Federal Reserve Bank of Dallas

Economic & Financial Policy Review

Volume 3, Number 2, 2004

Monetary Policy Prospects

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In this article Evan Koenig looks at measures of the Federal Reserve's policy stance and discusses why short-term interest rates will almost certainly have to increase at some point. The article also examines the historical relationship between Federal Reserve policy, inflation and resource slack for insights on future rate changes. Koenig concludes that a wide range of policy outcomes are plausible over the next two years, depending on the strength of the recovery, the economy's growth potential, and the sustainable unemployment rate—variables that economists can't, unfortunately, estimate with much confidence.

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Suggested Citation
Koenig, Evan F. (2004), "Monetary Policy Prospects," Federal Reserve Bank of Dallas *Economic and Financial Policy Review*, Vol. 3, No. 2, http://dallasfedreview.org/pdfs/v03_n02_a01.pdf.

Federal Reserve Chairman Alan Greenspan and other Federal Reserve officials have publicly noted that current monetary policy is "highly accommodative" and that short-term interest rates "will eventually need to rise toward a more neutral level" (Greenspan 2004). However, Federal Reserve pronouncements have also emphasized that with inflation low and resource use slack, "policy accommodation can be removed at a pace that is likely to be measured."[1]

This article looks at measures of the Federal Reserve's policy stance and discusses why short-term interest rates will almost certainly have to increase at some point. The article also examines the historical relationship between Federal Reserve policy, inflation and resource slack for insights on future rate changes. It concludes that a wide range of policy outcomes are plausible over the next two years, depending on the strength of the recovery, the economy's growth potential, and the sustainable unemployment rate—variables that economists can't, unfortunately, estimate with much confidence.

THE CURRENT STANCE OF U.S. MONETARY POLICY

The Funds Rate

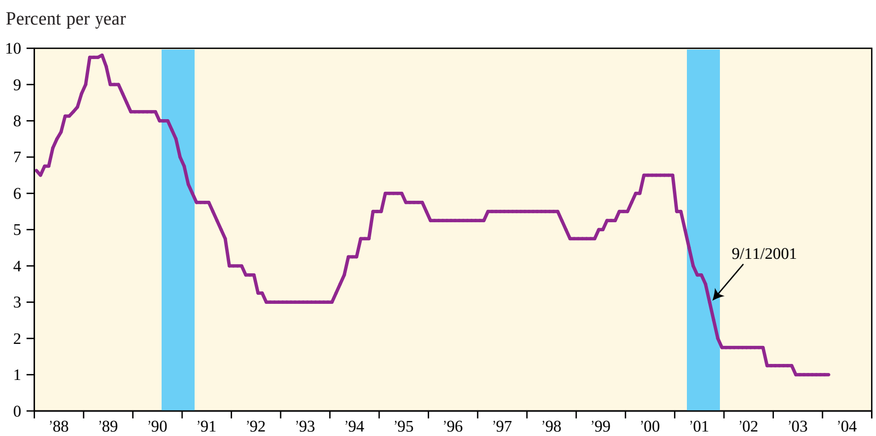
The Federal Reserve's principal policy instrument is the interest rate on overnight loans between banks—the federal funds rate. Eight times each year (roughly every six weeks), the Federal Reserve's Federal Open Market Committee (FOMC) meets to set a target for the federal funds rate. The Domestic Trading Desk at the Federal Reserve Bank of New York then adds or withdraws reserves from the banking system, as needed, to keep the actual funds rate near the target level.

Figure 1 shows a plot of the target federal funds rate going back to 1988. Bars indicate periods of recession as determined by the National

Figure 1

The Fed Has Cut Short-Term Interest Rates Aggressively Since 2000

(End-of-month target funds rate)



SOURCES: Haver Analytics; National Bureau of Economic Research.

This is an expanded version of a Federal Reserve Bank of Dallas *Southwest Economy* article with the same title. All data used in the preparation of this article are publicly available.

[1] See Greenspan (2004) and the public statement released by the FOMC following its May 2004 meeting, www.federalreserve.gov.

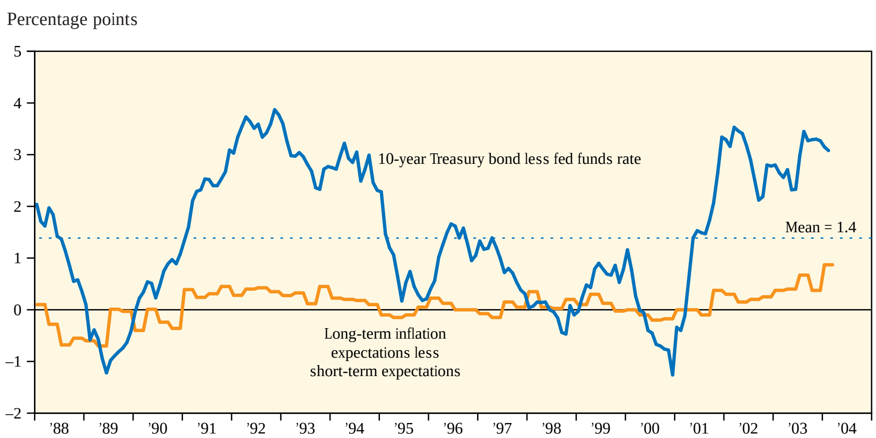
Bureau of Economic Research. The figure shows that the funds rate fell sharply in 2001, and then more gradually in 2002 and 2003. At 1 percent, the current funds rate target is the lowest in over 45 years. However, the Great Depression and 1990s Japan teach us that low interest rates need not signal that policy is accommodative. To determine how much stimulus policy is providing, we must have a reference against which to compare the federal funds rate. This article looks at two useful references. It compares the funds rate with the yield on 10-year Treasury bonds and then with measures of expected inflation.

The Yield Curve

It is generally accepted that at horizons of more than a few years, monetary policy primarily influences the rate of inflation and not the course of the real economy. A corollary is that monetary policy affects the 10-year Treasury bond yield mainly through expected inflation. The *real* yield on 10-year bonds—the market yield less expected inflation—varies mostly for nonmonetary reasons (such as changes in long-term productivity trends). However, financial frictions imply that monetary policy actions can have a temporary impact on short-term real interest rates and, through that channel, influence real economic activity at short horizons. A policy that drives short-term real rates down relative to the 10-year real rate encourages current investment and consumer-durables spending, stimulating real activity. Conversely, a policy that drives short-term interest rates up relative to 10-year real rates discourages current spending and restrains real activity.

Surveys of professional forecasters suggest that long-term and short-term inflation expectations have tended to move together over the past 20 years. As shown in Figure 2, the gap between 10-year and one-year inflation forecasts has never exceeded 1 percentage point nor fallen below –1 percentage point. This variation is trivial in comparison with movements in the gap between the market yields on 10-year bonds and federal funds. Consequently, this latter gap—the slope of the market yield

Figure 2
The Yield Curve Signals Highly Accommodative Policy



SOURCES: Federal Reserve Board; Federal Reserve Bank of Philadelphia.

curve—has been a reliable indicator of the difference between real long-term and short-term interest rates and, by the arguments given above, has also been a good guide to the stance of monetary policy and a useful indicator of the economy's future strength.[2]

The dividing line between policy accommodation and policy restraint isn't always clear-cut and varies over time, but a negatively sloped yield curve (when the 10-year bond yield is below the federal funds rate) is generally accepted as a signal of restraint and a precursor of sluggish output growth, if not outright recession. The yield curve was negatively sloped in 1989, 1998, and 2000 and almost turned negative in 1995. Currently, in contrast, the yield curve is far steeper than average, reflecting that the federal funds rate is unusually low relative to the 10-year Treasury rate. According to the yield curve, then, policy is highly accommodative.

The Real Funds Rate

It was argued above that by comparing the federal funds rate with a long-term bond rate, analysts approximate a comparison between the real federal funds rate and a real long-term interest rate. The approximation works well provided long-term and short-term inflation expectations move together. An alternative approach is to focus on the real federal funds rate alone, calculated as the difference between the market funds rate and a measure of short-term inflation expectations. Little is lost by excluding the long-term real interest rate from consideration provided it is fairly stable.

In calculating the real federal funds rate, we are hampered by the lack of a wholly satisfactory measure of inflation expectations. Historical consumer price index (CPI) forecasts are readily available, but the CPI contains well-known biases that have varied in importance over time (Wynne and Sigalla 1994). In response to the limitations of the CPI, the Federal Reserve policymakers have shifted their attention to the personal consumption expenditure (PCE) chain-weighted price index. Unfortunately, consistent historical PCE inflation forecasts are not easy to find. This article looks at two alternative workaround approximations. The first is to use actual core PCE inflation (excluding food and energy) over the prior 12 months to measure inflation expectations at each date. The idea is that the core inflation series captures trends in the overall index. The second workaround is to measure inflation expectations using consensus one-quarter-ahead gross domestic product (GDP) price inflation forecasts from the monthly Blue Chip survey of professional forecasters. The GDP price index has broader coverage than the PCE price index, but is similar methodologically and in its behavior.[3] The two resulting series for the real federal funds rate, plotted in Figure 3, are very much alike.[4]

Figure 3 also includes Congressional Budget Office estimates of potential real GDP growth. A real funds rate below this level is probably not

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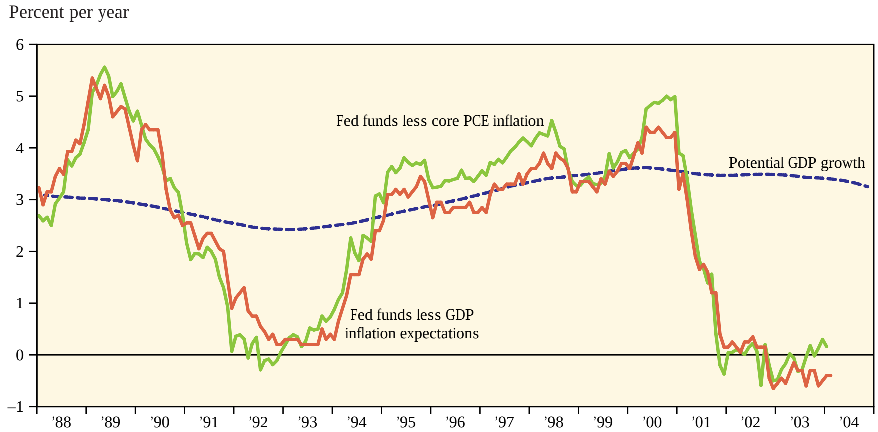
[2] The Conference Board, for example, includes the slope of the market yield curve in its Composite Leading Index.

[3] The correlation between quarterly GDP and PCE price inflation rates is 0.83 since 1988, and the correlation between four-quarter inflation rates over the same period is 0.96. GDP price inflation has averaged 2.3 percent, while PCE price inflation has averaged 2.4 percent.

[4] Their correlation is 0.97. Moreover, both series are very nearly mirror images of the slope of the yield curve plot in Figure 2. Thus, the correlation between the yield curve's slope and the real funds rate is –0.92 when the real funds rate is calculated using realized core PCE inflation and –0.90 when calculated using forecasted GDP price inflation.

Figure 3
The Real Funds Rate Signals Highly Accommodative Policy



SOURCES: Federal Reserve Board; Bureau of Economic Analysis; *Blue Chip Economic Indicators*; Congressional Budget Office.

sustainable over the long term and signals accommodative policy.[5] Conversely, the further the real funds rate exceeds this level, the more likely it is that policy is restrictive. By this standard, the real funds rate was notably high in 1989, and at least somewhat elevated in 1995, 1998, and 2000. On the other hand, the real funds rate was exceptionally low in 1992–93. Similarly, after a sharp drop in 2001, the real funds rate was highly accommodative in 2002 and 2003.

THREE DETERMINANTS OF FED POLICY

We've seen that both the yield curve and the real federal funds rate are signaling that monetary policy is highly accommodative. Moreover, the real federal funds rate is unsustainably low. Policymakers are cognizant of these facts but have argued that the Fed can likely afford to withdraw accommodation gradually. Without reaching a judgment on the merits of this position, we might hope to assess whether gradualism is consistent with the Federal Reserve's past behavior and to use past behavior to determine which economic variables are most likely to drive future policy changes. Of course, any such assessment or determination will only be as accurate as our characterization of past actions. A good starting point for this characterization is the Taylor rule.

The Taylor Rule

The Federal Reserve has a dual mandate to seek full employment and price stability. Work done by Stanford professor John Taylor and others suggests that Fed policymakers take this dual mandate seriously (Taylor 1993). Taylor showed that a simple formula relating the federal funds rate to recent inflation and current economic slack does a fairly good job

[5] Assuming a Cobb-Douglas production function with constant returns to scale, capital income should equal a fixed fraction of GDP. Hence, the present discounted value of the future stream of capital income would be infinite if the real interest rate were expected to remain below the economy's real growth rate. Such an economy is said to be "dynamically inefficient" (Blanchard and Fischer 1989). The usefulness of the interest-rate–growth-rate comparison is less clear in an economy subject to uncertainty (Abel, Mankiw, Summers, and Zeckhauser 1989).

of explaining Fed policy decisions. This formula has come to be known as the Taylor rule.

A number of researchers have found that the Taylor rule's performance improves if it is made more forward-looking.[6] For example, the version of the Taylor rule estimated for this article explains policy using *forecasted* inflation instead of inflation in the recent past. Current slack—measured by the unemployment rate—is included in the funds-rate formula, but so is forecasted real GDP growth relative to potential, which determines future *changes* in slack.

Specifically, the version of the Taylor rule used in this article takes the form:

$$\underset{}{f_t} = \underset{(0.317)}{-0.529} + \underset{(0.201)}{0.379}\, d_t + \underset{(0.078)}{0.487}\, f_{t-1} + \underset{(0.161)}{0.961}\, \pi^e_t - \underset{(0.136)}{1.054}\,(u_t - u^*_t)$$

$$+ \underset{(0.119)}{0.357}\,(\Delta y^e_t - \Delta y^*_t) + \underset{(0.130)}{0.424}\, e_{t-1}, \quad \text{Adj. } R^2 = 0.982, \text{ S.E.} = 0.293$$

where

f_t ≡ the target federal funds rate at the close of quarter *t*;

d_t ≡ a dummy variable defined to equal 1 during the period when the FOMC focused on PCE inflation (post-1999) and zero during the period when the FOMC focused on CPI inflation (pre-2000);

π^e_t ≡ Blue Chip consensus inflation forecast for the upcoming four-quarter period, as published during the third month of quarter *t*; CPI inflation forecasts are used before 2000 and GDP price inflation forecasts are used after 1999;

u_t ≡ average civilian unemployment rate in quarter *t*;

u^*_t ≡ "natural unemployment rate" interpolated between estimates published in Robert Gordon's intermediate macroeconomics textbook: equal to 6.0 percent in 1986 (Gordon, 4th edition), 1989 (5th edition) and 1992 (6th edition), and falling to 5.7 percent in 1997 (7th edition), 5.3 percent in 1999 (8th edition), and 5.0 percent in 2002 (9th edition) and thereafter;

Δy^e_t ≡ Blue Chip consensus real GDP forecast for the upcoming four-quarter period, as published during the third month of quarter *t*;

Δy^*_t ≡ four-quarter growth in "natural real GDP" interpolated between estimates published in Robert Gordon's intermediate macroeconomics textbook: equal to 2.63 percent in 1986 (Gordon, 4th edition), 2.36 percent in 1989 (5th edition), 2.05 percent in 1992 (6th edition), 2.18 percent in 1997 (7th edition), 3.16 percent in 1999 (8th edition), and 3.54 percent in 2002 (9th edition) and thereafter;

e_{t-1} ≡ lagged error term.

[6] Early examples of the forward-looking approach are McNees (1986, 1992).

The estimation runs from third quarter 1988 through fourth quarter 2003. Coefficients' standard errors appear in parentheses. Every right-hand-side variable is statistically significant at the 1 percent level except the constant term and the dummy variable (and the latter is significant at the 10 percent level). A Chow test fails to reject stability of the estimated coefficients. The lagged funds rate on the right-hand side of the equation is usually interpreted as a sign that policymakers smooth interest rates. The lagged error term suggests that persistent variables important to policy are excluded from the policy-rule specification.[7]

Just how important are expected inflation, labor-market slack, and expected GDP growth to Fed policy decisions? Suppose that inflation forecasts for the coming year are revised upward by a full percentage point. The coefficient estimates reported above suggest that the FOMC would respond, initially, with a 1-percentage-point tightening move, all else constant. If the inflation forecast remains elevated, the FOMC eventually hikes the funds rate by nearly 2 percentage points (*Table 1*). Similarly, a 1-percentage-point increase in the unemployment rate would initially be met with a 1-percentage-point funds-rate cut, and eventually with just over a 2-percentage-point decline. Real growth prospects appear to play a smaller role in the policy process. Thus, a 1-percentage-point increase in expected GDP growth, relative to potential, triggers only a 40-basis-point immediate rate hike and a 70-basis-point long-run response. However, this last figure is misleading because it ignores important indirect effects. Thus, if faster growth relative to potential actually materializes, it will put gradual downward pressure on the unemployment rate and may eventually put upward pressure on inflation. The fall in unemployment and the rise in inflation trigger a second round of interest-rate hikes that are not captured in the table. A good portion of the remainder of this article will be devoted to correcting this omission.

Assessing the Taylor Rule

First, though, let's put the Taylor rule to the test. In Figure 4, the solid line shows the actual end-of-quarter federal funds rate, and the dashed line shows predictions from the modified Taylor rule. The rule does a good

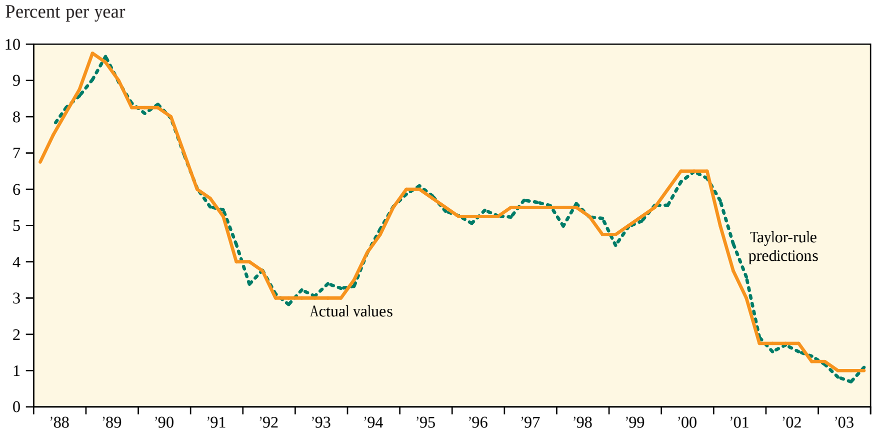
Table 1

Fund-Rate Response to a 1-Percentage-Point Increase in Each of Three Determinants

Determinant	Funds-Rate Response: Initial (percentage points)	Funds-Rate Response: Eventual (percentage points)
Expected inflation	+1.0	+1.9
Unemployment rate	–1.0	–2.1
Expected GDP growth	+0.4	+0.7

[7] Care is required when estimating an equation that has both a lagged dependent variable and a serially correlated error term. The results reported here are obtained using the regression software *EViews* 4, which estimates a nonlinear transformation of the funds-rate equation. The transformed equation's error term is uncorrelated with all right-hand-side variables.

Figure 4
The Taylor Rule Explains Fed Policy Fairly Well



SOURCES: Haver Analytics; author's calculations.

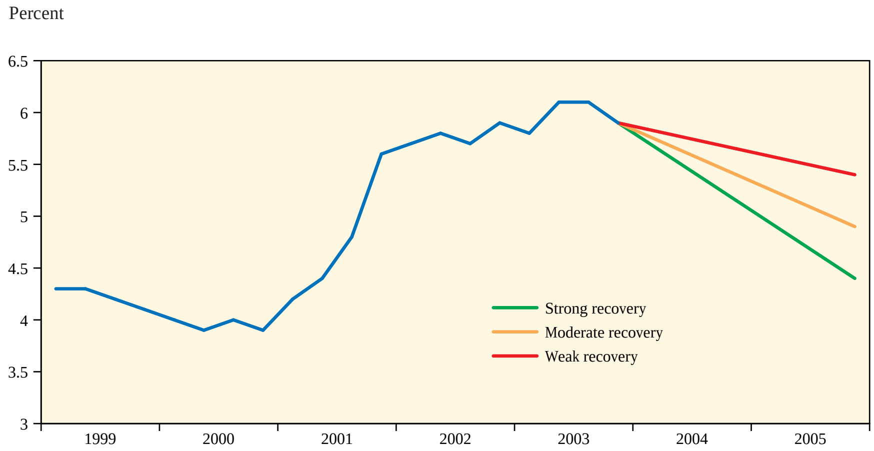
job, with errors generally a quarter point or less. However, the funds rate fell significantly faster in early 2001 than the modified Taylor rule predicts. From published FOMC minutes, it appears that policy was unusually aggressive during this period out of concerns that the stock market might act as a drag on consumer spending and that a large capital "overhang" might reduce the interest-rate sensitivity of investment spending. Since 2001, the rule has done fairly well. For example, the predicted value for the close of 2003 is 1.09 percent—quite close to the actual target value (1.0 percent).

Clearly, the version of the Taylor rule estimated for this article oversimplifies policymaking. It omits considerations that are, from time to time, important in policy discussions. More generally, the fact that the rule has done a good job of tracking the Federal Reserve's policy stance, to date, is no guarantee that it will continue to do so in the future. With the federal funds rate so near its zero lower bound, for example, it may be that policymakers would respond especially quickly or forcefully to any sign that the recovery might be weakening or that inflation might be falling. Moreover, the unemployment rate has recently been unusually low relative to alternative measures of slack, such as excess manufacturing capacity, and there is evidence suggesting that labor-force participation rates have become more sensitive to economic conditions (Koenig, Siems, and Wynne 2002). These sources of policy uncertainty are not captured by the analysis that follows.

ALTERNATIVE UNEMPLOYMENT-RATE AND INFLATION PATHS

As noted in the discussion of Table 1 above, the prospective strength of GDP growth relative to potential has important indirect effects on policy through future changes in the unemployment rate and inflation. Before we can get very far in our policy analysis, we must explore these indirect channels of influence.

Figure 5
Strength of the Recovery Determines How Quickly the Unemployment Rate Declines



SOURCES: Bureau of Labor Statistics; author's calculations.

Unemployment

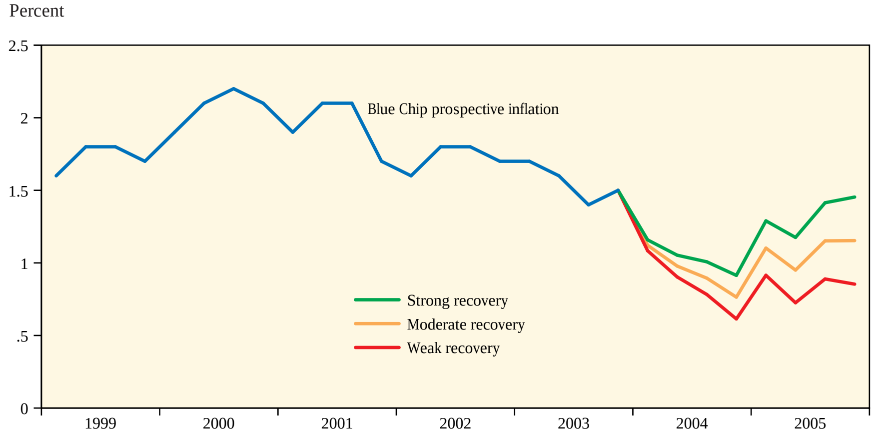
As shown in Figure 5, the unemployment rate reached a cyclical peak of just over 6.1 percent in second quarter 2003 and averaged 5.9 percent in fourth quarter 2003. Contingent forecasts of the unemployment rate's future path are straightforward using Okun's law, which tells us we can expect to see the unemployment rate decline by about 0.5 percentage point per year for each 1 percentage point real GDP growth exceeds potential growth.[8] If we have a weak recovery during 2004 and 2005, for example, with GDP growth only 0.5 percentage point above potential, then we can expect to see the unemployment rate fall to 5.4 percent in fourth quarter 2005. (See the path labeled "weak recovery" in Figure 5.) If we have a strong recovery, with GDP growth 1.5 percentage points in excess of potential, the unemployment rate will likely fall to 4.4 percent. (See the path labeled "strong recovery.") Finally, a moderate recovery, with GDP growth 1 percentage point above potential, should produce a 4.9 percent average unemployment rate in fourth quarter 2005.

Inflation

Most empirical studies, and some theoretical analyses, suggest that the unemployment rate is an important determinant of future changes in inflation. Unfortunately, the unemployment rate that is consistent with stable inflation is not constant over time, and shifts in this critical unemployment rate (known as the non-accelerating inflation rate of unemployment, or NAIRU) are imperfectly understood and often not identifiable until well after the fact. A policymaker's inflation expectations will thus depend both

[8] For an overview of Okun's law, see any of the editions of Gordon's *Macroeconomics* listed in the references. Here, it's assumed that the full-employment unemployment rate is constant in 2004 and 2005.

Figure 6
Inflation Prospects and the Strength of the Recovery



SOURCES: *Blue Chip Economic Indicators*; author's calculations.

on his beliefs about the future path of the unemployment rate and on the assumptions he makes about the NAIRU.[9]

Figure 6 shows four-quarter-ahead GDP price inflation forecasts from the Blue Chip survey of professional forecasters. For example, the plot shows that at the end of 2003, Blue Chip forecasters were expecting 1.5 percent inflation in 2004. The figure also contains three alternative inflation simulations, which are contingent on the strength of the economic recovery (and, hence, the path of the unemployment rate) in a manner consistent with historical experience. (Details are provided in the box titled "Inflation Simulations.") Each simulation assumes a 5.0 percent NAIRU. Each shows a V-shaped pattern, with prospective inflation first dipping and then turning upward. In no case does prospective inflation ever drop below 0.5 percent per year or rise above 1.5 percent per year. Inflation differences are small at the start of the simulation period but grow over time, reflecting the gradually widening unemployment-rate differentials shown in Figure 5.

Figure 7 shows the sensitivity of prospective inflation to the value of the NAIRU. The simulated inflation paths labeled "high NAIRU," "medium NAIRU," and "low NAIRU" assume 5.5-percent, 5.0-percent, and 4.5-percent NAIRUs, respectively, beginning in 2004.[10] In each case, the recovery's strength is "moderate." According to the simulations, a 0.5-percentage-

[9] The NAIRU is often associated with the accelerationist-Phillips-curve inflation model, which assumes that monetary policy affects inflation only indirectly, by creating or removing economic slack. This article interprets the NAIRU more broadly and, in particular, does not rule out a direct, inflation-expectations channel for monetary policy. For example, fear that the Fed's commitment to a low long-run average inflation rate might be wavering would have the same effects as a high NAIRU in the simulations presented here.

[10] The NAIRU is assumed to equal 5.0 percent in 2002 and 2003—an estimate taken from the latest edition of Robert Gordon's intermediate macroeconomics textbook (Gordon 2003). A comparison of Gordon's latest estimates with those published in earlier editions suggests that revisions have a standard deviation of 0.25 percentage points. Thus, a 4.5 to 5.5 percent NAIRU range approximates a 95 percent confidence interval about the baseline value. However, given that Gordon's latest estimates are not universally accepted as "truth," an actual 95 percent confidence interval would arguably be significantly wider than 1 percentage point.

Inflation Simulations

The simulations in the main text are based on a regression that relates changes in core inflation to the unemployment rate, lagged inflation changes, changes in the rate of productivity growth, changes in the foreign exchange value of the dollar, and the level of the markup of price over unit labor cost. Because markup data are subject to large revisions (Koenig 2003), the estimation (which starts in first quarter 1988) runs only through fourth quarter 2000. Results are as follows:

$$\Delta\pi_t = \underset{(0.404)}{3.064} - \underset{(0.150)}{1.065}\,\Delta\pi_{t-4} - \underset{(0.126)}{0.219}\,\Delta\pi_{t-8} - \underset{(0.024)}{0.005}\,\Delta q_{t-4} - \underset{(0.017)}{0.044}\,\Delta fx_{t-4}$$

$$- \underset{(0.027)}{0.123}\,m_{t-4} - \underset{(0.068)}{0.594}\,u_{t-4}, \qquad \text{Adj. } R^2 = 0.672, \text{ S.E.} = 0.257$$

where

- $\Delta\pi_t$ ≡ four-quarter change in four-quarter inflation, as measured by the chain-weight core PCE price index;
- Δq_t ≡ four-quarter change in four-quarter labor productivity growth, nonfarm business sector;
- Δfx_t ≡ four-quarter percent change in the real, broad, trade-weighted exchange value of the dollar;
- m_t ≡ 100 times the logarithm of the ratio of price to unit labor cost in the nonfarm business sector;
- u_t ≡ civilian unemployment rate.

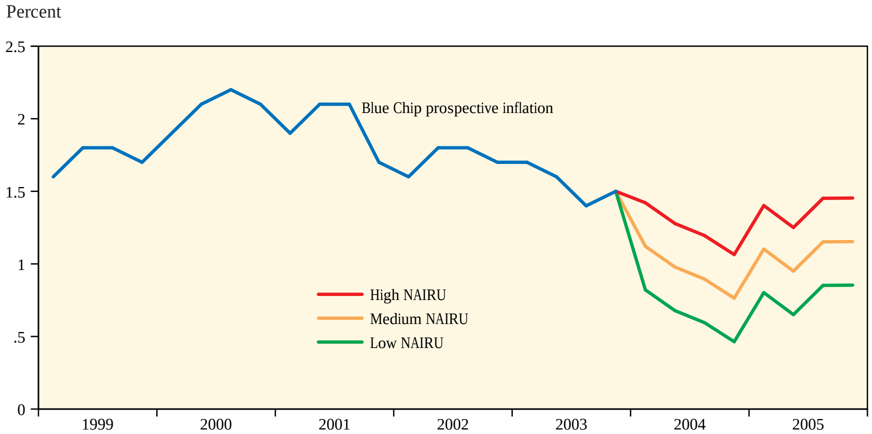
All standard errors (reported in parentheses) are corrected for the equation's moving average error structure. The coefficient on the lagged change in productivity growth is statistically insignificant. The coefficient on the second lag of the change in inflation is statistically significant at the 10 percent level. All other coefficients are significant at the 1 percent level. Very similar results are obtained when inflation is measured by the core GDP chain-weight price index. In particular, the coefficient on the unemployment rate in the GDP inflation regression is –0.588, with standard error 0.113.

Based on the above regression, the equation used to simulate inflation (and inflation expectations) in the main text is $\pi_t = 0.8\pi_{t-8} + 0.2\pi_{t-12} - 0.6(u_{t-4} - u^*)$, where u^* is the assumed value of the NAIRU. Note that in this specification u^* must absorb the effects of the markup and changes in the value of the dollar.[1] A swing from a stable dollar to a 10 percent dollar depreciation has the same effect as raising u^* by 0.75 percentage point. For example, the real value of the dollar fell by 8.4 percent in 2003, compared with a 1.2 percent decline in 2002. According to the above estimates, the accelerated pace of depreciation should have the same inflationary effect as a 0.5-percentage-point rise in the NAIRU. Similarly, a 1-percentage-point increase in the markup has the same effect as a 0.2-percentage-point reduction in u^*. So, the 2.6 percent increase in the markup between fourth quarter 2002 and fourth quarter 2003—if not revised away—ought to have the same *dis*inflationary effect as a 0.5-percentage-point *fall* in the NAIRU. Historically, the markup has been highly correlated with estimates of the NAIRU obtained using time-series methods (Koenig 2001).

NOTE

[1] It must also absorb any direct inflation impact of changes in expectations about the conduct of monetary policy. See Note 9 of main text.

Figure 7
Inflation Prospects and the NAIRU



SOURCES: *Blue Chip Economic Indicators*; author's calculations.

point difference in the NAIRU translates into a 0.3-percentage-point difference in inflation that remains constant throughout the simulation period. (If the simulated paths were extended further, gaps between them would begin to widen.) Comparing Figures 6 and 7, prospective inflation is more sensitive, in the near term, to the NAIRU than to the strength-of-recovery assumption. Even so, inflation stays between 0.5 and 1.5 percent during the entire simulation period, regardless of the assumed NAIRU. Moreover, the range of prospective inflation rates in fourth quarter 2005 is equally wide in the two figures.

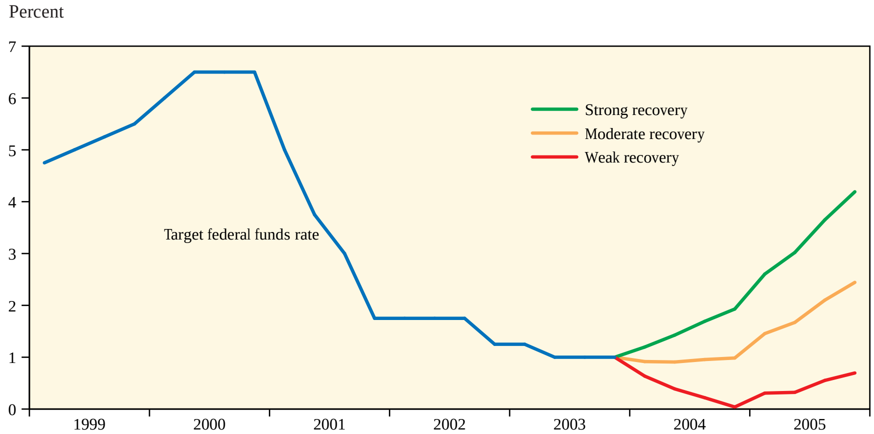
POLICY IMPLICATIONS

How sensitive are the modified Taylor rule's funds-rate prescriptions to the recovery's strength once indirect channels of influence are taken into account? What are the policy effects of shifts in the NAIRU and changes in the economy's potential growth rate? We're finally in a position to answer these questions. The main findings are that policy prescriptions for 2004 and 2005 are highly dependent on the strength of the recovery. Changes in the NAIRU are important, too, if they are promptly recognized.

The Strength of the Recovery and the Funds Rate

We've looked at how the unemployment rate and inflation might behave, depending on whether the recovery is weak, moderate, or strong. What does the modified Taylor rule say about the federal funds rate? Figure 8 shows the wide range of funds-rate paths implied by the rule, depending on the strength of the GDP growth relative to potential in 2004 and 2005. (All three simulations assume a 5.0-percent NAIRU.) As shown in Figures 5 and 6, the "weak recovery" scenario—which assumes output growth only 0.5 percentage point above potential—produces only a very modest decline in the unemployment rate. Prospective inflation drops initially and then partially rebounds. Fed policymakers respond by lowering the target funds rate to zero by the end of 2004, according to the modified Taylor rule, and then gradually increasing the funds rate to just under 75 basis points in fourth quarter 2005. In contrast, the "strong recovery" scenario produces an immediate (approximate) 25-basis-point funds rate

Figure 8
Policy Impact of the Recovery's Strength Builds Over Time



SOURCES: Haver Analytics; author's calculations.

hike, followed by a series of additional rate increases. By fourth quarter 2005, the funds rate is over 4 percent. Finally, with a "moderate recovery" the Fed holds the funds rate steady through the end of 2004 and then gradually raises rates to about 2.5 percent in fourth quarter 2005.

Comparing the "weak recovery" and "strong recovery" scenarios, a 1-percentage-point difference in output growth relative to potential produces roughly a 3.5-percentage-point difference in the funds rate over two years. Thus, indirect effects quintuple the so-called eventual impact of a change in expected output growth, as listed in Table 1.

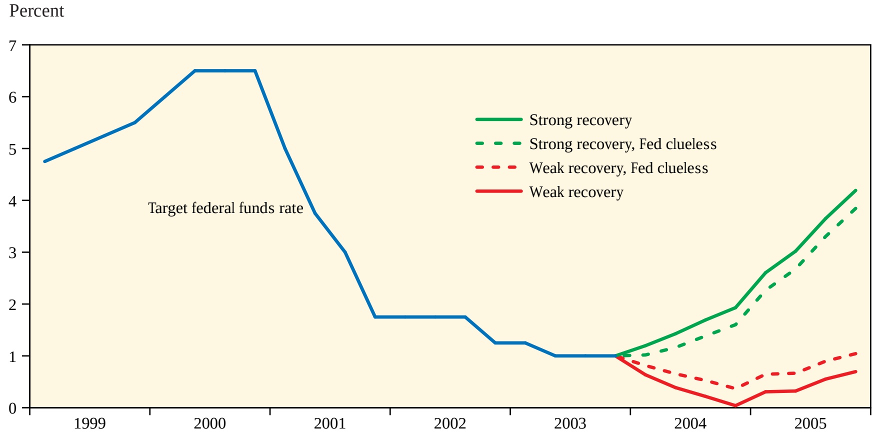
The Role of Policymakers' Beliefs About the Recovery's Strength

The simulations in Figure 8 assume that policymakers recognize that the economy is in "strong recovery," "moderate recovery," or "weak recovery" mode. Suppose, however, that regardless of how rapidly the unemployment rate may have fallen to date, policymakers believe that *future* growth in output relative to potential will be "moderate." Such a disconnect between policymaker forecasts and reality would not be unprecedented and is especially plausible if a shift in output growth relative to potential is due to a change in potential growth rather than a change in actual growth.[11] Accordingly, Figure 9 takes a look at how the "strong recovery" and "weak recovery" scenarios are affected if policymakers are "clueless" about the recovery's underlying strength.

The figure shows that misperceptions of the recovery's strength have relatively little effect on the course of policy, according to the modified Taylor rule. If output growth is strong relative to potential, but the Fed remains convinced that future growth will be moderate, then the funds-rate path shifts downward by less than 35 basis points compared with what it would have been had policymakers been better informed. Similarly, if growth is weak relative to potential, but the Fed believes future growth will be moderate, then the funds-rate path shifts upward by less than 35 basis points.

[11] Because of revisions to both GDP growth and estimates of potential GDP growth, the "growth gap" is quite uncertain. A comparison of the real-time growth gap with the gap as currently measured indicates that revisions have had a mean of –0.29 percentage point and a standard deviation of 0.71 percentage point.

Figure 9
Strength of the Recovery Has a Powerful Policy Impact Even If Policymakers Are Slow to Catch On

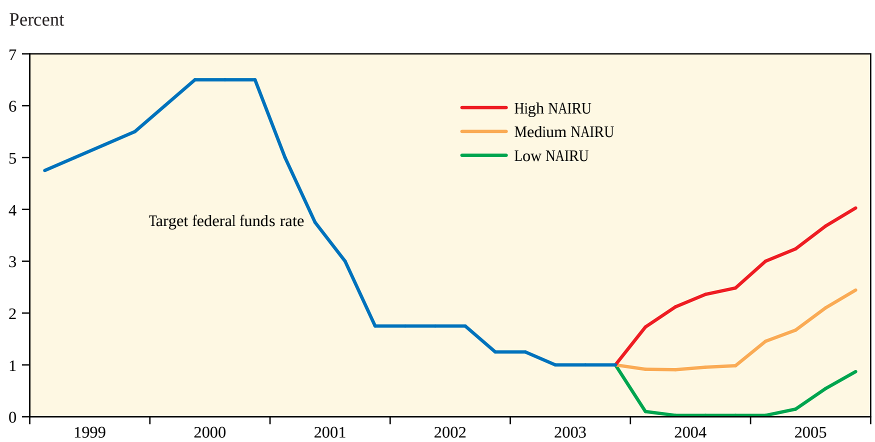


SOURCES: Haver Analytics; author's calculations.

The NAIRU and the Federal Funds Rate

Finally, Figure 10 examines the sensitivity of the modified Taylor rule's prescriptions to the assumed value of the NAIRU, given a moderate recovery. Results depend very much on whether policymakers are aware that a NAIRU shift has occurred. An increase in the NAIRU from 5.0 to 5.5 percent produces the "high NAIRU" policy response in the figure, assuming that Fed policymakers are immediately aware of what's happened. The funds rate is given an immediate 75-basis-point boost and then rises steadily to 4.0 percent in fourth quarter 2005. Conversely, a sudden decrease in the NAIRU to 4.5 percent (the "low NAIRU" scenario) causes the Fed to slash the funds rate to zero and hold it there through first quarter 2005. Even at the close of 2005, the funds rate is less than 1 percent. Finally, if policymakers believe that the NAIRU is 5.0 percent—regardless of whether that view is correct—the funds rate follows the middle, "medium NAIRU" path in Figure 10, which is identical to the "moderate recovery" path in Figure 8. The funds rate is constant in 2004, then increases steadily to 2.5 percent in fourth quarter 2005.

Figure 10
Perceived NAIRU Has a Powerful, Immediate Impact on Policy



SOURCES: Haver Analytics; author's calculations.

Note that different beliefs about the NAIRU produce immediate and significant differences of opinion about appropriate policy. More generally, looking at Figures 8, 9, and 10, it's easy to understand why the FOMC revised its policy directive to eliminate language suggesting policymakers were unconditionally committed to a 1 percent federal funds rate "for a considerable period." There are clearly plausible scenarios under which policymakers would not want to have their hands tied. Policy is determined by "economic time"—the pace at which slack resources are put back to work and inflation pressures arise—rather than chronological time.

SUMMARY AND CONCLUSIONS

By several measures, U.S. monetary policy is currently highly accommodative. Short-term interest rates will have to rise substantially at some point because a federal funds rate held permanently at 1 percent is inconsistent with the current level of inflation. The interesting question isn't *whether* interest rates are going to rise but how soon they'll rise and how fast they'll go up once they start. Policy simulations presented here suggest that the answers depend strongly on how much slack is thought to remain in the economy and on how quickly slack is eliminated in coming quarters. The fact that short-term interest rates must eventually rise does not necessarily mean they should increase immediately or sharply. By imposing various simplifying assumptions, this article has, if anything, understated uncertainty about the future course of policy.

An important corollary is that even if Fed policymakers followed a mechanical rule—which they emphatically do not—small differences in economic forecasts and assumptions might produce strong differences of opinion about current policy and about how policy ought to evolve in the future.

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