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Abstract

Over the past two decades, the FOMC has included in its policy decisions a statement of bias toward subsequent tightening or easing of policy. This paper examines the predictive content of these statements in a Taylor-rule setting, finding that they convey information that is useful for forecasting changes in the federal funds rate target, even after controlling for policy responses to inflation and the output gap. Moreover, the evidence suggests that this asymmetry can be represented in terms of shifts to the parameters of the Taylor-rule equation, indicating a greater or lesser degree of responsiveness to incoming information about inflation and output.

*The views expressed in this paper are those of the author, and do not necessarily reflect the official positions of the Federal Reserve Bank of St. Louis or the Federal Reserve System.

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INTRODUCTION

Since the beginning of 2000, the Federal Open Market Committee (FOMC) has regularly issued statements accompanying its policy decisions that refer to the "balance of risks" in the "foreseeable future." Paralleling the Federal Reserve's dual objectives of price stability and maximum sustainable economic growth, the statements take the form of stating that the concerns of FOMC members about prospective economic developments are tilted toward either "inflation pressures" or "economic weakness."

Although the "balance of risks" language was adopted only a relatively short time ago, the FOMC has since 1983 included in its policy statements a bias toward tighter or easier policy. The present configuration of the balance-of-risks statement was adopted as one of several steps intended to improve transparency of monetary policy and to clarify the meaning of asymmetric policy statements as they had evolved over the years.

The language of the balance-of-risks statement was intended to be more general than the previous statements of policy bias, to avoid giving the impression that the statements directly signaled impending changes in the funds rate target. Nevertheless, as was the case with the earlier language—the balance of risks statement has tended to be interpreted as indicating likely future policy moves.

In this paper, I examine the question of whether or not such an interpretation might be warranted as an empirical matter. In particular, I examine information content of asymmetric policy statements for predicting future FOMC policy actions using series of

monthly dummy variables to indicate the prevailing direction of policy asymmetry over a sample period of 1984-2002.

The time-series approach facilitates the use of a monthly data set for conditioning the information content of the bias statement on macroeconomic variables thought to be of importance to policymakers. In particular, I use inflation and output data to estimate a baseline Taylor-rule specification for policy and test whether the bias statement provides any additional information for forecasting changes in the FOMC's federal funds rate target.

The evidence presented shows that the statements of policy asymmetry do, indeed, convey information that is useful for forecasting changes in the funds rate target: The information content in the bias statement has been a statistically significant factor for predicting changes in the funds rate target over the sample period, even after controlling for responses to policy variables in the Taylor rule equation.

In light of this finding, I estimate an alternative specification in which the effects of asymmetry are represented as changes in the parameters of the estimated Taylor-rule. From this perspective, statements of policy bias are associated with a greater or lesser degree of responsiveness to inflation and output data. During the sample period considered here, variation in the Committee's responses to inflation data has evidently been the predominant factor for explaining the predictive power of asymmetric policy statements.

THE ASYMMETRIC POLICY STATEMENT AND ITS INTERPRETATION

A Brief History

From 1983 until 1997 statements of an asymmetric bias were included in the Policy Directive, as a note that "greater reserve restraint" or "lesser reserve restraint" either "would" or "might" be acceptable during the intermeeting period, depending on emerging economic circumstances. With "would" understood to be stronger than "might," the effect of this statement was to indicate a bias toward more restrictive or more accommodative policy.[1]

For example, consider the statement included in the Policy Directive adopted on July 3, 1996:

> *In the context of the Committee's long-run objectives for price stability and sustainable economic growth, and giving careful consideration to economic, financial, and monetary developments, somewhat greater reserve restraint* ***would*** *or slightly lesser reserve restraint* ***might*** *be acceptable in the intermeeting period. (Emphasis added)*
>
> (Federal Open Market Committee, 1996)

In many respects, the policy-bias statement is similar to the balance-of-risk language that has replaced it. The statement is predicated on a statement of the long-run objectives of monetary policy, and is cast in the context of the broader "economic, financial, and monetary" environment.[2] Although the statement explicitly refers to the "intermeeting period," the bias was often interpreted as a signal regarding the likely direction of future policy in a more general sense.

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[1] The directive sometimes modified the two options subtly by referring to "*somewhat* greater (or lesser)" or "*slightly* greater (or lesser)" reserve restraint. However, the somewhat/slightly distinction never directly conflicted with the asymmetry implied by the might/would classification. See Ritter (1993) and Muelendyke (1993, pp. 136-138) for discussion of the subtleties of language in the FOMC directive.

[2] In the earliest examples of the bias statement in 1983 and 1984, the statement was often made conditional on the growth rates of monetary aggregates. As uncertainties about the behavior of money velocity prompted the downgrading of the monetary aggregates as intermediate targets over subsequent years, the statements came to be more broadly cast.

Before 1999, the bias statements were included in the FOMC Policy Directive, and as such were not known to the public until the minutes of the meeting were released following the Committee's next meeting. Nevertheless, the significance of the statements often featured prominently in press coverage of the FOMC, being widely interpreted as suggesting an ongoing likelihood of policy actions. For example, in reporting on the minutes of the FOMC meeting of November 5, 1985, the *Wall Street Journal* described the import of the asymmetric policy directive as follows:

> *The officials, in another indication that they were leaning toward a looser, rather than tighter policy, decided that somewhat greater restraint on the growth of bank reserves "might" be acceptable, while somewhat lesser restraint "would" be acceptable, depending on a variety of factors.*
>
> (McGinley, 1985)

The use of the might-would convention persisted, with only subtle modifications, through the mid-1990s. The adoption of the present balance-of-risks language and the announcement of FOMC policy decisions evolved during the late 1990s as part of a trend toward greater policy transparency.[3] In August 1997, the Committee adopted a modification to the wording of the bias statement, making explicit reference to the federal funds rate. That is, the language referring to a greater or lesser degree of reserve restraint was replaced with wording that a higher or lower funds rate would or might be acceptable during the intermeeting period. In all other respects, the statement remained the same.[4]

[3] Rasche and Thornton (2002) and Poole and Rasche (2003) describe this change in disclosure policy in the broader context of the FOMC's moves to enhance transparency.

[4] The minutes of the August 1997 meeting suggest that another subtle modification to the role of the bias statement had taken place: Although the statement continued to refer to the intemeeting period, the minutes report that while the Committee members "did not attach a high probability to the prospect that the incoming information would warrant a tightening move during the intermeeting period, they continued to view the next policy move as more likely to be in the direction of some firming than toward easing."

Shortly thereafter, the FOMC began a policy of selectively announcing changes in the direction of the bias as part of the press statement released at the conclusion of each FOMC meeting. The first such announcement was made in May 1999.[5] In August 1999, the Committee formed a "Working Group on the Directive and Disclosure Policy." The recommendations of that working group for a change to the "balance of risks" language was adopted at the FOMC meeting of December 21, 1999. The new form for the asymmetric directive was announced in a press release dated January 19, 2000, and the new language was used for the first time at the Committee meeting of February 1-2, 2000.

In announcing the adoption of the "balance of risks" language, the Committee noted that the new language was intended to clarify the role of the policy bias and its interpretation by the public:

> *Previously, the Committee's directive and statement … may have intensified the public focus on the chance of a subsequent adjustment to the stance of policy, thereby increasing the possibility of misperceptions about the odds and timing of policy action. Also, the sentence in the directive cited a possible adjustment to the intended federal funds rate "during the intermeeting period," but Committee members often intended the time frame to encompass a longer period—another potential source of confusion.*
>
> (Federal Open Market Committee, January 19, 2000)

By stating a bias in the form of a balance or risks between two alternatives related to distinct policy objectives, the FOMC evidently intended to dispel the notion that statements of asymmetry signaled a likelihood of future policy moves directly. Rather, they should be interpreted as conditional assessments about how policy might respond to

[5] Although the first post-meeting announcement of a change in the bias statement was made in May 1999, the Committee had endorsed the idea earlier. The FOMC minutes of the December 1998 meeting include the summary of a discussion in which the "the members decided to implement the previously stated policy of releasing, on an infrequent basis, an announcement immediately after certain FOMC meetings when the stance of monetary policy remained unchanged. Specifically, the Committee would do so on those occasions when it wanted to communicate to the public a major shift in its views about the balance of risks or the likely direction of future policy."

incoming information about the economy. The Committee also disassociated itself with the intermeeting focus of the previous bias language, adopting the preface "for the foreseeable future."

Issues and Questions

Although the form and timing of public release of asymmetry in the policy directive has changed over time, certain aspects of the practice have been fairly consistent. The statement is explicitly cast in the context of the longer-run goals of monetary policy, indicates a direction of possible future policy moves, and has persistently been interpreted by the financial markets and the press as providing a direct reading on the future direction of monetary policy actions. Rasche and Thornton (2002) document that this interpretation has persisted since the adoption of the balance of risk language, citing numerous examples from the financial press.

Evidence is mixed on the subject of whether or not this view has empirical justification: Lapp and Pearce (2000) examined the predictive power of the bias statement for intermeeting funds rate changes from the beginning of the Greenspan Chairmanship through December 1998. They found the bias statement to be a statistically significant indicator of the likelihood and direction changes in the fed funds rate target during the subsequent intermeeting period. On the other hand, Thornton and Wheelock (2000) find that while the adoption of an asymmetric objective indicates the likely direction of a change in the funds rate target at or before the next FOMC meeting, no change in the target is also a likely outcome. For the sample period 1983-1999, they find that the hypothesis that a change in the funds rate target was independent of whether the directive at the previous FOMC meeting was asymmetric could not be rejected.

In this paper, I examine the information content of the policy-bias and balance-of-risks statements for predicting future FOMC policy moves using a monthly time-series approach, using indicator variables for the direction of bias in the FOMC's policy statements. I treat the sample periods 1984-2002 as a single regime, under the maintained assumption that the previous practice of adopting asymmetric Policy Directives and the current practice of issuing balance-of-risk statements represent the evolution of a procedure that has played a consistent role in the policymaking process.[6]

Previous empirical analyses of policy-bias statements have focused on the unconditional relationship between bias statements and subsequent changes in the federal funds rate target. The monthly time series approach of this paper facilitates the use of a Taylor-rule representation of the FOMC's implicit policy rule, in order to evaluate the information content of asymmetric policy statements conditional on information that is widely viewed to be important in the policymaking process.

To the extent that asymmetric policy statements do help predict subsequent policy changes, a remaining question is why? If available information indicates the efficacy of a particular policy action, the Committee would presumably have already taken that action. In order to address this question, I estimate an alternative specification in which the indicator variables for the bias statement are entered interactively with inflation and output-gap measures. This interactive specification shows that the effect of asymmetric policy statements can be represented as generating conditional variation in the parameters of the policy rule. From this perspective, statements of policy asymmetry derive their predictive content from changes in the responsiveness of the FOMC to incoming economic data.

[6] In addition to its potential signaling function, Thornton and Wheelock describe other hypothesized roles for the asymmetric objective: namely that the asymmetric bias has provided a mechanism for the Chairman to carry out intermeeting policy changes, and that the asymmetric directive has been used to help build consensus among the members of the FOMC.

DATA AND ANALYSIS

Monthly Indicator-Series Representing Policy Asymmetry

Monthly time series for representing direction of the bias in the policy objective are constructed as follows: A dummy variable for "greater reserve restraint," G_t, takes the value 1 when the bias was toward tightening and zero otherwise, while a corresponding dummy variable for "lesser reserve restraint," L_t, is equal to 1 when the bias was toward easing and zero otherwise. A summary measure of the asymmetric bias, B_t, is constructed as G_t - L_t. The summary variable B_t—which takes on values of one, zero, and minus one—is displayed in Figure 1. Of the 228 monthly observations, a tilt toward tightening was in effect on 75 occasions and a tilt toward ease on 55 occasions. For the remaining 98 observations the policy statement was balanced. The mean of the variable B_t therefore turns out to be 0.088.

Over the sample period, the FOMC had eight regularly scheduled meetings per year—an average of one each six weeks or so. In some months, the meetings were scheduled toward the beginning of the month while in other months the meetings were toward the middle or end of the month. In constructing dummy variables to represent policy bias, the timing convention I adopted was to assign changes to the month in which they were made, regardless of the specific meeting date. This practice amounts to an end-of-month convention for dating changes in the bias statement. Hence, a corresponding measure for the federal funds rate is the end-of-month target. [7]

[7] Alternative measures of the funds rate (the monthly average target and the monthly-average effective rate) were found to yield essentially equivalent results to those reported below.

Unconditional Relationships From VAR Estimates

As an initial examination of the unconditional predictive content of the policy bias measures, I estimate unrestricted vector autoregressions and test for Granger causality. The first column of Table 1 reports the tests for a bivariate VAR that includes the bias series, B_t, and monthly changes in the federal funds rate target, Δi_t.[8] Granger causality running from B_t to Δi_t is highly significant, and the evidence suggests Granger causality in the other direction as well: the hypothesis that Δi_t does not Granger-cause B_t can be rejected at a 5 percent significance level.

The next two columns report the results for a three-variable system that includes both G and L along with the funds rate target change. Block exogeneity restrictions on the inclusion of either variable in the funds rate equation are easily rejected, confirming the unconditional information content of asymmetric policy statements for forecasting changes in the funds rate. Although the evidence is somewhat weaker than in the bivariate case, the estimates suggest Granger causality in the other direction as well.

The finding that asymmetric policy statements are significant for predicting subsequent changes in the federal funds rate target in unconstrained VARs is consistent with previous research. Both Lapp and Pearce (2000) and Thornton and Wheelock (2000) note that policy actions in the opposite direction from a previous bias statement are highly unusual. Moreover, since policy actions have tended to take the form of sequences of changes in the funds rate target, the unconditional relationships from simple VARs are likely to indicate dual causality.

[8]The FOMC began targeting the federal funds rate directly in June 1989. Data for the "intended" federal funds rate before that date are compiled by Rudebusch (1995), based on Managers' Reports from the Open Market Trading Desk at the Federal Reserve Bank of New York.

However, the FOMC makes decisions about the funds rate target and the statement of asymmetry simultaneously in response to incoming information about the state of the economy. Hence, the potential for spurious correlation is a distinct possibility. The predictive power of asymmetric statements may simply derive from the fact that particular concerns expressed by the FOMC are subsequently confirmed by incoming economic data, prompting a policy move in the direction of the previously expressed contingency.

To investigate the relationship further, I turn to an examination of the information content of the asymmetric bias in the context of an estimated Taylor-type policy rule.

Taylor-rule Specification

Taylor (1993) suggested that a simple equation of the form

$$i_t^* = r + \pi_t + \alpha_\pi(\pi_t - \pi^*) + \alpha_y y_t \qquad (1)$$

could serve as a useful representation of monetary policy during the 1980s and 1990s. Equation (1) describes a target federal funds rate, i_t^*, that is set to equal the current nominal interest rate, $r + \pi_t$, plus responses to the deviation of inflation from target, $\pi_t - \pi^*$, and to the output gap, y_t.

In his original specification, Taylor proposed the simple parameterization $\alpha_\pi = \alpha_y = ½$ and $\pi^* = r = 2$. Subsequent researchers who have estimated the parameters of the Taylor rule empirically have found it desireable to incorporate interest-rate smoothing as an additional factor desribing FOMC policy.[9] One commonly-used smoothing specification takes the autoregressive form $i_t = \rho\, i_t^* + (1-\rho) i_{t-1}$, in which the

[9]Examples include Kozicki (1999), Clarida, Gali and Gertler (2000), Orphanides (2001), and Mehra (2001). The work of Rudebusch (2002), Mehra (2002) and English, Nelson and Sack (2003) has suggested alternative explanations for the lagged adjustment specification. For the purposes of this study, the interest-rate smoothing specification is simply adopted as a parsimonious representation.

observed funds rate target is a linear combination of an underlying latent-variable target rate, i_t^*, and the observed value in the previous period $i_{t\text{-}1}$.[10]

Because the focus of this study is whether asymmetric policy statements predict *changes* in the funds rate target, I adopt an alternative specification proposed by Judd and Rudebusch (1999), which takes the error-correction form:

$$\Delta i_t = \zeta (i_t^* - i_{t-1}) + \varphi \Delta i_{t-1} . \tag{2}$$

Substituting the expression for the funds rate target from (1) into (2), we obtain an estimable form for a the smoothed policy rule:

$$\Delta i_t = \zeta [\alpha_0 - i_{t-1} + (1 + \alpha_\pi)\pi_t + \alpha_y y_t] + \varphi \Delta i_{t-1} , \tag{3}$$

where α_0 is a constant term that represents a linear combination of estimates for the real interest rate and the inflation target, $\alpha_0 = r - \alpha_\pi \pi^*$.

Previous estimates of the Taylor rule have generally been made at the quarterly frequency. Given the relatively short-term horizon encompassed by asymmetric policy statements, however, analysis of quarterly data is likely to obscure their information content. As a baseline model for this analysis, I estimate a monthly version of equation (3). The dependent variable, $) i_t$, is the change in the end-of-month federal funds rate target. The output gap is represented by the deviation of the log of industrial production from a quadratic time trend. Consistent with the high-frequency version of the model being estimated, the inflation variable is measured as the annualized six-month growth rate of core CPI.

The first line of Table 2 reports the results of least-squares estimation of the baseline model. As found in the previous literature, estimated values for the smoothing

[10]Use of the autoregressive smoothing specification in levels was found to generate estimates nearly identical to those reported in this paper; however, the residuals from these regressions were highly autocorrelated.

parameters, ζ and φ, suggest very slow adjustment process. The constant term is estimated with a low degree of precision, and is not significant at any conventional confidence level. On the other hand, the coefficients on inflation and the ouptut gap are significant and of the expected sign. In fact, the hypothesis that α_π and α_y are both equal to ½, as in the original Taylor specification, cannot be rejected. Although the regression coefficient on inflation, $(1+\alpha_\pi)$, is not significantly different from one, a (one-tailed) test against the alternative hypothesis $\alpha_\pi<1$ strongly suggestes that the estimated monthly policy rule satisfies the Taylor principle (Taylor, 1999), which states that a successful anti-inflation strategy requires changes in the funds rate target that are greater than one-for-one with respect to changes in the inflation rate.[11]

The Predictive Value of Policy Bias: Intercept Dummy Variables

The second two lines of Table 2 report the results of adding lagged dummy variables for the status of the FOMC's bias statement to equation (1). The estimates suggest that the prevailing asymmetry statement is a significant predictor of subsequent changes in the funds rate target—even after conditioning on the policy variables in the Taylor-rule equation.

The second line of Table 2 includes lagged values of the bias variable B_{t-1},

$$\Delta i_t = \zeta[\alpha_0 - i_{t-1} + (1+\alpha_\pi)\pi_t + \alpha_y y_t + \beta B_{t-1}] + \varphi\Delta i_{t-1}, \qquad (4)$$

the coefficient on which, β, is positive and highly significant. This finding suggests that when the policy bias is tilted toward tightening (easing), there is a significant increase in the likelihood of an increase (decrease) in the federal funds rate target.

[11] The p-value on the one-tailed test is 0.061.

The third line of Table 2 reports the results of including lagged values of G_{t-1} and L_{t-1} as separate explanatory variables, relaxing the implicit constraint that the bias statement has symmetric implications for subsequent policy changes:

$$\Delta i_t = \zeta[\alpha_0 - i_{t-1} + (1+\alpha_\pi)\pi_t + \alpha_y y_t + \gamma G_{t-1} + \lambda L_{t-1}] + \varphi \Delta i_{t-1}. \qquad (5)$$

The coefficients on these variables are significant and have the expected sign: G_{t-1} is associated with a higher funds rate target while L_{t-1} is associated with a lower target. Although the point estimate of the coefficient on L_{t-1} is greater in absolute value than the coefficient on G_{t-1}, the hypothesis (= -8 cannot be rejected. In terms of adjusted R-squared and the standard error of the residuals, including *G* and *L* seperately contributes no additional explanatory power relative to the regression that includes only *B*.[12]

Under either specification including the bias variables, the point estimate of the output-gap coefficient is lower, but is still significantly positive and close to ½. Note also that after controlling for the effects of the asymmetry in the policy statement, the coefficient on inflation still clearly satisfies the Taylor principle.

Interaction Between the Bias and Policy-Rule Responses: Slope-Dummy Variables

The Taylor-rule estimates reported in Table 2 reveal the that asymmetric policy statements have signficant preditive power for explaining changes in the funds rate target. However, they reveal little about the mechanism by which statements of policy bias might be manifested in subsequent decisions by the FOMC to adjust the funds rate target. In this subsection I report estimates of Taylor-rule equations in which the dummy variables for

[12] Because the bias variables have nonzero means, their inclusion as intercept dummies affects the interpretation of the constant term in these regressions. Given the parameter values reported in Table 2, the inclusion of *B* has the effect of increasing the value of the constant term by 0.139, while including *G* and *L* acts to lower the estimated constant by 0.022.

policy asymmetry interact with data for inflation and the output gap, revealing the effects of a biased outlook on the FOMC's responses to incoming information.

Panel A of Table 3 reports estimates in which the bias variable, B_t, is entered interactively with inflation and output data . In particular, versions of the equation

$$\Delta i_t = \zeta[\alpha_0 - i_{t-1} + (1 + \alpha_\pi + \beta_\pi B_{t-1})\pi_t + (\alpha_y + \beta_y B_{t-1})y_t] + \varphi \Delta i_{t-1} \qquad (6)$$

are reported. The coeffieicents β_π and β_y represent the marginal influence of asymmetric statements on the reaction-function parameters. For example, the first line of Panel A shows that there is a statistically significant effect of the policy bias on the FOMC's reaction to inflation. In the absence of a bias, the estimate suggests that the FOMC responds to inflation with a coefficient of 1.47, but if there is a bias toward tightning the coefficient is effectively $1+\alpha_\pi+\beta_\pi=1.88$, while a bias toward ease is associated with a coefficient of only $1+\alpha_\pi-\beta_\pi=1.06$.

The second line of Panel A suggests that there is effectively no interaction between the policy bias and the FOMC's response to output gap innovations. The coefficient β_y has a point-estimate of -0.011, which is of the wrong sign but is clearly insignificant. The difference between the effects of the policy bias on reactions to inflation and output is confirmed in the third row of Panel A, which shows that when both interactive dummy variables are included in the regression, it remains true that the only significant effect is on the response to inflation. Hence, under the assumption that the effects of the bias statement on policy parameters are symmetric, the evidence suggests that the bias has been primarily associated with greater vigilance with respect to incoming information about inflation rather than real output.

Panel B of Table 3 reports the results of including G_t and L_t separately as interactive terms in the Taylor-rule equation:

$$\Delta i_t = \zeta[\alpha_0 - i_{t-1} + (1+\alpha_\pi)(1+\gamma_\pi G_{t-1} + \lambda_\pi L_{t-1})\pi_t + \alpha_y(1+\gamma_y G_{t-1} + \lambda_y L_{t-1})y_t] + \varphi\Delta i_{t-1}. \quad (7)$$

The first line of Panel B, which includes only the dummy variables interacting with inflation, shows that a both *G* and *L* have significant effects. In the absence of a bias in either direction the regression coefficient on inflation is 1.44, but when the existing bias is toward greater restraint the effective coefficient is $1+\alpha_\pi+\gamma_\pi=1.88$. The negative coefficient on L_{t-1} implies that that a bias toward easier policy is associated with a less forceful response to inflation: the effective coefficient in this case is only $1+\alpha_\pi+\lambda_\pi=1.08$. Once again, G_{t-1} and L_{t-1} enter symmetrically: the hypothesis that $\gamma_\pi = -\lambda_\pi$ cannot be rejected.

The observation that λ_π is negative has interesting implications. In an environment where inflation strays symmetrically both above and below the FOMC's implicit objective, we might expect the coefficient on L_{t-1} to be positive: a negative innovation to inflation would require a foreceful easing response to bring inflation back toward the target. The estimated coefficients suggest, however, that while the Committee responded vigorously to "inflation scares" (as described by Goodfriend, 1993), the response to declining inflation was simply to allow nominal interest rates to fall in approximately direct proportion. This pattern is consistent with the notion that the Fed was pursuing a policy of "opportunistic disinflation" (Orphanides and Wilcox, 2002) over the sample period.[13] Indeed, the data in Figure 1 shows that the Committee indicated a tilt toward easing during much of the period from 1990 through 1993, a period in which inflation was trending sharply downward.

[13] The statement issued by the FOMC following the meeting on May 6, 2003 citing the possibility of "an unwelcome substantial fall in inflation" suggests that the Committee may presently be inclined to respond more symmetrically to positive and negative inflation shocks than they evidently have been in the recent past.

The evident focus on disinflation over the sample period is also suggested by the lack of robustness in estimates of the interaction between the bias variables and the output gap, reported in the second line of Panel B. In contrast to the interaction with inflation, dummy variables interacting with the output gap have coefficients that are positive for both directions, but are significant at only a 10% level. Taking the coefficient estimates at face value, the implication is that the FOMC responds to output gap innovations more than twice as forcefully in the presence of a tilt in either direction than with no bias expressed. Nevertheless, this characterization provides little overall explanatory power: the adjusted R-squared and standard error of the equation show that little improvement in fit is provided by the inclusion of dummy variables interacting with the output gap.

The regression results reported in the third row of Panel B, which include all four of the possible interactive terms, confirm that the explanatory power of the bias variable is associated with interaction with inflation, but not the output gap. The coefficient estimates show the same pattern as in the previous two specifications.

Finally, the fourth set of estimates in Panel B show the results of assuming that the effects of asymmetric policy statements take a form consistent with the contemporary "balance-of-risks" language, in which a bias toward tightening is associated with concerns about inflation while a tilt toward easing is associated with prospects for weakness in economic growth. The estimates are generally supportive of this asymmetric interpretation of the asymmetric policy statement: The coefficient measuring the response to inflation under tightnening bias is positive and highly significant, and the coefficient representing the response to output under an easing bias is positive and signficant at the 10 percent level (the associated p-value is 0.072). Nevertheless, in terms of goodness-of-fit, this equation is virtually indistinguishable from the full specification reported in the third line of Panel B.

DISCUSSION AND CONCLUSION

Over the course of two decades, the FOMC has issued asymmetric statements regarding the economic outlook and likely policy responses. The findings reported in this paper show that those statements have contained significant predictive power for subsequent changes in the federal funds rate target.

In particular, when dummy variables representing the direction of the bias are included as intercept-shifters in a Taylor rule equation, they provide significant explanatory power in addition to the estimated average responses of the Committee to inflation and output innovations. When the dummy variables are entered as interacting with inflation and output-gap series, the estimated coefficients show that the expression of an asymmetric outlook can be interpreted as altering the magnitude of the Committee's responses to incoming information about the economy.

Although the results indicate some evidence to suggest that the FOMC has responded more forcefully to movements in the output gap following the expression of an asymmetric outlook, this effect tends to be overwhelmed by a heightened responsiveness to news about inflation. This finding is clearly consistent with the predominant disinflationary focus of U.S. monetary policy over the sample period, but it should be emphasized that a different pattern might well emerge in an ongoing low-inflation environment.

The effectiveness of the "balance of risks" statement and its interpretation by the public has recently been the subject of some controversy. At its meeting on March 18, 2003, the FOMC declined to specify a balance of risks, citing unusual geopolitical uncertainties. In the wake of this decision, comments by members of the Committee and analyses in the financial press raised some longstanding criticisms of asymmetric policy statements.[14] One

[14] See, for example, Berry (2003) and Derby (2003).

fundamental criticism is that such statements continue to be widely viewed by the markets as a direct signal about the direction of future policy changes, when in fact, the press release announcing the adoption of the balance-of-risks language in January 2000 clearly indicated the Committee's desire to avoid that interpretation.

The evidence presented in this paper provides some insight into this issue. In the regressions with the bias-variables are entered as intercept shift factors, the significance of the bias dummies implies the rather implausible interpretation that the Committee sets the funds rate target by considering the current state of the economy, then adding or subtracting a few basis points depending on the direction of their previously expressed bias. This is precisely the nature of the interpretation problem that has been widely discussed.

On the other hand, the regression results in which the bias dummies are entered as interactive terms provide a more reasonable explanation for the predictive power of asymmetric policy statements: Expressions of perceived risks in the outlook indicate an enhanced degree of diligence and generate more forceful responses to subsequent information about output and inflation trends. Nevertheless, in terms of predictive power, the interactive-dummy specification provides no improvement in the overall fit of the model relative to the intercept-shift specification.

Although the results reported in the paper provide a reasonable explanation for *why* asymmetric policy statements have predictive power for subsequent changes in the funds rate, many market participants and analysts might find it sufficient simply to know that the statements do, in fact, include significant information content.

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Table 1: Pairwise Granger-Causality Tests

		3-Variable VAR	
Direction:	B_t	G_t	L_t
$\Delta i_t \Leftarrow$	33.1725	19.4855	18.2223
	[0.0000]	[0.0006]	[0.0011]
$\Delta i_t \Rightarrow$	16.8735	16.2689	8.2846
	[0.0019]	[0.0027]	[0.0817]

Notes: Table 1 reports $\chi^2(4)$ test statistics for the null hypothesis of no Granger causality (block exogeneity), as estimated in VARs including four lags and a constant in each equation [p-values in square brackets].

Table 2: Taylor Rule Estimates With Dummy Variables for the Policy Bias

$$\Delta i_t = \zeta[\alpha_0 - i_{t-1} + (1+\alpha_\pi)\pi_t + \alpha_y y_t + D_{t-1}] + \varphi\Delta i_{t-1}$$

	Coefficient Estimates (Standard Errors)										
	ζ	φ	α_0	α_π	α_y	β	γ	δ	$\bar{R}^2$	SEE	Q
Baseline (D_{t-1}=0)	0.060** (0.016)	0.389** (0.061)	0.777 (0.893)	0.399 (0.257)	0.452** (0.080)	--	--	--	0.2268	0.2316	0.1917
$D_{t-1} = \beta B_{t-1}$	0.073** (0.015)	0.269** (0.063)	0.288 (0.715)	0.502** (0.202)	0.314** (0.062)	1.579** (0.433)	--	--	0.2937	0.2213	0.0378
$D_{t-1} = \gamma G_{t-1} + \lambda L_{t-1}$	0.072** (0.016)	0.262** (0.064)	0.397 (0.743)	0.515** (0.206)	0.317** (0.063)	--	1.342** (0.543)	-1.921** (0.710)	0.2920	0.2216	0.0219

Notes: Table 2 reports least-squares estimates of the parameters of a monthly Taylor-rule, estimated using the end-of-month federal funds, the six-month growth rate of core CPI, the deviation of Industrial Production from a quadratic trend, and the policy bias variables described in the text. $\bar{R}^2$ is the adjusted R-squared, SEE denotes the standard error of the equation, and Q is a Ljung-Box statistic for first order serial correlation. The sample period is 1984-2002.

* Significant at 0.10 ** Significant at 0.05.

Table 3: Taylor Rule Estimates With Interactive Dummy Variables

A.) Interactive *B*

$$\Delta i_t = \zeta[\alpha_0 - i_{t-1} + (1 + \alpha_\pi + \beta_\pi B_{t-1})\pi_t + (\alpha_y + \beta_y B_{t-1})y_t] + \varphi \Delta i_{t-1}$$

	Coefficient Estimates (Standard Errors)							$\bar{R}^2$	SEE	Q
	ζ	φ	α_0	α_π	β_π	α_y	β_y			
Inflation	0.074** (0.016)	0.260** (0.065)	0.454 (0.698)	0.469** (0.199)	0.406** (0.112)	0.345** (0.060)	--	0.2878	0.2222	0.0039
Output Gap	0.060** (0.016)	0.389** (0.061)	0.804 (0.930)	0.395* (0.259)	--	0.451** (0.080)	-0.011 (0.104)	0.2233	0.2321	0.1983
Both	0.074** (0.016)	0.260** (0.065)	0.486 (0.728)	0.464** (0.201)	0.405** (0.112)	0.345** (0.059)	-0.012 (0.081)	0.2847	0.2227	0.0027

B.) Interactive *G* and *L*

$$\Delta i_t = \zeta[\alpha_0 - i_{t-1} + (1 + \alpha_\pi + \gamma_\pi G_{t-1} + \lambda_\pi L_{t-1})\pi_t + (\alpha_y + \gamma_y G_{t-1} + \lambda_y L_{t-1})y_t] + \varphi \Delta i_{t-1}$$

	Coefficient Estimates (Standard Errors)									$\bar{R}^2$	SEE	Q
	ζ	φ	α_0	α_π	γ_π	λ_π	α_y	γ_y	λ_y			
Inflation	0.075** (0.016)	0.262** (0.065)	0.476 (0.698)	0.444** (0.216)	0.435** (0.153)	-0.368** (0.170)	0.343** (0.059)	--	--	0.2848	0.2227	0.0082
Output Gap	0.064** (0.016)	0.367** (0.061)	0.673 (0.874)	0.418* (0.243)	--	--	0.262** (0.102)	0.323* (0.187)	0.329* (0.174)	0.2400	0.2296	0.0277
Both	0.076** (0.016)	0.263** (0.065)	0.538 (0.732)	0.420* (0.223)	0.415** (0.155)	-0.303* (0.177)	0.272** (0.083)	0.113 (0.149)	0.163 (0.143)	0.2833	0.2229	0.0419
Asymmetric	0.079** (0.016)	0.304** (0.062)	0.963 (0.672)	0.225 (0.199)	0.519** (0.149)	--	0.293** (0.066)	--	0.226* (0.125)	0.2767	0.2240	0.0203

Notes: See Notes to Table 2. * Significant at 0.10 ** Significant at 0.05.

Figure 1:
Monthly "Bias" Index