The Taylor Curve and the Unemployment-Inflation Tradeoff

BY SATYAJIT CHATTERJEE

I n the past, monetary policy options were described in terms of a tradeoff between the unemployment rate and the inflation rate, the so-called Phillips curve. Macroeconomists no longer view the Phillips curve as a viable "policy menu" because its use as such is inconsistent with mainstream macroeconomic theory. In the late 1970s, John Taylor suggested an alternative set of options for policymakers to consider, one consistent with macroeconomic theory. These alternative options involve a tradeoff between the variability of output and the variability of inflation. Satyajit Chatterjee explains the logic underlying this new variability-based policy menu and discusses its implications for the conduct of monetary policy.

In thinking about how the Fed should conduct monetary policy, it's important to know what monetary policy can and cannot accomplish. Without a clear idea of what is within the reach of a central bank in terms of controlling economic activity, it's not possible to make sensible choices regarding monetary policy.

Scientific consensus on what central banks can do has evolved over time and so have prescriptions for conducting monetary policy.[1] In the 1950s and 1960s, monetary policy options were formulated in terms of a tradeoff between the unemployment rate and the rate of inflation, the so-called Phillips curve.[2] Economists back then thought that the Fed could sustain a lower or higher rate of unemployment by bringing about a higher or lower rate of inflation. The implication was that if the unemployment rate associated with price stability (that is, zero inflation) turned out to be too high, the Fed could improve economic performance by engineering some inflation in order to reduce the unemployment rate.

But by the early 1970s, scientific support for a tradeoff between the rate of inflation and the unemployment rate had ebbed. As a result of advances in monetary theory and a clearer perception of monetary facts, economists recognized that a higher inflation rate could lower the unemployment rate only temporarily. An expansionary monetary policy sustained over a long period would, in the end, generate only higher inflation with no reduction in the unemployment rate.

Currently, the conduct of monetary policy respects this circumscribed view of the effectiveness of monetary policy actions. The challenge for policymakers is to determine how best to carry out monetary policy when people know that monetary policy actions have only temporary effects on the unemployment rate.

One possibility is to refrain from exploiting the temporary tradeoff between inflation and unemployment and carry out monetary policy with some desired long-run inflation target in mind. For instance, Nobel laureate

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[1] See the article by Philadelphia Fed President Anthony Santomero in the First Quarter 2002 *Business Review* for more discussion of this point.

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[2] British economist A.W. Phillips documented an inverse relationship between the rate of wage inflation for U.K. workers and the unemployment rate in the U.K. for the years 1861-1957. In 1960, American economists Paul Samuelson and Robert Solow drew attention to the inverse relationship between the rate of price inflation in the United States and the U.S. unemployment rate, a relationship they called a "modified Phillips curve." The qualifier "modified" has long since disappeared, and the Phillips curve is now generally understood to represent the inverse relationship between price inflation and the unemployment rate.

Milton Friedman has suggested that the Fed should endeavor to keep the money supply growing at a constant rate, one consistent with long-run price stability or a modest level of long-run inflation.[3]

In 1979, economist John Taylor suggested a different possibility.[4] Taylor pointed out that the temporary tradeoff between inflation and unemployment was consistent with a permanent tradeoff between the *variability* of inflation and the *variability* of output over time. At some point, policymakers face a choice between lowering the variability of output at the cost of more variability in the inflation rate or lowering the variability of the inflation rate at the cost of more variability in output. In his article, Taylor estimated the tradeoff between variability in inflation and output for the U.S. economy.[5] This "Taylor curve" displays one set of options available to policymakers when monetary policy actions have only temporary effects on the unemployment rate.

In this article, I will explain how policymakers can exploit a temporary tradeoff between the unemployment and inflation rates to consistently achieve particular inflation and output variability combinations on the Taylor curve.[6] Then I will discuss what lessons about the conduct of monetary policy can be drawn from the Taylor curve. Taylor has argued that the very shape of the curve reveals the general nature of the monetary policy rule that macroeconomists should recommend to policymakers. I suggest

that macroeconomists should be cautious about recommending any particular policy rule too strongly until more is known about the effects that different combinations of inflation and output variability (on the Taylor curve) have on a typical household's standard of living.

A PRIMER ON THE THEORY OF THE NATURAL RATE OF UNEMPLOYMENT

The proposition that the policy choices suggested by the Phillips curve cannot be sustained is a key implication of the *theory of the natural rate of unemployment.* Since the natural rate theory is Taylor's point of departure in his search for a sustainable tradeoff between inflation and output, it's best to begin with a brief description of this theory and its implications for the Phillips curve.

The theory of the natural rate of unemployment centers on the determinants of the unemployment rate. The theory makes a distinction between the fundamental determinants of the unemployment rate and nonfundamental factors. Fundamental determinants are factors that change slowly over time, such as demographics, technology, laws and regulations, and social mores. These fundamental factors determine the *natural rate of unemployment.*

However, because of nonfundamental factors, the actual unemployment rate can deviate from the natural rate. The theory links these deviations to events that cause the actual inflation rate, at any given date, to diverge from the inflation rate expected for that date in earlier periods.

The reasoning underlying this link goes as follows.[7] In modern industrial economies, it's common for workers to enter into employment contracts in which they agree to supply as many hours of work as demanded by their employers (within reasonable limits) for an agreed-upon wage rate or salary. This contractually fixed wage rate or salary reflects, in part, what workers and employers expect the inflation rate to be over the term of the contract. If the inflation rate turns out to be as expected, employers demand (and workers supply) the normal level of work hours, and the overall unemployment rate is close to the natural rate. If the inflation rate turns out to be higher than expected, employers buy additional work hours because the price at which they can sell their products is higher than expected but the wage they must pay for additional hours of work remains contractually fixed. In this case the utilization of labor rises, and the unemployment rate tends to fall below the natural rate. Conversely, if the inflation rate turns out to be lower than expected, firms lay some workers off because the price at which firms can sell their products is now lower than expected but the wage they must pay their workers remains contractually fixed. In this case, the utilization of labor falls, and the unemployment rate tends

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[3] Friedman stated his views in his 1967 presidential address to the American Economic Association. The text of his address appears in his 1968 article.

[4] John Taylor is professor of economics at Stanford University and a renowned scholar on issues concerning monetary policy. Professor Taylor has served as a member of the President's Council of Economic Advisers and is currently serving as Undersecretary for International Affairs at the U.S. Department of Treasury.

[5] Taylor couches his arguments in terms of variability of output rather than unemployment but this difference is not important because the two are closely related. Macroeconomists often use a rule of thumb to translate variability in output to variability in the unemployment rate. The rule of thumb is that a 1-percentage-point reduction in the unemployment rate goes hand-in-hand with a 3-percentage-point increase in output. This rule of thumb, which appeared in a 1971 article by Arthur Okun, is referred to as Okun's Law. For the sake of comparison with the Phillips curve, later in the article I'll couch Taylor's arguments in terms of the variability of the unemployment rate instead of output.

[6] Economists refer to this tradeoff as a "policy menu."

[7] There are two variants of the natural rate theory. The text describes the variant formulated, in part, by Taylor, which forms the basis for Taylor's subsequent work. Robert Lucas Jr. developed the other variant, which focuses on informational frictions rather than employment contracts. Both variants appear to be consistent with the evidence.

to rise above the natural rate.[8]

The architects of the natural rate theory took a stand on which events caused actual inflation to diverge from expected inflation. They attributed these discrepancies to erratic monetary policy. They argued that when the monetary authority expands the money supply unexpectedly, it makes aggregate demand for goods and services rise faster than aggregate supply. This excess demand causes the actual inflation rate to rise above the expected inflation rate, which, in turn, motivates firms to increase the utilization of all factors of production, including labor. The increase in the utilization of labor leads to a decline in the unemployment rate. Conversely, when the monetary authority unexpectedly contracts the money supply, aggregate demand falls short of aggregate supply. Now excess supply causes the actual inflation rate to fall below the expected inflation rate, which, in turn, induces firms to reduce the utilization of labor (and other factors of production) and causes the unemployment rate to rise.

The Natural Rate and the Phillips Curve. Under certain conditions, the natural rate theory can explain why the data on inflation and unemployment can take the form of a Phillips curve. Recall that the Phillips curve refers to a negative relationship between the inflation rate and the unemployment rate: During years in which the inflation rate is high, the unemployment rate tends to be low; during years in which the unemployment rate is high, the inflation rate tends to be low. If the

average of unemployment rates over time is a good proxy for the natural unemployment rate and if the average of inflation rates over time is a good proxy for the expected inflation rate, the natural rate theory implies that a plot of the *actual* annual rates of inflation and unemployment should trace out an inverse relationship. According to the theory, a year with a higher-than-expected inflation rate should be a year with an unemployment rate lower than the natural rate, which, using averages of the two rates over time, implies that a year with a higher-than-average inflation rate should also be a year with a lower-than-average unemployment rate. In other words, there should be a negative relationship between the inflation and the unemployment rates.[9]

Figure 1 reproduces Paul Samuelson and Robert Solow's original estimate of the "modified" U.S. Phillips curve for the period 1933-58. The curve shows a negative relationship between the average annual rate of inflation and the annual unemployment rate. For instance, at point B on the curve, an inflation rate of 4.5 percent accompanies an unemployment rate of 3 percent; at point A, an inflation rate of zero accompanies an unemployment rate of 5.5 percent.
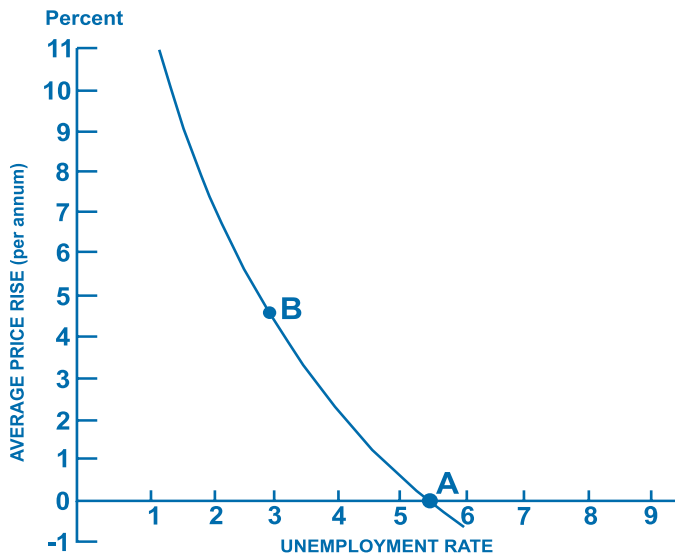
From the perspective of the natural rate theory, however, the most

interesting aspect of the figure is the authors' labeling of the curve. As noted at the bottom of the figure, Samuelson and Solow thought that this curve "shows the menu of choice between different degrees of unemployment and price stability." The authors' labeling suggests that if policymakers find the 5.5 percent unemployment rate corresponding to price stability (point A on the curve) unacceptably high, monetary

The natural rate theory can explain why the data on inflation and unemployment can take the form of a Phillips curve but implies that the Phillips curve shows a short-run tradeoff between inflation and unemployment.

policy actions could lower the unemployment rate to 3 percent at the cost of an annual inflation rate of 4.5 percent (that is, move the economy from point A to point B on the curve).

Although the natural rate theory accounts for the existence of a Phillips curve in the data, the theory also implies that the Phillips curve shows a short-run tradeoff between inflation and unemployment, not one that can be sustained over the long run. To see why, suppose that the natural rate of unemployment in the economy of Figure 1 is 5 percent, and suppose that policymakers want to lower the unemployment rate to 3 percent. According to the natural rate theory, the only way in which the monetary authority can sustain an unemployment rate of 3 percent is by generating actual inflation that's higher than *expected* inflation. Initially, the monetary authority may succeed in generating higher-than-expected inflation and get the unemployment rate below the natural rate. But eventually people will catch on to the fact that the monetary authority is generating more than the expected amount of inflation, and employment contracts will begin to take the new

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[8] If employers indexed wage rates or salaries to future inflation outcomes, the incentives to demand additional work hours when the inflation rate is higher than expected and to reduce work hours when the inflation rate is lower than expected would disappear. Thus, Taylor's variant of the natural rate theory leans rather heavily on the fact that most employers do not appear to index wage-rate or salary contracts to inflation outcomes in the future.

[9] It's worth noting that the prediction of the natural rate theory concerning Phillips curves holds up when the natural unemployment rate and the expected inflation rate are proxied by formulas more sophisticated than simple averages of the rates over time. See, for instance, Figure 1.5 in Thomas Sargent's 1999 book on U.S. inflation.

FIGURE 1

Phillips Curve for U.S.

This figure shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from American data from 1933-58. Adapted from Paul A. Samuelson and Robert Solow, "Analytical Aspects of Anti-Inflation Policy," *American Economic Review (Papers and Proceedings)*, 50, May 1960, pp. 177-94. Used with permission.

higher rate of inflation into account. Once that discrepancy between actual and expected inflation disappears, the unemployment rate will rise again to 5 percent. Thus, unless the inflation rate is continuously different from what people expect, the unemployment rate will return to the natural rate.

The natural rate theory implies that for the monetary authority to keep the unemployment rate permanently below the natural rate, it must continually stay ahead of people's expectations of rising inflation by generating inflation at an ever-rising rate. Put differently, the only unemployment rate that's consistent with nonaccelerating or nondecelerating price inflation is the natural unemployment rate. This also implies that the inflation rate associated with the natural rate is a matter of policy choice. Within limits, it can be anything the monetary authority wants it to be, since once people come to expect the

chosen inflation rate, it will be consistent with the natural rate of unemployment.

To summarize, the genesis of the Phillips curve lies in studies of the historical relationship between the growth rates of wages and prices and the unemployment rate. Although the negative relationship between inflation and unemployment exists in the historical data (for that matter, in more recent data as well), macroeconomists no longer believe in a long-run policy tradeoff between inflation and unemployment. The natural rate theory persuaded most macroeconomists that it's impossible for a monetary authority to achieve any unemployment rate other than the natural rate without eventually having either accelerating or decelerating inflation. Although the Phillips curve describes a genuine pattern in the data, the reason underlying the pattern implies it cannot be viewed as a policy menu.

THE TAYLOR CURVE: A TRADEOFF CONSISTENT WITH NATURAL RATE THEORY

If the Phillips curve cannot be used as a policy tool, is there any tradeoff between inflation and unemployment that can? Taylor argues that there is. Like the Phillips curve, this alternative curve also concerns the relationship between inflation and unemployment but focuses on the variability of inflation and the variability of unemployment.

To develop these variability-based combinations, Taylor takes the view that there are other nonfundamental events, besides erratic changes in monetary policy, that cause the actual unemployment rate to deviate from the natural rate. For instance, if consumers become unduly pessimistic about their prospects for future income and, consequently, reduce their spending, the economy can end up in a situation where aggregate supply will exceed aggregate demand at prices that firms expected to prevail. In this situation, the downward pressure on prices will make the actual inflation rate fall below the expected inflation rate and the utilization of factors of production will fall and the unemployment rate will rise. Conversely, if consumers become unduly optimistic about prospects for future income and, consequently, increase their spending substantially, prices will be higher than expected and the utilization of factors of production will rise and the unemployment rate will fall.

Given the possibility of such events, the central idea underlying Taylor's variability-based tradeoff is that policymakers can choose the degree to which monetary policy is used to *buffer* the unemployment rate against nonfundamental disturbances. For instance, if consumers become unduly pessimistic about the future and the actual inflation rate turns out to be lower than expected, the monetary authority can then expand the money

supply to counteract the higher unemployment that results from the disinflationary shock. Similarly, if consumers become unduly optimistic about the future and the actual inflation rate rises faster than expected, the monetary authority can then contract the money supply to counteract the negative unemployment effect of the inflationary shock.

The important point to note is that such buffering is not inconsistent with the natural rate theory because the monetary authority is not trying to create unexpected inflation or deflation on a sustained basis. On the contrary, the monetary authority is acting to offset variability in unemployment caused by a discrepancy between actual and expected inflation. Various events can cause actual inflation to deviate from expected inflation, so there is a scope for beneficial monetary policy actions that's entirely consistent with the natural rate theory.

The Unemployment-Inflation Variability Tradeoff. Taylor notes that successful buffering of the unemployment rate against nonfundamental disturbances can dampen the variability of both the inflation and the unemployment rate. However, he also argues that at some point, further reduction in the variability of the unemployment rate can come only at the expense of more variability in the inflation rate.

The problem is that a change in the inflation rate tends to persist over time. For instance, if the inflation rate rises because of some unexpected event, all else remaining the same, the inflation rate will tend to be higher in the future. This means that even if the monetary authority undertakes monetary policy action to fully offset the unemployment effects of, say, a positive inflation shock, it's left facing a path of *future* inflation that's higher than the path that everyone expected to prevail prior to the shock. To nudge the inflation rate back

down toward the previously expected path, the monetary authority has to tighten monetary policy more than what would be needed to keep the unemployment rate at the natural rate. The additional monetary restraint raises the unemployment rate above the natural rate and, therefore, *adds* to the variability of the unemployment rate. But it also works to bring the inflation rate back toward the pre-shock level and therefore serves to lower the variability of the inflation rate. Furthermore, the more quickly the monetary authority aims to bring the inflation rate back down to the pre-shock level, the more variability it will inflict on the unemployment rate.

This then is the tradeoff facing policymakers, according to Taylor's theory. To reduce the variability of the inflation rate, the monetary authority must be willing to tolerate increased variability in the unemployment rate. Two ingredients seem necessary for such a tradeoff to exist. First, there must be disturbances (other than erratic monetary policy actions) that cause the actual inflation rate to deviate from the expected inflation rate.[10] Second, any change in the inflation rate must tend to be persistent. It's this property of persistence that leads to a situation where the variability of the inflation rate can be lowered only at the expense of greater variability in the unemployment rate.

To summarize, Taylor has developed an inflation and output tradeoff consistent with the natural rate theory. His tradeoff involves the variability of the inflation rate and the variability of output, which, recall, is closely related to the variability of the unemployment rate. Figure 2 shows what this tradeoff looks like for the U.S.

By choosing how aggressively to combat variability in the inflation rate, the monetary authority determines where on this curve to locate. A policy of aggressively combating deviations in the inflation rate from a given target path will put the economy on a point like B, where the variability of output is relatively high but the variability of the inflation rate is low. Conversely, a less aggressive policy of combating deviations in the inflation rate from a given target path will put the economy on a point like A, where the variability in output is low but variability in the inflation rate is relatively high.[11]

THE TAYLOR CURVE AND THE CONDUCT OF MONETARY POLICY

Taylor posed the problem of the best way to conduct monetary policy in the following way.[12] Is there any particular point on the Taylor curve that's likely to be acceptable to all policymakers?

Suppose that some policymakers are more concerned about variability in the inflation rate and others about variability in the unemployment rate. In that case, the point where Figure 2 curves sharply, point C, is the variability combination for which there is likely to be consensus. The reasoning goes as follows. Policymakers more concerned about output variability are not likely to agree on variability combinations that lie to the northwest of point C because they would be giving up a lot in terms of

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[10] Such disturbances could be due to consumers' undue optimism or pessimism about their future earning prospects. More generally, any disturbance that results in pricing mistakes by businesses would qualify.

[11] The bowed-in shape of the curve indicates that policymakers face a form of "diminishing returns." To bring about a given level of decline in output variability, policymakers must accept larger and larger amounts of inflation variability (and vice versa). The existence of such "diminishing returns" seems plausible, although the exact reasons for it lie in the character of the macroeconomic model used by Taylor.

[12] This description draws on Taylor's 1999 article.

output variability for meager gains in inflation stability. Analogously, policymakers more concerned about inflation variability are not likely to agree on variability combinations that lie to the southeast of point C because they would be giving up a lot in terms of higher inflation variability for meager gains in output stability. Consequently, as long as there is some diversity of views about the relative demerits of inflation and output variability, the combination for which there is likely to be consensus is somewhere in the vicinity of point C.

Taylor recommended a policy rule that gives equal weight to stabilizing inflation and output. In particular, his rule recommends that the Fed lower the fed funds rate by half a percentage point when real GDP falls below potential GDP by 1 percent and that it raise the fed funds rate by half a percentage point if actual inflation rises above its target path (of 2 percent) by 1 percentage point. This policy rule has come to be known as the Taylor rule. Taylor recommended this rule, in part, because it was simple. As he notes in his 1999 article (p. 47), this "[p]olicy rule was purposely chosen to be simple. Clearly, the equal weights on inflation and the GDP gap are an approximation reflecting the finding that neither variable should be given negligible weight."[13]

Taylor's policy recommendation hinges on two important assumptions. His first assumption is that the selection of a policy rule (or, equivalently, the selection of a variability combination on the Taylor curve) will occur through a democratic process. Given this assumption, Taylor views the economist's job as proposing a policy rule that's most likely to command consensus. His second assumption is that he takes for granted that some

policymakers are more leery of inflation volatility and others more leery of volatility in the unemployment rate.

This second assumption, however, is troublesome. In effect, Taylor treats a policymaker's preferences for inflation stability over output stability or vice versa in the same way an economist would treat a person's innate preferences for, say, apples over oranges. But surely preferences about inflation and output variability must derive from some understanding of the relative merits of output and inflation stability, an understanding that ultimately must (or should!) have some connection to how output and inflation variability affects the welfare of working households.

This consideration suggests that the derivation of the variability tradeoff is an important first step for the satisfactory resolution of the question of which monetary policy rule to adopt. Taylor's variability tradeoff defines the choices that a monetary authority faces, choices that are consistent with the

natural rate theory. But there remains a second, equally important, step: to determine how the economic welfare of the typical household varies across different points on the Taylor curve.
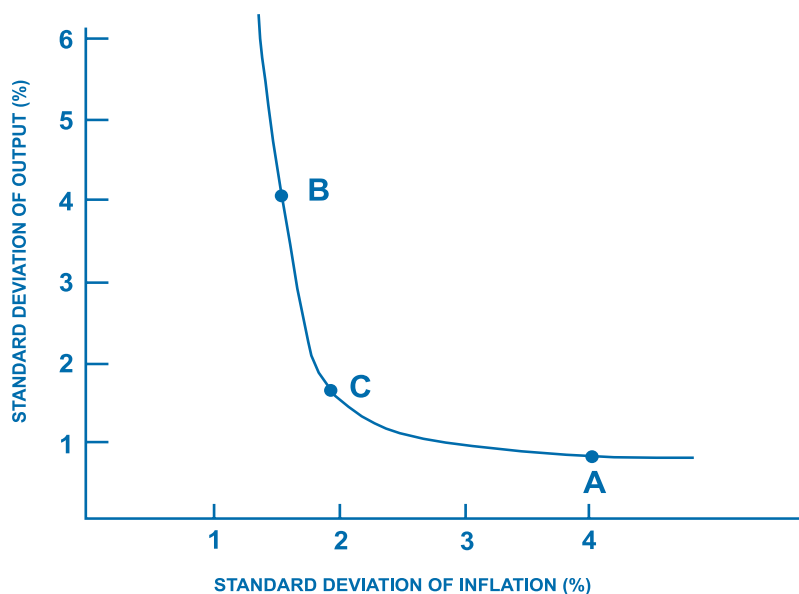
VARIABILITY AND ECONOMIC WELFARE

At present, not much is known about the economic welfare consequences of different variability combinations on the Taylor curve. Furthermore, the connection between economic welfare and different degrees of variability of inflation and output is sufficiently complex that we cannot be certain how economic welfare will change as we move from a point like A on the Taylor curve to points like B or C.

Turning first to the economic welfare effects of inflation variability, observe that variability of the inflation rate will be most harmful if it affects the real value, or purchasing power, of a household's earnings. During periods of higher-than-expected inflation, growth

FIGURE 2

The Taylor Curve

Adapted from John B. Taylor, "Estimation and Control of a Macroeconomic Model with Rational Expectations," *Econometrica*, 47 (5), 1979, pp. 1267-86. Used with permission.

[13] This rule will not put the economy on point C on the Taylor curve, but it will deliver similar variability in inflation and output.

in nominal compensation will lag growth in the general level of prices, and real compensation will decline (recall that this decline in real compensation is the reason firms expand hiring during periods of surprise inflation). Conversely, during periods of lower-than-expected inflation, households will experience faster growth in real compensation.

These fluctuations in real income inflicted by variability in unexpected inflation cannot be good for households. But how bothersome variability in inflation is depends on how much variability in unexpected inflation it leads to. The important point here is that the high variability of inflation at a point like A in Figure 2 need not imply a high variability of unexpected inflation. The logic of the Taylor curve suggests that some of it will come from variability in expected inflation. But variability in expected inflation need not have the same effect on economic welfare as variability in unexpected inflation. For one thing, firms and workers have the opportunity to alter compensation terms in response to changes in inflation that are expected to happen. Arguably, the disruption caused by changes in inflation that are expected to happen is likely to be less than the disruptions caused by unexpected changes in inflation. Therefore, to assess the effects of inflation variability on households, we need information on how the mix between expected and unexpected inflation variability varies as we go from a point like B on the Taylor curve to a point like A. At present, this knowledge is lacking.

Turning to the economic welfare effects of output variability, consider, again, points A and B on the Taylor curve. At point A, variability in output is much lower than at point B. Why is this relevant? One obvious answer is that output variability goes hand-in-hand with variability in the unemployment rate, which is of immediate concern to households. If we use Okun's rule of thumb that a 1-percentage-point increase in the unemployment rate corresponds to a 3-percentage-point drop in output from trend, points A and B on the Taylor curve would roughly correspond to unemployment rate variability of about 1/3 and 1-1/3 percent, respectively.

Fluctuations in the unemployment rate affect households in two ways: the probability of job loss for employed members and the probability of job gain for unemployed members. For instance, during a recession, when the unemployment rate is relatively high, the probability of job loss for employed workers is also relatively high, and the probability of job gain for unemployed individuals is relatively low. Thus, all individuals face a higher risk of unemployment. Conversely, during an economic expansion, the probability of job loss for employed workers is relatively low, and the probability of job gain for unemployed workers is relatively high. Hence, all individuals face a lower risk of unemployment. If a policy rule reduces the variability of the unemployment rate, it will reduce fluctuations in the risk of unemployment.

To make matters concrete, let's suppose that the monetary authority is comparing two policy rules with the following properties. Under the first policy, the unemployment rate is predicted to be (almost) constant at, say, 5 percent, and under the second policy it's predicted to fluctuate, with equal probability, between 6 percent and 4 percent from one period to the next. Observe that the average unemployment rate is 5 percent under the second policy as well.

The effects of these two policies on economic well-being will depend on exactly how these policies affect an individual's probability of experiencing unemployment. Suppose that a lower or higher unemployment rate implies that all households face a proportionately lower or higher probability of experiencing unemployment. If we ignore for now the inflation variability effects of the two policies, it follows that all households will benefit under the second policy, relative to the first, when the unemployment rate is 4 percent but will lose under the second policy, relative to the first, when the unemployment rate is 6 percent. Economic research has shown that the gain will be less than the loss so that, overall, households will be economically worse off under the second policy as compared to the first. However, this research has also shown that the predicted loss can be quite small.[14] If this is the case, the important consideration in comparing the two policies may turn out to be the policies' effects on inflation variability rather than unemployment rate, or output, variability.

But this is not, by any means, the only possibility. The economic welfare effects of unemployment rate variability depend importantly on the details of how the fluctuations in the unemployment rate affect an individual's probability of experiencing unemployment. If we drop the assumption that a lower or higher unemployment rate implies that all households face a proportionately lower or higher probability of experiencing unemployment, the outcome may be different. In particular, if an increase or decrease in the unemployment rate makes the probability of experiencing unemployment rise or fall proportionately more for people who are currently jobless, the loss in economic welfare from following the second policy will be larger. Also, unemployment rate variability may not be the only important consequence of output variability; greater output variability may adversely affect the investment decision of firms and thereby reduce the long-term growth rate of worker productivity and wages.

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[14] For details on this point, see my *Business Review* article.

CONCLUSION

An intelligent choice of monetary policy requires knowledge about what monetary policy can or cannot accomplish. In the past, monetary policy options were described in terms of a tradeoff between the unemployment rate and the inflation rate, the so-called Phillips curve. Macroeconomists no longer view the Phillips curve as a viable "policy menu" because its use as such is inconsistent with mainstream macroeconomic theory. In the late 1970s, John Taylor suggested an alternative tradeoff for policymakers to consider. Like that

suggested by the Phillips curve, Taylor's tradeoff is also concerned with unemployment and inflation, but it focused on the variability of both the unemployment rate and the inflation rate. (Actually, Taylor focused on output variability instead of unemployment rate variability, but the two are very closely related.)

In particular, Taylor argued that policymakers face a tradeoff between the variability of inflation and the variability of the unemployment rate. Unlike the Phillips curve, the Taylor curve displays a tradeoff consistent with mainstream macro-

economic theory. Taylor's development and elucidation of this variability-based tradeoff is clearly an important advance in monetary policy thought. Still, the Taylor curve does not resolve the question of which monetary policy rule to adopt. That decision requires some understanding of how the welfare of working households is affected by the different combinations (of variability of inflation and unemployment rates) on the Taylor curve, an understanding that, at present, is lacking. We hope that future research will fill in this gap in our knowledge. ⓑⓡ

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