

# FEDERAL RESERVE BANK OF ST. LOUIS

JUNE 1976



# REVIEW



## CONTENTS

Inflation and the Economic Recovery .....	2
Automobile Sales in Perspective .....	11
The Link Between Money and Prices — 1971-76 .....	17

Vol. 58, No. 6

# Inflation and the Economic Recovery

ROGER W. SPENCER

**T**HE recovery is solid. That unfortunate combination of falling output and rising rates of price increase which characterized the latest recession has been sharply reversed. There remains sufficient capacity for output gains to continue for some time, but many observers are monitoring price data and policymakers' actions closely for any signs which might foreshadow a resumption of inflationary pressures.

This article first compares the current recovery to others in the recent past and then describes the two chief factors responsible for the economic progress observed heretofore: moderate stabilization policies and the absence of adverse structural shocks. The interaction of these factors with inflation and inflationary expectations is analyzed in the final section of the article. It is argued that the abatement of inflation and inflationary expectations is an important element in assessing the likelihood of long-lasting economic prosperity.

## THE RECOVERY TO DATE

Up to the present time, the economic recovery, although not exceptional when measured against other recovery periods, has been stronger than anticipated by most analysts. Only a short time ago, it was claimed in many quarters that because of the severe shocks dealt to the economy in the form of unexpected

increases in the cost of energy, liquidity crises and political turmoil, exceptional monetary and fiscal stimuli would have to be applied to get the economy turned around. Growth rates of the money supply (M1) of 10 to 15 percent were advocated as a desirable stimulant to economic activity.<sup>1</sup> Such actions were never taken and yet the recovery has moved smoothly into high gear.

<sup>1</sup>See, for example, U. S. Congress, Hearings Before the Joint Economic Committee, *The 1975 Economic Report of the President*, 94th Cong., 1st sess., February 5, 6, 7 and 14, 1975, p. 548.

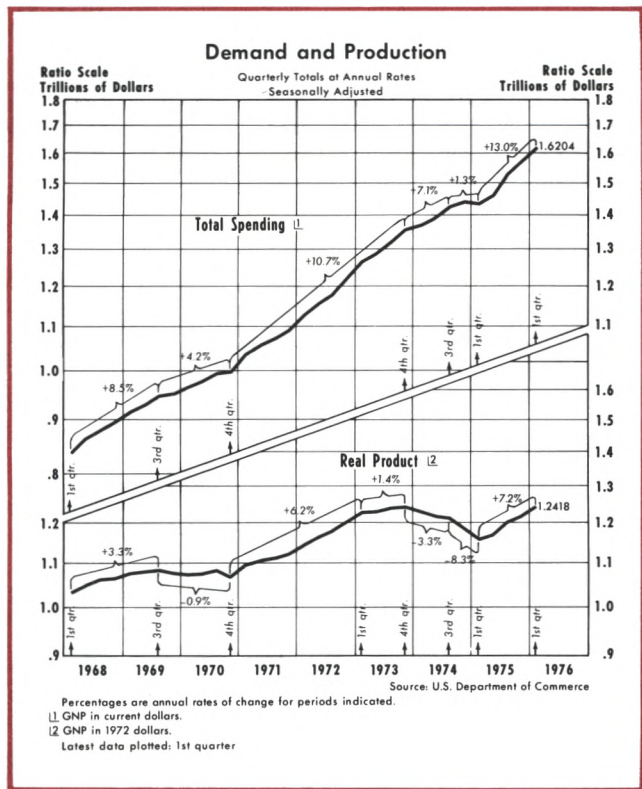
Table I

Comparison of Output, Employment and Price Data in Recent Recession and Early-Recovery Periods  
(Annual Rates of Change)

	Industrial Production	Real Product	Payroll Employment	GNP Deflator
<b>RECESSION<sup>1</sup></b>				
III/57 - II/58	-14.5%	-3.4%	-5.3%	0.9%
II/60 - I/61	- 7.3	-0.4	-2.3	0.6
IV/69 - IV/70	- 6.1	-0.6	-0.8	5.1
IV/73 - II/75	- 8.9	-4.0	-1.3	9.6
<b>RECOVERY<sup>2</sup></b>				
II/58 - I/59	20.2	8.6	4.7	2.3
I/61 - IV/61	15.1	7.4	2.8	1.4
IV/70 - III/71	3.5	5.0	1.5	5.1
II/75 - I/76	12.6	8.4	3.4	5.8
<b>TOTAL PERIOD</b>				
III/57 - I/59	1.4	2.4	-0.4	1.6
II/60 - IV/61	3.3	3.4	0.2	1.0
IV/69 - III/71	- 2.1	1.8	0.2	5.1
IV/73 - I/76	- 2.2	0	0.3	8.3

<sup>1</sup>Second quarter 1975 was selected as the trough of the most recent recession. Other troughs are defined by the National Bureau of Economic Research.

<sup>2</sup>The recoveries are defined to be the three-quarter period following the trough.

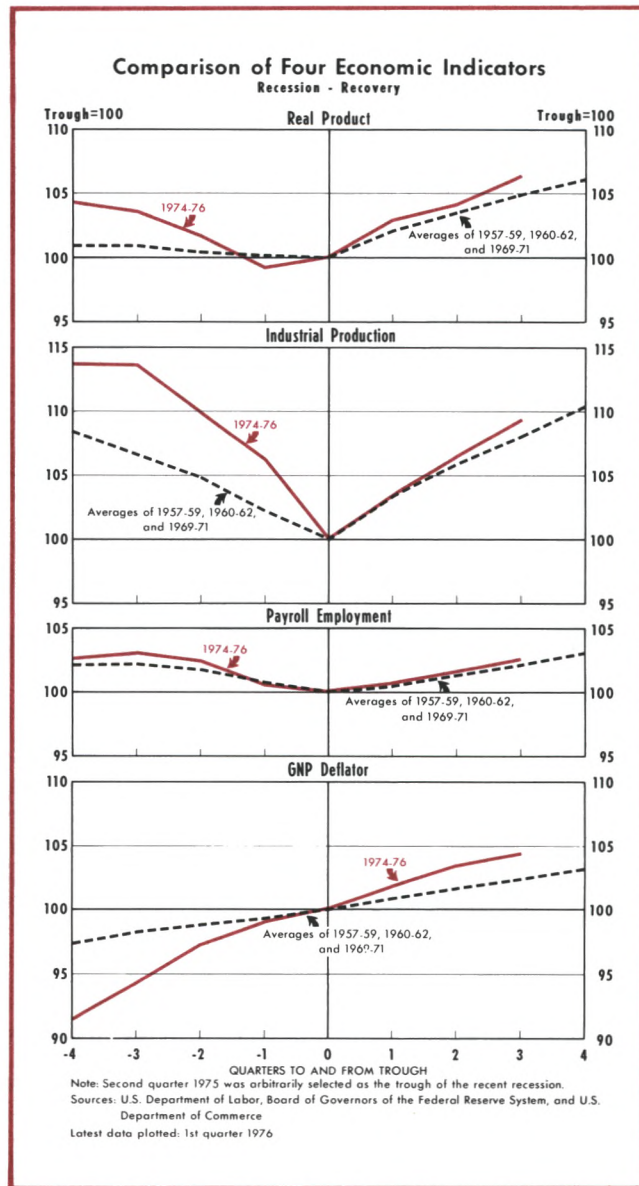


**Output, Employment, and Prices**

Table I indicates that output and employment increased rapidly over the past three quarters, about in line with similar periods following earlier recessions. The rebound has been more vigorous than following the 1969-70 recession, and roughly similar to the first three quarters following the two earlier recessions.

Employment gains have been sufficiently strong relative to labor force growth to push the unemployment rate down from a high of 8.9 percent in May 1975 to the 7.3 percent rate observed one year later. Industrial production growth, which has been most pronounced in the consumer goods area, has been steady but unspectacular throughout the recovery. Reported capacity utilization of major materials rose from 70.9 percent last spring to 80.7 percent in the first quarter of this year.

Prices have increased at a more rapid rate in this recovery than in others. Only the 5.1 percent rate of increase in the first three quarters following the 1970 recession is at all comparable to the 5.8 percent rate of increase in the three quarters ending first quarter 1976. Of course, prices rose at a far more rapid pace during the latest recession than during others. Note also the 8.3 percent rate of increase of prices over the latest total recession/recovery period.



**Sectoral Activity**

The recovery has not been unusual in terms of the pattern of growth of most economic sectors. Consumer spending has provided much of the good economic news since early 1975. Retail sales, especially automobile sales, have been impressive. Yet, as indicated in Table II, consumption for the latest total recession and recovery period has not increased quite as rapidly as in any other comparable period.

Government spending has not expanded by an exceptional amount relative to previous recession/recovery periods. The Table indicates that housing expenditures, although increasing at a moderate pace in the latest recovery, remain far below spending levels reported in 1973. Plant and equipment ex-

Table II

Comparison of Selected Spending Components of GNP in Recent Recession and Early-Recovery Periods  
(Annual Rates of Change)

	Real Government Spending	Real Consumption	Real Residential Structures	Real Producers Durable Equipment and Structures
<b>RECESSION<sup>1</sup></b>				
III/57 - II/58	6.2%	0.1%	- 2.7%	-16.7%
II/60 - I/61	5.4	-0.1	- 3.8	- 5.9
IV/69 - IV/70	- 1.9	0.9	8.2	- 7.2
IV/73 - II/75	0.4	0.1	-26.8	-11.9
<b>RECOVERY<sup>2</sup></b>				
II/58 - I/59	3.0	6.3	44.9	4.4
I/61 - IV/61	6.7	4.8	12.8	7.6
IV/70 - III/71	0.1	5.1	53.5	1.8
II/75 - I/76	3.6	5.3	32.5	5.7
<b>TOTAL PERIOD</b>				
III/57 - I/59	4.6	3.0	18.7	- 6.8
II/60 - IV/61	6.1	2.3	4.2	0.6
IV/69 - III/71	- 1.0	2.7	19.3	- 3.5
IV/73 - I/76	1.4	1.8	-10.8	- 6.4

<sup>1</sup>Second quarter 1975 was selected as the trough of the most recent recession. Other troughs are defined by the National Bureau of Economic Research.

<sup>2</sup>The recoveries are defined to be the three-quarter period following the trough.

**Stabilization Policies**

The growth of monetary aggregates and the level of interest rates are associated closely with monetary actions. The Federal deficit and tax and expenditure functions are representative fiscal indicators.

**Monetary Actions** — The monetary base, the primary determinant of money supply (M1) trend growth, has increased at a fairly steady 6 to 8 percent rate since 1970. However, M1 has fluctuated considerably around its trend growth in recent years. Changes in the demand for currency and time deposits relative to demand deposits have been chiefly responsible for the fact that M1 slowed from about a 6 percent trend growth to a 3 percent rate from second quarter 1974 to first quarter 1975, rose at a 7.4 percent rate over the next two quarters, and fell to a 2.5 percent rate of increase in the two quarters ending first quarter 1976. The latest available

data indicate that growth of both the monetary base and the money supply have picked up sharply in recent months.

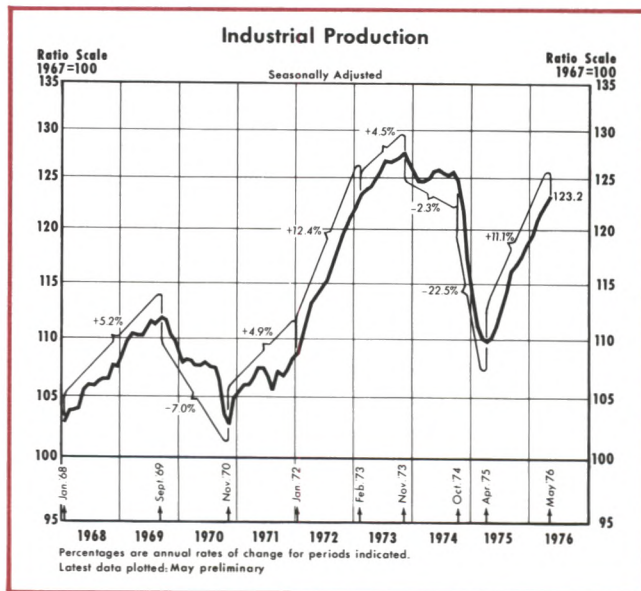
On balance since the Federal Reserve declared its one-year target range of M1 growth in March 1975 to be 5 to 7.5 percent, the rate of growth of money has been near the lower end of the range, increasing about 5 percent from first quarter 1975 to first quarter

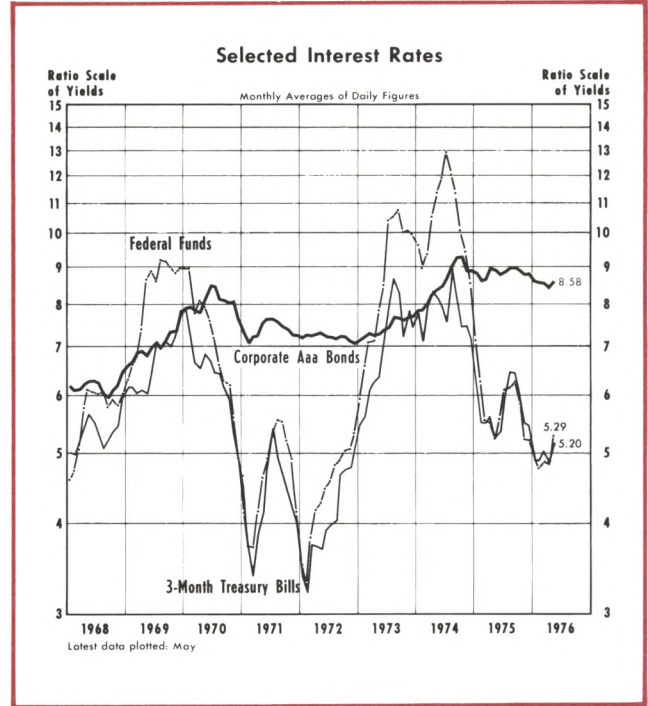
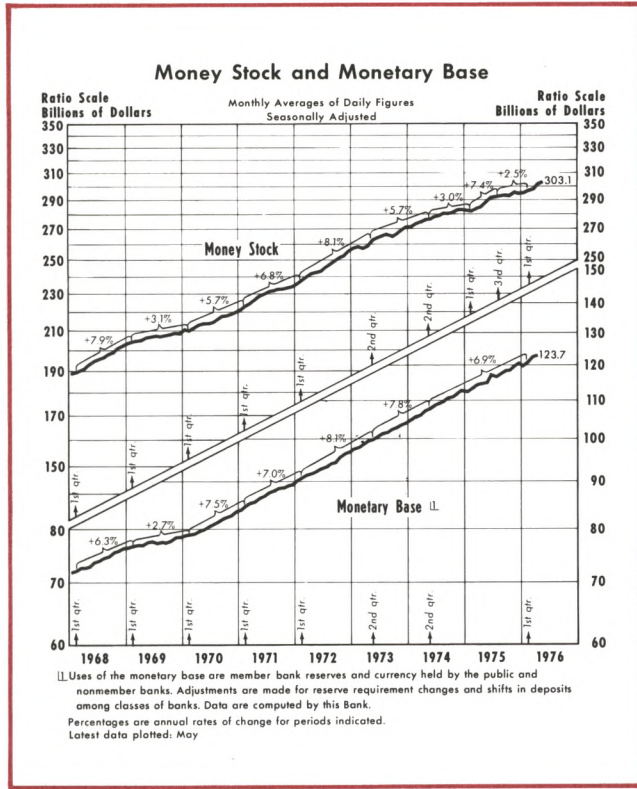
penditures, which picked up considerably in the first quarter of 1976, have been weaker over the latest total recession/recovery period than in any other period, with the exception of 1957-59.

**SOURCES OF THE RECOVERY**

In every recovery there are normal cyclical forces which support the upward impetus given the economy by outside, or exogenous, forces. For example, if the recession has been a severe one, many key workers such as foremen and skilled tradesmen would have lost their jobs. As the economic situation improves, however, these individuals generally will be the first to be rehired, and will make significant contributions to the production process. The same is true of equipment. The best, most efficient equipment will be the last to stop running as the recession deepens, but the first to be brought back into operation as the upswing begins. In short, the nature of the business cycle itself is conducive to increased productivity, efficiency, and output in the early stages of a business upturn.

Apart from cyclical forces, there are two major factors which have contributed to the latest upturn in economic activity: moderately expansive stabilization policies and the absence of adverse structural shocks.





1976. Over the past year the Federal Reserve has shifted its base periods and targets somewhat, the latest declared target range being 4.5 to 7 percent growth from first quarter 1976 to first quarter 1977.

M2 (M1 plus net time deposits) growth, although subject to some fluctuations, has been close to the range of 8.5 to 10.5 percent targeted by the Federal Reserve in March 1975. M2 increased 9.5 percent in the year ending first quarter 1976, about the same as its trend rate over the first several years of the current decade.

Both long- and short-term interest rates fell unevenly from their 1974 peaks, although such rates have moved up somewhat in recent weeks. The fall in rates accompanied, to some extent, the slowing in real economic activity in 1974 and the decline in the rate of inflation which began in 1975. There is little evidence that the Federal Reserve was actively trying to push down short-term interest rates through excessive money supply growth during this latest recovery period. The published records show that for the most part in 1975, the Federal Reserve adopted policies in which the Federal funds rate was to be kept in a range consistent with moderate money supply growth.

**Fiscal Actions**—Last year the Congress instituted a new budget process designed to bring Federal

spending under closer control. Despite one of the largest budget deficits in history, many observers contend that significant progress was made under the Congressional Budget Act of 1974 toward getting the Congress to approach the budget process in a broader, more responsible manner than in the piecemeal fashion which prevailed previously.

In the year ending June 1976, the budget deficit (on a unified budget basis) is expected to be about \$76 billion. This figure compares with the \$43.6 billion deficit experienced in the preceding year. Currently, the President and Congress are attempting to set the budget for fiscal year 1977 which begins October 1, 1976 and runs through September 30, 1977. The President's announced expenditure target of \$394.2 billion would amount to only a 5.5 percent rise over the previous year, the smallest year-to-year increase since 1969. Combined with the President's expectations of tax revenues in fiscal year 1977, the expenditure figure, if attained, would give a budget deficit of about \$43 billion.

Congress' target of \$413.3 billion is consistent with a 10.7 percent growth in expenditures, a figure lower than the 1975 and expected 1976 percentage increases. These data do not include expected outlays of about \$98 billion for the "transitional quarter," a period between July 1, 1976 and September 30, 1976. Inclusion of this big jump in expenditures gives fiscal policy a more expansive look. Moreover, it should be noted that so-called "off-budget" outlays, which receive little

public attention, have been rising at a rapid rate, and must be watched more closely than in the past.

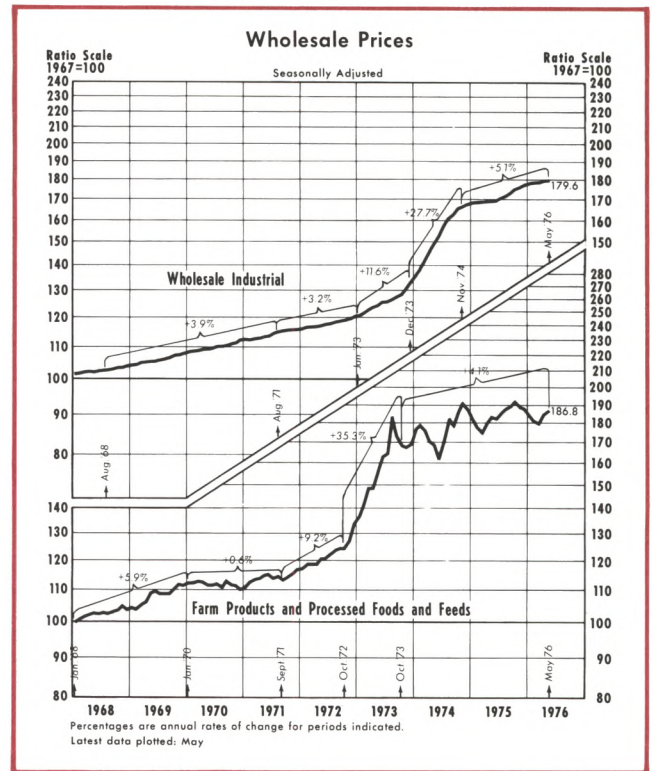
Despite the generally perceived trend toward fiscal responsibility, there is concern that governmental "crowding out" of the private sector will become a more serious problem as private demand continues to pick up. One way in which crowding out occurs is through the capital market route. The government's demand for funds competes with private sector demands for funds, and those private sectors which are most responsive to rising market yields are most likely to be crowded out. Two rather interest-sensitive sectors are housing and private capital spending, neither of which has bounced back from the recession as strongly as anticipated by many analysts.

**Structural Factors**

Since August 1971, the economy has been subjected to an unusual series of destabilizing shocks. Beginning with the imposition of price and wage controls in August 1971 and going through the recent liquidity crises of various governmental and non-governmental organizations, the wide variety of shocks administered and overcome is a testimonial to the considerable resiliency of the U. S. economic system. The reduced frequency of such shocks over the past year has permitted cyclical and policy forces to promote the normal recovery so far observed. Some of these shocks are described below.

**Energy**—Energy price levels remain high, but rates of change have about stabilized. The embargo of autumn 1973 and subsequent four-fold rise in oil prices adopted by the oil cartel contributed significantly to the one and one-half years of recession. Prices and employment in and outside the energy sector were adversely affected for quite some time. Oil came to cost the United States much more in terms of currently produced goods and services as well as in terms of goods and services to be produced in the future.

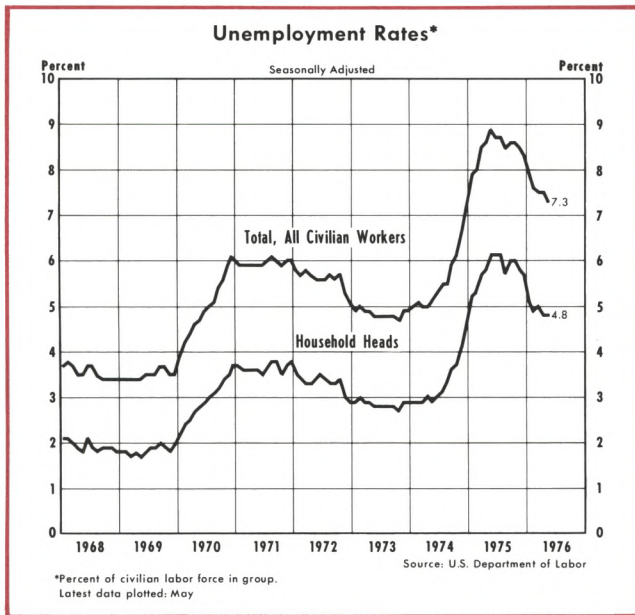
An energy bill was passed by Congress and signed by the President in late 1975. This legislation forced down prices of some domestically produced oil and authorized oil de-regulation to begin in thirty-nine months. These actions will probably keep oil prices down briefly, but in the absence of prompt, certain de-regulation, will do little to encourage greater domestic production and lower energy prices over a sustained period.



**Agriculture**—During the period of the recovery, the food-supplying sector of the U. S. economy began to recover from a battering series of agricultural setbacks which occurred for about two years beginning in 1972. Floods, droughts, blizzards, and other misfortunes combined to foster sharply higher prices for meats, poultry, grains, soybeans, and fish. As with the energy situation, most nations of the world were affected in one way or another by the unfortunate developments in the food sector.

Although food short-falls promoted huge price increases, these increases in turn encouraged the production of more agricultural products. Moreover, unlike the reaction to oil price increases, government policies were swiftly altered to stimulate the production of more, not less, agricultural products. The suspension of wheat acreage allotments and controls on meat imports are two examples of such policies. Food supplies rose so rapidly that wholesale prices of farm products and processed foods and feeds in May 1976 were actually below the level attained in November 1974.

**Mandatory Controls**—The normal and desirable reaction of the economy to the above shocks would be changes in relative prices—that is, changes in the price of an individual commodity relative to the average price of all other commodities. However, this process was hampered by the existence of actual,



and fear of future, price and wage controls. Peacetime price and wage controls were adopted for the first time in August 1971. For a brief period, the controls held measured prices and wages below what they otherwise would have been, but the associated inequities and inefficiencies were so great as to require their removal. The initial positive effects of the controls were soon reversed, as workers and firms attempted to get their wages and profit margins as high as possible in case another round of controls were to be instituted. A jump in price levels and greater unemployment were the predictable results of the "reverse" wage and price control effort.

The specter of controls, however, has diminished with each passing month of relative price and wage stability. Only the Council on Wage and Price Stability continues as a reminder. Fortunately, this agency has been as interested in halting the supply-restrictive measures of government organizations as it has been in directly monitoring wages and prices.

**Government Regulations** — In recent years all business organizations have become subject to a growing maze of government regulations.<sup>2</sup> Older agencies, such as the Interstate Commerce Commission, Federal Communications Commission, and the Federal Aviation Agency, which regulate specific industries, have been joined in the past several years by new agencies whose rulings apply to much broader cate-

gories of business firms. Prominent examples are the Occupational Safety and Health Administration, the Environmental Protection Agency, the Equal Employment Opportunity Commission and the Consumer Product Safety Commission. Each of these well-intentioned agencies was created by Congress to correct a specific problem area, but an undesirable side effect has been the shift of resources away from the production of capital and consumer goods and services toward the production of regulatory services.

The resources of virtually every firm in the nation have been affected by the necessity of acquiring knowledge of each new regulation and the burden of meeting the increased paper work demands. To cite three individual cases, there is evidence that: several hundred foundries in the United States were closed over the past few years because they could not meet EPA and OSHA regulations; the steel industry will have to allocate more than one-fourth of its capital expenditures from 1975 to 1983 to pollution control equipment; firms could be required to invest about \$31 billion to meet the 85 decibel noise level the EPA has recommended as a maximum limit in work areas.<sup>3</sup> These examples suggest the breadth of the regulatory shocks to which firms have recently been and are being subjected. In many cases the costs to businessmen are passed along to consumers in the form of higher prices to cover higher resource costs. The inflationary impact will be even greater in the future if capital formation is significantly affected.<sup>4</sup>

**Liquidity Crises** — The recession sharply accentuated the difficulties of institutions controlled by poor, corrupt, or "unlucky" management and subject to cash flow problems. In a short period of time such major firms as Lockheed, Penn Central, and Equity Funding either neared or went into bankruptcy. Franklin National Bank failed; in fact, 13 banks collapsed in 1975. There had not been more than nine bank failures in any one year since 1942. In addition, New York City's financial plight served to call atten-

<sup>3</sup>See "Pollution Control: High Operating Costs Seen Boosting Steel Price \$25 to \$30 a Ton by 1983," *Daily Report for Executives*, 14 May 1975, p. A-13; "Where Overregulation Can Lead: An Interview with Dr. Murray L. Weidenbaum," *Nation's Business* (June 1975), p. 29; "Regulators: A Rising Clamor Over Noise Limits," *Business Week*, 30 June 1975, p. 34.

<sup>4</sup>Leonall C. Andersen, "Is There a Capital Shortage: Theory and Recent Empirical Evidence" (Paper presented before the Joint Meeting of the American Finance Association and the American Economic Association, Dallas, Texas, December 28, 1975). Andersen contends that a negative relation indeed exists between these types of government regulation and capital formation.

<sup>2</sup>See Murray L. Weidenbaum, *Government-Mandated Price Increases: A Neglected Aspect of Inflation* (Washington, D. C.: American Enterprise Institute for Public Policy Research, 1975).

tion to the less than robust financial condition of a large number of state and local governments around the country.

Fortunately, the recovery has pushed up real profits and equity prices, permitting many firms to avoid debt-financing while restructuring their asset and liability positions. Cash flow has also improved significantly at the state and local government level, as tax revenues have improved and governmental bodies have cut back the rate of expenditure increase. Dire predictions of the imminent collapse of the U. S. financial system have been shown to be premature.

**International Economic Developments** — Along with price and wage controls came another shock in August 1971 — the U. S. Government's decision to halt the convertibility of dollars into gold. Subsequently, there occurred two official devaluations of the U. S. dollar, and an international move toward freely floating exchange rates. The implications of these developments were further muddled by the payments problems associated with the oil cartel's new-found wealth and the U. S. Government's decision to sell gold to private citizens. Given the degree of change that these events brought to the international payments system, fears arose that the worldwide financial system was on the verge of collapse.

Thus far, the international monetary system has held up remarkably well. Despite the fact that serious problems remain, the issues regarding gold, flexible exchange rates, and disposition of oil profits are being worked out in various markets with surprising dispatch.

**Summary** — The policy and structural factors discussed above combined so as to precipitate the worst recession in the postwar era. Rapid price increases during this period contributed to uncertainty and expectations of further price increases. With the slowing in price increases which began more than a year ago, many observers have gained confidence in the durability and strength of the current recovery. The following section of this article develops the inflation issue in more detail in order to shed light on the future course of economic activity.

## INFLATION AND INFLATIONARY EXPECTATIONS

There is an underlying trend of inflation even in the absence of substantial structural changes such as those described above. This trend is determined pri-

marily by domestic monetary and fiscal policy actions. Most analysts believe the current underlying trend to be about 5 to 6 percent, approximately the same as the trend growth of M1. Policy actions influence the price trend by affecting the demand for goods and services, given a stable underlying growth of supply or potential output. Most structural wrenching of the economy, on the other hand, directly affects the supply of goods and services, and with given demand, causes volatile short-run price fluctuations.

Fiscal and monetary policies represent the "macro" approach to serious economic problems. Altering such policies affects the demand for all goods and services. A reduction in the supply of a particular good, such as oil or soybeans, constitutes a "micro" economic problem, which is best corrected by micro or structural economic policies. One result of a decline in the supply of oil or soybeans is a rise in the price of oil or soybeans relative to other goods. All that a stimulative monetary or fiscal policy could do, in such cases, is push up the absolute price of all goods and services, leaving the relative price of oil and soybeans unchanged. However, a structural policy oriented toward increasing the supply of oil or soybeans could bring the relative prices of these commodities back into alignment.<sup>5</sup>

During the period in which relative prices of goods and services are adjusting toward some equilibrium value, relative rates of return on labor and nonlabor inputs are also adjusting. Because there is not *immediate* adjustment of factors of production to changes in rates of return, unemployment of resources is typically associated with this adjustment period. Indeed, the sharp rise in unemployment in 1974 was largely due to the severe structural shocks absorbed by the economy over a relatively brief period of time. Policymakers, recognizing the limited ability of macroeconomic measures to eliminate structural unemployment, adopted policies of moderation. This has been more the case with regard to monetary than fiscal policy.

Why might these policies be considered appropriate? There are at least two explanations. One has to do with the effect of such policy actions on the economy independent of their effect on price anticipations and the other considers the impact with price anticipations.

<sup>5</sup>See the accompanying article by Denis S. Karnosky, "The Link Between Money and Prices — 1971-76," this issue of the *Review*.



### *Stimulative Policies Assuming No Price Expectations Effects*

Ignoring for the moment the effect of stimulative policies on price expectations, what would be the implications of a doubling of both the actual budget deficit and the rate of growth of the actual money supply? First, because the entire economy is and has been operating at less than capacity, unemployment would fall at a faster pace than it would fall under more moderate policies. Second, policymakers would soon face the necessity of reversing their stimulative policy actions. Given sharply declining unemployment, at what point should expansionary policies be curtailed—7 percent, 6 percent, 5 percent, 4 percent, or at a 3 percent aggregate unemployment rate?

The fact is that no one knows with any high degree of certainty the specific lags between policy change and unemployment response. Nor is it known with precision what rate of price increase is associated with a particular unemployment rate. Because aggregate unemployment measures of either labor or capital resources are comprised of sectors in which capacity utilization rates differ widely, shortages and rising wages and prices can emerge quickly in bottleneck areas under the lash of forceful macroeconomic policies. The capacity utilization measures themselves often give contradictory signals as to just how much slack exists at any time in the economy.

Finally, the track record of our policymakers in the postwar period is not good with regard to an awareness of when to cut back stimulative policies. In the early 1960s, prominent economists professed the belief that we had acquired the necessary knowledge and the tools to “fine tune” the economy with just the proper injection of, say, more government spending here and higher interest rates there. Historical experience with upward ratcheting inflation rates in the face of periodic recessions over the past fifteen years has shown that we have no such knowledge or that it has not been applied.

### *Stimulative Policies Assuming “Policy Announcement” Price Expectations Effects*

In recent years the Federal Reserve has become more open in the announcement of its policy intentions. In addition, the Federal Government, to include the Congress, makes available for public scrutiny its specific budget policy preferences. Many observers believe there is an important linkage between policy statements, policy actions, and economic activity. Stimulative policy actions have come to be as-

sociated with inflationary pressures and restrictive actions with periods of recession. Assuming that stated policy preferences bear some relation to policy actions, it is not too far-fetched to conjecture that an important segment of the public includes policy announcements as an input into its expectations of the future course of economic developments. In fact, a body of literature is currently being amassed which suggests that the public forms its expectations “rationally” on the basis of currently available economic information, which includes public policy pronouncements.

If we accept the notion that policy statements influence the expectation of future inflation, what impact would the announcement of, say, a money growth rate and a Federal deficit twice the actual declared targets, have had on such expectations last year? Quite likely, given past experience with deficits, money supply growth, and inflation rates, there would have been a marked rise in inflationary expectations. This could have been transmitted through the economy in numerous ways.

Mortgage and other lenders demand higher premiums when faced with the expectation of higher prices, thereby putting upward pressure on interest rates. Union and nonunion workers are placing greater emphasis on inflation escalator clauses in their negotiations; the anticipation of further price hikes could only strengthen their wage demands. Because firms were hit hard in recent years by the impact of inflation on profits due to their vulnerability to higher inventory costs and inadequate depreciation write-offs, corporate officials are among those most likely to give great attention to changes in macro-policies and policy statements. Such officials would likely attempt to protect themselves from the adverse effects of inflation, and conceivably, further price controls, by increasing prices.

With anticipations themselves forcing up prices, the stabilization authorities would have to continue any stimulative policy actions they might adopt in order to validate the price and wage hikes, or risk the outbreak of widespread unemployment by applying the monetary and fiscal brakes.

The long-run effects of higher price anticipations are more difficult to forecast. There is little evidence that consumers, over the long run, will spend more or that firms will invest more than otherwise in the face of rapid inflation. In fact, the likelihood is that so much energy and effort is put into beating inflation, that productivity is adversely affected. Lower productivity, given aggregate demand growth, means

more inflation. In other words, there may be a vicious cycle associated with price anticipations, and the realization of such anticipations, which must be broken if the economic system is to continue to function in a viable manner.

## OUTLOOK

Economic activity has bounced back from the recent recession at a pace somewhat greater than other postwar recoveries, and stronger than anticipated by many analysts. Strongly expansionary policies were not required to spur the recovery because of the interplay of normal cyclical forces and the cessation of harmful economic shocks. In fact, if price expectations are affected by current macroeconomic policies, the adoption of moderate policy measures was conducive to a strengthened recovery.

The recovery should continue at a healthy pace for some time—in the absence of further shocks and

given policies oriented toward eliminating structural deficiencies and curbing inflationary pressures. Some progress has been made by eliminating price and wage controls and by stimulating agricultural output, but not much has been done to further energy growth, or halt the growing network of government regulations.

So far as macroeconomic policies are concerned, firms must be convinced that they will not again be caught in an inflation-induced profit squeeze if they are to increase substantially their capital expenditures; and labor must be convinced that their wages will not be eaten up by rapid price advances if strikes and excessive wage settlements are to be avoided. Continued large deficits and the resumption of rapid monetary growth are inconsistent with such objectives. They are consistent with a return toward a path taken by a large number of inflation-plagued countries throughout the world.



# Automobile Sales in Perspective

JAMES E. TURLEY

**D**UE to both its relative size and its tendency toward large cyclical fluctuations, the automobile industry has tended to receive a great deal of attention in analyses of current economic conditions. In terms of new car sales, developments of the past three years have been particularly well publicized, popular topics of concern. In part, this has probably been a response to the impact of the oil embargo which highlighted developments in a number of industries. The purpose of this article is to provide some perspective on this recent period by comparing it with the pattern of new car sales in the previous three recession/recovery periods.

## ECONOMIC IMPACT OF AUTOMOBILES

In 1972 (latest data available) expenditures for passenger and freight transportation totaled \$208.7 billion, or 18 percent of GNP in that year; passenger transportation expenditures related to automobiles accounted for over half of this amount — \$111.6 billion.<sup>1</sup> About 26 percent of all retail sales and 19 percent of all wholesale sales were automotive related in that year. Employment in motor vehicle and equipment manufacturing totaled 858,100 in 1974, or 4.3 percent of total manufacturing employment.

In addition, the health of the automobile industry has a profound impact on a number of so-called “feeder” and related industries. The rubber industry, in particular, is extremely sensitive to changes in the economic condition of the automobile industry. For example, 74 percent of the rubber consumed in the United States in 1973 was related to consumption of automobile services. Consumption of lead for auto-

motive usage amounted to 63 percent of total U.S. consumption in 1973. Iron, zinc, and steel are the next most dependent industries with 47, 33, and 21 percent, respectively, of their consumption accounted for by automobiles. Financial institutions are also affected by the automobile industry. As an example, installment credit extended for automobile purchases amounted to one-third of total consumer installment credit raised in 1975.

The revenue generated from automotive-related purchases represents an important source of funds for government operations. For example, in 1974 the Federal Government collected \$6.1 billion in excise taxes on such purchases as motor fuel, tires, trucks, buses, and trailers. State revenues from motor use taxes amounted to 16 percent of total funds collected by the states in fiscal 1974.<sup>2</sup>

## HISTORICAL OVERVIEW OF AUTO SALES

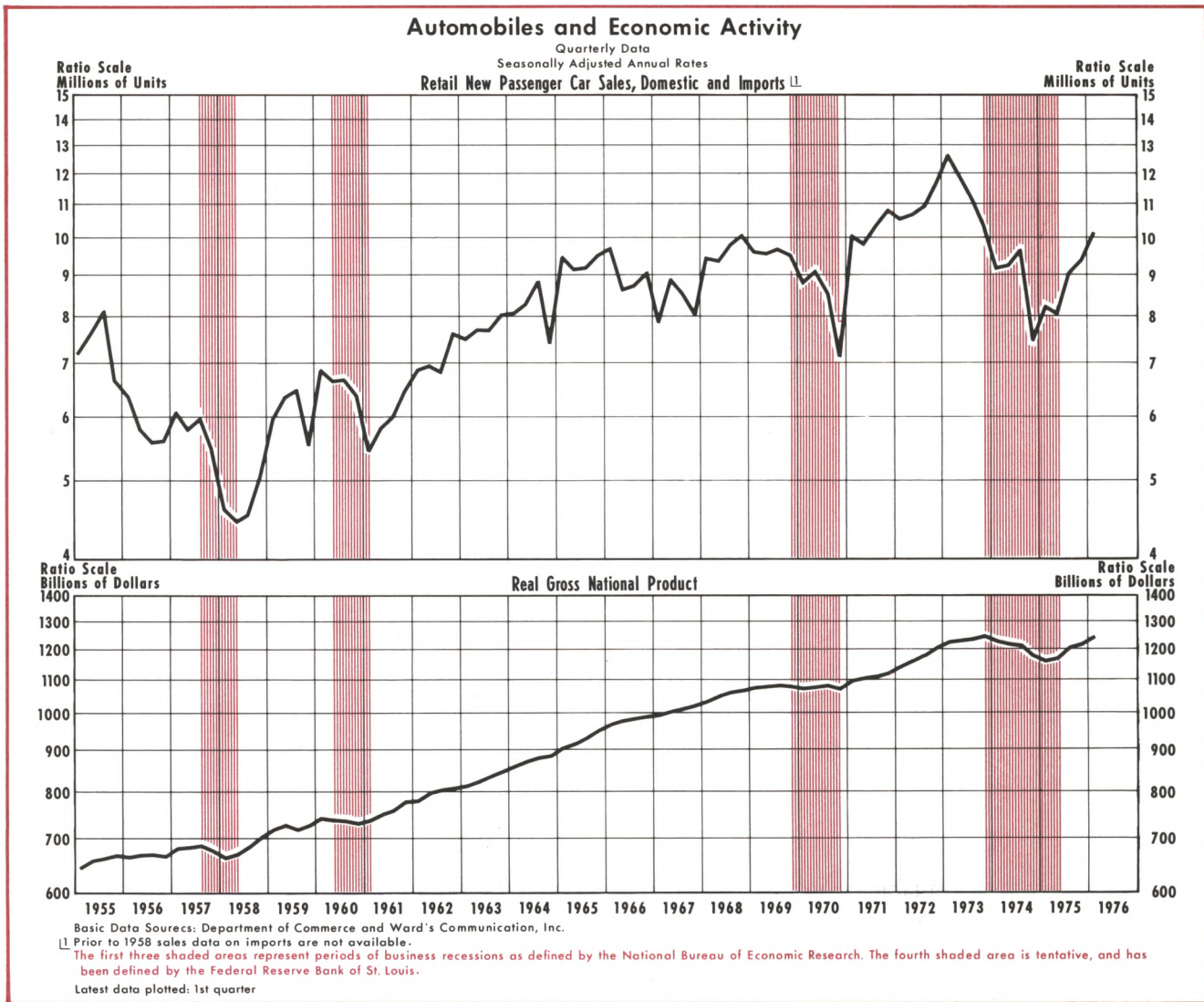
Growth of the automobile industry has been substantial in the past 26 years, with auto sales slightly outpacing the growth of the economy in general. Total new car sales, including imports, have increased at a 4.7 percent annual rate, rising from about 3.5 million units in 1948 to a peak of 11.4 million in 1973. For comparison, production of all goods in the nation advanced at a 4.3 percent rate over this period.

### *Trend Growth*

As indicated in the accompanying chart, the rise in new auto sales has not been steady or uniform. There have been boom periods followed by periods of sluggishness, but the trend has been unmistakably

<sup>1</sup>Included in the auto transportation figure are expenditures for new and used cars, gasoline and oil, insurance, auto registration fees, and repairs. For additional information, see Motor Vehicle Manufacturers Association, *1975 Automobile Facts and Figures*, p. 53.

<sup>2</sup>New Hampshire collected the highest proportion of funds from this source, with 34 percent of its revenue originating from motor use taxes.



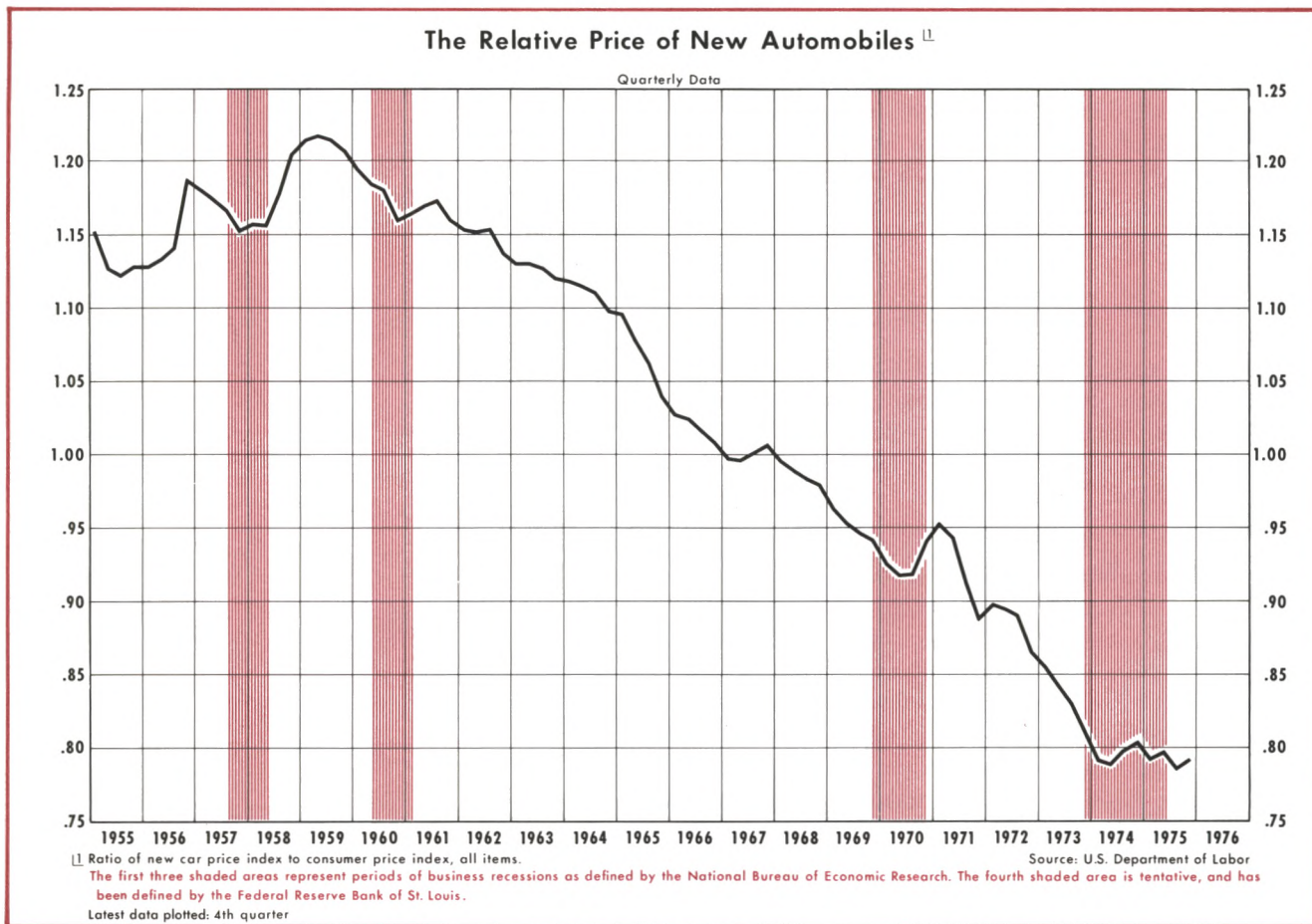
upward. In general, each periodic crest and trough has occurred at a higher level than the previous high and low points. For example, the year 1955 was a banner year with new car sales of 7.4 million units; three years later sales fell to 4.7 million units. In 1965, auto sales were recorded at a high of 9.3 million units; two years later, in 1967, sales had fallen to a relative low of 8.3 million units.

The upward trend in auto sales is related to several factors, one of which is the trend growth of disposable personal income adjusted for the effects of inflation. Such a measure is generally regarded as an indication of an individual's ability to purchase goods and services. Since 1955 this measure of purchasing power has increased at a 3.4 percent annual rate.

Another important factor in the determination of the trend growth in auto sales is the price of autos

relative to the prices of other goods and services. As can be seen in the accompanying chart, since early 1959 the price of new automobiles has declined relative to all goods and services — that is, there has been a shift of relative prices in favor of new automobiles. Even considering the substantial price boosts posted by the auto manufacturers recently, the new car price index relative to the consumer price index (CPI) is 35 percent below its peak of early 1959.

In this regard, it is interesting to note the behavior of new car prices relative to other prices during recessions. The overall downward trend is halted during economic contractions as the relative price of new cars either rises or, on balance, remains essentially unchanged. Available data indicate that this pattern tends to be the result of overall prices slowing and auto prices accelerating during recession periods. In other words, prices of other goods appear to be more



responsive to the deflationary forces of recession than do new automobile prices.<sup>3</sup> For example, the upturn in the relative price of autos from second quarter 1970 to first quarter 1971 was the result of new automobile prices posting a 9.9 percent rate of gain and the CPI increasing at a 4.5 percent rate. In the four previous quarters, new automobile prices and the CPI increased at respective rates of 2 and 6 percent.

The upward trend in retail sales of new cars is also related to demographic developments which have affected the demand for autos. For example, the number of individuals with licenses has increased in both level and as a percent of the population of driving age. In 1955, 75 million individuals were

licensed, which represented about 66 percent of the population 16 years of age and older; in 1974, there were about 125 million licensed drivers, or 83 percent of the driving-age population. In the mid-1950s, only 10 percent of all families in the nation owned two or more cars; in 1971, about 30 percent of all families owned two or more automobiles.

### Market Shares

The composition of new automobile sales between foreign and domestic models has undergone significant change since 1947. In general, auto imports have represented an expanding proportion of the total new car market, although there are current indications that this trend is being reversed or at least being halted temporarily. Up until about 1955, the percentage of new car sales attributable to imports was negligible, less than one percent. Over the next four years imports increased to 10 percent of the new car market, then by 1962 slipped to under 5 percent. From 1962 through 1974, the upward path was re-established, with 16 percent of 1974 new car sales attributed to imports.

<sup>3</sup>This relative downward inflexibility of auto prices in recessions, coupled with the observation made by others that the demand for automobiles is relatively more responsive to changes in income implies, a greater adjustment downward in the number of units sold than would be the case if auto prices were more responsive to deflationary forces. For a summary of various estimates of income elasticity, see "The Demand for Automobiles," Senate Subcommittee on Antitrust and Monopoly, in Donald Stevenson Watson, *Price Theory in Action* (Boston: Houghton Mifflin Company, 1965), p. 23.

Beginning in 1975, however, another reversal appears to be taking shape. With the narrowing in the price differential between foreign and domestic models, among other factors, sales of imports have recently become a declining portion of new auto sales. In first quarter 1975, imports were credited with about 20 percent of total new car sales; in first quarter 1976, this proportion had fallen to about 13 percent.

### CYCLICAL CONSIDERATIONS

The trend growth of auto sales has been far from smooth or steady. In fact, automobile sales, like most durable goods, have been highly volatile in the short run. Among other factors, such volatility appears to be closely related to an individual's perception of near-term income and employment prospects.<sup>4</sup>

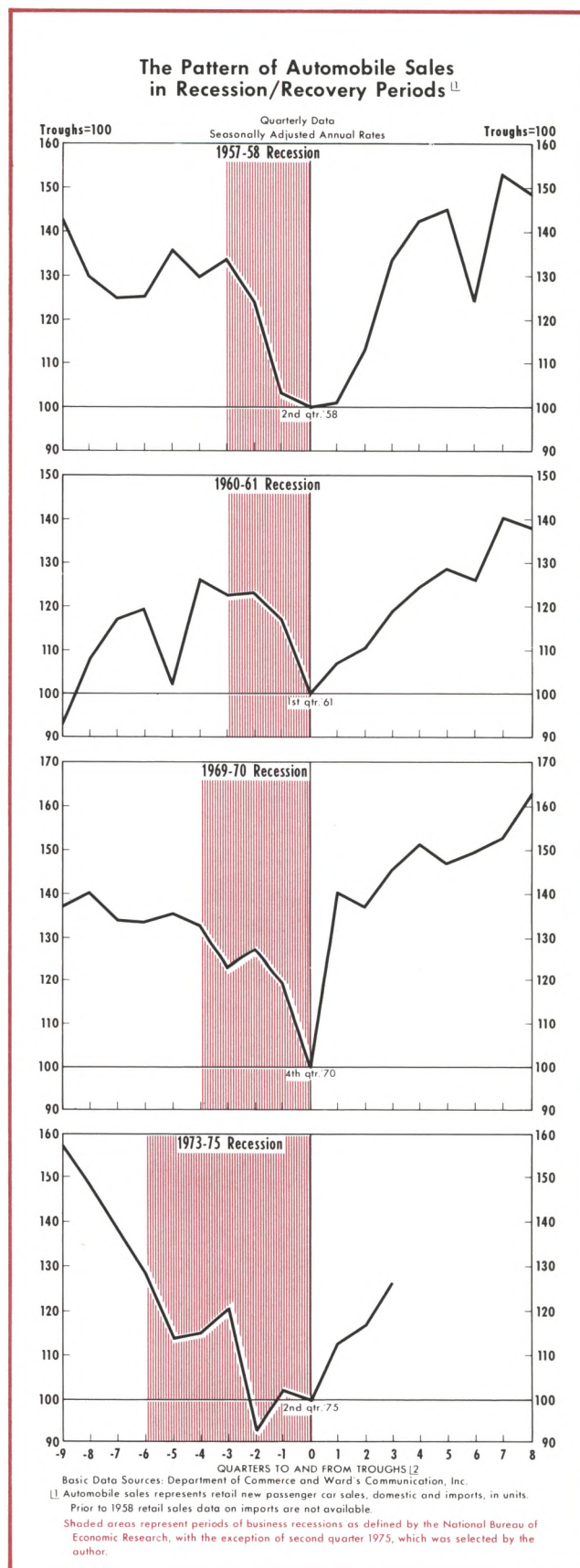
Expectations about future economic conditions are very influential forces in the decision to purchase a durable good, such as a new auto. Prior to and during periods of business contractions, expectations about the future become increasingly clouded. As unemployment rises, uncertainty about future income increases and individuals reduce purchases of "big-ticket" items, such as many durable goods. These purchases can be delayed until individuals again expect more favorable economic conditions to prevail. Autos appear to be quite sensitive to such changes in expenditure decisions.

### Timing

The downturn in automobile sales has generally tended to lead the downturn in aggregate activity, although the lead time in the past four recessions has been variable. In the 1973-75 recession, auto sales peaked about three quarters prior to the generally recognized peak in overall economic activity. Autos posted a record annual sales rate of 12.6 million units in first quarter 1973, while the peak in aggregate activity was not reached until fourth quarter 1973. In the recessions of 1969-70, 1960-61, and 1957-58, the downturns in auto sales preceded the contractions in economic activity by four, one, and two quarters, respectively.

During economic expansions, auto sales generally begin picking up about the same time as aggregate activity. In the 1970, 1961, and 1958 periods of aggregate expansion, the upswing in auto sales co-

<sup>4</sup>For a more thorough discussion of the role of expectations in the determination of short-run movements in auto sales, see Ron P. Smith, *Consumer Demand for Cars in the U.S.A.* (London: Cambridge University Press, 1975).



incided with the upswing in overall activity. In 1975, however, it appears as if auto sales picked up about two quarters prior to the economy in general.<sup>5</sup> Boosted by the offer of rebates on new car purchases, auto sales increased in first quarter 1975 from its trough in fourth quarter 1974.

### Magnitude

**Recession** — Any downward movement in overall economic activity, as measured by real GNP, tends to be magnified several times over for automobiles. For example, as shown in Table I, real GNP in the past four recessions has declined in a range of between 1.1 percent in the 1969-70 period and 6.6 percent in the 1973-75 period. Purchases of new automobiles, however, have posted declines ranging from 20.7 percent in 1960-61 to 40.7 percent in 1973-75.<sup>6</sup>

As can be seen by these numbers, the more severe the downturn in aggregate activity, the sharper is the drop in auto sales. But this relationship between autos and overall economic performance is far from systematic. For instance, the 3.2 percent decline in real GNP in 1957-58 was associated with a near 32 percent decline in new car sales. Although the decline in real GNP in 1973-75 (6.6 percent) was twice as great as in 1957-58, the decline in auto sales was only somewhat greater (40.7 percent).

**Recovery** — With respect to economic upswings, the same pattern of pronounced changes in auto sales relative to real GNP seems to hold; but again, there does not appear to be a tight relationship between the strengths of the expansions displayed by the two series.

For example, in the four quarters following the troughs in real GNP in 1975 and 1958, this measure of real activity advanced by 7.1 percent; however, the expansion in total auto sales in the earlier period was much stronger than that displayed for the current period — 42.4 percent versus 25.3 percent. The sharpest rebound in auto sales was posted in the year following the relatively mild recession of 1969-70; real GNP expanded 4.6 percent while new auto sales

<sup>5</sup>Timing aspects in the 1975 recovery period are somewhat more difficult to determine. The judgement of the National Bureau of Economic Research (NBER) is generally accepted for the purpose of determining the turning points in aggregate activity. This determination has not yet been made for the most recent trough, although the NBER is using April 1975 as a preliminary estimate. The second quarter of 1975 is used here as the terminal quarter of the latest recession.

<sup>6</sup>The actual peaks and troughs in real GNP and auto sales are not necessarily the same as those defined by the NBER for the aggregate economy. See footnotes to Table I.

Table I

#### MOVEMENTS IN REAL GNP AND NEW AUTO SALES IN RECESSION/EARLY-RECOVERY PERIODS

Data Series	Annual Rate of Change, Peak to Trough	Percent Change, Peak to Trough	Percent Change, Trough to Subsequent Four Quarters
<b>1957-58 Recession</b>			
Real GNP <sup>1</sup>	- 6.4%	- 3.2%	7.1%
Total Auto Sales <sup>2</sup>	<sub>3</sub>	<sub>3</sub>	42.4
Domestic Auto Sales	-26.3	-31.7	39.6
Import Auto Sales	<sub>3</sub>	<sub>3</sub>	77.0
<b>1960-61 Recession</b>			
Real GNP	- 1.6	- 1.2	6.1
Total Auto Sales	-20.7	-20.7	26.2
Domestic Auto Sales	-19.9	-19.9	28.6
Import Auto Sales	-34.7	-34.7	- 7.3
<b>1969-70 Recession</b>			
Real GNP	- 0.9	- 1.1	4.6
Total Auto Sales	-15.6	-28.7	51.1
Domestic Auto Sales	-20.1	-36.2	63.9
Import Auto Sales	+18.7	40.9	- 4.6
<b>1973-75 Recession</b>			
Real GNP	- 5.3	- 6.6	7.1
Total Auto Sales	-25.8	-40.7	25.3
Domestic Auto Sales	-27.2	-42.6	31.1
Import Auto Sales	-17.3	-28.2	0.3

<sup>1</sup>The peaks and troughs in real gross national product are:

Peaks	Troughs	Quarters	Duration
III/1957	I/1958	2	
I/1960	IV/1960	3	
III/1969	IV/1970	5	
IV/1973	I/1975	5	

<sup>2</sup>The peaks and troughs in retail new passenger car sales are:

Peaks	Troughs	Quarters	Duration
I/1957	II/1958	5	
I/1960	I/1961	4	
IV/1968	IV/1970	8	
I/1973	IV/1974	7	

<sup>3</sup>Quarterly data on import auto sales are not available prior to 1958. However, the percentage change in domestic auto sales approximates total auto sales since imports constituted only 3.4 percent of total in the year 1957 as a whole.

increased by about 51 percent.<sup>7</sup> In the four quarters of expansion following its trough in the 1960-61 recession, real GNP increased about 6 percent and automobile sales rose 26 percent.

In the early recovery periods of the last three recessions, essentially all of the increase in auto sales has been accounted for by domestic models. A negligible (0.3 percent) rise in sales of foreign autos in the period of recovery from first quarter 1975 to first quarter 1976 compares with actual declines (-4.6 and -7.3 percent, respectively) in the four

<sup>7</sup>Some distortion is introduced into the GNP and auto sales data by the automobile strike in fourth quarter 1970.

quarters following the two previous business contractions. Sales of imports in the 1958-59 recovery period posted an exceptionally large gain in percentage terms, but this is primarily the result of the relatively small base associated with the level of imports in this period.

### CONCLUSIONS

It was generally argued over the course of this most recent recession that the auto industry was especially hard hit because not only were the typical forces of recession placing downward pressure on auto sales, but a number of special factors were also serving as sales depressants. These special factors included substantial price boosts posted by the auto manufacturers, uncertainty about the availability and

price of petroleum products generated by the oil embargo, and general consumer resistance to the Government-mandated pollution and safety equipment.

All of these factors were supposedly accentuating the plight of the auto industry in 1973-76 and when viewed in isolation, the numbers associated with the swings in auto sales appear to be substantial. But, when viewed in the context of previous recession/recovery periods, the numbers are somewhat less surprising. In particular, when one considers the extent of the decline in overall economic activity in the recent recession and the subsequent expansion in the aggregate economy, movements in new auto sales in the 1973-76 period do not appear to be significantly out of line with the general pattern observed in the three previous recession/recovery periods.





# The Link Between Money and Prices – 1971-76

DENIS S. KARNOSKY

**T**HAT group which gathers under the banner of monetarism has long blamed excessive monetary expansion as the source of inflation. They have argued that inflation, as a persistent increase in the general price level, results solely from a maintained expansion of the money stock at rates in excess of increases in the amount of money demanded in the economy.

The validity of this view, or at least its usefulness, rests on the issue of whether or not its predictions are consistent with the evidence.<sup>1</sup> The purpose of this exercise is to subject the money-price hypothesis to a test, using the experience of the past five years for evidence. This period is particularly useful in this context since it was unique in the number and magnitude of nonmonetary shocks to the economy. Price controls, devaluations, agricultural problems, new government regulations, the actions of OPEC (Organization of Petroleum Exporting Countries) and disappearing anchovies, among others, worked on the pattern of prices. The question is how these factors fit, if at all, in the money-price hypothesis and how well the hypothesis “performs” in such an environment.

## *The Money-Price Connection*

The notion that inflation is a monetary process is based on the conception of “money” as that asset which minimizes transaction costs in the economy. The cost of the services derived from any money holdings, like that of other assets, are consumption opportunities that are foregone as long as the money is held in inventory. In this sense the price of money is the inverse of the general price index, properly weighted to include the prices of all consumption opportunities, current and future.<sup>2</sup> This view implies that disequilibrium in the market for money, with a given stock, can be eliminated only through a change in the general level of prices or the emergence of some force that works to shift the demand for money to equate the amount demanded to the stock supplied, at existing prices.

A fundamental tenet of what has come to be called the monetarist position is that the second situation is not likely, in the sense that disequilibrium in the market for money does not set into motion forces in other areas of the economy which then work to shift the demand for money, with little or no change in the existing price level. Similarly, this position denies the possibility of factors outside of the market for money generating a permanent change in the rate of inflation, without creating a situation of permanent excess money supply. Thus inflation, as a *continuing* increase

<sup>1</sup>Recently, Michael Levy attempted to provide evidence to refute the money-price linkage by showing that other variables, such as unit labor costs, capacity utilization rates, and measures of inflation severity and sensitivity, “explain” prices better than does money. Levy’s effort falls far short, however, in that his tests were based on a basic misrepresentation of the theory which says inflation is a monetary phenomenon. The analysis presented here is addressed to this misconception and attempts to point out how much can be gleaned from the popular “evidence.” See Michael E. Levy, “Constraining Inflation: Concerns, Complacencies, and the Evidence,” *The Conference Board Record*, National Industrial Conference Board, Washington, D.C., October 1975, pp. 8-14. For a similar analysis and a critical discussion, see Peter Fortune, “An Evaluation of Anti-Inflation Policies in the United States” and “Comment” by William Poole in Federal Reserve Bank of Boston, *New England Economic Review* (January/February 1974), pp. 3-34.

<sup>2</sup>The general price level thus is more extensive than is accounted for by current price indexes, which typically include prices of output, but ignore the prices of existing assets. This raises very interesting questions for the issue at hand, but they will be ignored – in the spirit of commonly practiced macroeconomic analysis. See Armen A. Alchian and Benjamin Klein, “On a Correct Measure of Inflation,” *Journal of Money, Credit and Banking*, February 1973, pp. 173-91.

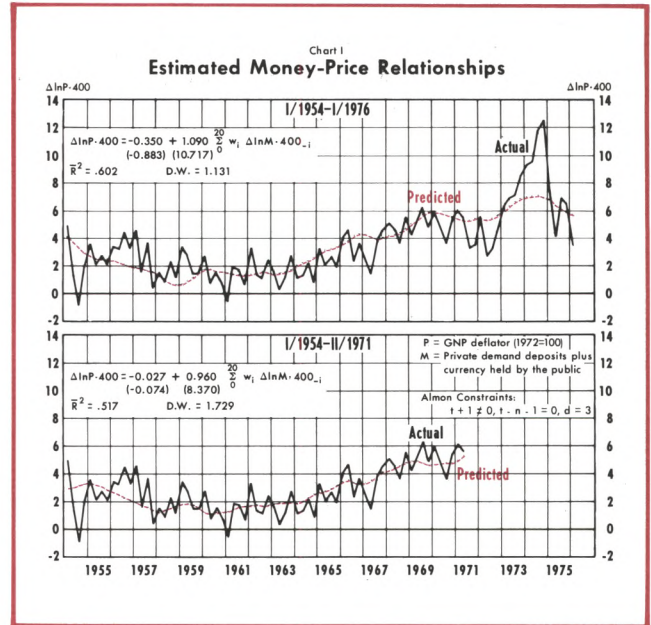
in the general level of prices, is a manifestation solely of a persistent excess of money supplied at existing prices, and the money supply, in turn, is the result of actions by the monetary authorities.

Empirically, this argument implies that the rate of change of prices can be expressed as a function of the rate of change of the money stock. With some regard for lags in adjustment, an equation of the following form is implied:

$$(1) \Delta \ln P = \alpha_0 + \alpha_1 \sum_{i=0}^n w_i \Delta \ln M_{-i} + \mu$$

where  $\alpha_0 = 0$  and  $\alpha_1 \sum w_i = 1.0$ , and  $\mu$  demonstrates all of the usual nice properties. This equation says only that the fundamental rate of inflation is reflective of the long-term rate of monetary expansion. The exclusion of nonmonetary factors from the equation reflects the view that these factors can have only a temporary effect on the rate of change of prices.<sup>3</sup> The equation has been estimated for the period I/1954 - I/1976, with  $n = 20$ . Prices are measured by the GNP deflator and the money stock is taken to be composed of currency in the hands of the public plus private demand deposits. The fit is shown in Chart I. The explanatory power of the regression is reasonably good through most of the sample period, with the glaring exception of 1971-74. The errors in this period are the point of interest in this paper.

The period since mid-1971 is rather unique in the postwar period and offers a rare opportunity to test the money-price connection in that so many factors were working to disturb the relationship. Comprehensive price controls were introduced in August of 1971, and fiddled with over the next two and a half years. The formal arrangements on international exchange rates and payments collapsed under the pres-

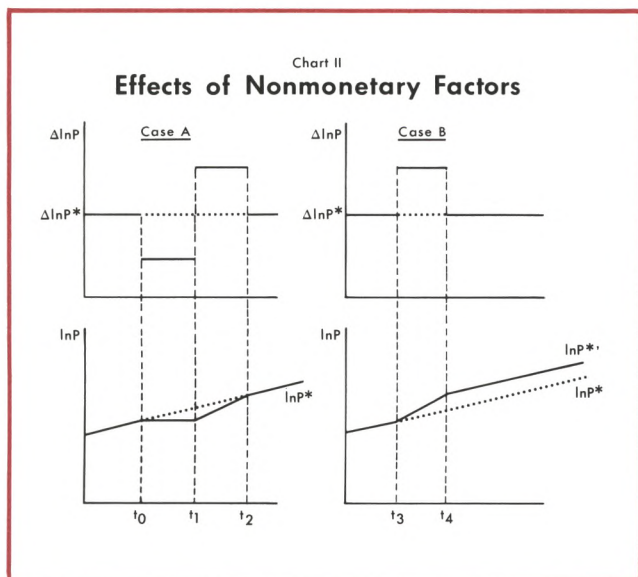


sure of diverse national economic policies. The agricultural sector was buffeted by price controls and massive and unexpected foreign demand. Finally, the oil embargo, the increase in the price of petroleum, and the government's programs aimed at the energy situation worked to increase the price of energy dramatically.

It is not sufficient to investigate the validity of the money-price hypothesis on the basis of the predictive power of equation (1) for a period like 1971-74, for the equation is specified on the presumption that other autonomous factors had no significant impact on the rate of change of prices during the sample period. Obviously, this was not the case over the past five years. The Durbin-Watson statistic (D. W. = 1.131) is indicative of an omitted-variable problem in the 1954-76 sample period. However, when equation (1) is run over the period I/1954 - II/1971 (Chart I), there is little indication of serial correlation (D. W. = 1.729). This suggests that, while equation (1) might have been a reasonable proposition, something caused it to go wrong in the 1971-74 period. The evidence suggests that nonmonetary factors were influencing the rate of inflation in this period.

The relevant point is not that nonmonetary factors affected the price level; instead, the focus is on the manner in which such influences are held to operate in the monetarist framework. In summary, the monetary explanation of inflation views these factors as being incapable of exerting a *lasting* influence on the rate of change of the general price level. Some factors,

<sup>3</sup>It is important to keep in mind that equation (1) is not intended to "explain" each and every wiggle in the rate of change of prices, but instead is a short-hand description of the fundamental inflation process. As such, it does not include those factors which have a temporary or short-run impact on the rate of price change. While this caveat might give the impression of defining away the problem, it is intended only to forestall arguments to the effect that some other price equation, based perhaps on measures of wages, productivity, and utilization rates, better "explains" the price data and thus is a better representation of the inflation process. These alternatives typically are structural equations, with endogenous variables on the right-hand side. Equation (1) is offered as a reduced form, where several potential exogenous shift variables have been excluded. As such, it is not offered in competition with structural price equations. In fact, it can be shown that models which incorporate the standard type of price equation can yield equation (1) in their reduced form. Leonall C. Andersen and Denis S. Karnosky, "A Monetary Interpretation of Inflation" (a paper presented to the Conference on Price Behavior, National Bureau of Economic Research Conference on Research in Income and Wealth, November 21, 1974).



however, are capable of affecting permanently the level of prices.

The various factors which have arisen since 1971 can be divided into two general categories: (A) those that temporarily affect the price level, relative to that consistent with monetary conditions, and (B) those that permanently displace the price level.

Referring to Chart II, Case (A) is descriptive of the monetarist handling of the effects of a shock like general price controls, instituted at  $t_0$  and maintained until  $t_1$ , where the interval  $t_1 - t_0$  is "reasonably" short. The duration of the control program is important because there is no doubt that differential price controls, if maintained for a long period of time or, at least, announced to be long-lasting, can be expected to affect in a fundamental way the allocation of resources within the economy. The consumption-investment pattern probably would be affected, and with it, wealth, and therefore the demand for real money balances. With an unchanged money stock, or a constant rate of increase, desired and actual real balances would be equated by a change in the general level of prices, but probably upward.<sup>4</sup>

In Case (A), the price level is temporarily displaced from that consistent with monetary conditions ( $P^*$ ). Since price controls typically are aimed at those prices which are included in the price indexes, the data will show a noticeable deceleration of price change during the period that controls are in place

( $t_1 - t_0$ ).<sup>5</sup> Once the controls are removed, however, prices adjust upward to the level dictated by the monetary situation, and the observed rate of change will increase sharply (period  $t_2 - t_1$ ).

During the interval ( $t_2 - t_0$ ) equation (1) would show abnormally large errors; overpredicting the rate of price change during the period of controls ( $t_1 - t_0$ ) and underpredicting in the immediate post-control period ( $t_2 - t_1$ ). Thus, the errors generated by a relationship like equation (1) in a period like ( $t_2 - t_0$ ) are not sufficient to refute the money-price linkage. In fact, such an occurrence could be construed as offering evidence in support of the theory which yields equation (1), if the price level returns to the path dictated by the rate of monetary expansion.

Case (B) is somewhat more complicated, but then it is also more interesting. This situation is descriptive of the manner in which the monetarist framework views the impact of cost-push factors — autonomous decreases in aggregate supply resulting from non-market increases in factor prices, maintained by increased unemployment of those factors. For many years concern has been directed at labor as the prime source of such pressure, but the evidence has been far from conclusive on the willingness of labor to undertake such a policy.<sup>6</sup> OPEC has been quite generous, however, in creating a situation which comes as close to a laboratory experiment on this issue as economists could ever hope for.

The significant increase in the price of energy which has resulted since the oil embargo of late 1973 represents exactly the type of pressure typically identified with cost-push inflation. The oil price increase represents an unexpected and substantial rise in the cost of production across a large segment of the economy and, as such, results in a decrease in the productive capacity of the economy. Many processes now in place, implemented with some expectation of absolute

<sup>5</sup>Witness the remarks of James W. MacLane, Deputy Director of the Cost of Living Council under the Nixon administration: "These two items, beef and oil, have a large impact on the overall Consumer Price Index, and that is why we are keeping the price freeze on beef until September 12, and keeping a price ceiling on gasoline." *New York Journal of Commerce*, July 31, 1973.

<sup>6</sup>It is irrelevant that labor might act on the supposition that the monetary authorities will validate wage increases in excess of productivity gains, hoping thereby to avoid the increase in unemployment. That is a policy decision, reflected in the relative weight given to unemployment in the policy deliberations of the monetary authorities. Even though the money supply would then appear to be endogenous, relative to the wage rate, the fact remains that the monetarist position holds that in the absence of the increased rate of money growth, the rate of change in the general price level will not be affected in a permanent way by the increase in factor prices.

<sup>4</sup>On a more pedestrian level, the shift in resources between markets would destroy whatever small validity there remains of the fixed weight price indexes currently in use.

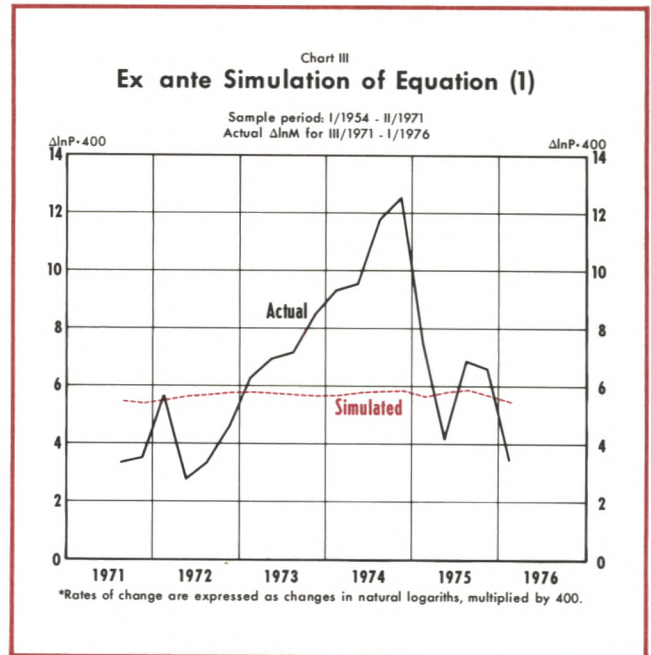
and relative factor prices, are made obsolete by the unexpected increase in energy prices. The effect is exactly that which would be associated with an autonomous rise in wage rates above that justified by increased productivity. With aggregate demand unchanged, an increase in the level of prices and a decrease in the rate of production would result.

So long as OPEC is willing to tolerate the reduced rate of oil production that their price actions cause, the wealth of the United States and others is permanently decreased. One manifestation of this wealth loss is a one-shot decrease in the demand for real money balances. With the money stock unchanged, or growing at the prior trend rate, equilibrium in the market for money is restored by a one-shot increase in the general price level. During the interval of this adjustment ( $t_4 - t_3$ ) the rate of change of prices will be seen to rise above the rate consistent with the rate of money growth. However, once the price level has adjusted, the *rate of change of prices* would return to the fundamental inflation rate consistent with the rate of monetary expansion.

Through this period of adjustment the rate of price change would exceed that predicted by the rate of money growth. But, as in Case (A), care must be taken in viewing this experience as evidence contrary to the monetarist position. The monetary hypothesis says that nonmonetary factors can have only temporary effects on the rate of inflation, not that they can have no effect at all. The key to analysis of a situation like the change in energy prices is the behavior of the rate of price change after the adjustment to the initial shock. The monetarist position holds that, for a particular rate of money growth, the price level that results will be a constant proportion  $(1 + p)$  of that consistent with the rate of monetary expansion. This is shown in the lower-right panel of Chart II, where, after adjustment at ( $t_4$ ), the new price level increases at the same rate and thus runs parallel to  $P^*$ .

Such a prediction is in direct contrast to that yielded by the more common view of cost-push inflation where an autonomous nonmonetary shock to aggregate supply is sufficient to set off a wage-price spiral which feeds on itself, independent of monetary developments.<sup>7</sup> It is not appropriate to hedge this

<sup>7</sup>Levy, for example, goes so far as to conclude that monetary actions have little direct influence on the rate of inflation, once factors such as unit labor costs, capacity utilization rates, and expectations are accounted for. In the context of his analysis, an increase in wages above gains in productivity raises unit labor costs and then prices. Such action then is sufficient to increase the rate of inflation permanently, with no recourse to whether or not the monetary authorities expand the money stock in response. See Levy, p. 12.

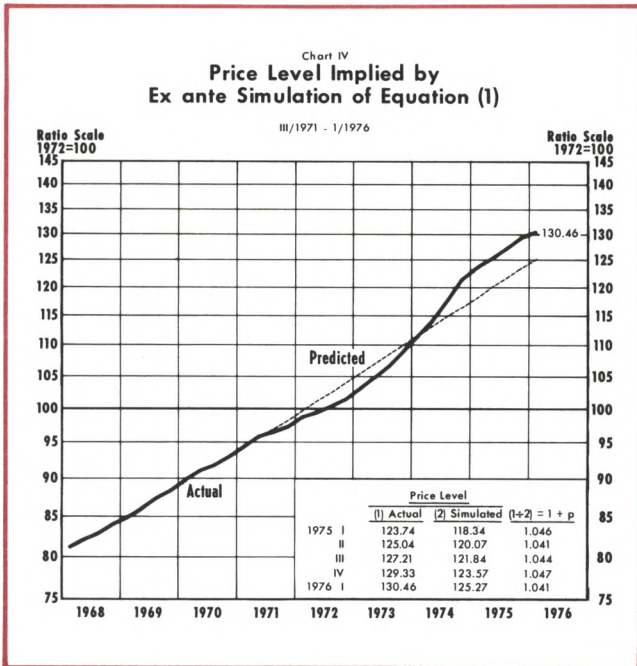


position in the current context, on the observation that the substantial rise in unemployment since mid-1974 has muted somewhat the thrust of the wage-price spiral. That point is, after all, an element of the alternative hypothesis — namely that autonomous increases in prices above market clearing levels can be maintained only through the acquiescence of the unemployed.

### A Look at the Evidence

How well does equation (1) hold up in the face of the numerous nonmonetary shocks which have beset the economy since 1971? A preliminary indication is given by the predictions of equation (1) estimated from a sample ending in mid-1971 and simulated over the period III/1971 - I/1976 using the actual pattern of money growth. This simulation, shown in Chart III, yields errors in the 1971-76 period similar to the regression errors for the same period, which are presented in Chart I. The rate of price change is overestimated through 1972 and underestimated in 1973-74. The prediction errors since 1974 are more in line with the regression residuals in the 1954-71 sample period. The errors resemble generally the cases shown in the upper panels of Chart II, where the economy moves sequentially through Cases A and B.

But what of the price level? Using the actual level of the GNP deflator in II/1971 as the base, the price level implied by the simulation of equation (1) can be computed by accumulating the predicted rates of change. The results are presented in Chart IV and



are compared to the reported index. The predicted price level is above the reported deflator through 1973 and below thereafter.

The significant observation, however, is the behavior of the price level since 1974. The reported price index through the year runs almost parallel to that predicted by equation (1), averaging about 4.5 percent higher. This observation is consistent with the prediction that the various nonmonetary factors (with the union of government regulations and OPEC pre-eminent) that have worked to increase costs of production since mid-1971 have caused a one-time decrease in productive capacity, and with the rate of monetary expansion unchanged, an equal one-shot increase in the general level of prices.

*... But So What?*

These results show that, within the monetarist framework, the predictive performance of the money-price relationship over the past five years is not sufficient to reject the position that only money matters for inflation, as a continuing increase in the general level of prices. This does not say that the money-price hypothesis is proven true, but only that some of the often cited evidence does not show it to be false. As with any hypothesis that has not been refuted by evidence, acceptance of the money-price process remains a matter of confidence and is conditional on the results of further testing. Beyond providing the opportunity for some nose-thumbing to the

critics of monetarist doctrine, however, the argument and evidence presented here have serious implications. If, in fact, the domestic price level has been significantly and permanently displaced by an autonomous decrease in wealth, then much of the current debate about the nature of the inflation, unemployment, and degree of capacity utilization are misplaced.

Consider the implications of a 4.5 percent increase in the price level for the productive capacity of the economy. The argument presented earlier explained this price increase as a non-recurring wealth effect. The channel through which this impact is transmitted is the productive capacity of the economy.<sup>8</sup>

The autonomous 4.5 percent increase in the price level in 1974 suggests an approximately equal decrease in productive capacity. The reasoning should be fairly obvious, especially in view of much of the work done on the effects of costs of information and adjustment on economic activity, especially investment. In a world where the mix of factors of production is expensive to change once production processes are put in place, an unexpected increase in a factor cost (in this case, energy) renders some portion of vintage capital obsolete. The immediate effect is a contraction of productive capacity. Vested production processes simply cannot be used profitably at the same rate as had been consistent with prior expectations about energy prices. Nothing happens to the productive capacity in an engineering sense, but the economically efficient rate of production is slashed.

In the normal course of events such an autonomous shift in relative factor prices would induce attempts to alter factor proportions, within the constraints imposed by adjustment costs. Other factors, including labor, would become relatively attractive and the demand for these other factors would increase — relative to energy. A problem would be expected to rise quickly, however, since the attention of “labor” will be directed at the absolute wealth loss they suffered, as

<sup>8</sup>The argument presented here is akin to that found in Edmund S. Phelps, “Stopover Monetarism: Supply and Demand Factors in the 1972-74 Inflation” (*Proceedings of a Conference on Japan-U.S. Economic Policy*, American Enterprise Institute, 1975), pp. 51-68. See also A. B. Balbach and Denis S. Karnosky, “Real Money Balances: A Good Forecasting Device and a Good Policy Target?” this *Review* (September 1975), pp. 11-15.

A clear statement of the alternative argument that the recession can be explained in terms of a decrease in aggregate demand induced by the decrease in real income suffered because of the increase in energy prices is found in Robert J. Gordon, “Alternative Responses of Policy to External Supply Shocks,” *Brookings Papers on Economic Activity*, No. 1, 1975, pp. 183-204.

measured by the rise in the general price level.<sup>9</sup> The situation is further confused by the increased short-term, structural unemployment caused by the differential effect of increased energy prices on various segments of the economy. The actions of labor to resist absorbing their share of the aggregate wealth loss and government actions to reduce the burdens of rising unemployment would retard the factor substitution process and extend the duration of unemployment.

The end result would be pressure on the stabilization authorities to do something to stimulate employment with aggregate actions. As the price level adjustment to the wealth decrease runs its course, the rate of price change would fall toward the fundamental rate of inflation, currently about 5.5 percent per year, as shown by the results presented here. However, those analysts with a penchant for the Phillips-curve framework would view the deceleration of inflation and concurrent high or rising unemployment as reflecting restrictive stabilization actions.<sup>10</sup> The call would be for more concern about unemployment and less for inflation, that is, stimulative policy.<sup>11</sup>

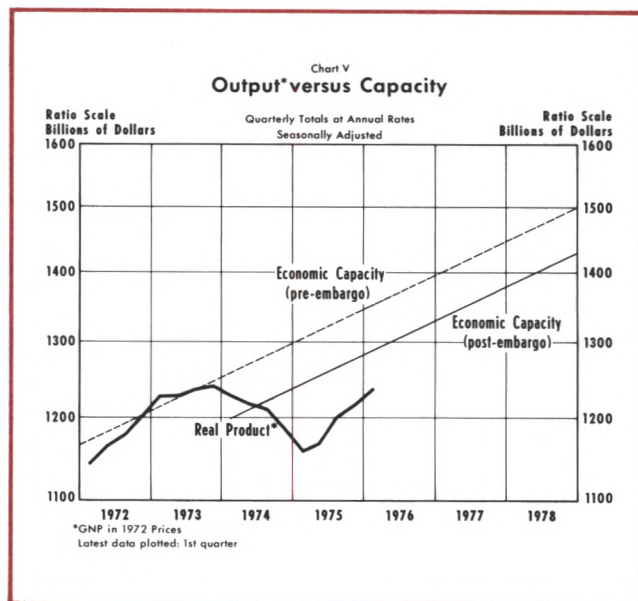
This analysis is faulty, in the monetarist view, in that it misinterprets the economic data. Much of the decline in production in 1974 was due to the autonomous constriction of profitable production ventures. As such, it was beyond the control of the monetary authorities. This runs contrary to the analysis that the recession resulted because the government (that is, the Federal Reserve) did not increase the money supply to offset the increase in oil prices. The money-price hypothesis says that, if anything, the money stock could be reduced in order to avoid the increase in the price level, but in no way would monetary actions have much of a permanent expansionary effect on output. The economic contraction could be cushioned temporarily, but at the cost of a permanent increase in the rate of inflation.

In the same vein, much of the subsequent increase in unemployment, resulting from the interaction of

<sup>9</sup>One area where this would be manifested, albeit indirectly, is the escalator clauses in labor contracts.

<sup>10</sup>For example, the rate of change of prices fell from 11.4 percent in 1974 to 6.0 percent over the first half of 1975. The rate of unemployment rose from 7.2 percent of the labor force in December 1974 to 8.9 percent at mid-1975.

<sup>11</sup>See, for example, U.S. Congress, Hearings Before the Joint Economic Committee, *The 1975 Economic Report of the President*, 94th Congress, 1st Sess., February 5, 6, 7, and 14, 1975, pp. 534-49.



the wealth decrease, adjustment costs, and frustrated expectations, was not responsive, in any lasting sense, to stimulative actions of the Federal Reserve. Much of current unemployment is more of a problem of the legal infrastructure of the economy than it is one of deficient aggregate demand. As such, the problem requires structural change in the form of easing restrictions on the operation of markets, and not more money.

The effect of the autonomous shocks of the past few years on the productive capacity of the economy is shown in Chart V. The sustainable, long-term expansion path for total production in the economy, prior to the oil embargo, is labelled "Economic Capacity (pre-embargo)." This is a measure of the production potential of the economy, in the absence of such factors as the quadrupling of oil prices and new government safety, environmental and resource allocation programs. The analysis presented here suggests that this rate of production is no longer achievable, without fundamental change in the structure of the economy or an ever accelerating inflation. The new productive capacity is estimated to be 4.5 percent lower, as shown by the line labelled "Economic Capacity (post-embargo)."<sup>12</sup> By this measure total product in the first quarter of this year was 96.2 percent of capacity, as opposed to 91.9 percent of the old capacity measure. In other words, the economy is much closer to full employment than many analysts claim. For labor, this suggests that the *full employ-*

<sup>12</sup>This estimate does not incorporate the possibility that the trend rate of growth of productive capacity might also have been affected.

*ment rate of unemployment* is much higher, at least for the next several years, than previously.

### **Summary**

The immediate purpose of this exercise is to present an empirical test of the proposition that inflation, as a continuing increase in the general level of prices, is everywhere a monetary phenomenon. The test is severe, being based entirely on a rare situation characterized by the emergence of a large number of nonmonetary forces which many analysts claim to have an effect on the rate of inflation. The evi-

dence shows the money-price hypothesis to be unscathed. The hypothesis is still refutable, but other forms of evidence are required.

The analysis implies that current measures of aggregate capacity utilization overstate the amount of slack in production that can be taken up through stimulative monetary and fiscal actions. This means that the economy will encounter an effective capacity constraint long before current measures of unemployment and capacity signal the danger. More than four percent of the productive capacity was destroyed by the events of the past few years. This potential is restored neither quickly nor cheaply.

