Curbing Price Expectations: The Key to Inflation Control

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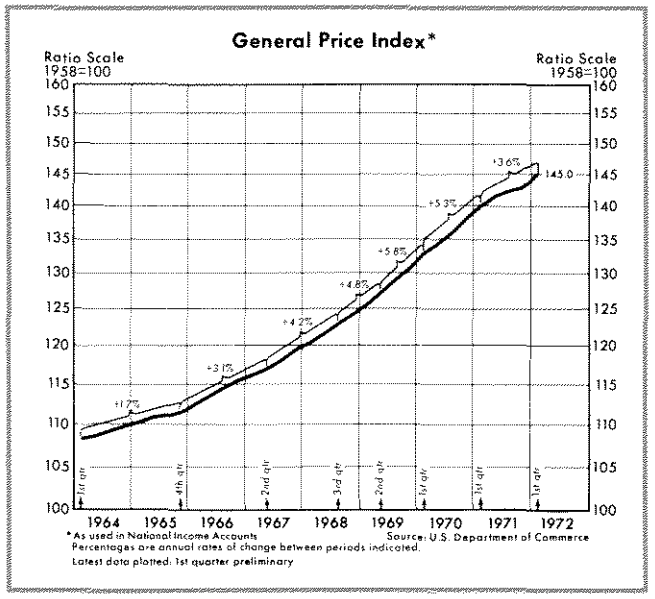
THE PERIOD since 1969 has proven to be a difficult one for monetary and fiscal stabilization authorities. The rate of inflation has been quite resistant to attack – prices continue to rise rapidly even now, more than three years after the Government initiated its battle against inflation. Moreover, the slowing of aggregate demand in 1970 had only a moderate impact on inflationary pressures, while generating substantial increases in unemployment. High rates of unemployment have persisted since early 1970.

Much of the basis for the stabilization actions taken to curb inflation, such as the 1968 tax surcharge and a concurrent slowing in Government expenditures, was predicated on a view of aggregate economic behavior which evolved from the Great Depression of the 1930s. This view largely reflects the "standard" model of economic activity found in many basic economic textbooks. It states that prices and unemployment are determined fundamentally by the relation between aggregate demand and the level of full employment output.

In its simplest form, the standard model indicates that when the demand for goods and services falls below the level of potential output, the economic system will experience increased unemployment and the rate of increase of prices will tend to fall. This implication of the model has been refined into an hypothesis describing a trade-off between unemployment and the rate of inflation, where reductions in one are associated with predictable increases in the other – less inflation entails more unemployment and *vice versa*.

Since unemployment averaged 5.9 percent of the labor force in the six-month period ending March 1972, and the implicit GNP price deflator rose at almost a 4 percent rate over the same period, despite the imposition of price-wage controls, something was apparently amiss with this view of economic behavior. Clearly, the simultaneous occurrence of both high rates of unemployment and inflation since 1969 requires additional explanation. A logical explanation centers on price expectations, a factor generally neglected by most analysts until very recently.

The economic model developed at this Bank has, since its inception, utilized the concept of price ex-



pectations as a factor influencing both prices and unemployment. This article considers the effect of market expectations in the current inflation-unemployment situation in order to point out the pitfalls connected with this phenomenon in the analysis of aggregate economic behavior. These pitfalls will be considered within the context of a fairly standard, but somewhat simplified, view of aggregate behavior. For purposes of illustration, this standard model, which until recently evidenced little concern for expectations, will be compared with the model of this Bank, which takes explicit account of price expectations.

The Standard Model

The standard view of aggregate economic behavior has its origins in the 1930s, a period marked by exceptionally high rates of unemployment throughout much of the world and little or no inflation. As a consequence, the economic theories which evolved from that period were oriented toward the development of ways to generate sufficient demand to achieve full employment.[1]

In addition to a concern for sufficient aggregate demand to insure full employment, the theory as developed emphasizes the short run, quantities (not prices), real variables (instead of nominal ones), and the entire demand structure of the economy as summarized by the following:

[1]The subordination of prices to employment (or real output) in the standard model is further reflected at the economic level by the absence of prices in the diagrammatic "IS-LM" version of the standard model developed in the late 1930s, and at the political level by an important Act which seeks to promote maximum employment, production and purchasing power, but is known as the Employment Act of 1946.

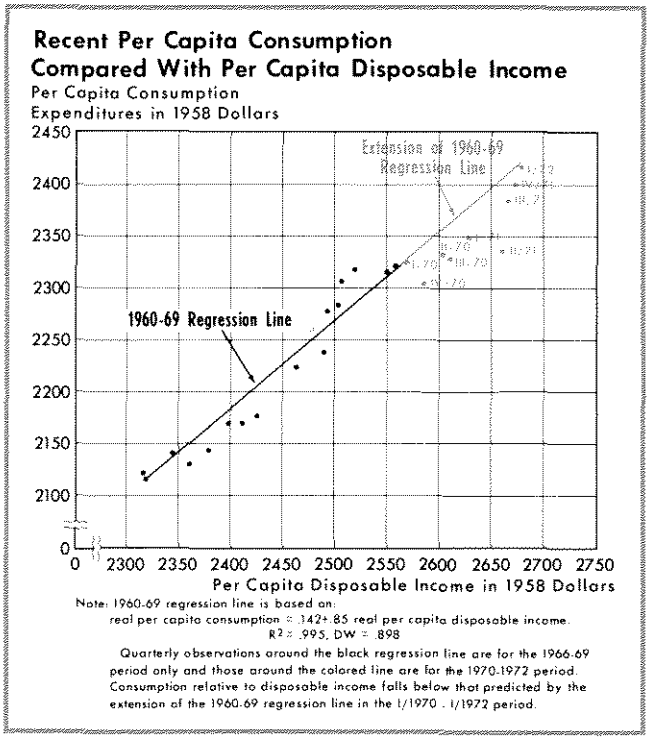
Consumption Demand + Investment Demand + Government Demand = Total Demand

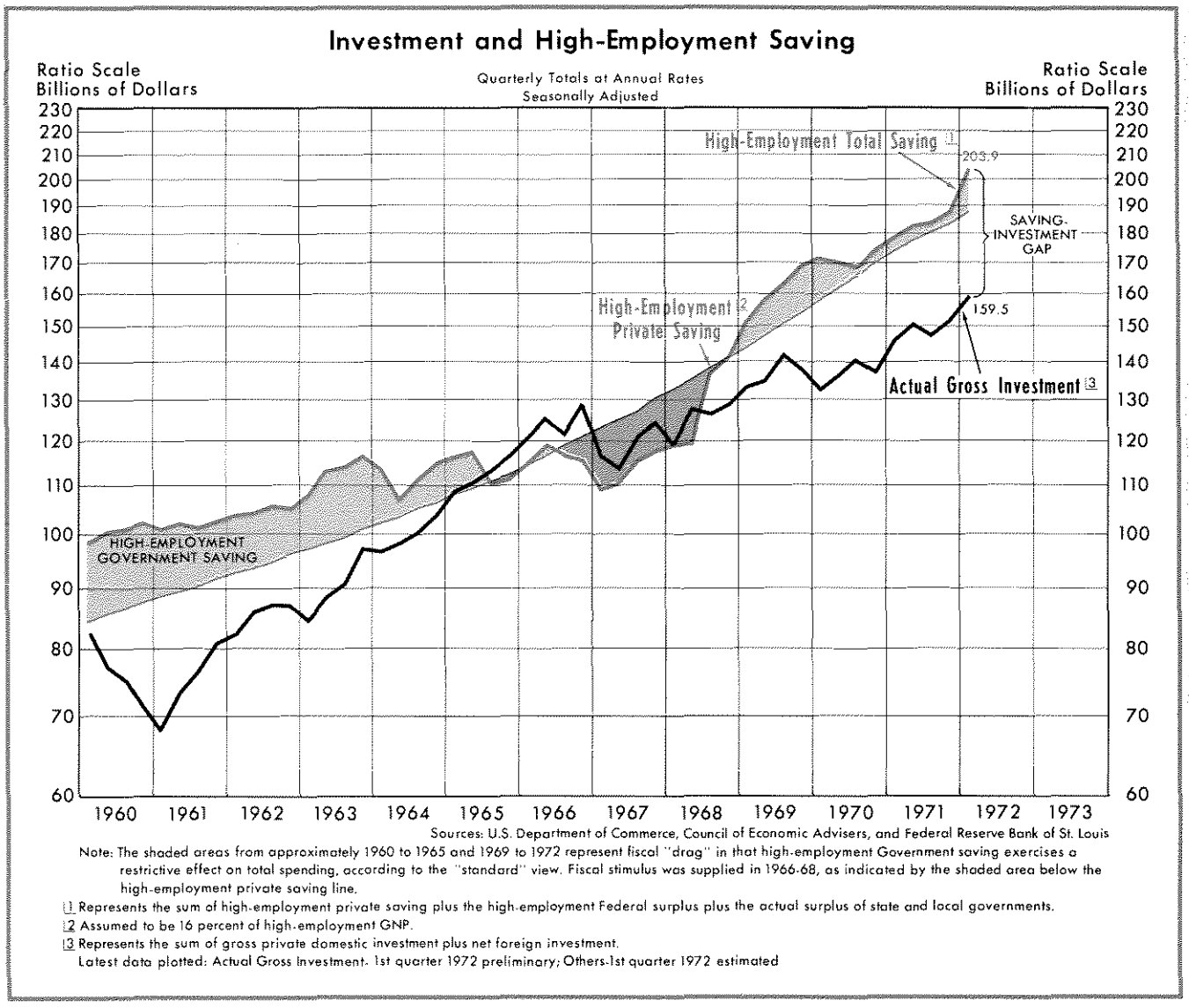
Establishing Sufficient Demand

The standard view of economic behavior, whether formalized by dozens of equations or etched on the back of an envelope in "judgmental" style, has as its basis consumption demand and investment demand. It is primarily by affecting consumer and investor spending plans that the Government attempts to influence aggregate demand and thereby affect prices and unemployment.

Consumption – The consumption sector of the standard model places strong emphasis on income as a major determinant of consumer demand. The analysis centers on the fact that individuals can either consume or save a portion of each extra dollar of income. The more of each extra dollar of income spent on consumption, the greater the impact on total spending. The effect of increased consumer spending is then "multiplied" through the economy from individual to individual.

Historical comparisons indicate consumption spending has not been especially strong in recent years. Consumer spending relative to disposable income (the average propensity to consume) declined from an average of .92 in the 1960-65 period, to .91 in 1966-69 and .89 in 1970-71. The accompanying chart indicates





Sources: U.S. Department of Commerce, Council of Economic Advisers, and Federal Reserve Bank of St. Louis

Note: The shaded areas from approximately 1960 to 1965 and 1969 to 1972 represent fiscal "drag" in that high-employment Government saving exercises a restrictive effect on total spending, according to the "standard" view. Fiscal stimulus was supplied in 1966-68, as indicated by the shaded area below the high-employment private saving line.

[1] Represents the sum of high-employment private saving plus the high-employment Federal surplus plus the actual surplus of state and local governments.

[2] Assumed to be 16 percent of high-employment GNP.

[3] Represents the sum of gross private domestic investment plus net foreign investment.

Latest data plotted: Actual Gross Investment- 1st quarter 1972 preliminary; Others-1st quarter 1972 estimated

that real per capita consumer spending relative to real per capita disposable income was below a 1960-69 regression line over the past two years. A slowing in the rate of growth of consumer spending for nondurable goods and services has occurred since 1969. Expenditures on durable goods (in real terms) recovered strongly from the 1970 recession in 1971 and early 1972, but real consumer expenditures on nondurable goods and services (which comprise the bulk of consumer spending) have not rebounded. Thus, the lack of strength in consumer spending, has been (according to the standard view) a factor contributing to sluggish aggregate demand in recent times.

If individuals have decreased the proportion of their income they desire to spend, they must have increased, it is argued, the share they desire to save. The ratio of saving to disposable income rose from an average of 6 percent in the 1960-69 period to an average of 8.1 percent in 1970 and 1971. A small change in the ratio entails a change of many billions of dollars into saving or consumption.

Total private saving (personal saving plus gross business saving) relative to GNP, increased from an average of 15.6 percent in 1968 to an average of 16.6 percent in 1971. Saving has also been high throughout the latest recession-recovery period compared with the 1960-61 recession-recovery period. The ratio of total private saving to GNP averaged 15 percent in 1960-61, well below the 1970-71 average of 16.2 percent.

Investment – The rise in saving has been accompanied by relatively weak investment, as the so-called

"paradox of thrift" suggests:[2]

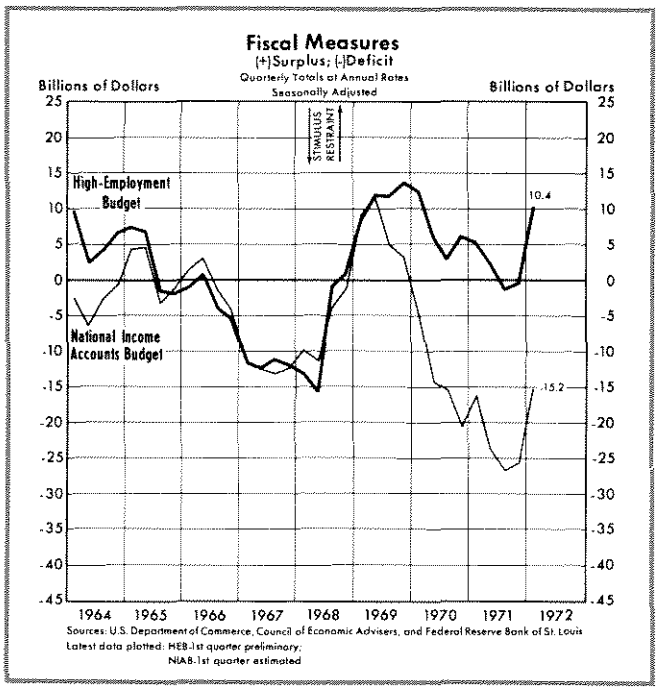
> An increased desire to consume — which is another way of looking at a decreased desire to save — is likely to boost business sales and increase investment. On the other hand, a decreased desire to consume — i.e., an increase in thriftiness — is likely to reduce inflationary pressures in times of booming incomes; but in time of depression, it could make the depression worse and reduce the amount of actual net capital formation in the community. *High consumption and high investment are then hand in hand rather than opposed to each other.*[3]

The chart on the preceding page indicates that a substantial gap between investment (gross private domestic investment plus net foreign investment) and high-employment total saving (private plus Government) opened over the past three years. Investment was still almost $45 billion short of the level of saving estimated to occur if the economy were operating at full employment in the first quarter of 1972.

Strong residential construction investment over the past year was accompanied by gains in business fixed investment which partially offset recent setbacks in net exports and sluggish inventory accumulation. Yet, the full employment-saving analysis suggests that total investment must accelerate if full employment is to be achieved. The importance of the investment stimulus has been described by the Council of Economic Advisers:

> But the economy can have high employment only if actual investment demands of businesses are large enough to match the amount that consumers, businesses and governments wish to save at high employment incomes. If actual investment falls short of high-employment saving, total spending will fall short of high-employment output. Because of insufficient demand, production will be held to some lower level where a smaller volume of saving does match the forthcoming investment.[4]

Fiscal and monetary actions — The typical fiscal policy response to sluggish consumer and private investment spending is stepped-up Government spending and/or tax reductions to increase aggregate demand. Government spending adds directly to total spending while tax reductions affect consumer spending by increasing disposable income, and investment spending by increasing the after-tax return to the firm.



The Government adopted restrictive policies in 1968 and 1969 to slow inflation, but has since attempted to provide moderate stimulus to the economy through tax reductions and increased spending. Cutbacks in Federal defense spending about coincided with the tax surcharge of mid-1968 to swing the high-employment budget from a $15.7 billion deficit in mid-1968 to an $11.9 billion surplus in mid-1969. The high-employment budget remained in surplus until 1971 (declining unevenly from the large surplus in mid-1969 to balance in mid-1971). Earlier estimates of the 1972 budget, reflecting tax reductions and Government spending increases, projected a sizable high-employment deficit. Overwithholding of tax obligations, however, has led to the current projection of a $3.5 billion high-employment surplus in fiscal year 1972 (as estimated by this Bank) and a $4.1 billion deficit in fiscal year 1973.

The standard view recognizes that Government deficits are more effective in stimulating economic activity when accompanied by expansionary monetary actions, and Government surpluses are more effective in curbing such activity when accompanied by monetary restraint. Monetary actions were restrictive throughout most of 1969 as stabilization authorities attempted to curb inflationary pressures. Such actions became moderately expansive in 1970 and considerably more stimulative the first half of 1971, despite the fact that prices continued to rise at a rapid rate. After remaining about unchanged from July 1971 to December, money supply growth accelerated sharply to

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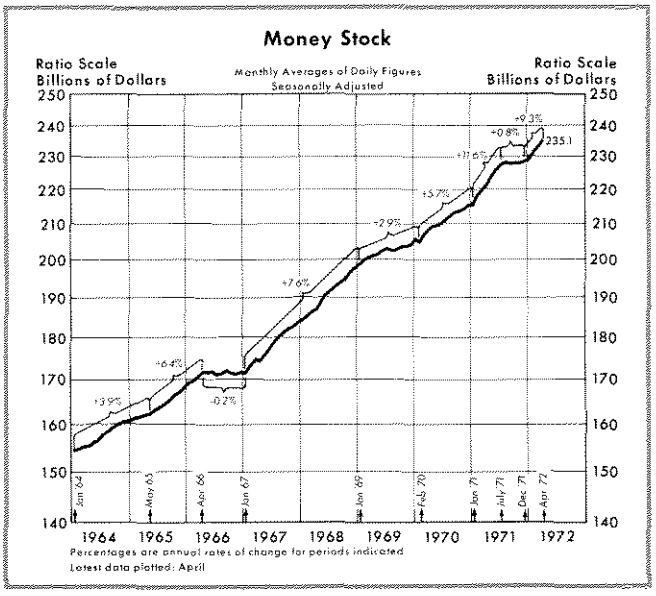
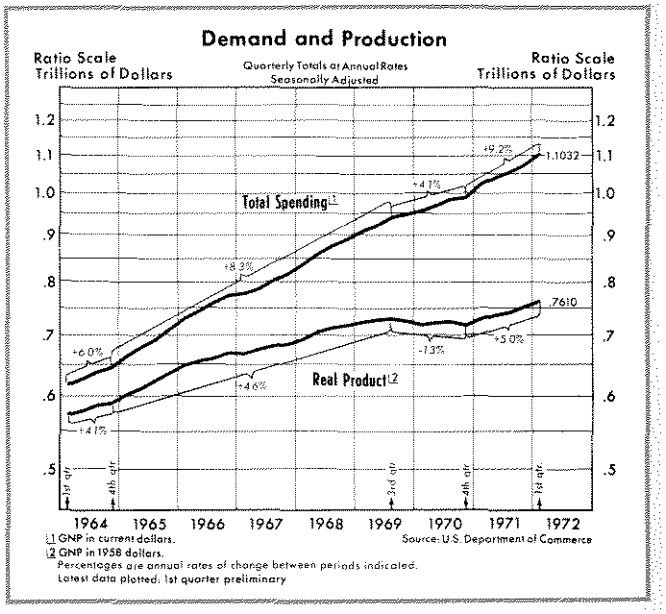
[2]The paradox is that while saving is often considered a virtue for individuals, massive saving by everyone adversely affects economic activity.

[3]Paul A. Samuelson, *Economics*, 8th ed. (New York: McGraw-Hill, 1970), p. 224.

[4]*Economic Report of the President* (January 1966), p. 42.





a 9.3 percent rate from December to April 1972. Growth of total spending also increased from a 5.3 percent annual rate in third quarter 1971 to a 7.6 percent rate in fourth quarter and an 11.8 percent rate in first quarter 1972.

Aggregate Demand, Potential Output, and Inflation

The ability of the standard model to accurately project aggregate demand changes into real output and price changes was seriously overestimated in recent years. The sufficiency of aggregate demand is usually judged relative to potential output. Typically, it is presumed that strong aggregate demand relative to potential output results in low unemployment rates and considerable inflation, while weak aggregate demand relative to potential output culminates in high unemployment and near price stability.

Further, prices are normally related to unit labor costs, which comprise the major portion of business costs throughout the economy. Unit labor costs, being the ratio of the average wage rate to output per man-hour, respond positively to wage increases in excess of productivity. The unemployment rate enters the pricing process through a presumed negative effect on wage demands of workers.[5]

With its historically strong orientation toward employment considerations, it is not surprising that the standard model has come closer to capturing changes in the unemployment rate than changes in prices (see Table I) at a time when the typical Phillips curve relation has seemingly gone awry. Weak aggregate demand since 1969 has had an adverse impact on unemployment, as the standard model would suggest, but prices have continued to rise at a rapid rate. Despite price-wage controls, prices have increased only slightly less rapidly since August 1971 than before the three-month "freeze" announced last August. Much of the price slowing recorded during the freeze itself was reversed in the early months of 1972.

Wholesale prices of all commodities (seasonally adjusted) increased at a 3.1 percent rate from August 1971 to April, compared with a 4.7 percent rate from February 1971 to August; consumer prices (seasonally adjusted) rose at a 2.8 percent rate from August to March, compared with a 4.1 percent rate from February 1971 to August. The implicit GNP deflator, the broadest measure of average prices, increased at a 3.9 percent rate from third quarter 1971 to first quarter 1972, after rising at a 3.3 percent rate in the preceding two quarters.

It would appear that the continuation of inflationary pressures in the face of high rates of unemployment reflects a possible change in the determination of prices.[6] Such a change is quite probably due to an upward shift in price expectations. Since the standard model incorporated little or no role for expectations prior to the recent inflation-recession experience, there

[5]See Michael Evans, *Macroeconomic Activity* (New York: Harper and Row, 1969), pp. 263-74.

[6]Conditions surrounding the determination of unemployment also have probably changed over the past few years. See, for example, George L. Perry, "Labor Force Structure, Potential Output, and Productivity," *Brookings Papers on Economic Activity* (3:1971).

Table I

The Record of Prediction

	ASA Survey[1]		Livingston Survey[2]		St. Louis[3]	
	Predicted	(Actual)	Predicted	(Actual)	Predicted	(Actual)
1969						
Prices[4]	3.3%	(4.8%)	3.5%	(6.0%)	4.1%	(5.1%)
Unemployment[5]	3.9	(3.5)	4.1	(3.6)	3.5	(3.6)
1970						
Prices	4.7	(5.5)	4.0	(5.6)	4.6	(5.7)
Unemployment	4.3	(4.9)	4.6	(5.9)	5.4	(5.9)
1971						
Prices	3.9	(4.7)	4.0	(3.3)	4.0	(3.4)
Unemployment	5.6	(5.9)	5.6	(5.9)	5.7	(5.9)

The consensus projections from the annual ASA and Livingston forecasting surveys are based predominantly on studies of forecasters who employ some form, either econometric or judgmental, of the standard model. The table indicates these forecasters and the St. Louis Bank model experienced more success in projecting unemployment rates than price increases over the past three years. The St. Louis model, which makes use of price expectations in its forecasts, has done relatively better in recent years in capturing inflationary movements in a high-unemployment economy.

Other comparisons of recent projections are given in "Has Monetarism Failed? — The Record Examined," a speech by Darryl R. Francis, this Review (March 1972), pp. 32-48.

[1]ASA Survey projections are from *The American Statistician*, February 1969, February 1970, and February 1971.

[2]Livingston Survey projections are from J. A. Livingston, *American Banker*, December 30, 1968, December 29, 1969, and December 28, 1970.

[3]St. Louis predictions were made in "A Monetarist Model for Economic Stabilization," this *Review* (April 1970), pp. 18-19. These predictions are based on the assumption of 6 percent money growth.

[4]Rate of change of prices for the ASA Survey is the change in the GNP deflator from one calendar year to the next. Rate of change of prices for the Livingston Survey is the change in the consumer price index from December to December. St. Louis model price projections are for the GNP deflator from fourth quarter to fourth quarter.

[5]ASA unemployment projections are for the calendar year, Livingston projections are for December, and St. Louis projections are for the fourth quarter.

has been considerable effort expended to graft expectations variables somewhere onto the model.

A Model With Expectations

The economic model of the St. Louis Bank, published in April 1970, incorporated from the start a measure of price expectations as an important factor in the explanation of price changes. Prices and real output are related directly to total spending changes rather than indirectly.

Key Relations of the Model

The determination of unemployment is basically the same as in the standard view of economic behavior; that is, unemployment emerges from the relation between real and potential output. Spending is determined directly by monetary and fiscal influences rather than as the result of aggregating consumption, investment and government spending. Prices are estimated by a comparison of total spending to potential output (as with the standard model) together with a price expectations variable.[7] Thus, monetary and fiscal actions and the anticipation of future price changes are closely associated with current prices.

This rather small model indicated, largely because of the price expectations variable, that inflation would probably continue for some time, even after the implementation of restrictive monetary and fiscal actions in 1969.[8] The importance of price expectations, particularly in a period such as the present, requires further elaboration. The foundation for price expectations is essentially microeconomic, resting on the individual decisions of workers and firms. Since the reasons for individual decisions are quite difficult to quantify, the following scenario of recent economic behavior is but one possible explanation of the events leading to the current high unemployment and inflation dilemma.

Expectations

The importance of expectations emerges most clearly when viewed against a background of accelerating price increases. The late 1960s were characterized by rising interest rates, rising unit labor costs, rising rental costs, rising commodity prices, low rates of unemployment, sluggish productivity and lackluster profits. These are traits typically observed near the peak of a business cycle. The expansionary phase of this cycle was, however, the longest in the post-War period. Thus, these cyclical traits at the end of the expansion of the 1960s were exceptionally strong.

The marked changes in the growth patterns of most of these indicators began in 1965 when Government defense and domestic spending demands expanded on top of strong private demands for a limited supply of goods and services. Much of the increased Government spending was accomplished through monetary expansion rather than through public purchases of

[7]See Ronald L. Teigen, "A Critical Look at Monetarist Economics," and Robert H. Rasche, "Comments on a Monetarist Approach to Demand Management," this *Review* (January 1972) for appraisals of recent contributions to the price expectations literature.

[8]See Leonall C. Andersen and Keith M. Carlson, "A Monetarist Model for Economic Stabilization," this *Review* (April 1970), p. 20.

Treasury bonds or tax increases. The money stock, which had increased at a 3 percent annual rate from 1960 to 1965, rose at a 5.1 percent rate from 1965 to 1968.

Increased demand could only be met by the additional employment of relatively inefficient capital and labor; the more efficient productive factors were already being utilized. Growth of output per man-hour, which had increased at a 4.1 percent annual rate from 1960 to late 1965, began to slow almost immediately, averaging 3.1 percent from third quarter 1965 to third quarter 1966. From 1966 to third quarter 1969, labor productivity increased at a 1.9 percent annual rate. Since profits had been strong until the period of rapid demand acceleration, firms were able to employ these additional capital and labor inputs so long as they believed the higher costs could be passed along in the form of higher prices.

Firms apparently expected their own prosperity to continue for some time and they were not especially concerned at first that accelerated wage increases and a slowing growth of productivity, due in large part to the utilization of inefficient resources, pushed up unit labor costs. The firms were able to raise their own prices since aggregate demand was continually stimulated until late 1968, but the price increases they were able to get were not sufficient to cover all of the rising costs of production. Average prices of goods and services produced in the private portion of the economy rose 2.9 percent from late 1965 to late 1967, slightly more than double the rate of increase from 1960 to 1965. From 1966 to late 1969 these prices rose at a 3.8 percent annual rate. Unit labor costs, which had increased at an annual rate of 0.4 percent from 1960 to 1965, rose 4.4 percent in the next year, and at a 5.1 percent rate from 1966 to late 1969. The acceleration of costs in excess of price increases adversely affected profit rates throughout the late 1960s.

With the restrictive fiscal and monetary policies which began in 1968, the rate of growth of aggregate demand started to fall. At first, firms did not know whether the cutback in demand for their products was random, temporary, or of a longer duration. Since the tendency of most economic units probably is to extrapolate the experience of recent years into the near future, the firms' immediate response to the slowing in demand was to allow inventories to pile up in anticipation of a later run-off with the resumption of normal demand.

As demand continued to slow, firms were faced with the choice of reducing prices, output, or both. Costs of production continued to rise rapidly. Unit labor costs, for example, rose at a 5.5 percent rate from late 1969 to late 1970, reflecting a 7.5 percent increase in compensation per man-hour and a 1.8 percent increase in output per man-hour. Thus, reducing prices and maintaining the same level of output could well result in substantially larger declines in profit rates. Output could, however, be slowed at first with less cost simply by eliminating overtime; that is, output could change without initially affecting employment.

As the slowing in demand persisted, it became necessary to take stronger steps to eliminate the rising inventory levels. Again firms were faced with the choice of changing prices or output. Since prices of most productive factors are established for long periods, it is often less costly to reduce employment than factor prices. For example, wage contracts are often negotiated for a three-year period, so that wages of the *working* employees are set; interest payments on capital equipment and other loans are set for years in advance; rent contracts are also negotiated for more than a short period. Thus it is easier to release workers – normally the least productive ones first – than it is to get them to take pay cuts. The minimum wage law is another obstacle to lowering wages, thereby encouraging the reduction of employment.

Firms will still be reluctant to release employees, at first, however, since there is a cost to hiring and retraining workers later, after demand picks up. Consequently, firms' decisions to release employees do not begin with the initial slowing in demand, but only after it becomes apparent that the slowing is more than temporary. Because of downward wage rigidities and a lack of knowledge on the part of the workers that the slowing in demand is pervasive,[9] employment normally falls before prices are reduced. Workers demand higher wages, in anticipation of continually rising commodity prices and because they believe (incorrectly, in the case of many of the less productive workers) they can obtain employment elsewhere, if necessary.

Eventually wage and other contracts are re-negotiated, and at that time, the prices of productive factors can be brought into line with the lower level of demand. A reduction in factor costs makes it possible for firms to lower prices, as does the increase in productivity which should occur with the decision not

[9]See Roger W. Spencer, "High Employment Without Inflation: On the Attainment of Admirable Goals," this *Review* (September 1971). There are significant costs of acquiring information to both firms and workers.

to utilize the least efficient labor and capital resources. If firms *expect* their own costs (wages, rent, interest payments, raw resource costs) to continue rising, they will attempt to continue increasing the prices of their own products to cover costs. At the aggregate level, they can be successful in permanently boosting prices if output is reduced or aggregate demand is restimulated by monetary and fiscal actions.

The initial acceleration in the rate of price increase was begun by stimulative monetary and fiscal actions, and the initial slowing in aggregate demand followed restrictive policy actions. The rate of increase in prices peaked and began decelerating sometime later. Firms and workers' decisions, then, in establishing price, wage, and employment patterns are closely related to stabilization actions, although the lag patterns often differ.

Expectations are important in this view of economic behavior because: (1) firms do not know what to expect from the initial fall in demand; (2) after it is established that the fall in demand is more than temporary, workers do not know what to expect in the way of demand for their services when they are asked to leave (or invited to take a wage cut); (3) firms do not know throughout the process what to expect in terms of costs of releasing and eventually re-hiring employees and re-negotiating new factor price contracts, the eventual strength of demand after the fall, and the costs of carrying excessive inventories over the entire period. However, if firms expect their own costs to continue to rise, they may attempt to increase prices despite widespread current unemployment.

This scenario of events in the late 1960s can only suggest the complexity of the element of expectations and the difficulty of capturing such an element in an economic model. The St. Louis model attempts to aggregate price expectations of all workers and firms by relating current prices to a weighted average of past prices. This relation indicates that under "normal conditions," the prices of one to two years ago have the strongest impact on current price anticipations.

The imposition of price-wage controls is, among other things, an attempt to alter the normal pattern of price anticipations. The initial success of last fall's "freeze" in altering price anticipations through curbs on actual prices may have been lost by the sharp rise in prices during the first quarter of 1972.

Summary

Two basic models of economic activity are described in this article. The standard model historically has emphasized the spending components of aggregate demand and employment while the St. Louis model stresses the relation between policy actions and total spending, and the division of total spending into real output and prices.

The standard model can explain the existence of sluggish demand and high unemployment the past two years, but has had limited success in projecting price increases. The St. Louis model, which utilizes price expectations directly in its determination of actual prices, has been more accurate in projecting continued inflation over the 1969-71 period.

Both models projected stronger economic activity in 1972 than in 1970 or 1971, and GNP data for the first quarter of 1972 suggest this will be the case.[10] Prices, however, have risen at a rather rapid pace in recent months despite price-wage control measures. The St. Louis model indicates that unless expectations of higher prices can be curbed, inflation will not soon dissipate. If prices are allowed to subside gradually through moderate gains in total spending, price expectations will fall with or without the shock treatment of controls.

[10]See "The Economy in 1972," this *Review* (February 1972) for a comparison of the projections of the St. Louis model and other 1972 forecasts.