Economic Review

Federal Reserve Bank of San Francisco

1993 Number 3

Using a Nominal GDP Rule to Guide Discretionary Monetary Policy

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They would like to thank Jack Beebe, Chan Huh, Bennett McCallum, Ann-Marie Meulendyke, Glenn Rudebusch, John Taylor, Bharat Trehan, and Carl Walsh for helpful suggestions, and Andrew Biehl for excellent research assistance. Any remaining errors are the sole responsibility of the authors.

Given doubts about the reliability of the monetary aggregates as intermediate targets of monetary policy, the Federal Reserve attempts to meet its dual goals—gradual reduction of inflation and mitigation of cyclical downturns in output—through purely discretionary adjustments of an interest rate instrument in response to myriad incoming data. A procedure in which the Fed would consult a nominal GDP feedback rule, while retaining the flexibility to use discretion in its monetary policy decisions, might contribute to achieving its long-run inflation goal without significantly interfering with its ability to pursue its short-run cyclical goal. This paper describes such a policy regime, and presents some empirical evidence pertinent to an assessment of how it might work.

In recent years, the Federal Reserve has become more explicit about its desire to reduce and ultimately eliminate inflation, citing the beneficial effects of stable prices on long-term economic growth.[1] At the same time, it has retained the goal of mitigating cyclical downturns in employment and output. Dual goals inevitably raise the issue of which should take precedence when they have conflicting implications for policy. The Fed resolves these conflicts on a case-by-case basis, using its discretion to set policy after analyzing a wide array of real and financial indicators. Like most of its counterparts in other industrial countries, it uses a short-term nominal interest rate (the federal funds rate) as its policy instrument (Kasman 1993).

In pursuing gradual disinflation over the last fifteen years, the Fed has attempted to use the monetary aggregates (mainly M2 since 1982) as a "nominal anchor" to help prevent short-term discretionary decisions from inadvertently allowing inflation to stray from the long-term goal. Annual target ranges have been established for various measures of money, and these have been lowered gradually over time to be consistent with declining inflation. The idea underlying this approach is that if the funds rate were adjusted so that money fell within these declining ranges over time, inflation would be slowed correspondingly. At the same time, the ranges are wide enough to permit flexibility to respond to cyclical downturns.

However, the Fed has de-emphasized the monetary aggregates because their relationships with prices and output have deteriorated, apparently in response to financial deregulation and innovation (Judd and Trehan 1992). As a consequence, policy has been left without much guidance from a nominal quantity variable that is closely linked to inflation in the long-run.

This void makes it difficult to tell if short-run decisions about the funds rate are consistent with the long-run objective of lowering inflation. Moreover, since there is no single variable that provides an *automatic* signal to policymakers that an interest rate change should be seriously contemplated, each change in the funds rate must be made on a judgmental, case-by-case basis. Perhaps inevitably, there is a temptation for policymakers to respond more

1. See Judd and Beebe, this issue. For a discussion of the possible benefits of low inflation, see Howitt (1990).

strongly and quickly to shocks that threaten a recession than to those that are stimulative, and this can test policymakers' resolve to control inflation (Barro 1986).

Use of an interest rate instrument without the guidance of a nominal anchor also tends to foster the questionable view that the stance of policy can be characterized by the level of the funds rate. As a result, tightening or easing policy becomes defined as raising or lowering the funds rate, while a decision to leave the funds rate unchanged is seen as no change in policy. However, these characterizations can be misleading. For example, a constant interest rate can be consistent with either tighter or easier policy, depending upon what is happening to the other determinants of aggregate demand. Thus a sudden rise in consumer confidence that leads to less saving could render a constant interest rate more expansionary. The same problem also arises for long-run inflation policy. To maintain a constant policy with respect to the inflation rate, interest rates would need to change frequently to offset the effects of shocks and assure that aggregate demand grew in line with the economy's productive potential.

The purpose of this paper is to describe a monetary policy regime in which *discretionary* changes in a short-term interest rate would be oriented around a *baseline* interest rate path that would be designed to be consistent with a disinflation or low-inflation goal. Specifically, under this approach, the baseline (or no-change-in-policy) option would be defined by a policy rule that would link changes in a short-term interest rate to a nominal GDP target designed to be consistent with the inflation goal in the long run. Thus, the rule would provide information to policymakers in formulating short-term discretionary actions that might help them avoid inadvertently allowing inflation to drift away from its desired level over time. The nominal GDP target either could be made public or used for internal purposes only.

The remainder of this paper is organized as follows. Section I discusses the relationship between monetary and nominal GDP targets, and argues that the latter have intrinsic appeal when unstable velocity makes monetary targets unreliable. In Section II, simulations of a specific nominal GDP rule are presented as an example to illustrate some properties of such rules. Section III discusses how a nominal GDP rule could be used to inform a discretionary monetary policy, and concludes by briefly noting some practical problems that would need to be solved in actually implementing such an approach.

I. NOMINAL GDP TARGETS

In this section, we discuss why nominal GDP may have some appeal as an intermediate target of monetary policy, especially as an alternative to the monetary aggregates when their velocities become unstable.

The channel of influence from nominal GDP growth to inflation can be seen from the following definition, which states that inflation is equal to the difference between growth in nominal and real GDP:

$$(1) \qquad \Delta p \equiv \Delta x - \Delta y,$$

where Δp, Δx, and Δy represent the annualized growth rates of the implicit GDP deflator, nominal GDP, and real GDP, respectively. In the long-run, real GDP growth can be approximated by a trend rate that is determined by real factors including the growth in labor, capital, and productivity, and thus is largely independent of nominal GDP growth.[2] As a consequence, any given growth rate of nominal GDP can be translated into a corresponding inflation rate in a straightforward way.[3] For example, trend (or potential) real GDP growth commonly is estimated at around 2 percent, so that a 5 percent growth rate of nominal GDP would fix long-run inflation at around 3 percent.

Since the growth rate of nominal GDP is equal to the growth rate of money (Δm) plus the growth rate of velocity (Δv), targeting money can be seen as an indirect method of targeting nominal GDP. Thus,

$$(2) \qquad \Delta x \equiv \Delta m + \Delta v,$$

Putting these definitions together yields,[4]

$$(3) \qquad \Delta p \equiv \Delta m + \Delta v - \Delta y.$$

So long as trend velocity growth is stable, any given long-run growth rate of money can be translated into a long-run inflation rate in a straightforward manner. When the velocity of M2 was stable, the relationship between M2 and inflation was particularly simple, since historically the

2. This statement abstracts from possible effects of trend inflation on trend real GDP growth. Thus lower (higher) nominal GDP growth will result in lower (higher) inflation, which for various reasons may be associated with higher (lower) trend growth of real GDP (Motley 1993). However, these effects are likely to be small when compared with the range of nominal GDP growth rates and inflation observed in the past.

3. We have specified the nominal GDP identity in terms of growth rates rather than levels. Research suggests that the steady-state growth rate of real GDP is stationary, so that fixing the growth rate of nominal GDP will result in a stationary inflation rate. The situation is more complex when the equation is specified in levels. It is uncertain whether the level of real GDP is stationary or not, so that it is difficult to tell if the price level would be stationary under a nominal GDP level target.

4. The relationships discussed in this paragraph are growth-rate versions of the ones behind the P^* model (Hallman, Porter and Small, 1991).

trend growth rate of M2 velocity was zero. Thus, for example, a 5 percent growth rate of M2 would produce 5 percent nominal GDP growth and 3 percent inflation in the long run. However, *when velocity is unstable,* direct nominal GDP targeting has the advantage that it is not adversely affected by unpredictable swings in velocity. In effect, nominal GDP targeting is a way to circumvent problems with the velocity of money in conducting monetary policy.[5]

The principal drawback to using nominal GDP as an intermediate target is that it does not respond as promptly as money does to the Fed's policy instruments, and hence is not very controllable, even over periods as long as several quarters. Thus it would be difficult for the Fed, or the public, to know if day-to-day policy actions were consistent with achieving the nominal GDP target over time. One way of dealing with this control problem is to compare discretionary policy changes to those called for by a *feedback rule,* which specifies responses of the policy instrument to incoming data on nominal GDP.[6]

A feedback rule of the type suggested by McCallum (1990), for example, would specify that the policy instrument would be adjusted in each period by a predetermined proportion of the difference between actual and targeted nominal GDP in the prior period. If the instrument were set strictly according to a properly specified rule of this type, the nominal GDP target would be achieved to a reasonable approximation over the long run, even though it might be missed over shorter time periods. Hence, a practice of orienting *discretionary* changes in the policy instrument around such a baseline would provide policymakers with information they could use to help them achieve their nominal GDP target over the long haul. And, achieving the nominal GDP target in the long run would hold average inflation to within a reasonable range around its target.

5. Given that the ultimate objective of long-run monetary policy is to control inflation, it might make sense to target the rate of inflation directly. However, as shown in Judd and Motley (1991), the lags from monetary policy to the rate of inflation appear to be sufficiently long in Keynesian-type (sticky-price) models that attempts at direct inflation targeting might result in extreme volatility in the interest rate and real GDP. Since it is desirable to select a rule that is robust across alternative types of models, we have not focused on direct inflation targeting in this paper.

6. The feedback rule discussed later in this paper is specified along the lines of rules originally proposed and analyzed by McCallum (e.g., see his 1990 paper). Feedback rules also have been examined by a number of other researchers, including Hess, Small and Brayton (1993), Judd and Motley (1991, 1992), Meltzer (1987), and Taylor (1985, 1992).

II. EXAMPLE: A NOMINAL GDP GROWTH RATE RULE

A number of different nominal GDP feedback rules have been explored in the literature. These differ as to whether the policy instrument is a reserves aggregate or a short-term interest rate, and whether nominal GDP and/or the policy instrument are specified in levels or growth rates. A common feature of these feedback rules is that the Fed responds to actual data on nominal GDP rather than to forecasts.[7] This feature has an advantage when decisions are being made by a committee of individuals who may disagree about the implications of incoming data for the future path of nominal GDP.

Below we briefly review research on a policy regime in which the Fed changes the short-term interest rate in response to divergences between actual and targeted nominal GDP *growth rates* (Judd and Motley 1992).[8] A short-term interest rate is specified as the instrument because it is controllable in the short run and because the FOMC has shown a preference over the years for operating through such an instrument rather than a reserves aggregate.[9] Our purpose in presenting this example is neither to advocate this particular form of feedback rule, nor to advocate strict adherence to any rule. Rather our purpose is to show how this class of rules might work as a baseline for discretionary policy decisions. The rule we have examined is specified as follows:

$$\Delta R_t = \lambda(\Delta x_{t-1} - \Delta x^*_{t-1}),\ \lambda > 0. \tag{4}$$

In this equation, ΔR_t is the quarterly percentage point change in a short-term interest rate (we used the three-month Treasury bill rate), and Δx_{t-1} and Δx^*_{t-1} are the

7. This feature of the rule could be modified to incorporate more up-to-date information by replacing last quarter's nominal GDP growth rate with a projection of the current quarter's data. Such short-term forecasts would be purely a matter of interpreting monthly indicator variables and would not depend very much upon views of the structure of the economy. As such they would not violate the spirit of the feedback rule.

8. Specifying a rule in terms of the change, rather than the level, of the interest rate has the advantage that it is not necessary to know in advance the equilibrium level of the real interest rate. Under a properly specified rule for the change in the nominal interest rate, the economy automatically would tend to adjust such that the real interest rate would move toward its equilibrium level over time, whatever that level happened to be.

9. As shown in Judd-Motley (1992), in principle, a reserves aggregate offers the possibility of much tighter control over inflation than appears likely under an interest rate instrument. The main difficulty with these aggregates as instruments of policy is that financial innovation and deregulation have made the velocities of reserves and the monetary base highly unstable. Moreover, increased international (paper) currency movements have added to problems with the velocity and controllability of the monetary base.

actual and targeted annualized growth rates of nominal GDP in the preceding quarter.[10]

The nominal GDP growth rate target would be chosen to be consistent with the target for inflation. For example, a goal of reducing inflation gradually to zero and holding it there would imply that the nominal GDP growth target would be lowered gradually toward 2 percent and held at about that pace.

The strength of the interest rate response to a given target deviation is defined by λ, and would be chosen by the central bank. As discussed below, simulations suggest that a value of λ of 0.2 would be sufficient to achieve reasonable control of inflation, without raising the volatility of output or interest rates compared with actual experience in the past three decades. This value of λ implies that the interest rate would be raised (lowered) by 20 basis points during each quarter in which the annualized nominal GDP growth rate exceeded (fell short of) the target by 1 percentage point. Although this may seem a rather weak response, it is important to recognize that under the rule the interest rate would continue to be raised (lowered) each quarter so long as growth remained above (below) target. According to the simulations, the consistent application of this modest response is sufficient to hold nominal GDP growth near its target over the long haul.

Simulation Results

In order to obtain a rough idea about how implementation of this rule might affect the economy, we employed simulations of two simple macroeconomic models under the assumption that the rule was in place and the economy was hit by shocks like those that actually occurred. We did large numbers of stochastic simulations so that we could construct confidence intervals for the outcomes for inflation, real GDP, and the short-term interest rate. In constructing these simulations, we had to assume that the rule was followed precisely. If the rule were used as a baseline for discretionary policy, the policymakers could attempt to improve on these results in whatever ways they deemed appropriate.

As with any counterfactual simulations, these exercises are subject to some valid criticisms, which mean that such results should be interpreted with caution. First, the simulation results will depend upon the particular model(s) used. Since individuals will differ as to what they think characterizes a reasonable model, simulation results may be suspect. In an attempt to deal with this problem, the simulations were run with two alternative models, a small Keynesian model, and a (largely) atheoretical vector error-correction model.

Second, counterfactual simulations are subject to the Lucas critique that the structure of the economy would have been different from history if the rule actually had been used. To attempt to deal with this concern, we varied the key coefficients in the models and re-ran the simulations to test for robustness. As discussed in Judd-Motley (1992), based upon these exercises, we concluded that the results were not particularly sensitive to the alternatives considered, although there were some instances in which coefficient changes did significantly affect the simulation results. We do not consider our study, or any other single study, to be definitive, and it would be useful to test this and other rules further in the context of other models.

The simulations suggest that following such a rule would have provided for improved control of inflation compared with actual experience over the past three decades. As measured by the GDP deflator, actual inflation averaged 5½ percent over the 30-year sample. The simulation results suggest that average annual inflation over 1960–1989 would have been held to between about zero and about 2½ percent (depending on the model) with a probability of two-thirds (see the box.) Moreover, it appears that this result could have been achieved without significantly increasing the volatility of real GDP and with a reduction in the volatility of interest rates compared to historical experience.[11] The lessened interest rate swings

10. As an alternative, the rule could specify a target for *average* nominal GDP growth over more than one prior quarter. For example, the nominal GDP target could be specified each quarter in terms of growth over the prior half year or full year. This approach would have the advantage of smoothing out quarter-to-quarter volatility in nominal GDP growth (whether due to "noise" in preliminary data, inventory cycles, or other factors) that might otherwise induce unnecessary interest rate responses. The disadvantage of using averages of several past quarters of nominal GDP growth would be that it introduces additional lags into the interest rate responses under the rule. Simulation experiments with the models referred to in this paper suggest that these longer lags tend to increase the size of cycles in real GDP and inflation that might occur under a mechanical application of the rule. In effect, using an average of several prior quarters of nominal GDP growth delays the response of interest rates to deviations of nominal GDP from the target, and thus tends to set off cycles of overshooting followed by undershooting of that target.

11. According to our simulations, a rule that focuses on the *growth rate*, rather than the *level*, of nominal GDP has the advantage of producing less volatility in real GDP and interest rates. However, the growth rate rule has the disadvantage that the price level could drift over time in the event of a prolonged series of positive or negative shocks. One way of attempting to deal with this problem would be to provide for occasional adjustments to the nominal GDP growth target when it permitted unacceptably large price-level (or nominal GDP) drift. This method might help to preserve the price level in the long run, while retaining the benefits of less volatility most of the time.

SIMULATIONS OF THE NOMINAL GDP GROWTH RATE RULE

Below we present results of simulations that assess how the macroeconomy might have evolved over the past three decades if the nominal GDP growth rate rule had been in use, and the structure of the economy had remained unchanged. In these "counterfactual simulations," the targeted values of nominal GDP growth were set to be consistent with zero inflation over 1960–1989. We used a value for λ of 0.20. For each of two models (a small Keynesian and a VECM, described in Judd and Motley 1992, pp. 14-16), we calculated 500 stochastic simulations, where the random shocks in each model equation were drawn from distributions that had the same means and variances as the estimated error terms.

We measure inflation performance in terms of average annual inflation over the simulation period. The volatility of output is measured in terms of the four-quarter growth rate of real GDP. Finally, the volatility of interest rates is measured as quarter-to-quarter changes in the three-month Treasury bill rate. The results of the simulations are shown below in the form of one standard deviation confidence bands (thus, two-thirds of the stochastic simulations fell within the bands.)

STOCHASTIC SIMULATIONS WITH NOMINAL GDP GROWTH RULE
ONE-STANDARD DEVIATION CONFIDENCE INTERVALS
1960-1989

	AVERAGE ANNUAL INFLATION RATE	4-QUARTER REAL GDP GROWTH RATE	QUARTER-TO-QUARTER CHANGE IN INTEREST RATE
ACTUAL	5.4%	0.5% to 5.5%	−1.0% to 1.0%
RULE			
Keynesian Model	−0.2% to 2.7%	1.2% to 5.8%	−0.6% to 0.9%
VECM	0.4% to 2.1%	2.5% to 7.5%[a]	−0.6% to 0.8%

[a]Taken literally, the results of the VECM simulations suggest that achieving lower inflation would produce an average rate of growth of real GDP that is above the experience in the U.S. in the post World War II period. This result reflects the well-known negative correlation observed in the U.S. data between inflation and real GDP growth, which is embedded in the VECM coefficients. This correlation could reflect the effects of inflation on growth, and/or the effects of supply shocks (e.g., oil shocks) on both variables. Since the VECM is not designed to distinguish between these two effects, our results should be interpreted as agnostic concerning the extent to which low inflation might boost long-term growth. In this paper, we take as given the Fed's stated goal of gradually moving toward price stability, and do not attempt to assess the possible effects of such a policy on average real GDP growth.

apparently arise because a consistent application of the rule keeps the inflation rate under control in the simulations, and thus highly aggressive policy responses are not likely to be needed. Thus, for example, use of the rule prevents simulated inflation from rising as sharply in the mid 1970s and early 1980s, and thus moderates the size of any policy tightening that might have been necessary to return inflation to lower levels.

One potential problem with these simulations is that they do not take into account the effects of measurement errors in nominal GDP. Even though the rule involves policy reactions to "actual" data on nominal GDP lagged one quarter, these data are revised a number of times before they are considered final. Measurement errors in the early releases of nominal GDP data, which policymakers would observe as they used the rule, would induce movements in interest rates and thus also affect outcomes for real GDP and inflation. In order to estimate the size of any such effects, we re-ran the above simulations with measurement errors (equal in size to those observed over 1978–1989) added to the "observations" of nominal GDP in the rule.[12]

12. The measurement errors were introduced as white-noise shocks with a standard deviation of 1.5 percent (annual rate), which is equal to the standard deviation of the differences between the "advance" nominal GDP growth rates and the "latest revised" nominal GDP growth rates over 1978-1989 (Bureau of Economic Analysis). Following the approach of Gagnon and Tryon (1993), the model was estimated with final revised data, but we added shocks representing measurement errors to the nominal GDP growth rates that enter the rule. Thus, the rule used in these simulations was: $\Delta R_t = \lambda\,(\Delta x_{t-1} + \epsilon_{t-1} - \Delta x^*_{t-1})$, where ϵ_{t-1} represents measurement error. We also investigated the possibility that the revisions are autocorrelated by estimating first and second order

This exercise yielded confidence intervals for inflation, real GDP and interest rates very close to those shown in the box—in fact, no confidence interval was increased in width by more than 0.1 percentage point.[13]

Comparison of the Rule with Actual Policy

How would the nominal GDP growth rate rule have performed in recent years in comparison with actual policy? To shed some light on this issue, we conducted counterfactual simulations over 1988–1993 in which we assumed that the economy was hit by the same set of shocks that actually occurred during this period. Consistent with the Fed's objective to lower the inflation rate gradually over time, we (somewhat arbitrarily) assumed targets for nominal GDP growth that declined by ¼ percent per year from 7 percent in 1988 to 5¾ percent in 1993, so that they roughly matched the *overall* decline of nominal GDP growth rates over the period.

As shown in Figure 1, the simulated path of the interest rate generated by this combination of target path and rule is fairly close to the path that actually occurred.[14] These simulations were computed using the latest revised data, rather than the data the FOMC actually observed at the time. When the measurement errors in these data are accounted for in the simulations, the short-term interest rate is about 50 basis points lower (in both models) over mid-1990 to mid-1993 than the simulation shown in Figure 1. In the final four quarters shown in Figure 1, the simulated interest rates with and without measurement errors bracket the actual level of the interest rate (for both models).

These simulations suggest that, even though the Fed was not following a nominal GDP rule during this period, actual policy was not inconsistent with that indicated by the rule in combination with a disinflationary path for nominal GDP.[15] It should be noted, however, that the level (but not the pattern) of the simulated interest rate is sensitive to the exact level of the assumed nominal GDP growth rate targets. Thus, for example, an equally plausible set of targets that consistently were ½ percentage point lower than the ones assumed would produce a simulated interest rate path that was parallel and uniformly higher than the one in the figure.

Figure 2 shows simulations of the interest rate paths that would be produced by adopting alternative targets for nominal GDP growth, and compares them with the path produced by the nominal GDP target assumed in Figure 1. The line marked "easy" corresponds to a nominal GDP growth rate target that remains unchanged at 7 percent in 1988 through mid 1993. The line marked "tight" simulates what might have happened if the nominal GDP growth rate target had been reduced by ½ percent per year from 7 percent in 1988 to 4½ percent in 1993. As can be seen, the constant nominal GDP growth rate target is projected to involve a lower interest rate by 1993 than projected under the gradual disinflation targets of Figure 1 (labeled "moderate"), while the more rapid ½-percent-per-year decline in the nominal GDP growth target under the "tight" policy would have involved a higher interest rate. Under all three target paths for nominal GDP growth, the interest rate would have fallen noticeably in the 1990–1991 recession.

III. Informing Discretionary Policy Decisions with a Rule

The above discussion of the nominal GDP growth rate rule was not designed to advocate that particular feedback rule as a baseline for a discretionary policy, but rather to provide a specific illustration of the properties of this class of rules. Given the demise of the monetary aggregates as reliable intermediate targets, the FOMC attempts to meet its dual goals (control of inflation and the mitigation of cyclical downturns in output) through purely discretionary adjustments of an interest rate instrument in response to myriad incoming data. A procedure in which the FOMC would *consult* a nominal GDP feedback rule, while retaining the flexibility to use discretion in its short-run decisions, might contribute to achieving its inflation goal without significantly interfering with its ability to pursue

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autocorrelation coefficients of nominal GDP revisions over 1976-1983, as shown in Walsh (1985). Autocorrelation was rejected at very high marginal significance levels. Despite this result, we experimented with first-order autocorrelated revision errors (with standard error of 1.5 percent) in the simulations, and found that their effect was virtually the same as the white-noise errors as long as the autocorrelation coefficient was less than 1.

13. The small effect of measurement errors in the simulations results from several factors. First, the size of the typical revision to nominal GDP in recent years is sufficient to have only very modest effects on the short-term interest rate in the nominal GDP rule. For example, a one-standard deviation revision (1.5 percent, annual rate) induces a change in the interest rate of 30 basis points. Second, as is typical of macroeconomic models, the coefficients linking changes in interest rates to changes in real GDP and inflation in the models used in this paper are relatively small. Third, interest rates affect real GDP and inflation with relatively long distributed lags. Thus measurement errors of opposite signs will tend to have offsetting effects on real GDP and inflation.

14. Similar results were obtained when the simulation was begun in later years.

15. Taylor (1992) has obtained a similar result with a different nominal GDP rule, using data prior to the most recent re-benchmarking.

FIGURE 1

SIMULATIONS OF A POLICY RULE

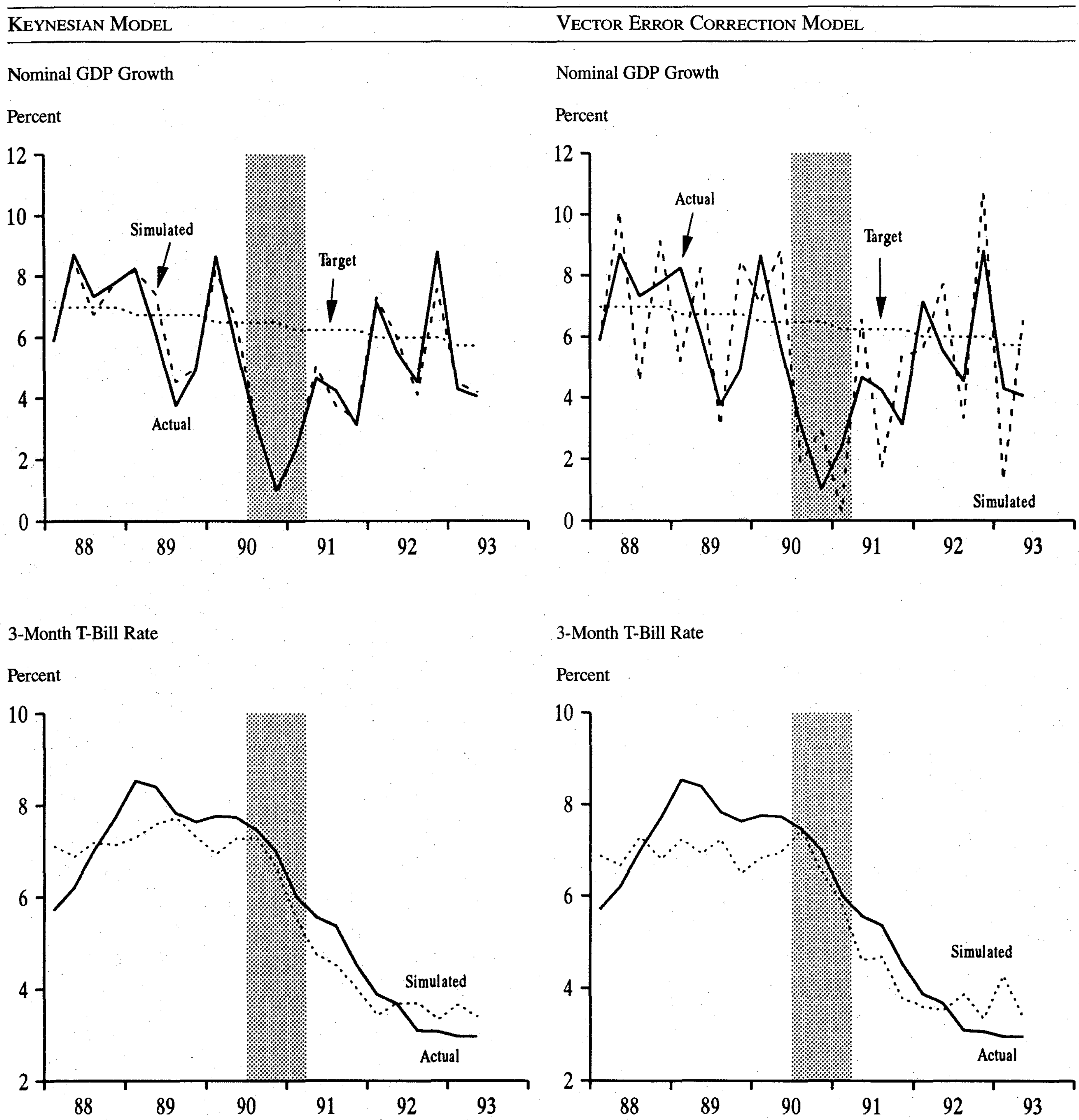
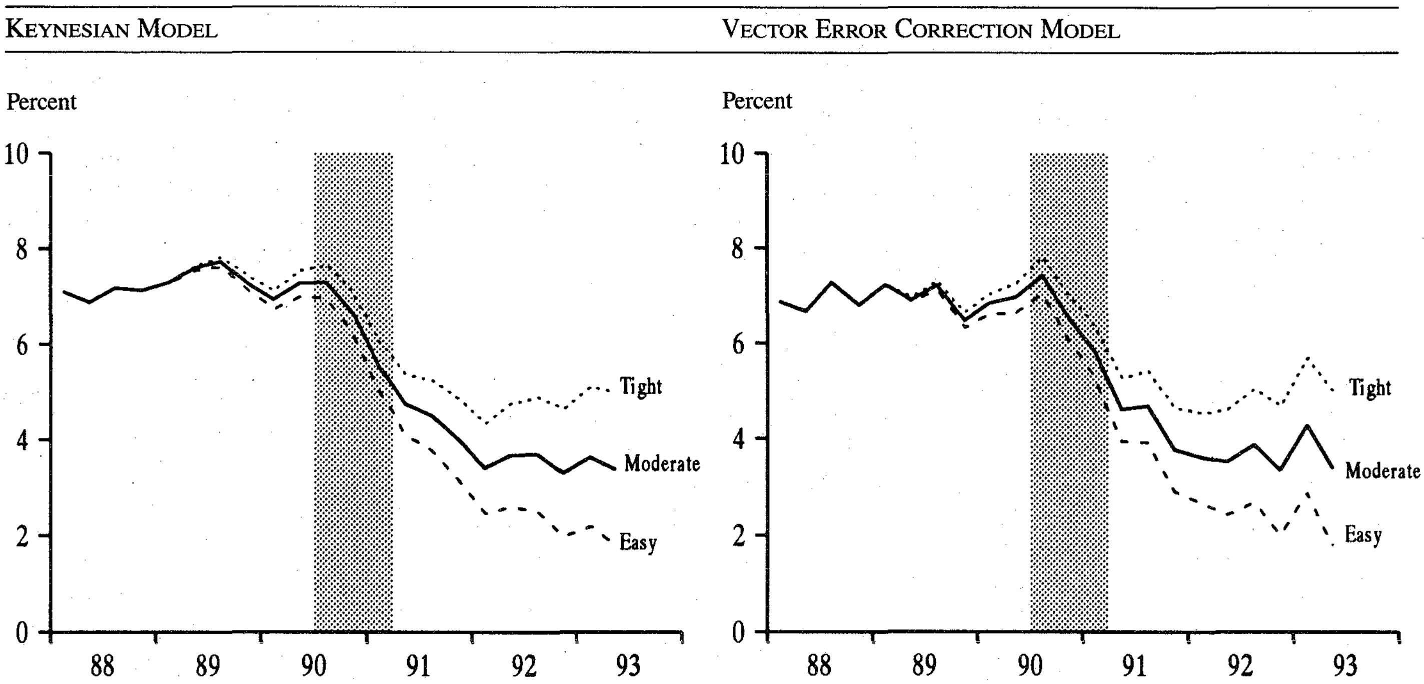


FIGURE 2

ALTERNATIVE POLICY SIMULATIONS: 3-MONTH T-BILL RATE



its cyclical goal. Such a rule could be announced to the public or used for internal information only.

Consultation with a rule could take several forms. For example, Taylor (1992) has suggested that the FOMC simply include the interest-rate "recommendations" of a nominal GDP feedback rule with any other monetary policy indicators they wish to consult.

While this idea seems reasonable, the decision-making process might benefit by having a feedback rule play a more central role. Specifically, the interest rate path indicated by a rule could be defined explicitly as representing an unchanged policy stance, in the sense of a consistent policy regime designed to achieve the Fed's inflation goal in the long run. In this way, the rule-based interest rate path would provide a benchmark around which discretionary decisions could be made.[16] In any specific situation, more or less expansionary policies than indicated by a rule could be adopted. During a recession the FOMC might want to lean toward a lower short-term interest rate than was called for by a rule. For example, if the growth rates of real and nominal GDP were to increase—and thus to signal an interest rate increase—the Fed might choose to override this signal if the *level* of real GDP were considered to be far below its potential level. By the same token, if the economy seemed to be "overheating," as a result, say, of a surge in demand for our exports, policy could lean in the direction of tightness for a time. So long as such discretionary deviations from a rule-based policy averaged out to zero over time, the long-run benefits of a feedback rule for inflation would be realized. Of course, if it were deemed advisable to change the inflation objective, the policy regime could be modified by changing the nominal GDP target itself.

In this paper we have focused on the general issue of whether using a nominal GDP feedback rule as a baseline for discretionary decisions might help the FOMC achieve its goals by rationalizing and simplifying the decisionmaking process. Of course, a number of practical issues would need to be addressed before such an approach could be adopted in practice. The biggest one would be to choose a specific nominal GDP feedback rule. As noted above, our earlier research suggests that a rule defined in terms of an interest rate instrument, a nominal GDP growth rate target, and a relatively mild reaction coefficient seems promising. However, since other researchers have supported other types of feedback rules, this issue is by no means

16. Following such an approach might enhance the credibility of the disinflation goal (Judd and Beebe, this issue.)

settled. Actual use of a feedback rule would require more research within the context of other models in order to narrow the range of appropriate choices of rules.

A number of more detailed issues also would arise. For example, the FOMC meets eight times per year, whereas the rules discussed above give a "recommendation" for the average level of the short-term interest rate over a quarterly period (given last quarter's level). Thus a method would need to be devised to link the decision period between FOMC meetings (which averages 6½ weeks) with the quarterly period of time used to define the rule.

Finally, as with any new approach to policy, there is no way to anticipate all of the problems that might be encountered if it actually were implemented. The process of implementation most likely would involve a good deal of learning and modification. The approach discussed in this paper does *not* require mechanically following a rule. Instead, it represents a discretionary approach that would be informed by a rule. As such, policymakers would continue to be in a position to use their judgment to react to circumstances as they arose, but with the benefit of the additional information provided by the rule.

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