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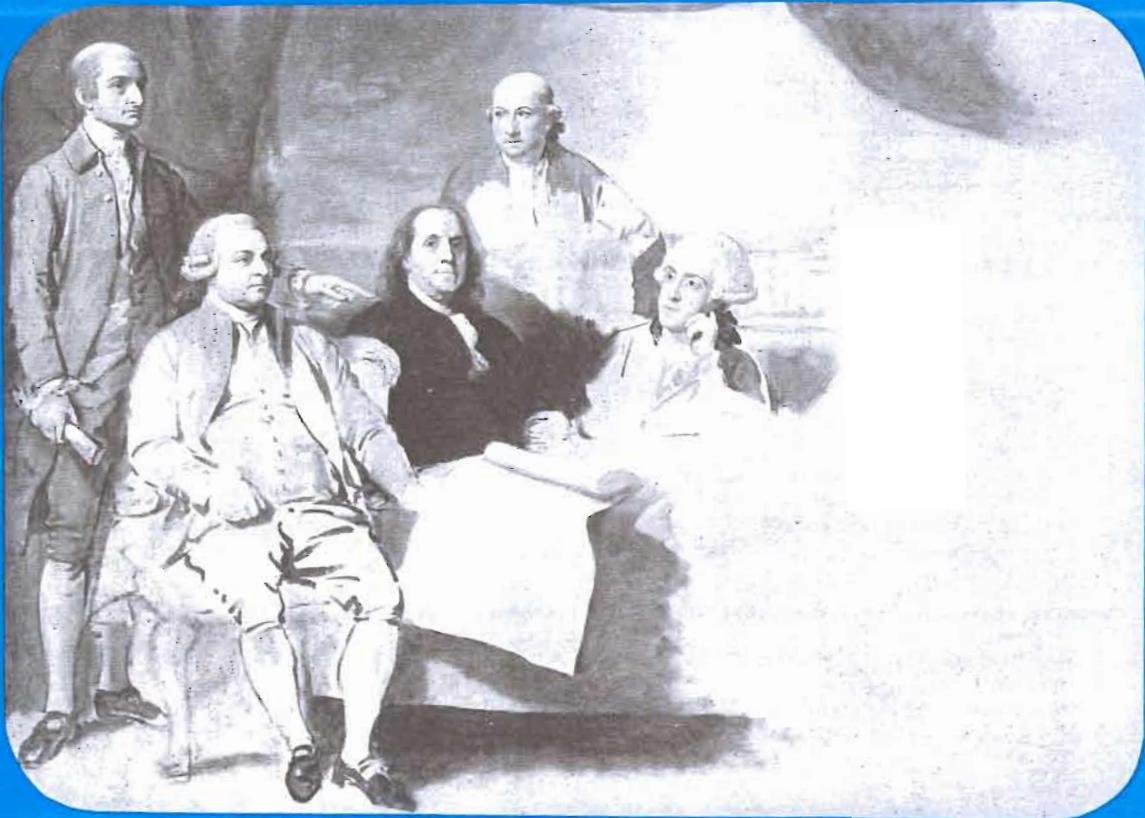
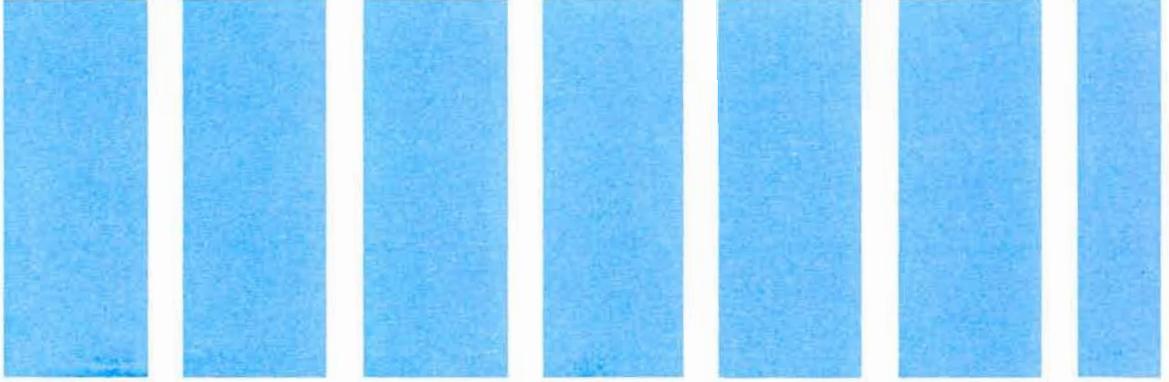
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REVIEW

Money Growth, Jobs, and Expectations: Does a Little Learning Ruin Everything?

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On Our Cover: *American Commissioners of the Preliminary Peace Negotiations with Great Britain.* Oil on canvas by Benjamin West (1738-1820). Courtesy, The Henry Francis du Pont Winterthur Museum.

Born in Springfield, Pennsylvania, West early showed an aptitude for painting. At the age of nine he studied in Philadelphia with the English portraitist, novelist, and mariner William Williams, and by the time he reached eighteen he had established himself as a painter. He left America to study in Europe in 1759 and settled in London in 1763. West enjoyed the patronage and friendship of King George III for several decades, and he served as president of the Royal Society from 1792 forward. Although he never returned to this country, West exercised an important influence on American painting through his students John Singleton Copley, Charles Wilson Peale, Rembrandt Peale, Gilbert Stuart, and John Trumbull.

This unfinished painting depicts the American commissioners at Paris in 1782—John Adams, Benjamin Franklin, John Jay, and Henry Laurens—with William Temple Franklin, who was their secretary and Dr. Franklin's grandson. West showed the picture to John Quincy Adams when the latter was in London in 1817. Adams pronounced the likeness of Jay "striking," those of the Franklins "also excellent," and those of his father and Laurens, though less perfect resemblances, yet "very good." West told him, Adams records, that he could not complete the canvas because Richard Oswald, the British Plenipotentiary, had died without leaving any likeness of himself.

The Treaty of Paris, ratified in 1783, recognized United States sovereignty, set the northern and western boundaries, regulated the use of fishing grounds and rivers, and recommended efforts to restore to loyalists the property they had lost.

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Money Growth, Jobs, and Expectations: Does a Little Learning Ruin Everything?

By Donald J. Mullineaux*

Should the Federal Reserve actively adjust the rate of money growth to try to affect the pace of economic activity, or should it announce a money-growth target and stick to it regardless of the state of the economy? Economists have debated this important question for many years. The way people form expectations bears directly on the impact of a change in money growth, and the present article surveys some recent developments concerning this issue. Until more evidence is accumulated, however, the question whether the Fed should sponsor an active or a passive money-growth stance must remain open.

Money is a veil, but when the veil flutters, real output sputters.—John Gurley.

Professor Gurley's clever comment highlights a fact well known to monetary economists: that changes in the quantity of money can affect the pace of economic activity and hence the number of people holding jobs. Indeed, economists have done so well at

publicizing this fact that Congress has considered legislation—the Full Employment and Balanced Growth Act of 1976—that requires the Federal government to set a numerical target for the unemployment rate. If such a bill became law, the Federal Reserve would be required to adjust its policies, including its target for growth in the money supply, to help achieve this unemployment goal—or, alternatively, to explain to the Congress and the public why it chose not to do so.

This legislation would mandate that the Fed do what it at times has done on its own initiative—speed up money growth to stimulate the economy and create new jobs in

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periods of higher unemployment. But it also would make the target rate of unemployment—3 percent of the adult labor force¹ in the Balanced Growth Act—a matter of public record. At present, neither the Fed nor the Congress announces an unemployment rate target.

The Balanced Growth Act takes for granted that policymakers are able to achieve a certain unemployment rate whenever they want to. But this assumes that money growth is linked firmly and permanently to jobs. Unfortunately, it seems that faster money growth produces more jobs only in the short run. In the long run, many economists believe, more money yields only higher prices; employment is not affected.

The policymaker is faced with a dilemma. Should the government act on Keynes's famous dictum—"in the long run, we are all dead"—and tinker with the money-growth rate to take advantage of the temporary relation money has to jobs? Or should it set a steady course for money growth, regardless of the pace of economic activity, to minimize the threat of fluctuations in prices and production?

Almost all the market-oriented economies in the world have opted for at least some tinkering. Some economists have suggested, however, that a reassessment of these policies may be in order. They argue that once we acknowledge the simple fact that people learn from their mistakes, the best policy is to set a money-growth rate and stick to it whatever the momentary state of the economy. While the call for constant money growth hardly is new, the logic in its favor recently has been bolstered, ironically enough, by investigations of the reasons for the short-run link of money to jobs.

JOBS AND GROWTH IN THE MONEY SUPPLY

As early as the eighteenth century, economists realized that accelerating the growth

rate of money (typically defined today as the sum of currency and checking accounts in the hands of the public) would stimulate production of goods and services and hence create more jobs. David Hume declared in 1750, for example, that "in every kingdom, into which money begins to flow in greater abundance than formerly, everything takes on a new face; labour and industry gain life, the merchant becomes more enterprising, and even the farmer follows his plow with greater alacrity and attention."² Yet Hume and other classical economists recognized the transitory nature of the money-jobs nexus. Hume went on to say that "some time is required before the money circulates through the whole state, and makes its effect be felt on all ranks of people. At first, no alteration is perceived; by degrees the price rises, first of one commodity, then another; til the whole at last reaches a just proportion with the new quantity of specie [money] which is in the kingdom. In my opinion, it is only in this interval or intermediate situation, between the acquisition of money and the rise of prices, that the increasing quantity of gold and silver is favorable to industry."

With over two hundred years of hindsight, many economists believe that Hume captured the essence of the effects of changes in money growth on the economy. What has been far less clear all along, however, is why boosting the growth rate of the money supply has a permanent effect on price levels—inflation—but only a temporary effect on such real-sector items as jobs and production. Several explanations have been suggested, and one increasingly popular view attributes the money-jobs tie-in to **imperfect information**. Buyers and sellers make plans based on the current state of the economy and their best guesses of what lies ahead. If they make mistakes either in assessing the present situation or in forecasting the future, they'll have to revise their plans. When they do, the pace

¹Members of Congress thus far have had some trouble agreeing about the appropriate definition of 'adult'.

²David Hume, "Of Money," *Essays* (Oxford: Oxford University Press, 1750).

of economic activity will be affected. Thus the answer seems to be that the short-run effects of changes in the money-growth rate differ from the long-term results because people act on imperfect information and, hence, frequently make mistakes.

Relative Prices: The Key Information Variable. In a free-market economy, both businesses and households face a plethora of complex decisions. Firms must consider how much output to produce and how many workers to hire, households must calculate how many hours to work and what basket of goods to purchase. Buyers and sellers could rely on divine inspiration for guidance; but, instead, they turn to more mundane signals to tell them what to do. The information is contained in changes in market prices. An increase in wages relative to machine rentals, for instance, signals employers to hire fewer workers and buy more machines. Similarly, an increase in demand for some item a firm produces relative to demand for other goods and services induces a price rise; and the price rise signals that this item has become more profitable and that production schedules should be accelerated. If the price of television sets, for example, rises 5 percent relative to the price of everything else (as measured by, say, the price index for GNP), then television manufacturers can increase their profits by upping production. But if the price tags on all other goods and services also are marked up 5 percent, then the relative price of television sets is unchanged and manufacturers shouldn't speed up production. The reason is that, in this case, the cost (or price) of everything used in making television sets is 5 percent higher too, so that bringing more TVs to the market won't pay off in higher earnings.

Relative prices are the key items that firms need to consider in everyday decisionmaking, and the same is true for households. Unfortunately, however, it's often hard to recognize a change in relative prices. Businessmen probably become aware of changes in demand and price developments in

markets for their own products sooner than they recognize changes in the overall level of prices. Dress manufacturers, for example, probably will take note of an increase in garment prices before they perceive that the prices of other goods and services reflected in the GNP price index also are rising. Hence, when inflation—a general rise in all prices—is just getting underway, or when it's accelerating or decelerating unexpectedly, firms may interpret a change in the price of their own product as a relative price change when in fact its price is changing at the same rate and in the same direction as everything else. It's this tendency to think one sees relative price changes during periods of inflation and deflation that allows policymakers to use the leverage of changes in money growth to affect output and jobs.³

More Money, More Jobs? Suppose that the money supply has been growing for some time at 2 percent a year, that there has been no inflation to speak of, and that the unemployment rate is 5 percent. The Fed then speeds up money growth to, say, 6 percent, to create more jobs. What will be the impact of this policy change?

As the money supply increases, people will acquire more money than they want to hold at prevailing interest rates. They'll attempt to get rid of their excess money by spending it on assets such as government or corporate securities, and perhaps on goods and services as well. Interest rates will fall; and since more funds will be available for lending, it will become cheaper to finance expenditures with borrowed funds. As a result, the sum total of demand for goods and services in the economy (aggregate demand) will begin to rise, and the increase in demand will put upward pressure on prices. Businessmen in

³Some economists argue that jobs are linked to money by other uncertainties as well as by misperceptions of this kind. See, for example, James Tobin, "Inflation and Unemployment," *American Economic Review* 62 (1972), pp. 1-18. According to Tobin, this link, far from being merely temporary, may carry over into the long run.

individual markets will recognize that demand is on the rise, but, because there has been no inflation for some time, they'll conclude that there has been a relative shift in demand for their own products rather than an increase in demand for all goods and services. In response to the perceived shift in demand, businessmen will begin to increase prices for their own goods. And because they haven't recognized yet that other prices also are rising (including their costs for labor and machinery), they'll step up production in concert. To produce more output, firms will hire more workers and the unemployment rate will fall—much as Hume said it would.

But as Hume recognized, this euphoric state is temporary. Eventually, businessmen wake up to the fact that inflation makes them pay more for labor and materials; so they cut back on production and lay off workers. Business activity returns to previous levels and the unemployment rate returns to 5 percent; but, unless the money-growth rate is reduced, inflation proceeds at a higher rate.

Many economists would accept this as a long-run scenario. They agree that as people become aware of inflation and adjust their expectations of the future to reflect it, the Fed will find it harder and harder to reduce unemployment, even by following ever more expansionary monetary policies. At the same time, however, they disagree about the appropriateness of changing the money-growth rate to try to alter the pace of economic activity in the short run. One school of thought suggests that the Fed should seldom if ever tinker with the growth rate of the money supply. This policy prescription—that the money supply should be expanded at the same rate year in and year out—isn't new.⁴ Its popularity is growing now, however, as a result of recent research into how households

and businesses form expectations about the outlook for future prices.

EXPECTATIONS AND MONETARY POLICY: HOW LEARNING CAUSES COMPLICATIONS

The information that buyers and sellers possess plays a key role in determining the impact of a change in the money-growth rate. When people make mistakes and interpret a general increase in prices as a relative price change, their behavior affects the economy both at the time they err and also when they correct their mistakes. Indeed, these misperceptions are at the root of the relations money growth has to production and jobs. In fact, monetary policy must generate **unexpected** increases in prices in general in order to add to the number of jobs. For if the inflation that results from an increase in money growth is expected, it will not boost production (since people will not err in perceiving inflation as a relative price rise).

This is why some economists believe that shifts in money growth can't have a permanent effect on the unemployment rate and that the Fed isn't able to peg the rate wherever it wants to. Suppose the demand and supply of workers are consistent with an unemployment rate of 5 percent (the unemployed are those in transition from job to job or out of work on their own initiative seeking employment). The Fed can depress the unemployment rate temporarily by accelerating money growth and causing people to believe that relative prices have changed. As people become aware of inflation, however, unemployment will move back toward 5 percent. In order to maintain a low unemployment rate permanently, the Fed would have to generate the appearance of relative price changes on a continuing basis.

Most economists would agree that keeping the public in the dark about inflation would be a difficult job. People eventually will catch on to the process that produces inflation simply because it's in their economic interest to do so. And once they stop making systematic errors in recognizing and forecasting

⁴Two economists from the University of Chicago have been the strongest proponents of constant money growth. Henry Simons argued the position in the 1930s, and Milton Friedman has seconded it on innumerable occasions since the 1950s.

inflation, then changes in money growth won't affect the production and employment picture.

The fact that people won't stay ignorant of the influences that make for inflation is a source of bedevilment to policymakers. When people recognize that changes in money growth affect the inflation rate, they'll learn to take money growth into account as they form expectations about the future. As stock market analysts frequently say, people will discount the effects of policy changes; they'll build this information into their decisions. When the money-growth rate increases, they'll respond by raising their inflation forecasts. Similarly, any other developments that affect inflation, such as fiscal policy moves, will be taken into account in generating a forecast. Economists refer to this method of forming expectations—where all the available information is built into the forecast—as a rational expectations process.

If people become aware of what normally causes inflation (if expectations become rational), policymakers will have a hard time bringing about unexpected inflation. One thing they might try is generating unexpected changes (on average) in money growth. The Fed currently announces its long-term targets for money growth. If the public believes these declarations, then the Fed should be able to generate unexpected money growth by systematically missing its target. The Fed probably would come under heavy attack if it was off target all the time; but even if this weren't so, it's doubtful that the public would continue to accept the announced targets at face value. For, after watching the actual money-growth numbers, people eventually would figure out what the Fed was responding to and then would use this information to predict the actual (rather than announced) rates of money growth and inflation. So unexpected money growth probably won't do as a systematic source of unexpected inflation.⁵

⁵The money stock is not perfectly controllable, however, so that it is quite likely that expectations about

The consequences for monetary policy are radical. The spread of rational expectations would shatter the link that connects employment to the money supply. When people at large use all available information to forecast inflation, accelerating money growth will produce only higher prices, not more jobs; slowing money growth, though it will check inflation, won't affect employment either. In this scheme, if policymakers were satisfied with the rate of inflation, there would be no justification for changing the money-growth rate. In fact, the best policy would be to let the money supply grow at some constant rate year in and year out. In a world where expectations are rational, a variable money-growth rate simply makes the level of economic activity more uncertain. This happens because changes in money growth cloud the picture and make it more difficult for businessmen and households to recognize shifts in relative demands and supplies.

Consider the shoe producer who notices an increase in his orders. He must ask whether this represents an increase in demand for shoes relative to everything else (so that he should step up production) or whether the demand for everything, shoes included, is on the rise (and production should not be increased). If the Fed has sworn off a policy of tinkering with money growth, the shoe manufacturer can be more confident that the increase in orders represents a relative demand shift. A constant growth rate in money, however, would not mean constant growth in income and production. Unpredictable factors that affect economic activity, such as weather, wildcat strikes, and political upheavals, will continue to produce variations in income. But constant money growth

money growth frequently will be disappointed. These surprises will produce unexpected temporary inflation and a consequent effect on production and employment. The uncontrollable random factors that push and pull money growth away from its expected path will tend to cancel each other over time, however, so that on average the Fed will not be able to alter production in some arbitrarily chosen fashion.

would eliminate one source of income variation so that, on average, income changes should be less uncertain.

IS THERE SCOPE FOR AN ACTIVIST POLICY?

Should policymakers accept the rational expectations view and passively peg the growth of money at some constant rate? Those who answer No and favor an activist monetary policy believe that the rational expectations scenario isn't now and isn't likely to become a faithful representation of the real world. They emphasize reasons for thinking that changing money growth will affect the pace of production and the number of jobs available. It has been pointed out, for instance, that if policymakers have better information than the public about the state of the economy or the way money growth will be altered, then monetary policy can affect employment despite the fact that expectations are rational. Policy works when the public has an information disadvantage because the Fed can induce buyers and sellers to behave in ways that create additional jobs. It seems doubtful, however, that the Fed possesses better information than the public. Economic data are made available with only a short lag in the U.S. and are well publicized in the media. And forecasts of economic activity can be purchased from a number of private firms that use methods quite similar to those employed by the Fed. Thus it seems reasonable to conclude that the relevant information is there for those who want it—including the outlook for future money growth which the Fed announces each quarter—and that informational advantages for policymakers cannot establish a firm foundation for an activist monetary policy.⁶

Others have argued for an activist policy by contending that predictions become rational

(correct on average) only over a very long period of time. On this view, there's considerable room for monetary policy to operate during the transition period. In fact, though, very little is known about how fast people learn and how long it takes them to adjust their expectations accordingly. But even if they learn only gradually, policymakers still may have a problem. The difficulty is that the Fed's forecasts of the outcomes of policy changes assume there will be virtually no learning at all. Thus, to the extent that people gradually are catching on and adjusting their expectations, the Fed's predictions of the effects of a change in policy will be systematically wrong.⁷ In other words, to take advantage of the time lag in getting to a state of rational expectations, the Fed must know how people learn and adjust their behavior. Researchers only now are beginning to tackle this problem. Hence, there remains some doubt that the Fed currently has enough information to temper fluctuations in economic activity despite the lag in forming rational expectations.

Finally, there is a school of thought that questions the assumptions employed in the rational expectations argument. The rational expectations scenario presumes, it's argued, that prices are flexible—that they change promptly when there's a shift in demand or supply. Yet there seems to be a lot of evidence that many prices are sticky—that they have little tendency to go down and that they go up fairly gradually, at least in the beginning stages of an inflationary period. In a world where prices don't change at all, any disturbance to the economy (such as a drought, an oil embargo, or a change in the money-growth rate) must be reflected by quantity adjustments rather than price changes. If prices are rigid and some workers are unemployed

⁶If the Fed does have better information than the public, changing the money-growth rate is not the only way it can stabilize production. It can achieve its goal also by simply making its superior information available to the public.

⁷This point has been argued forcefully in Robert E. Lucas, "Econometric Policy Evaluation: A Critique," in Karl Brunner, ed., *The Phillips Curve and Labor Markets* (1976), supplement to the *Journal of Monetary Economics*.

against their wishes, then an increase in money growth will stimulate production and create new jobs.

In reality, of course, prices are neither perfectly flexible nor completely rigid. Some economists have argued that there's enough stickiness in prices to justify an activist monetary policy. One way to resolve this issue is to ask whether what has happened in the past is consistent with the notion that monetary policy can affect production and employment systematically. Over the last fifteen to twenty years, economists have amassed a great deal of evidence which shows that increasing the money-growth rate would produce more jobs (but at the cost of higher prices). None of these studies, however, considered the impact of learning on people's behavior. A recently completed investigation took a different tack and assumed that people do form expectations rationally. No evidence emerged which tended to show that money growth is related to employment.⁸ While one study hardly amounts to a closed case, these results do indicate that expectations are an important factor and that more effort should be devoted to studies of how people forecast and how they adjust their behavior to what they expect.

TIME FOR AN EXPERIMENT?

Policymakers themselves still haven't

⁸See Thomas J. Sargent, "A Classical Macroeconometric Model for the United States," *Journal of Political Economy* 84(1976), pp. 207-237.

bought the view that a little learning destroys the jobs-money nexus. The Fed hasn't sworn off adjusting money growth to changes in the state of the economy, and Congress hasn't stopped considering ways to influence the Fed's targets for money growth. But the rational expectations argument at the very least should have increased our skepticism about what policy can do. After all, it's hard to quarrel with the notion that people act in their own best interest and use all the information they profitably can get their hands on to do so. Indeed, once economists discard this notion, they find it quite difficult to justify their analyses and predictions of how people will behave.

Monetary policy of late has been directed toward gradual reductions in money-growth rates. The Fed is aiming for a reduced rate of inflation along with an adequate recovery in production. Once inflation has slowed to a satisfactory rate, it might well be desirable to consider an experimental period of constant money growth. After subjecting an announced policy of unchanged money growth to the acid test of a real-world experiment, the policymakers and the public would be in a better position to judge the case for a passive monetary policy on its merits. No one, of course, can guarantee that such an experiment would reduce fluctuations in economic activity. But neither can anyone show from past experience that policy activism has a strong claim on our confidence. 

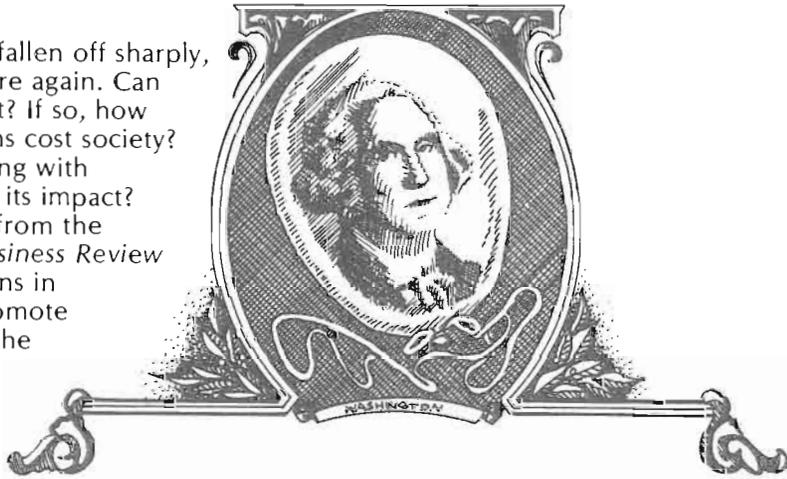
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ECONOMICS of INFLATION

Though inflation has fallen off sharply, it could become severe again. Can policymakers curtail it? If so, how much will their actions cost society? Are there ways of living with inflation that cushion its impact? Six articles reprinted from the Philadelphia Fed's *Business Review* address these questions in detail and seek to promote an understanding of the problem among both policymakers and the general public.



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