

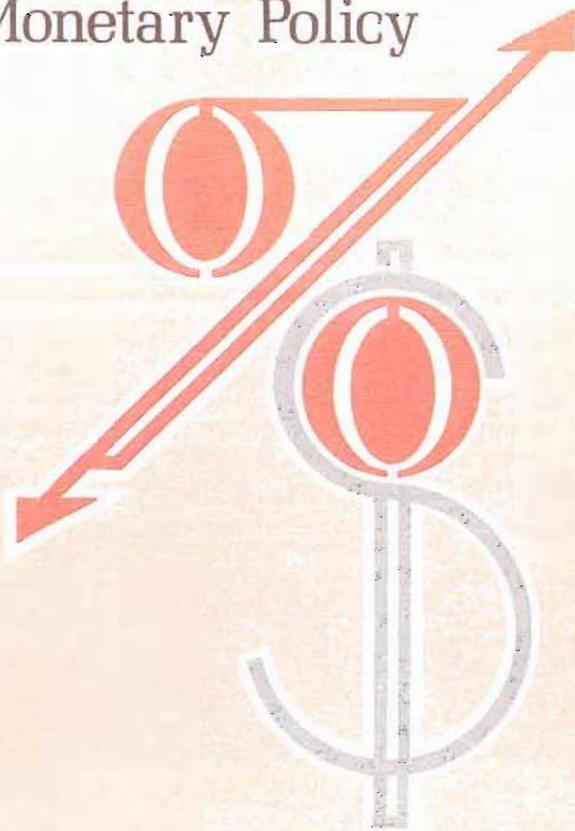
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Efficient Markets,  
Interest Rates, and  
Monetary Policy



Supply-Side Economics:  
What Chance for Success?

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INTEREST RATES,  
AND MONETARY POLICY**

*Donald J. Mullineaux*

. . . Efficient markets theory argues for a stable and predictable monetary policy.

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REVIEW**

**Federal Reserve Bank of Philadelphia**  
100 North Sixth Street  
(on Independence Mall)  
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WHAT CHANCE FOR SUCCESS?**

*Aris Protopapadakis*

. . . Inflation probably cannot be reduced significantly through supply-side policies alone.

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## Efficient Markets, Interest Rates, and Monetary Policy

By Donald J. Mullineaux\*

*"It is evident, then, that the rate of interest is a highly psychological phenomenon . . . the long-term rate of interest will depend, not only on the current policy of the monetary authority, but also on market expectations concerning its future policy . . . a monetary policy which strikes public opinion as being experimental in character or easily liable to change may fail in its objective of greatly reducing the long-term rate of interest."*

A well-read student of current trends in economic thinking no doubt would judge these the musings of one of today's growing number of rational-expectations theorists. Actually, though, the words were penned in 1936 by John Maynard Keynes in his classic *General Theory of Employment, Interest and Money*. This may come as a small surprise to those who credit Keynes with the proposition (or fault him with it, depending on the reader's perspective) that an increase in the supply of money will lower both short-term and long-term interest rates. To be sure Keynes said just that; but economist par

excellence that he was, qualifications clearly crept into his argument.

The link between money and interest rates is, like sex, both an old issue and a hot topic. The President's economic program, which includes an assumption that the Federal Reserve will pursue gradual reductions in monetary growth over the next six years, has generated a flurry of commentary. Administration spokesmen claim that monetary deceleration will mean rapid and substantial declines in interest rates. But many economists, and practically all the large-scale econometric models, contend that slower money growth brings on higher interest rates in the short term. Rates will fall in this traditional view only after a long period of adjustment. Since higher interest rates could have damaging effects on a recovering economy, the issue is more than academic.

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One fairly novel approach to explaining how financial markets work—the efficient-markets view—suggests that either the Administration or its critics could prove correct. A monetary slowdown can result in higher, lower, or even unchanged interest rates in this theory. The outcome hinges on *what's happening to expectations in financial markets*. Unlike the traditional view, the efficient-markets approach *allows for a very quick reduction in interest rates in the face of slower money growth, though other outcomes are also possible*.

The efficient-markets logic illustrates the complexities of the link between money and interest rates—an issue that policymakers can hardly ignore. The message that emerges is to avoid a monetary policy that, in Keynes's words, "strikes public opinion as being experimental in character or easily liable to change." A stable policy will be a predictable one, and where efficiency reigns, a predictable policy should lend stability to financial markets and to the economy as a whole.

**THE CONVENTIONAL WISDOM:  
SLOWER MONEY GROWTH  
MEANS HIGHER RATES  
AND LESS ECONOMIC ACTIVITY**

One of the oldest topics in monetary theory concerns the so-called transmission mechanism of monetary policy—in plain English, the way monetary policy works. Most economists agree that interest rates, especially long-term interest rates, play a center-stage role in this story. As the tale begins, in the traditional view, a deceleration in money growth induced by the Federal Reserve leads to a prompt increase in short-term interest rates. Short rates rise because people must be persuaded to slow the pace at which they build up their money holdings. Since the short-term rate (the 90-day Treasury bill rate, say) measures the interest people forgo by holding noninterest-bearing money, a sufficiently large increase in this rate should

make people want to add to their money balances at a more gradual pace.

But this curtain-raiser represents only the beginning of a complicated story. Having seen that interest rates have increased, financial market participants are said to revise their outlook about the *future course* of short-term interest rates. In particular, the conventional wisdom claims that people will think that, because interest rates are higher today, they are likely to be at least somewhat higher in the near-term future. Once this happens, long-term interest rates also will increase. Why? Because long-term rates depend to some extent on what people expect to happen to future short-term rates.

Consider the following two alternatives facing Miss Marple, who has funds available to lend for a one-year period:

Strategy 1

Buy a one-year (long-term) Treasury bill yielding 12 percent.

Strategy 2

Buy a six-month (short-term) Treasury bill currently yielding 10 percent, then reinvest at maturity in another six-month bill which she expects to be yielding 14 percent at the time.

If we ignore the element of risk (which arises in part because future rates are imperfectly predictable), she will be indifferent between the two strategies since each yields an average return of 12 percent over the year. But if the short-term rate expected six months from now suddenly were to increase to, say, 20 percent, Miss Marple—and people with expectations similar to hers—would then prefer the six-month (short-term) bill; purchasing two short-term bills successively would yield an average return of 15 percent. As everyone attempted to sell off one-year

bills, however, the rate on these securities would rise. In fact, it would increase until the long rate was once again approximately equal to the average of the current short rate and the expected future short rate (15 percent). Long-term rates in effect embody a forecast of future short rates.<sup>1</sup>

According to the standard view, then, long rates increase on the heels of decelerated money growth once people recognize that current short-term yields have risen and they consequently boost their forecasts of future rates. But rates don't change all at once; rather it takes time for people to adjust their expectations. So long-term rates will be increasing over what might be a substantial time period following a slowdown in money growth.

The denouement to this standard transmission-mechanism story is that several kinds of spending—especially housing expenditures and business expenditures on plant and equipment—are sensitive to movements in long-term rates. Here again, people and businesses are viewed as reducing these expenditures only gradually in response to higher long-term rates, so that still another time lag is introduced into the monetary policy process. Thus slower money growth exercises a constraint on spending over a lengthy period of time, lasting at least several years.

The story has an epilogue, and economists such as Milton Friedman have strongly emphasized it.<sup>2</sup> As reduced spending slows economic activity, the increase in rates

eventually will be reversed because of weaker demands for credit. And if the policy restraint imparts less momentum to inflation, interest rates will fall still further as lenders recognize that more slowly rising prices in the future mean each dollar they're repaid will buy more goods and services. To reflect this anticipated increase in purchasing power, they'll be satisfied with a lower rate of interest. Thus to the extent that slower money growth means a lower rate of output or less inflation, it will bring on lower interest rates eventually. But according to many monetary analysts, this shift takes quite a long period of time. And many econometric models indicate that it will be a number of years before slower money growth leads to lower long-term rates of interest.

#### THE EFFICIENT-MARKETS CHALLENGE

The conventional view of the way monetary policy works pays only limited attention to the role that information about a policy change might play in the whole process. In particular, financial-market participants are viewed as reacting mainly to information about what's happening to short-term interest rates while paying little heed to the behavior of other policy related phenomena, such as the rate of money growth. This apparent disregard for potentially useful information lies at the root of the criticism of the traditional view levied by those who believe financial markets are efficient.

Market efficiency has to do with the relation of prices to information. The market for financial assets such as long-term bonds is said to be efficient, for example, if the price of each bond fully reflects all the available information that might have an impact on its price. Information about the Federal government's plans for future borrowing, for instance, will be reflected in current bond prices in an efficient market. And if a bond's price reflects such information, so will its yield.

The argument for believing that a market

<sup>1</sup>This averaging formula holds as an approximation for longer term securities of any maturity (again, in the absence of risk). The longer the maturity, the greater the number of future short-term rates that get averaged into long rates, however.

<sup>2</sup>For a nontechnical discussion, see Milton Friedman, "Factors Affecting the Level of Interest Rates," Proceedings of the 1968 Conference on Savings and Residential Financing, sponsored by the U.S. Savings and Loan League (Chicago: The League, 1969), pp. 11-27.

is efficient flows from this fact: an inefficient market offers opportunities for above-average profits. An old economic adage says that people will move quickly to take advantage of unusual profit opportunities until they disappear. To take an example from the stock market: suppose only one person knows about tomorrow's announcement of a firm's sharply higher earnings. He can do quite well by buying that firm's stock today. But if everyone knows the announcement is coming, the stock price will have been bid up already and there won't be any unusual profit opportunity. An efficient market allows above-average profits only when relevant information isn't publicly available.<sup>3</sup>

A basic message of the efficient-markets approach is that only unexpected events will cause changes in interest rates, so that only new information will have an impact on financial-market yields. Past developments and even anticipated events—such as an expected large cut in government spending—already will be reflected in today's yields in financial markets.

The efficient-markets approach calls into question the traditional view of the monetary policy process, particularly its failure to distinguish anticipated from unanticipated policy shifts. Since only new information can affect yields in an efficient market, a change in the current stance of monetary policy (as reflected by the growth rate of the money supply) will affect interest rates only if the shift was not expected. An expected policy change would be factored into financial market yields before the shift takes place.

**Interest Rates and Shifts in Money Growth: The Key Role of Expectations. Many**

<sup>3</sup>Trading on inside information (such as was alleged in recent reports of stock purchases by individuals involved in arranging corporate mergers) could yield very large profits, even in an efficient market. Trading based on this kind of information, however, generally is prohibited by law.

economists argue that the interest rate on a financial asset of given maturity roughly equals the so-called real rate (the interest rate in the absence of any inflation) plus the expected rate of inflation over the asset's time horizon (the inflation premium). So if people expect that inflation rates will fall in the future, they also should expect lower future short-term interest rates because the inflation premium will fall. This anticipated reduction in future short rates should be reflected in long rates now because long rates reflect forecasts of future short rates.

But why should people expect future inflation to be lower than today's inflation? One reason might be that they expect money growth rates to fall since slower money growth historically has been accompanied by lower inflation rates. If people anticipate that money growth will be reduced permanently next year by five percentage points, for example, then today's long-term rate should be lower than if people expect no reduction in money growth. If and when money growth does so decelerate, there will be no reason for long-term rates to change because there will be no new information in the fact that people's expectations are borne out.

But suppose people receive a piece of news that leads them to revise their expectations of future money growth. Suppose everyone has been expecting a steady eight-percent rate of money growth over the next ten years. If for some reason people revise their forecasts to a permanently lower three-percent growth rate, then long-term rates should fall quite promptly. Why? Because people now should anticipate lower inflation than before.

The notion that people can be convinced to lower their expectations about future money growth and consequently become more optimistic about the prospects for lower inflation is a major reason why Administration economists believe interest rates will show a steady decline over the next four to

five years. But many are skeptical of this view, especially those who subscribe to the traditional view. These traditionalists argue that monetary decelerations are almost always accompanied by at least some period of increasing interest rates. In fact, the efficient-markets logic itself suggests that slowdowns in money growth can be accompanied by rising rates, but only if the slower money growth comes as a surprise to market participants.

Money growth different from what people expected does represent new information and therefore should influence interest rates. In particular, an unexpected decline in money growth should mean higher rates for the very reasons stressed by the traditional view—people have to be discouraged from adding to their money holdings as rapidly as before.

One way to interpret the traditional view, then, is that it treats all shifts in money growth as unexpected, at least for a while. And, indeed, most large-scale econometric models of the economy do not attempt to differentiate between anticipated and unanticipated shifts in money growth. These models simply do not allow for revisions in anticipated money growth to have quick and direct effects on interest rates. Rather, a reduction in money growth lowers interest rates only after actual inflation begins to fall—which, the traditionalists claim, takes quite a long time.

Which view of the world is correct? If the Administration's budget plan is implemented and if the Fed gradually reduces monetary growth over each of the next six years, will rates drop quickly, or will they increase, perhaps dramatically, before they begin to fall? An honest answer is: no one can say with any strong degree of confidence. We simply do not know enough about how people form expectations about monetary policy or how changes in those expectations affect interest rates. But, while the Administration's interest-rate forecast may be opti-

mistic, it is not, as some have claimed, implausible. Those who judge the rapid-rate-decline scenario totally unlikely must see no merit to the efficient-markets approach. This is an extreme position. While we lack good estimates of precisely how a particular policy package works out over time, there is a large body of evidence that says, on balance, financial markets tend to be highly efficient.

#### WHAT DOES THE EVIDENCE SAY ABOUT EFFICIENT MARKETS?

In a 1976 paper, William Poole had this to say about tests of the efficient-markets theory: "Numerous investigators have analyzed an enormous amount of data using many different statistical techniques, and no serious departures from the predictions of the hypothesis have been found. Thus, there is very strong evidence in favor of the hypothesis."<sup>4</sup> Since Poole's analysis, even more supporting evidence has accumulated, especially concerning the long-term bond market and the link between long-term rates and monetary policy actions.

Tests of financial market efficiency usually revolve around the statement that, if a market is efficient, it shouldn't be possible to explain changes in yields on the basis of any information that was publicly available prior to the price change; only new information causes prices to change. In a large number of cases, certain segments of the financial markets have been found to satisfy this condition.<sup>5</sup> More importantly from the perspective of students of monetary policy, several recent investigations have found that the long-term bond markets in both the United States and Canada appear to be

<sup>4</sup>See William Poole, "Rational Expectations in the Macro Model," *Brookings Papers on Economic Activity* 1976: 2, p. 467.

<sup>5</sup>For an extensive survey of the evidence, see Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance* 25 (May 1970), pp. 383-417.

efficient.<sup>6</sup> Phillips and Pippenger show, for example, that long-term rates efficiently reflect information about past inflation rates and past short-term interest rates.<sup>7</sup> Using a somewhat different approach, Mishkin confirms this result. And Pesando reports that changes in long-term bond rates in Canada cannot be predicted by prior changes in either interest rates or in key economic variables such as the money supply or the unemployment rate. These studies suggest that the long-term bond market is no less efficient than the short-term debt market, the stock market, or the foreign-exchange market.<sup>8</sup>

<sup>6</sup>See Llad Phillips and John Pippenger, "The Term Structure of Interest Rates in the MIT-PENN-SSRC Model: Reality or Illusion?" *Journal of Money, Credit, and Banking* 11 (May 1979), pp. 151-163; James E. Pesando, "On the Efficiency of the Bond Market: Some Canadian Evidence," *Journal of Political Economy* 86 (1978), pp. 1057-1076; and Frederic Mishkin, "Efficient-Markets Theory: Implications for Monetary Policy," *Brookings Papers on Economic Activity* 1978, pp. 708-752.

<sup>7</sup>More exactly, past interest rates don't explain long-term Treasury rates. Corporate bond rates are found to be related to past short-term rates (on commercial paper). The authors suggest the latter result may be colored by statistical problems, however.

<sup>8</sup>Not all the tests of market efficiency tend to be supporting, however. Some recent work suggests that prices in certain financial markets are more volatile than we should expect if markets were, in fact, efficient. Robert Shiller, for example, has recently argued that stock prices and long-term interest rates move around too much to be explained simply by the receipt of new information. See his papers: "The Volatility of Long-Term Interest Rates and Expectations Models of the Term Structure," *Journal of Political Economy* 87 (October 1979), pp. 1190-1219; and "Do Stock Prices Move Too Much To Be Justified by Subsequent Movements in Dividends?" National Bureau of Economic Research Paper No. 456. These so-called "variance bounds" tests represent a new approach to testing market efficiency, and the results suggest that something more than new information may be affecting behavior in financial markets. While this doesn't necessarily mean the efficient-markets view is wrong, it does imply the theory may be incomplete.

This evidence calls into question econometric models in the traditional view which often violate the efficiency criterion by linking interest rate changes to old information. But the market-efficiency studies don't offer direct support to the view that interest rates will drop rapidly if the Administration's economic package, including gradual deceleration in money growth, is implemented. The reason is that none of this work examines the relationship of interest rates to revisions in anticipated monetary policies. Efficient-markets logic contends that a newly expected permanent deceleration in money growth should be accompanied promptly by lower interest rates. Unfortunately, no tests of this proposition have been reported in the literature to date.

But while it doesn't help predict the timing of the interest-rate outcome of this particular policy strategy, the overall evidence does embody some broad lessons for the exercise of monetary policy.

#### EFFICIENT MARKETS AND MONETARY POLICY

A number of important implications for the conduct of monetary policy flow from the theory of efficient markets. Perhaps the most crucial is the key role that expectations play in the process, a point that Keynes clearly recognized. To be precise, three different outcomes for long-term interest rates are possible when the Fed slows the growth of the money supply. If the shift was expected before the Fed acted, nothing should happen to financial-market yields. People already would have taken account of the monetary slowdown in their decisionmaking. But if the policy is accompanied by revised expectations of permanently lower money growth, then rates should fall because expectations of future inflation also should be reduced. Finally, if the deceleration in money growth is unexpected, interest rates should rise for the reasons emphasized in the traditional view.

To predict the interest-rate outcome of its policies, then, the Fed must have a good estimate of what people are anticipating. Unfortunately, this is not an easy piece of information to acquire. Yet without it, there is a serious risk that a policy will have unintended effects. Suppose policymakers reduce money growth one percentage point hoping to slow economic activity, for example. If the market had been expecting a two-percentage-point drop, money growth would be unexpectedly higher rather than lower. Interest rates would fall, for a while at least, and the economy would be unintentionally stimulated. One lesson of the efficient-markets approach, then, is that without a good gauge of people's expectations concerning the monetary policy outlook, the interest-rate outcome of a policy shift can't be estimated.

Policy anticipations presumably would be easier to appraise in a relatively stable environment (see **WHAT IS A STABLE MONETARY POLICY?**). To borrow again the language of Keynes, if monetary policy "strikes public opinion as . . . easily liable to change," then assessing the market's policy expectation may be next to impossible. Yet another advantage of a stable monetary policy is the

prospect that policymakers would acquire more credibility concerning their intentions. Reductions in expectations of future money growth should be accompanied in efficient markets by interest-rate declines, and vice versa; but it is doubtful that public pronouncements from policymakers can have much impact on what people expect if money growth has been highly unstable.

Finally, even though the efficient-markets view suggests that interest rates might decline in the face of an unanticipated acceleration in money growth, there are reasons to doubt the wisdom of trying to exploit this link in an attempt to stimulate the economy. First, there is the practical problem of gauging the market's policy-related anticipations (so that the Fed could do the unexpected). Second, some recent evidence fails to support the proposed link between unexpected money growth and long-term rates.<sup>9</sup> And third, it may not be possible for the Fed to generate unexpected shifts in money growth systematically. One school of thought, the rational-

<sup>9</sup>See Frederic Mishkin, "Monetary Policy and Long-Term Interest Rates: An Efficient-Markets Approach," *Journal of Monetary Economics* 7 (January 1981), pp. 29-55.

### WHAT IS A STABLE MONETARY POLICY?

Stability, like motherhood and the home team, is something most people are inclined to support; the term, in other words, is a loaded one. Just what do people mean, operationally speaking, when they cite a need for a stable monetary policy?

In most instances, the phrase is used to characterize a monetary policy involving relatively infrequent changes in the longer term growth rate of the money supply. Note that the stance of policy is reflected in money growth, not some other factor such as the level of interest rates. While this is somewhat controversial, the Fed itself views the rate of money growth as the primary gauge of the thrust of policy over periods of, say, six months or more.

Also, the argument is usually made that money growth rates can fluctuate over short periods (week to week and month to month) without violating the notion of a stable policy, provided that money growth behaves smoothly over longer time periods. This means the Fed must avoid cumulations of short-run deviations in money growth from its longer term target in one direction or another. The case for the view that short-term changes in money growth don't reflect policy instability rests mainly on evidence suggesting these fluctuations have very little impact on economic activity.

expectations view, argues that if the Fed continuously adjusts money-growth rates in attempting to smooth out fluctuations in economic activity, people will recognize this policy propensity and factor it into their forecasts of policy actions.<sup>10</sup> Policy-related changes in money growth therefore would be anticipated by financial-market participants. The sum of these factors again argues

for a monetary policy characterized by few, if any, changes in money growth once inflation has settled at a socially tolerable level.

In short, Keynes recognized well over 40 years ago that there are several reasons to be skeptical of what we know about the link between money and interest rates. Efficient-markets theory, rather than resolving some of that skepticism, serves mainly to offer still more outlets for Murphy's Law ("If something can go wrong, it will") to work its way. In the face of all this, the best monetary policy appears to be the most predictable one, and a stable policy seems more likely to be predictable than an unstable one.

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<sup>10</sup>For a general discussion, see Donald J. Mullineaux, "On Active and Passive Monetary Policies: What Have We Learned from the Rational Expectations Debate?" *Business Review*, Federal Reserve Bank of Philadelphia, November/December 1979, pp. 11-19.