. Unfortunately, Friedman's excursion into dynamics and differential equations is difficult, if not impossible, to relate to individual market forces.[2]

Thus, the issue remains unsettled. On the one hand, we are left without a clearly specified analytical framework for the monetarist approach which can be contrasted with the well-developed static income determination model. On the other hand, and even more importantly, there is no general model which can produce the post-Keynesian model as a particular case, and the monetarist and classical models as alternative cases. Such a framework is useful in order to discriminate between alternative hypotheses and to construct empirical tests which have the potential to refute one, or both, positions.

[1]These propositions have been gleaned from Leonall C. Andersen, "A Monetarist View of Demand Management: The United States Experience," this *Review* (September 1971), pp. 3-11.

[2]Milton Friedman, "A Theoretical Framework for Monetary Analysis," *Journal of Political Economy* (March/April 1970), pp. 193-238.

This study attempts to develop a general model by examining equilibria which differ by the length of the "run." This Marshallian tool should be clearly defined as applying to the behavior which is assumed to be embodied in the *ceteris paribus* assumptions: the more behavior which is embodied in *ceteris paribus*, the shorter the "run." Traditional macrostatics has been of the Marshallian "short-run" variety; that is, the real capital stock has been held constant. This leads to some unfortunately confusing terminology. Most of the traditional analysis from which the "long-run" monetarist propositions can be gleaned is not long-run analysis in the Marshallian sense. At the risk of adding further confusion to the discussion we shall stay with the traditional short-run definition as the "short run," and compare the results of this model with those of an even shorter run, or "momentary run" model.

It is well established that a Patinkin-type four market model (labor services, commodities, bonds, and money), under assumptions of complete price flexibility, absence of money illusion, unitary elasticity of price expectations, and perfect information on market prices, will exhibit propositions (1), (2), and (5) above, in comparison of "short-run" equilibria which differ because of a shock to some policy variable.[3] However, these analyses have nothing to contribute to the discussion of propositions (3) and (4).

Basic Elements of Model

More than a decade ago, it appears that the assumption of perfect information on prices was implicitly relaxed in some of the research work of leading monetarists. Friedman, in his work on the demand for money, distinguished between the current commodity price index, and a longer-run concept which he called the "permanent price level." He argued that:

> . . . holders of money presumably judge the "real" amount of cash balances in terms of the quantity of goods and services to which the balances are equivalent, not at any given moment of time, but over a sizable and indefinite period; that is, they evaluate them in terms of "expected" or "permanent" prices, not in terms of the current price level. This consideration does not, of course, rule out some adjustment to temporary movements in prices.[4]

Recently, following the pioneering work of George Stigler and Armen A. Alchian, considerable theoretical and empirical work on labor market behavior and the Phillips curve has been produced.[5] These studies assume that workers do not possess perfect information on the wages available to them in return for their labor services, and it is costly for workers to search out information on the opportunities available to them. Within this framework it is necessary to distinguish between the nominal wage rate which is actually offered for labor services at a point in time, W, and the wage rate which is perceived by suppliers of labor services, W_e. In this paper we employ a wage rate information parameter, λ_1, to relate the perceived wage rate to the currently offered rate and an exogenous, or predetermined, component, W_o.

The relationship we postulate is:

$$W_e = W^{\lambda_1} (W_o)^{1-\lambda_1}$$

so the perceived nominal wage rate is a geometric average of the current wage rate and a predetermined wage rate, presumably based on the history of previous wage experience. If the wage information parameter, λ_1, is set equal to 1.0, there is costless information and the perceived wage rate is the current nominal wage. At the other extreme, if λ_1 is set equal to zero, information about the current wage rate has an infinite price and there is total ignorance of current market conditions.

This cost of information approach can be extended to the commodity market. We assume that households make their consumption and portfolio decisions on the basis of their perceived commodity price index, P_e, which can differ from the actual commodity price index if information on commodity prices is imperfect and costly to gather.[6] Analogous to the case of the wage rate, we postulate a price information parameter, λ_2, which relates the perceived price index to the current price index as follows:

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[3]For a derivation of these propositions and a discussion of the effects of the presence or absence of government bonds in the model, see Don Patinkin, *Money, Interest, and Prices: An Integration of Monetary and Value Theory*, 2nd ed. (New York: Harper and Row, 1965), chap. 10; Robert L. Crouch, *Macroeconomics* (New York: Harcourt, Brace and Jovanovich, 1972), chaps. 6-9; and Franco Modigliani, "The Monetary Mechanism and Its Interaction with Real Phenomena," *Review of Economics and Statistics, Supplement* (February 1963), pp. 79-107.

[4]Milton Friedman, "The Demand for Money: Some Theoretical and Empirical Results," *Journal of Political Economy* (August 1959), pp. 327-351.

[5]George J. Stigler, "Information in the Labor Market," *Journal of Political Economy, Supplement* (October 1962), pp. 94-105, and Armen A. Alchian, "Information Costs, Pricing, and Resource Unemployment," Edmund Phelps et al., *Microeconomic Foundations of Employment and Inflation Theory* (New York: Norton, 1970) pp. 27-52.

[6]For simplicity, we assume firms have zero information costs with respect to wages and prices.

Table I

Equations for the Complete Macroeconomic Model
(excluding a Government Sector)

	Equation	Name	Market
(I)	$N^d = N^d\left(\frac{W}{P}, \bar{K}\right)$	Labor demand function	Labor market
(II)	$N^s = N^s\left(\frac{W_e}{P_e}\right)$	Labor supply function	
(III)	$N^d = N^s = N$	Labor market equilibrium condition	
(IV)	$X^s = X^s(N, \bar{K})$	Production (or commodity supply) function	Commodity market
(V)	$C = C\left(X_d, \frac{V}{P_e}\right)$	Commodity demand function for consumption (the consumption function)	
(VI)	$I = I(X, r)$	Commodity demand function for investment (the investment function)	
(VII)	$X = C + I$	Total (or aggregate) commodity demand function	
(VIII)	$X = X^s$	Commodity market equilibrium condition	
(IX)	$\frac{B^d}{rP_e} = B^d\left(X_d, \frac{1}{r}, \frac{V}{P_e}\right)$	Bond demand function	Bond market
(X)	$\frac{B^s}{rP} = B^s\left(X^s, \frac{1}{r}, \frac{V}{P}\right)$	Bond supply function	
(XI)	$B^d = B^s$	Bond market equilibrium condition	
(XII)	$\frac{M^d}{P_e} = L\left(X_d, r, \frac{V}{P_e}\right)$	Money demand function	Money market
(XIII)	$M^d = \overline{M^s}$	Money market equilibrium condition and (exogenous) money supply function	
(XIV)	$S = X^s - C$	Definition of saving	Definitions of supplementary variables
(XV)	$Y = PX^s$	Definition of money income	
(XVI)	$V = P\bar{K} + \overline{M^s}$	Definition of money wealth (net assets or net worth)	
(XVII)	$X_d = \frac{Y}{P_e}$	Definition of real perceived disposable income	
(XVIII)	$W_e = W^{\lambda_1} W_0^{(1-\lambda_1)}$	Definition of perceived wage rate	
(XIX)	$P_e = P^{\lambda_2} P_0^{(1-\lambda_2)}$	Definition of perceived price level	

$$P_e = P^{\lambda_2} (P_0)^{1-\lambda_2}$$

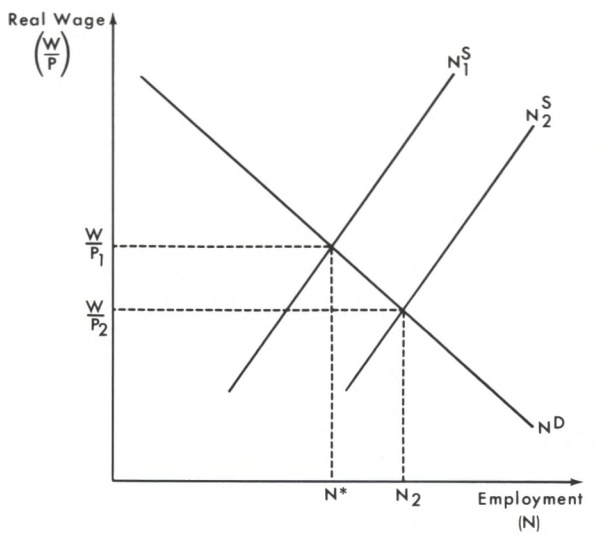
Again the perceived commodity price index is a geometric average of the current price index and an exogenously determined price level. When λ_2 equals one, information on the commodity price is free, and all information on current prices can be incorporated into decision making. When λ_2 is equal to zero the cost of information is infinite, and no current market behavior is incorporated into decision making.

Once we allow the perceived price level and perceived wage rate to differ from the respective current market value, we must explicitly introduce P_e and W_e into the model. This is indicated in Table I, where the labor supply function of households is expressed as a function of the perceived real wage rate $\left(\frac{W_e}{P_e}\right)$, real consumption demand is a function of perceived real net worth $\left(\frac{V}{P_e}\right)$ and perceived real disposable income, as are real bond demand and the demand for real cash balances. If we interpret P_e as equivalent to Friedman's "permanent" price index concept, the money demand equation (equation XII in Table I) is the money demand function used by Friedman with the exception of his use of a per capita specification and an explicit functional form.[7] All other functions are specified exactly as in the Patinkin model. In particular it should be noted that the interest elasticity of the demand for real cash balances has not been constrained to zero.

First, the behavior of the labor market has to be considered. As indicated in Figure I, there is a single labor demand curve plotted as a function of the prevailing real wage $\left(\frac{W}{P}\right)$. We have to analyze how the labor supply curve interacts with this labor demand curve. Consider a situation in which the movement from one equilibrium to another involves a rise in the commodity price index, P. If, under these circumstances, the labor supply function shifts to the right, from N^s_1 to N^s_2, then the new equilibrium of the system is characterized by higher employment and a lower real wage rate than the initial equilibrium. Since employment is higher, real output is also higher in the new equilibrium relative to the initial equilibrium.

[7]Friedman, "The Demand for Money," pp. 327-351.

Figure I



It can be shown that a sufficient condition for the labor supply curve to shift to the right in the real wage-employment plane in response to increases in the commodity price index is that λ_1, the information parameter for the perceived nominal wage rate, be greater than λ_2, the information parameter for the perceived commodity price index.[8] In the analysis which follows, we shall characterize the "momentary" equilibrium as one in which information on both wages and prices is not free – that is, $0 < \lambda_2 < \lambda_1 < 1$. The short-run equilibrium will be characterized by perfect information on both wages and prices – that is $\lambda_1 = \lambda_2 = 1$. In the short run, there are no shifts of the labor supply curve in response to changes in commodity prices and the equilibrium level of employment remains at N*, the initial equilibrium level. This phenomenon appears to be identical to that conceived by Friedman in his discussion of the natural unemployment rate.[9] N* could be termed the "natural level of employment" in this static model.

Changes in the Money Stock

It remains to be seen how the model reacts in a momentary equilibrium, after the money stock has changed. A monetarist scenario has been provided by Friedman:

> . . . suppose . . . that the "natural" [unemployment] rate is higher than 3 per cent. Suppose also that we

[8]For a proof of this proposition see Appendix A, which is available only in the reprint to this article.

[9]Milton Friedman, "The Role of Monetary Policy," *American Economic Review* (March 1968), p. 8.

start out at a time when prices have been stable and when unemployment is higher than 3 percent. Accordingly, the [monetary] authority increases the rate of monetary growth. This will be expansionary. By making nominal cash balances higher than people desire, it will tend initially to lower interest rates and in this and other ways to stimulate spending. Income and spending will start to rise.

To begin with, much or most of the rise in income will take the form of an increase in output and employment rather than in prices. People have been expecting prices to be stable, and prices and wages have been set for some time in the future on that basis. It takes time for people to adjust to a new state of demand. Producers will tend to react to the initial expansion in aggregate demand by increasing output, employees by working longer hours, and the unemployed, by taking jobs now offered at former nominal wages. This much is pretty standard doctrine.

But it describes only the initial effects. Because selling prices of products typically respond to an unanticipated rise in nominal demand faster than prices of factors of production, real wages received have gone down – though real wages anticipated by employees went up, since employees implicitly evaluated the wages offered at the earlier price level. Indeed, the simultaneous fall *ex post* in real wages to employers and rise *ex ante* in real wages to employees is what enabled employment to increase.[10]

This is precisely the behavior implicit in our four-market model. The increase in the money stock initially causes an excess supply in the "money market," an excess demand for bonds, and an excess demand for commodities through increased consumption demand, since both $\left(\frac{V}{P_e}\right)$ and $\left(\frac{V}{P}\right)$ are larger. In the momentary equilibrium, real output, commodity prices, and money wages are all higher than their initial equilibrium values.[11] However, the change in W, the money wage rate, is less than proportional to the change in P, and the actual real wage rate declines. The real wage perceived by suppliers of labor services $\left(\frac{W_e}{P_e}\right)$, increases as long as the cost of obtaining information about prices is greater than the cost of obtaining information about wages ($\lambda_2 < \lambda_1$). Thus, the labor supply curve shifts to the right. The momentary equilibrium results correspond quite closely to the monetarist scenario outlined by Friedman and to the third proposition taken from Andersen.

[10]Friedman, "The Role of Monetary Policy," pp. 9-10.

[11]The mathematical proof of these propositions, with a statement of sufficiency conditions, can be found in Appendix B, which is included only in the reprint to this article.

Table II

Notation

I. Endogenous Variables
- A. Flow variables
  1. N^d, demand for labor (labor services per time period)
  2. N^s, supply of labor (labor services per time period)
  3. X^s, real income (total output of commodities per time period)
  4. C, real consumption (commodities consumed per time period)
  5. I, real investment (commodities invested, added to the capital stock, per time period)
  6. X, real aggregate demand (total demand for commodities per time period)
  7. S, real saving (output of commodities not consumed per time period)
  8. Y, money income (money value of total output of commodities per time period)
  9. X_d, perceived real disposable income
- B. Stock variables
  1. B^d, demand for bonds (number of bonds demanded to hold)
  2. B^s, supply of bonds (number of bonds planned to be outstanding)
  3. M^d, demand for nominal money (number of dollars demanded to hold)
  4. V, nominal wealth, or net worth (dollar value of real assets and money)
- C. Price variables
  1. P, the absolute, or nominal, price level (the price of commodities)
  2. W, the absolute, or nominal, wage level (the price of labor or wage rate)
  3. 1/r, the absolute, or nominal, price of bonds

II. Exogenous Variables
- A. Flow variables
  1. G, government demand for commodities (commodities per time period)
  2. $\$B^g$, interest cost of the outstanding government debt (equals B^g times one dollar per time period)
  3. T, real tax receipts (per time period)
- B. Stock variables
  1. $\bar{K}$, the real capital stock (the number of commodities that have been accumulated up to the beginning of the present time period)
  2. $\bar{M}^s$, the supply of nominal money (the number of dollars available to be held)
  3. B^g, supply of government bonds (number of government bonds outstanding)
- C. Price variables
  1. P_0, predetermined component of the perceived price level
  2. W_0, predetermined component of the perceived wage rate

An interesting question remains on the extent to which prices respond to a change in the money stock in this momentary equilibrium. In particular, we wish to consider the percentage change in the commodity price index generated by a one percent change in the money stock. In Appendix B (included only in

reprint) it is shown that when (1) a set of sufficient conditions for a positive change in real output in response to a positive change in the money stock is satisfied, and (2) the money demand function is elastic with respect to perceived real disposable income, then the elasticity of the price level with respect to the money stock is less than one. Hence, the change in the price level between the two equilibrium states is less than proportional to the change in the money stock.

This result allows some interesting comparative static results to be obtained between the momentary equilibrium and the short-run equilibrium in which perceptions have been allowed to adjust fully to the change in the actual price level. In this state money can be shown to be neutral. Therefore, in comparison to the initial equilibrium, the percentage change in the commodity price index mut be equal to the percentage change in the money stock. Thus, P must be higher in the short-run equilibrium than it is in the momentary equilibrium for a given change in the money stock. On the other hand, in the short-run equilibrium real output and employment must be unchanged from the initial equilibrium and, therefore, employment must be *lower* than in the momentary equilibrium.

This simultaneous increase in the price level and reduction in employment is a close analog to the dynamic phenomena of increasing inflation and increasing unemployment which perplexed economists and policymakers during 1970-71. In the model, the cause of this type of behavior is not price rigidity or monopolistic market power, but rather the correction of false perceptions.

Open Market Operations in Existing Government Debt

The analysis of the previous section applies to an economy in which there is no government debt, and money has to be created by some artificial construct such as throwing it out of airplanes. This is frequently the convention with textbook models. More realistically, the model should be expanded to include a government sector and an outstanding stock of government debt. In such an economy, open market operations can be conducted with the monetary authorities purchasing or selling government debt in exchange for cash balances. The modifications to the equations of Table I, necessary to incorporate the government sector, are given in Table III.

Table III

Modified Equations to Incorporate a Government Sector in the Macroeconomic Model

VIIa	$X = C + I + G$	Aggregate commodity demand function
XIa	$B^d = B^s + B^g$	Bond market equilibrium condition
XVIa	$V = P\bar{K} + \bar{M}^s + \frac{B^g}{r}$	Definition of money wealth
XVIIa	$X_d = \frac{P}{P_e}(X - T) + \frac{\$B^g}{P_e}$	Definition of real perceived disposable income

Government financing constraint:

$$P(G - T) + \$B^g = \frac{dB^g}{r} + dM$$

There are three basic additions to the model of Table I. First, the commodity demand equation has to be expanded to incorporate the government demand for goods and services, G. Second, we assume that the public does not discount future tax liabilities which will be required to pay the interest on the outstanding debt, so that the value of the stock of government debt is a component of private wealth. Third, the definition of perceived real disposable income must be modified to allow for the taxing of income by the government, T, and the payment of interest on the outstanding debt.

The remaining problem is to define what is meant by a pure open market operation. Open market operations are defined as exchanges of government debt and cash balances of equal value between the monetary authorities and the private sector of the economy. Unfortunately, we cannot leave the definition at this point. It is now well established that macroeconomic models frequently have been careless in the treatment of the relationships between government fiscal and monetary operations which are implicit in a financing constraint on the government sector.[12] In the model developed here, the government must finance the difference between its tax receipts and the value of its purchases of goods and services plus the interest payments on the outstanding debt either by issuing new debt, or by printing new money. This relationship is indicated as the government financing constraint in Table III.

[12]Carl Christ, "A Simple Macroeconomic Model with a Government Budget Restraint," *Journal of Political Economy* (January/February 1968) pp. 53-67.

Consider an initial equilibrium of the economy where the right hand side of the equation for the financing constraint is zero; that is, tax receipts just cover government expenditures and interest cost. Now consider an open market operation which changes the amount of government debt held by the public. Since debt and cash balances of equal value are exchanged in the transactions, if the right hand side of the financing constraint was zero initially, it remains zero. Since the stock of debt held by the private sector has changed, the left hand side of the equation can no longer sum to zero without some changes in either G or T, to offset the direct effect on the financing constraint of the change in the interest cost, and the indirect effect of the change in value of government purchases and taxes through induced changes in commodity prices. We shall define a *pure open market operation* as an exchange of government debt and cash balances between the monetary authorities and the private sector, which is *simultaneously* accompanied by whatever change in T is necessary to maintain the government financing constraint, with G remaining unchanged.

The effects of a pure open market operation in the momentary equilibrium are analyzed in Appendix C (included only in reprint). The sufficiency conditions for positive responses of real output, employment, and commodity prices to an open market operation which increases the stock of money held by the public are the same as those for the situation where the stock of money was increased in the absence of government debt.

It is well known that in the Patinkin-type model with which we are working, money will not be neutral in the short run in the presence of interest bearing government debt. Therefore, the response of prices to open market operations in the short run must be analyzed before we can determine that all of the results of the first model carry over to this case.[13] There are no real output or employment responses relative to the initial equilibrium in this case, since the classical labor market behavior without any money illusion is present.

It can be shown that the conditions which are sufficient for a positive output response to an open market operation which increases the stock of money in the momentary equilibrium are also sufficient to insure that the elasticity of the price index to the increase in the money stock is greater in the short-run than in the momentary run. Thus, the result of the first model that prices are higher in the short-run relative to the momentary equilibrium, even though employment is lower between the two equilibria, carries over to the model including government debt in the presence of a pure open market operation.

[13]This analysis is carried out in Appendix D, which is available only as part of the reprint to this article.

Fiscal Policy: Tax-Financed Changes in Real Government Expenditures

The conclusions for the comparative static impacts of fiscal policy in the momentary equilibrium are quite similar to those of monetary policy. A tax-financed increase in real government purchases of goods and services generates an initial excess demand in the commodity market which causes commodity prices to rise. The increased commodity price causes a shift of the labor supply function as in Figure I, since the same type of money illusion prevails here as in the monetary policy case. In the momentary equilibrium real output, employment, prices, and money wages are higher than in the initial equilibrium, but real wages are lower. In this case, since the stock of money has not changed, we can conclude unambiguously that the interest rate, r, must be higher for the "money" and bond markets to be restored to equilibrium.

It is well known that in the short-run equilibrium the increases in real government purchases and taxes do not have any impact on real output and employment. Hence, output and employment must be lower relative to the momentary equilibrium. Real government purchases, in the short run, "crowd out" an equal amount of real private expenditures. This "crowding out" comes about through increases in P and r which reduce both private consumption demand and private investment demand. Since in the short-run equilibrium, as compared to the initial equilibrium, P is higher and X remains unchanged, "crowding out" does not in general occur in nominal terms.[14]

[14]Nominal "crowding out" is implied by Andersen's fourth proposition. It is not clear how generally this proposition is accepted among "monetarists". The implication of the St. Louis model (Leonall C. Andersen and Keith M. Carlson, "A Monetarist Model for Economic Stabilization," this *Review* (April 1970), pp. 7-25), is that changes in nominal *high employment* government expenditures, if unaccompanied by changes in the money stock, will ultimately leave nominal GNP unchanged. Since high employment government expenditures differ from actual government expenditures only by some adjustments to unemployment compensation, this equation might be interpreted as implying complete 'nominal crowding out'. For a further defense of the nominal crowding out position see Roger W. Spencer and William P. Yohe, "The 'Crowding Out' of Private Expenditures by Fiscal Policy Actions," this *Review* (October 1970), pp. 12-24.

In this model, crowding out occurs in nominal terms only if P remains unchanged, and all the adjustment of private demand comes about through interest rate changes. This occurs only if additional assumptions are made about the nature of the demand for real cash balances. In particular, complete nominal "crowding out" of tax-financed changes in government purchases of goods and services occurs in this model only if both the interest elasticity of the demand for real cash balances and the real wealth elasticity of the demand for real cash balances are equal to zero. In addition, the demand for real cash balances must be specified as a function of real output, and not real disposable income, to the extent that there exists a current real income elasticity of this function. Under these circumstances, if P were to rise (fall), the supply of real cash balances would decline (rise), but the demand for real cash balances would remain unchanged. Hence, any P other than the initial P would be inconsistent with equilibrium in the "money" market.

Fiscal Policy: Changes in Real Government Expenditures Financed by Selling Debt or Printing Money

The impacts of changes in government expenditures financed by debt issue or money creation are similar to those of the tax finance case, but the magnitudes are different. In the debt financing case, there exists a problem of definition similar to that encountered in the open market operation discussed above. Changes in outstanding debt imply changes in interest costs. Also, to the extent that there are induced effects on the commodity price level, the value of government purchases of goods and services and the value of tax receipts are changed, upsetting the financing constraint. We have assumed that a debt-financed change in government expenditures is accompanied by changes in real taxes which leaves real disposable income in the short-run equilibrium unchanged from the initial equilibrium value. Using this convention, a situation of financing by printing money, which can be thought of as a debt financing situation simultaneously accompanied by a pure open market purchase of government debt, requires no change in taxes.

As noted above, the effects of changes in government expenditures on the commodity price level in the short-run equilibrium differ depending on the financing mode. In particular, debt financing has a smaller impact on the price level than printing money. Further, the impact of a debt financed change in government expenditures on the price level is not zero, unless both the interest elasticity and the wealth elasticity of the demand for real cash balances are zero. Again, complete nominal crowding out of real government expenditures requires extreme assumptions in this model.

The Relation of this Model to the Textbook Post-Keynesian Model

The model presented in Tables I and III has been discussed in terms of the monetarist propositions stated in the introduction. It has been shown that comparison of a momentary run, in which information costs are positive, with a short run, in which information is perfect, can produce conclusions similar to those alleged by the proponents of monetarism.

Consider a situation in which, no matter what the length of the run, households remain perfectly ignorant with respect to commodity prices ($\lambda_2 = 0$). In contrast, assume households possess perfect information on money wages ($\lambda_1 = 1$). The perceived real wage rate in all runs is then $\left(\frac{W_e}{P_e}\right)=\left(\frac{W}{P_o}\right)$, and the labor supply function states that the quantity of labor services supplied is a function solely of the nominal wage rate, regardless of the length of the run. This, however, is just the usual post-Keynesian assumption about the labor supply function.

Theoretical consistency suggests that these assumptions about the information parameters be carried over to the other household behavior functions. This implies that the consumption function and asset demand functions should not be homogenous of degree zero in money income, nominal wealth, and commodity prices. The post-Keynesian literature on these functions is not completely consistent on this interpretation. Modigliani states that the homogeneity restrictions should be applied to both the consumption functions and asset demand equations, even though the labor supply function depends only on the nominal wage rate.[15]

In empirical studies, the approach has been mixed. At least one study of the consumption function has taken the approach that the specification should allow for the existence of money illusion in the consumption function and the data should be allowed to in-

[15]Modigliani, "The Monetary Mechanism," pp. 79-107.

dicate the result.[16] More frequently, the homogeneity restrictions have been applied *a priori*. In the empirical literature on the money demand function, the approach has been less one sided, with both homogeneous and non-homogeneous functions prevalent in the literature.[17]

The assumption that $\lambda_2 = 0$ and $\lambda_1 = 1$ is of course just a particular case of the general case of $\lambda_2 < \lambda_1 \leq 1$, which we use to characterize the momentary equilibrium case above. Thus, all of the results which were discussed for the momentary equilibrium are characteristic of the post-Keynesian case. Within this framework, the main difference between the post-Keynesians and the monetarists appears to be how rapidly households develop correct perceptions of price and wage developments.

The Relation of this Model to Other Monetarist Issues

It was noted at the beginning of this analysis that the results which were generated from this framework would satisfy many of the monetarist propositions about the working of the macroeconomy. However, it was emphasized that this should not be considered as "the" monetarist model. In particular, there are many aspects of it which monetarists would allege are incomplete. Since the analysis is confined to comparative statics, nothing has been said, nor can anything be said, about real versus nominal interest rates.

In addition, the analysis is restricted to the four-market model which is usually presented, implicitly or explicitly, in the commonly used macroeconomics texts. This has been done purposefully in the attempt to maintain comparability. On the other hand, the model definitely will appear deficient to many monetarists because of this restriction. In particular, no banking sector has been explicitly developed, so all cash balances in the economy are high-powered money. Thus, all problems associated with the relationship between money and a monetary base concept are swept aside.

Recently, Karl Brunner and Allan Meltzer have alleged that the four-market model is an inadequate framework within which to discuss the working of the macroeconomy because it omits an essential market, the market for existing real capital.[18] The analysis presented above could be extended to include an additional market and an additional price, that of existing assets. Obviously, such a model can have different implications on the results of various policy actions, and it is possible that a thorough analysis of such a model along the lines presented here would produce considerably more optimistic results for those who are persuaded that "nominal crowding out" of real government expenditures, in the absence of monetary financing, is an important feature of the economic picture.

Conclusions

All of the "monetarist" propositions about the results of monetary policy actions, and all but one of the propositions about the results of fiscal policy actions (the exception being nominal "crowding out"), have been derived without any explicit restrictions on the interest elasticity of the demand function for real cash balances. In particular, the results *do not* require that this elasticity be zero, either at momentary equilibrium or at short-run equilibrium. Rather, the propositions are derived from explicit and differing assumptions about price perceptions. Furthermore, the original model, with the labor supply curve replaced by the assumption of a permanently rigid money wage rate, is easily recognizable as the textbook "complete" Keynesian model.

The rather pessimistic conclusion suggested by this analysis is that a decade of academic debate on the relative stability of monetary velocity and the autonomous expenditure multiplier has been totally extraneous to the basic problem. On balance, the debate has probably been harmful to our understanding of the impact of alternative stabilization policies. The issues involved in these debates just do not discriminate between alternative hypotheses of macroeconomic behavior.

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[16] William H. Branson and Alvin K. Klevorick, "Money Illusion and the Aggregate Consumption Function," *American Economic Review* (December 1969), pp. 832-49.

[17] See David Laidler, "The Rate of Interest and the Demand for Money: Some Empirical Evidence," *Journal of Political Economy* (December 1966), pp. 543-555.

[18] Karl Brunner and Allan Meltzer, "Money, Debt, and Economic Activity," *Journal of Political Economy* (September/October 1972), pp. 951-977.

This article and a forthcoming algebraic appendix will be available in spring 1974 as Reprint No. 82.