
and direction of overall economic activity, importantly including not only the level of aggregate output and employment but also the general rate at which prices rise or fall. Indeed, the predominant trend since the mid-twentieth century has been to place increasing emphasis on monetary policy (and correspondingly less on fiscal policy) for these purposes. Governments carry out monetary policy, typically via specialized agencies called central banks, by exploiting their control over the supply of certain kinds of claims against the central bank—hence the label ‘monetary’—that enable a country’s businesses, banks, and individuals to carry out their day-to-day economic affairs. In most financial systems, banks in particular are legally required to hold claims against the central bank in order to create deposits and make loans, and so the central bank’s control over the supply of claims against itself also gives it a form of control over the economy’s money and credit in a far broader sense. The evidence from experience, in one country after another, makes clear that the exercise of this control—‘monetary policy’—powerfully affects a country’s economy, for either good or ill.

1. How Monetary Policy Arises

Providing money for use in everyday transactions has been a commonplace function of governments for well over 2,000 years. Today almost all paper currency is ‘fiat money’—in other words, it has value only because the government mandates that within the country’s borders it must be accepted as payment in any and all transactions. (Importantly, the government does not mandate, because in a market economy it cannot, the price level at which its currency is accepted.)

In principle, the existence of fiat currency alone would be sufficient to enable a government to carry out a primitive form of monetary policy, distributing paper money to the public, through some device or other, in either small volume or large as it saw fit. In fact, modern central banks conduct monetary policy differently: by exchanging claims against themselves for other claims against the government—typically interest-bearing bills, notes, and bonds—in markets in which these instruments are freely traded. For this exchange to be possible, however, there must be other claims against the government outstanding in the first place.

Hence, monetary policy, as carried out in practice, is made possible by the existence of fiscal policy, in the usual sense of overall government spending and taxing and the government’s need to finance any excess of expenditures over revenues by means of borrowing. It is only because on balance over time most governments have spent more than they have taken in—that is, have run a fiscal deficit—that they have a stock of debt obligations outstanding.

Monetary Policy

Monetary policy is one of the two principal means (the other being fiscal policy) by which government authorities in a market economy regularly influence the pace

2. How Monetary Policy Works

The chief objectives of monetary policy in modern times typically have been to maintain stability of a country's general price level—that is, to prevent either inflation or deflation—and to promote maximum levels of output and employment. Other often accepted goals of monetary policy include maintaining balance in a country's international trade, preserving stability in its financial markets, and fostering increased capital investment so as to enhance its economic growth over time. With the exception of preserving financial market stability, which is usually taken to be secondary, all of these objectives pertain to aspects of an economy's nonfinancial economic activity. By contrast, central banks' monetary policy operations take place exclusively in the financial markets. For monetary policy to be effective therefore requires some process, often called the monetary policy 'transmission mechanism,' by which the purely financial actions taken by the central bank influence the nonfinancial decisions of households and firms.

2.1 Demand for Central Bank Liabilities

The key to how this mechanism works is that, in part for reasons of convenience and in part as a matter of law, participants in a country's nonfinancial economy need to hold claims against its central bank—the outstanding total of which is usually called the country's 'monetary base.'

At the simplest level, currency is usually a claim on a country's central bank. Individuals who buy everyday items for cash, and the businesses with which they deal, therefore need to hold and exchange central bank liabilities. In the past, sudden large increases in the public's demand for currency, when not met by an increase in currency supplied by the central bank, often triggered financial crises and consequent economic downturns. In modern times, however, most central banks have passively supplied whatever changing volume of currency the public seeks. As a result, demand for currency typically plays no significant role in the monetary policy process.

Instead, what matters are the claims that the country's private-sector banks hold in the form of deposits, usually called 'reserves,' at the central bank. For several reasons, the banks' need for these reserves expands or contracts roughly in pace with the overall level of activity taking place in the nonfinancial economy.

First, in many countries banks must, by law, hold such reserves in proportion to the volume of deposits (or if not their total deposits, then some forms of deposits) that they have outstanding. Hence, the ability of the banking system to create deposits for businesses and households to use in executing transactions that they do not make in cash depends on the quantity of reserves that they can obtain.

Second, a bank's ability to make loans depends on its ability to create deposits. A loan is an asset to the bank, while a deposit is the bank's liability. Apart from changes in the bank's capital due to retained profits or new securities issues, its total assets and total liabilities must expand or contract together. The requirement that banks hold reserves in proportion to their deposits, therefore, also means that they must hold reserves in order to advance credit to businesses or households.

Third, although some countries do not impose legal reserve requirements, their banks hold balances at the central bank to use for settling the claims among themselves that arise whenever an account holder at one bank deposits a check drawn on another bank. Even in some countries that do have reserve requirements, a large part of the balances that banks hold at the central bank are likewise held primarily for purposes of settling interbank claims. The standard way of effecting such transfers is to shift reserves, on the books of the central bank, from one bank to the other.

2.2 The Central Bank as Monopolist

The central bank's power to conduct monetary policy stems from its role as the sole source of reserves (or, again, monetary base) to meet this demand. In short, the central bank is a monopolist over the supply of its own liabilities.

2.2.1 Open market operations. The most common procedure by which central banks either increase or reduce the outstanding supply of bank reserves is through 'open market operations'—that is, buying or selling securities (normally the debt obligations of the central bank's own government) in the free market. When a central bank buys securities, it makes payment by increasing the reserve account of the seller's bank. Doing so increases the total volume of reserves that the banking system collectively holds. No bank, nor any other market participant, can add to or take away from the total volume of reserves that all banks together hold.

Expanding or shrinking the total volume of reserves in this way matters because banks can trade reserves among one another in exchange for other assets. Because the central bank pays only a low rate of interest (often zero) on these balances, any bank that has more reserves than it needs typically will try to exchange them for some interest-bearing asset. If the banking system as a whole has excess reserves, however, more banks will seek to buy such instruments than to sell them, thereby bidding up these instruments' price and thus reducing the interest rate on them. The resulting lower return on interest-bearing assets means a reduced opportunity cost of holding

zero-interest reserves. Only when market interest rates fall to the level at which banks collectively are willing to hold all of the reserves that the central bank has supplied will the financial system reach an equilibrium.

Hence, an 'expansionary' open market operation (in which the central bank expands the supply of reserves) creates downward pressure on short-term interest rates not only because the central bank is itself a buyer in the securities market but, more importantly in quantitative terms, because it leads banks to become buyers of securities as well. Conversely, a 'contractionary' open market operation, in which the central bank sells securities, puts upward pressure on short-term interest rates. Under ordinary conditions, a well-functioning central bank following these procedures can pick some short-term interest rate (in many countries the central bank focuses on the overnight interbank lending rate) and establish that rate at whatever level it chooses.

2.2.2 Reserve requirements. In a banking system that imposes reserve requirements, an alternative way for the central bank to achieve the same objective would be to adjust the stated percentage indicating how much in reserves banks are required to hold in relation to their outstanding deposits. Lowering the reserve requirement, and therefore reducing the demand for reserves, has roughly the same effect as an expansionary open market operation, which increases the supply of reserves: either action creates downward pressure on interest rates. Although in principle central banks could carry out monetary policy by either means, in practice most rely primarily on open market operations, using changes in reserve requirements only to achieve more technical objectives concerning the composition of banks' liabilities.

2.2.3 Central bank lending. Another way in which central banks can change the supply of reserves is by lending reserves directly to some bank. In most countries that have reserve requirements, such direct lending of reserves is normally small in scale, and it plays only a minor role in the monetary policy process. Especially in countries that impose no reserve requirements, however, lending directly to banks is an important part of how the central bank supplies reserves.

Because no bank will pay more to borrow elsewhere than the rate at which it can freely borrow from the central bank—and, similarly, will not sell a higher-yielding asset rather than borrow at a lower rate in order to continue holding it—setting the interest rate at which the central bank lends reserves to the banks

effectively establishes a ceiling for (risk-free) short-term market rates. In some countries, the central bank confines the market rates on short-term instruments to trade within a narrow range by imposing both a ceiling and a floor: setting an interest rate at which it will lend to banks as well as a (slightly lower) interest rate that it will pay banks on their holdings of reserve balances.

2.3 Effects on the Nonfinancial Economy

For monetary policy to achieve its objectives with respect to the nonfinancial economy, there must be some causal process by which the changes that the central bank brings about in short-term interest rates in turn affect real output and employment, or prices and wages, or both. Economic theory, as well as empirical observation, suggests a variety of avenues by which such influences can operate.

2.3.1 Influences on the demand for goods and services. In an economy with well-developed credit markets, households and firms frequently borrow to finance their spending. Fluctuations in interest rates naturally affect the willingness to undertake such expenditures. Although the central bank directly controls only the interest rates on short-term instruments like Treasury bills, the longer-term interest rates applicable to borrowing for these purposes mostly move in the same direction as short-term rates because banks and other investors are able to substitute among different debt instruments in their asset portfolios. Moreover, because banks' ability to create credit depends on having reserves, by decreasing the supply of reserves the central bank can induce banks in particular to cut back on lending in ways that go beyond merely charging a higher interest rate, including rationing credit among would-be borrowers.

The same process of portfolio substitution also leads to downward pressure on the market prices of other assets, most prominently equity securities and real estate. Because these price-sensitive assets bulk large in the total holdings of households (and sometimes firms too) in many countries, changes in wealth also normally influence the demand for goods and services. Yet a further extension of the same process enables monetary policy to influence the value of a country's currency in international markets, which in turn affects demand abroad for the country's exports as well as demand at home for foreign imports.

2.3.2 Demand effects on prices, employment, and wages. If a central bank's monetary policy stimulates

the demand for its economy's goods and services, and there is no immediate matching change in supply, the result will be to create upward pressure on prices. Higher prices in turn lead businesses to seek to produce more. In industries that are labor intensive, increasing production means hiring more workers. Hence, monetary policy also influences employment. In order to attract more workers, however, firms normally have to pay higher wages. Hence, an increase in output and employment due to expansionary monetary policy usually means upward pressure on both prices and wages—in other words, inflation.

2.3.3 Price misperception effects on aggregate supply. Under some economic theories, this tendency for output to increase and prices to rise following expansionary monetary policy has a different interpretation: what matters is that the increased prices due to greater aggregate demand come as a surprise. If a firm mistakenly interprets a rise in the general price level for a rise only in the price of its own specific product, it will, as before, choose to expand production. The immediate effect is the same, but once the firms that react in this way realize their mistake, their incentive to maintain higher production disappears. Under this theory, therefore, monetary policy can still influence both output and prices, but the effect on prices is lasting while that on output is only temporary.

2.3.4 Effects on prices and wages only. Yet a further extension of this same line of theorizing suggests that if people understood that the effects of monetary policy on output and employment are merely temporary—and, importantly, if they also understood what the central bank is doing as it is doing it—there would be no real consequences of monetary policy at all but only the influence on prices and wages. Although constructs that deliver this conclusion appear frequently in theoretical work, evidence that monetary policy does have real effects is sufficiently widespread that current-day interest in this line of thought focuses less on whether monetary policy is 'neutral' in this sense than on the theoretical rationale for understanding why it is not.

3. The Design of Monetary Policy

Monetary policy is problematic not only because the central bank's goals are sometimes in conflict but also because the mechanisms by which central bank actions affect the nonfinancial economy mostly involve lags often measured in years rather than weeks or months.

Many important aspects of the economic circumstances in which the central bank's actions will be having their effect are, therefore, not just unknown but unknowable when the decisions governing these actions are taken. Much of the study of monetary policy since World War II has focused on how to conduct monetary policy under these handicaps.

3.1 The Monetary Policy Instrument

Because of its monopoly position, the central bank can fix the quantity of reserves (or, including currency, the monetary base). Doing so affects the market equilibrium of interest rates on all debt instruments. Alternatively, the central bank can set the interest rate on any one class of debt instrument by continuously supplying whatever amount of reserves is consistent with market equilibrium at the chosen interest rate level, allowing market forces to determine what quantity of reserves it supplies. The market equilibrium also determines the interest rates on all other debt instruments. (A variant of this latter strategy is for the central bank to set the foreign exchange rate of its currency.) By contrast, the central bank cannot directly set the volume of banks' deposits or lending. Nor can the central bank directly determine real output, or prices, or any other aspect of nonfinancial economic activity.

If all other influences bearing on whatever constitutes the ultimate objective of monetary policy were known in advance, it would make no difference whether the central bank conducted policy by fixing the supply of reserves or by setting an interest rate (or the exchange rate). These operating strategies would be equivalent. Because many forces bearing on the central bank's objectives are unpredictable, however, the choice of 'instrument' by which to implement policy matters for the effectiveness of policy. In general, the more uncertainty surrounds the behavior of households and firms in the markets for goods and services—for example, the strength of consumer spending, or of business investment—the more advantage there is to fixing the quantity of reserves. By contrast, the more uncertainty surrounds behavior in the financial markets—households' and firms' demands to hold deposits vs. other assets, their desire to borrow, the willingness of banks to lend, and so on—the more advantageous it is to set the price of reserves (in other words, an interest rate).

Actual practice in this regard has varied over time and across countries. Especially in the 1970s and 1980s, many central banks experimented with strategies based on fixing the quantity of reserves (or of the monetary base), or its growth rate. As of the beginning of the twenty-first century, however, most central banks of large countries operate by setting an interest rate.

3.2 Intermediate Targets

The central bank cannot directly set the amount of either money, in the usual sense that includes both currency and bank deposits, or bank credit. Much empirical work over many years, however, has gone into documenting the relationships between money and either income or prices—especially between money and future income or prices—and there has been some research on comparable relationships for credit. Moreover, data reporting in most countries is such that money and credit are observed before output and prices. To the extent that money, for example, displays a reliable relationship with the aspects of nonfinancial economic activity that the central bank ultimately seeks to influence, conducting monetary policy as if the quantity of money itself, or its growth rate, were the objective of policy—that is, using money as an ‘intermediate target’—in effect enables policy to respond to unwanted movements in output or prices before they occur (or at least before they are directly observed). Especially in the 1970s and 1980s, many central banks adopted intermediate targets of this kind.

In time, however, this way of conducting monetary policy fell out of favor for several reasons. First, research showed that using money as an intermediate target amounts to a way of exploiting the information contained in observed movements of money, but that it fails to make use of other information provided by the many different financial and economic variables that are also observable on a timely basis. Further, except under highly special circumstances, using money as an intermediate target fails to use efficiently even the information provided by observations of money itself.

Second, there was never a sound theoretical basis for knowing which measure of money was the right one to target, and even within any one country empirical evidence on which measure had the closest relationship to income and prices was often mixed. Presumptions that different measures of money would show roughly similar growth rates over relevant time horizons proved mistaken.

Third, and most importantly, by the 1990s the empirical relationships between money (or credit) and either income and prices had broken down in many countries. Standard explanations for this breakdown included financial innovations that enabled money holders to switch more easily among different kinds of deposits, or between deposits and other assets; new patterns of wealth holding in the wake of the high inflation of the 1970s and early 1980s; and the advancing integration of world financial markets. But for whatever reason, the previously observed predictive power associated with money disappeared, and without it there was little rationale left for using any measure of money as an intermediate target for monetary policy.

3.3 Rules vs. Discretion

One reason the use of money as an intermediate target had been so attractive was that it supposedly provided an ‘anchor’ to a country’s price level—or, if the central bank was targeting money growth, to the inflation rate. (Once the empirical relationship between money and prices broke down, this supposition bore much less force.) A second reason was that money could potentially serve as the basis for very simple rules for conducting monetary policy. For example, always seeking to have money grow at a constant percentage rate (which some economists have advocated) may be suboptimal, but it is not inherently flawed on theoretical grounds. By contrast, always setting some interest rate at a constant value is inherently unstable.

The long-standing preference among some economists for rules to govern monetary policy reflects, in the first instance, matters less of economics than of political economy. But in the 1970s and 1980s a new line of theory suggested a more specifically economic ground for favoring rules for monetary policy: that the sequential, discretionary decisions made even by fully knowledgeable and well-intentioned central banks were ‘dynamically inconsistent’ in a way that accounted for the chronic high inflation that by then had appeared throughout the industrialized world. Central banks understandably seek to boost output and employment above the level that market forces would otherwise establish, and under some theories a way to do so is to generate inflation that comes as a surprise to producing firms. But once the central bank has already generated any particular rate of inflation, which is then expected to continue, a yet higher rate is necessary to create the needed surprise. This process goes on until the inflation rate is so high that the cost of any further increases in inflation per se outweighs the consequent gain in output. At that point output reverts to its normal level, but inflation remains high.

Because the dynamic inconsistency argument placed discretionary decision making at the center of the industrial countries’ inflation problem, this line of theory pointed to a monetary policy rule as the most straightforward solution. Judged from this perspective, the disinflation that followed was, in most countries, strong counter-evidence. By the early 1990s (earlier still in many countries), inflation had fallen sharply in most industrialized economies. In many this disinflation occurred without any change in central bank procedures, and certainly without the adoption of a monetary policy rule. Even in countries that did change their approach to monetary policy—for example, by adopting an explicit inflation target—the change typically came after inflation had already subsided.

A policy rule is not the only way to overcome dynamic inconsistency, however. Further research showed that the central bank’s awareness of the importance of its public reputation (‘credibility’) acts

in the same way. So does appointing central bank decision-makers whose aversion to inflation is more pronounced than that of the general public. Hence, it remains unclear to what extent theories based on dynamic inconsistency provide a good account of the rise and fall of postwar inflation.

3.4 Central Bank Independence

The debate over rules vs. discretion in monetary policy also focused attention on the differing status of different countries' central banks: whether the central bank has the authority to establish the objectives of monetary policy and/or to carry out policy operations as it sees fit in pursuit of objectives even if they may be determined by other parts of the government, whether the central bank's officials are subject to removal over matters of policy, and so on. Countries where the central bank was more independent, either legally or *de facto*, tended on average to have lower inflation. Some economists inferred from this tendency that the motivation to seek higher output and employment by creating surprise inflation was mostly imposed on the central bank from outside. Hence, a more independent central bank would deliver lower inflation. (At the same time, however, other research pointed out that a key corollary of this line of reasoning—the implied tendency for more independent central banks to find it less costly, in terms of foregone output and employment, to reduce inflation by any given amount—did not correspond to observed cross-country differences.)

One result of this line of research and public discussion was that in the late 1990s several countries formally granted their respective central banks greater independence. Also, the new European Central Bank, established in 1999, has very substantial independence from the governments of the participating member countries.

3.5 Inflation Targeting

By the 1990s the combination of the demise of intermediate targets for monetary policy, the renewed emphasis on interest rate setting, and the failure (by some lights) to impose rules limiting central bank discretion had left a widely perceived vacuum in the structure of most countries' monetary policymaking. The problem of providing an 'anchor' to prices remained. So did the risks associated with step-by-step discretion.

In response, a number of central banks adopted formal 'inflation targets.' Importantly, adopting an inflation target does not necessarily mean eschewing concern for real economic outcomes, nor does it imply

the belief that money is neutral in the short or medium run. When a central bank seeks to maintain both low inflation and full-employment output, the relative strength of its preferences between these two objectives determines how rapidly it will seek to return to the targeted inflation rate after some departure has occurred.

One hoped-for advantage of having an explicit inflation target is to facilitate public monitoring and evaluation of the central bank's performance. The underlying presumption is that, on average over time, the central bank can achieve whatever inflation rate it seeks. Hence, failure to satisfy the stated target can be laid at the central bank's door.

4. Outstanding Research Questions

It would be wrong to give the impression that by the end of the twentieth century the combination of experience and research had settled all important questions about monetary policy. Monetary economics is not a laboratory science with the ability to conduct controlled experiments. Moreover, many questions that bear centrally on how best to conduct monetary policy hinge on how an economy's businesses, households, and banks behave in contexts where the changing economic backdrop and changing institutional arrangements matter importantly. Even if such questions appear settled at some time, therefore, the answers do not necessarily remain valid.

4.1 The Transmission Mechanism

A perennial goal of the monetary policy research agenda is to understand the behavioral process by which the central bank's actions influence the non-financial economy. In theory, there are many potential influences at work. But especially for purposes of actual policy implementation, knowing how much of the overall effect of policy is due to each is important. One particular focus of theoretical and empirical research in this area, for example, centers on the distinction between the 'money view,' according to which contractionary monetary policy works by restricting the amount of deposits that banks can create (thereby driving interest rates higher, and thus depressing demand for goods and services), and the 'credit view,' under which what matters is instead banks' reduced capacity to extend loans to firms and households seeking to finance expenditures.

Part of what makes this research program difficult is the tension between the preference for simple theories and the need to take account of the often quite involved circumstances under which banks, businesses and households interact. Extremely simple theories of

monetary policy often deliver conclusions that may be appealing intellectually but that observed experience readily contradicts—for example, that monetary policy affects prices but not real economic activity, or that inflation varies in close proportion to money growth. Theories leading to conclusions more in line with experience tend to be complicated, and the need to draw more finely focused inferences thwarts easy empirical validation.

4.2 Quantitative Measurement

For a central bank charged with carrying out a country's monetary policy, even full knowledge of the qualitative process by which policy works is not sufficient. It is also necessary to have some idea of how much to increase or reduce the supply of reserves, or how far to raise or lower interest rates, in order to achieve any given objective at any particular time. Such knowledge can be no more than a statistical estimate, subject to uncertainty. But having such estimates, and also an informed sense of the associated uncertainty, is crucial.

In recent decades three lines of empirical research have represented attempts to gain such knowledge. Structural economic models—models that use theory to place restrictions on the admissible representation of the behavior under study—allow the use of observed data to measure specific parts of the monetary policy process, and putting together enough such parts produces a quantitative representation of the monetary policy process as a whole. Here theory matters: the value of the resulting estimates, for either the parts or the whole, depends on the validity of the *a priori* restrictions imposed. Most central banks estimate and regularly use structural models of this form, although little such work has taken place in the academic world in recent years.

Especially since the 1970s, vector autoregressions (sets of equations that intensively exploit the raw covariation over time of a small number of economic variables) have been the main vehicle used in academic research for addressing questions about monetary policy at the aggregative level. When used for purposes like assessing the effects of monetary policy, however, even vector autoregressions are not free from restrictions based ultimately on theory—most basically, what (usually small) set of variables to include, and what 'causal ordering' to impose on them. Still richer sets of cross-equation restrictions allow 'structural vector autoregressions' to exploit the covariation in the data yet more fully. As is true for structural models, the resulting estimates depend on the validity of the restrictions imposed.

Beginning in the late 1980s, there has also been renewed interest in combining standard statistical methods with the use of nonquantitative informa-

tion—drawn, for example, from close reading of minutes of central bank meetings. To date this work has been carried out for only a few countries.

4.3 Phillips Curve Issues

The trade-off between the desire for price stability and the desire for high output and employment has been a persistently important aspect of monetary policy debate, and consequently of monetary policy research, throughout the postwar era. One crucial question is what level of real activity is consistent with maintaining an unchanged inflation rate. Another is how much foregone output or employment is required to bring a high inflation rate down to a lower one (what is the 'sacrifice ratio'?). Although some theories imply that monetary policy is neutral, most experience indicates that there are real costs to disinflation. The question that much research has tried to answer from observed evidence is how much.

Neither the noninflationary level of output (or employment) nor the sacrifice ratio is a natural constant, however. An important part of this same line of research has been to establish what factors, especially including factors subject to influence by national policies, cause each to vary across countries. Possible determinants suggested by familiar theory include labor market institutions governing the difficulty of hiring or firing workers, the generosity of publicly provided unemployment benefits, the economy's openness to international trade, the degree of central bank independence, the central bank's established 'credibility,' and the extent to which monetary policy decisions are transparent to the public. Research on each of these topics has provided mixed results.

Each of these lines of inquiry is implicitly a question about the short, or at most the medium, run. Implicit in the underlying theory is that in the long run output and employment revert to levels determined by resources, technologies, preferences, and other fundamental factors that are independent of monetary policy. Even so, there remains a long-run trade-off between the variability of output and employment and the variability of inflation, which the central bank's approach to monetary policymaking does influence. Seeking to understand how this variability trade-off arises, and exploring the implications for it of different ways of conducting monetary policy, remains an important object of research.

A quite different line of research on these issues, prompted in part by the chronic high unemployment and stagnant growth in so many European countries in the last quarter of the twentieth century, has questioned the standard theory that monetary policy is neutral in the long run, so that a reduction in inflation requires only a temporary loss of output and

employment. If the economy's production process adjusts so that some part of the reduced output or employment never recovers (e.g., because some unemployed workers leave the labor force permanently, or because some productive investments are not undertaken), then the usual interpretation of the sacrifice ratio in terms of strictly temporary real costs of achieving permanent disinflation is invalid.

4.4 Costs of Inflation

Much of the motivation underlying the conduct of monetary policy is to preserve price stability, or at least a low rate of inflation. For some central banks, price stability is the only economic objective formally stated in the bank's charter. For others price stability is one among just a few objectives set forth.

By contrast, economic theory and empirical analysis have never been able to identify just why movements in an economy's overall price level are so harmful. In the simplest theories, inflation that is anticipated in advance has no real effects at all, and unanticipated inflation merely creates transfers from some groups to others. Abandoning simplicity in favor of realism introduces many avenues for inflation to result in welfare-reducing costs, but empirical estimates of the magnitude of such costs are typically small. There is also no evidence that inflation below about 10 percent per annum reduces an economy's growth rate.

Yet opinion surveys as well as election returns give evidence that the public in most countries dislikes inflation, and even accepts sizeable real costs as a sacrifice necessary to reduce inflation. One possibility is that the aspect of inflation that most distresses the public is not economic, in any narrow sense, but instead the concern that if the government is not able to carry out this aspect of its responsibilities effectively—providing a medium of exchange has been a government function almost as long as there have been governments—then perhaps the social order may be at risk in other ways as well. In any case, although understanding the costs of inflation has long been on the research agenda surrounding monetary policy, it remains an even more open question than most.

See also: Central Banks; Consumer Economics; Consumer Psychology; Economics, History of; Keynes, John Maynard (1883–1946); Price Inflation.

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