Monetary-Policy Rules and the Great Inflation

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With the exception of the Great Depression of the 1930's, the Great Inflation of the 1970's is generally viewed as the most dramatic failure of macroeconomic policy in the United States since the founding of the Federal Reserve. Following the euphoria and apparent success of stabilization policy during much of the 1960's, macroeconomic events during the 1970's were agonizing and perplexing. After all, this was meant to be the "Age of the Economist" (Walter Heller, 1966 p. 2); when the latest scientific advances in macroeconomic theory, model building, and forecasting were brought to bear on policy decisions; when, having mastered optimization techniques, economic advisers could rely on the tools of activist stabilization policy to guide the economy to its "optimum feasible path" (Herbert Stein, 1984 p. 171).

Judging from the dismal outcomes of the decade, especially the rising and volatile rates of inflation and unemployment, it is hard to deny that policy was in some way flawed. But how exactly? Did not the policymakers of the 1970's make a systematic effort to guide the economy to its noninflationary full employment potential? This, after all, had been and remains the underlying macroeconomic policy objective of government policies in the United States since at least the end of World War II. And were not the policymakers of, say, the mid-1970's, as well-informed, well-reasoned, and distinguished as their counterparts of, say, the mid-1950's or the mid-1990's, when economic outcomes were better?

Retrospectively, policy choices during the 1970's may appear unsystematic, myopic, and even inconsistent with basic principles of what macroeconomic models sometimes suggest is good policy practice. The period if often cited as a prime example of the dangers associated with discretion. But were policy decisions truly inconsistent with what "scientific" treatises in macroeconomics identify with good policy practice, even today? Building on analysis and evidence I presented in a series of recent papers (Orphanides, 1998, 2000a, b, 2001a). I argue that, on the contrary, policy decisions during the 1970's can be reconciled with the application of a "modern" systematic, activist, forward-looking approach. I review monetary policy during the 1970's through the lens of a forward-looking Taylor rule to outline the origins of this apparent paradox and discuss some of its unpleasant implications for the role of perceived methodological advances for policy design.

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I. Activist Policy Rules

A forward-looking version of the familiar Taylor rule serves as a useful organizing device for describing activist monetary policy. Suppose the policy objective is to maintain unemployment at its full-employment noninflationary level (i.e., the "NAIRU" [non-accelerating inflation rate of unemployment] or "natural" rate), u^*, and inflation around a target, π^*. Let f denote the federal funds rate (the policy instrument), r^* the "natural" real rate of interest, π the outlook for inflation, and u the outlook for unemployment, all expressed as percentages (and annual rates when applicable). Then,

$$(1) \quad f = r^* + \pi^* + \beta(\pi - \pi^*) + \gamma(u^* - u)$$

provides a prescription for the desired setting of the federal funds rate in terms of the inflation and unemployment "gaps." I employ the "unemployment gap" in place of the "output gap" concept in the classic rule proposed by John B. Taylor (1993), noting that Okun's law implies a close relationship between the two concepts. A discussion based on the output gap concept is presented in Orphanides (2000b, 2001a). Using a coefficient of 3 in Okun's law (see e.g., Robert E. Hall and Taylor, 1997), the classic Taylor

rule corresponds to the parameter settings $\beta = \gamma = 1.5$ and $\pi^* = r^* = 2$.

Policy rule (1) captures key elements frequently highlighted as reflecting good policy practice: a strong systematic response to inflationary developments in the economy, $\beta > 1$; a countercyclical response to the business cycle, $\gamma > 0$ (with higher values of γ associated with a greater policy activism); and in light of the well known lags in the monetary transmission mechanism, a forward-looking policy approach, accommodated by using near-term forecasts of inflation and unemployment as summary indicators of the state of the economy. Indeed, versions of (1) have been shown to represent "optimal" policy in simple models where a central bank has a quadratic loss function in inflation and unemployment (see e.g., Orphanides, 1998), and approximately optimal in several more complex estimated models (see Taylor [1999] for a useful survey).

II. Implementation Issues

Though remarkably simple in appearance, implementation of a rule such as (1) is quite complex in practice. Determining the appropriate forecast horizon and response coefficients β and γ is certainly difficult. Even assuming that these are known (for example, by drawing on historical experience or on econometric policy evaluation), two sources of significant difficulty and possible error remain. One arises from the presence of possibly systematic errors in assessments of the outlook of the economy. In implementing the rule in real time, a policymaker would need to rely on preliminary assessments and forecasts of inflation and unemployment, π^f and u^f. By responding to these forecasts and preliminary assessments instead of the actual outcomes, which are obviously not known when policy is set, the policymaker inadvertently responds to the errors, $\varepsilon_\pi = \pi - \pi^f$ and $\varepsilon_u = u - u^f$, and adds what could easily prove to be a substantial element of noise to the policy actions. The other source of error arises from the pervasive ignorance associated with attempts to quantify the notions of "natural" rates of interest and unemployment in real time. Policy could be set with the presumption that these natural rates equal r^{*P} and u^{*P} (their *perceived* values) only to be discovered, perhaps many years later, that $\bar{r}^*$ and $\bar{u}^*$ (their true values) would have been better guesses.

These difficulties have long been identified as likely sources of error for activist countercyclical policies. For example, Allan Meltzer (1987) highlighted the unreliability of forecasts in this regard. In addition, in his forceful critique of policy activism, Milton Friedman (1968 p. 10) noted that "[u]nfortunately, we have as yet devised no method to estimate accurately and readily the natural rate of either interest or unemployment," and this remains true today.

Surely, accounting for the role of errors in assessments of the outlook and misperceptions about the natural-rate concepts in a policy rule such as (1) would appear crucial for useful policy evaluation and design. Unfortunately, the practice of describing optimal policies based on the presumption that such errors are small, unimportant, or easily avoided is not uncommon. Policy influenced by this practice can have paradoxical results. As Orphanides (1998) demonstrated, for example, if policymakers adopt policies perceived to be optimal under the naive presumption that such errors are less important than they actually are, they may inadvertently induce instability in the economy—precisely as warned by Friedman and Meltzer. Interestingly, unless the presence of such unintended errors is carefully accounted for, policy could retrospectively appear flawed and unsystematic even when it is set exactly in accordance to a rule such as (1), and meant to be optimal. Thus, retrospective policy evaluations can easily obscure the true source of historical policy errors.

If persistent over a period of time, misperceptions about natural rates and errors in assessments of the outlook in a policy rule such as (1) could also result in a significant deviation of the average rate of inflation from the policymaker's objective. A useful thought experiment for quantifying this problem is to translate systematic misperceptions into the implied distortion of the policymaker's inflation objective that would preserve the same policy setting. Thus, suppose policy during some period is set with an inflation target π^*, and perceptions r^{*P} and u^{*P}. From rule (1), systematic misperceptions about the natural-rate concepts $(\bar{r}^* - r^{*P})$ and $(\bar{u}^* - u^{*P})$ and systematic errors in assessments of the outlook, $\bar{\varepsilon}_\pi$ and $\bar{\varepsilon}_u$, over a period of time, would be equivalent to a policy free of misperceptions

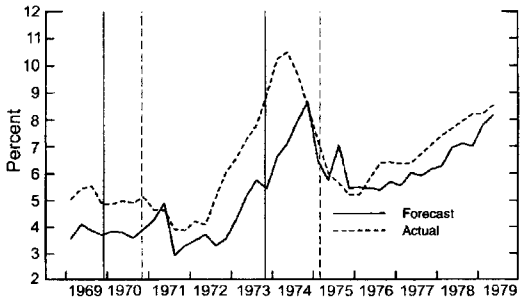

FIGURE 1. INFLATION FORECASTS AND OUTCOMES

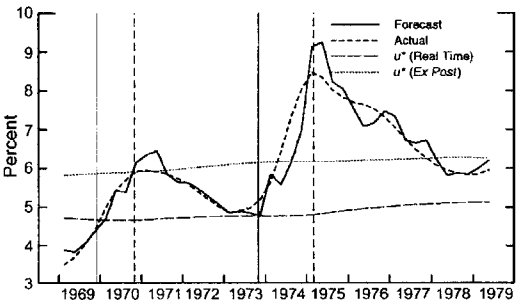

FIGURE 2. UNEMPLOYMENT FORECASTS AND OUTCOMES

but with the distorted inflation target, $\bar{\pi}^*$, such that

$$(2)\quad \bar{\pi}^* - \pi^* = \frac{(\bar{r}^* - r^{*P}) + \beta\bar{\varepsilon}_\pi - \gamma\bar{\varepsilon}_u + \gamma(\bar{u}^* - u^{*P})}{\beta - 1}.$$

Thus, estimates of the natural rates of interest or unemployment that prove too low, forecasts of inflation that are too optimistic, or forecasts of unemployment that are too pessimistic all lead to policy settings equivalent to a policy with an inflation target that appears inappropriately high. For example, with $\beta = \gamma = 1.5$, forecasts of inflation and estimates of the natural rate of unemployment that are systematically 1 percentage point too low would each be equivalent to a policy with a distorted inflation target that is 3 percentage points too high. Such errors become worse as γ rises or β falls.

III. Misperceptions and Policy in the 1970's

Next, I illustrate how policy such as suggested by rule (1) that might otherwise have been expected to provide good policy advice could have instead contributed to the dismal outcomes of the 1970's. To capture, as well as possible, perceptions in real time, when actual policy decisions were made, I rely on forecasts from the Greenbook, a document prepared by Federal Reserve Board staff for the Federal Open Market Committee before every regularly scheduled meeting. (Specifically, I use forecasts from the Greenbook prepared during the middle month of any quarter, and when that is not available, the last month. Christina D. Romer and David H. Romer [2000] offer a detailed discussion of the usefulness of Greenbook forecasts.)

Figure 1 compares forecasts of inflation as prepared in real time from 1969:1 to 1979:2 with *ex post* outcomes as measured today. For each quarter t, the figure shows the forecast of the rate of change in the output deflator from quarter $t - 1$ to quarter $t + 3$. As is evident, these forecasts of inflation proved considerably biased over this period. The average error is about 1 percentage point. (I use current data as a proxy for "truth" noting that even the most recent historical estimates could be subject to further revision and, presumably, improvement.)

Figure 2 compares corresponding forecasts and *ex post* outcomes for the average rate of unemployment over the current and next three quarters and also presents an illustrative comparison of real-time and current estimates of the natural rate. While the unemployment forecast errors appear large at times (e.g., at the ends of both recessions in the sample [vertical dashed lines]), they are essentially unbiased. With respect to real-time estimates of the "natural" rate of unemployment, the figure presents some suggestive evidence of a significant bias. The *ex post* series shown represents the latest historical estimates of the NAIRU constructed by the Congressional Budget Office. The real-time estimate shown is the one-sided simple average of the historical unemployment series which Hall (1999), and others, suggest is a good estimate for this nebulous concept. Though larger than 1 percentage point, the average bias shown in the figure for u^* likely underestimates the bias in real-time policymaker perceptions. As noted in Orphanides (2000a, b), key policymakers

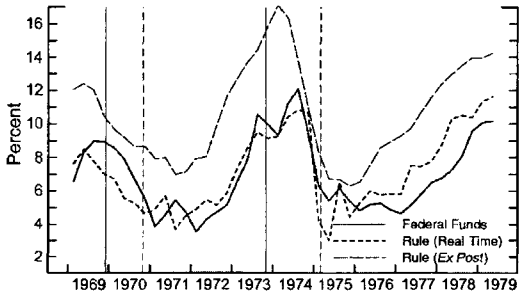

FIGURE 3. REAL-TIME AND *EX POST* TAYLOR RULES

suggested that 4 percent was a reasonable estimate of u^* at the end of the 1960's. (However, I have not been able to reconstruct the evolution of real-time consensus policymaker views for the period.) As is evident in the figure, the error in the real-time assessments of the natural rate of unemployment meant that for much of the 1970's policy decisions were based on the incorrect belief that the economy was operating below its full employment potential, while the opposite was true. These errors are similar to the misperceptions seen in official estimates of the output gap (Orphanides, 2000a, b). In addition, these errors and the errors in forecasting inflation over the same period are likely to be intimately related by a Phillips curve lurking in the background.

The large misperceptions of the natural rate of unemployment and inflation forecast errors imply that real-time and *ex post* policy settings based on a fixed parameterization of policy rule (1) would differ significantly. Figure 3 presents such a comparison for the classic Taylor rule with the parameter settings $\beta = \gamma = 1.5$ and $\pi^* = r^* = 2$. As can be seen, the two versions suggest significantly different policy settings throughout the period. Knowing the history of the 1970's, one would now prefer that policy had followed the settings suggested by the *ex post* rendition, which systematically points toward tighter policy than was actually implemented. Indeed, it is tempting to conclude that the Great Inflation might have been avoided if only policy had followed this retrospective rendition of the policy rule. Of course, proper evaluation of the historical policy choices could only be based upon comparison of actual policy with the real-time rendition of the rule. As the figure shows, this leads to the exact opposite

TABLE 1—ESTIMATED POLICY RULE

α	β	γ	ρ	$\bar{R}^2$	SEE
11.37	1.52	2.04	0.59	0.89	0.75
(1.32)	(0.24)	(0.30)	(0.05)		

Notes: Standard errors are given in parentheses.

conclusion: The real-time rule yields policy very similar to that actually pursued. Thus, had this policy rule been followed during the 1970's, economic outcomes would likely have been similar to the actual history.

Another way to assess the nature of policy during the 1970's, is by estimating a policy rule using real-time perceptions of the state of the economy. Consider the following regression:

(3)

$$f_t = \rho f_{t-1} + (1 - \rho)(\alpha + \beta \pi_t^{\mathrm{f}} - \gamma u_t^{\mathrm{f}}) + \eta_t.$$

This generalizes policy rule (1) to allow for possible partial adjustment, $\rho \in [0, 1)$, as suggested by Richard Clarida et al. (2000), Orphanides (2001b), and others. Table 1 presents least-squares estimates of (3) using the real-time forecasts shown in Figures 1 and 2. Figure 4 compares the predicted settings from this estimated rule with the federal funds rate. Note that in (3), $\alpha = r^* + \pi^*(1 - \beta) + \gamma u^*$. Setting $\pi^* = r^* = 2$, for example, suggests that policy during the period was consistent with a perceived estimate of 5.1 percent for the natural rate of unemployment, not unreasonable for the period. These results confirm that policy decisions during this period were essentially indistinguishable from what might reasonably be seen as "good" policy practice.

IV. Discussion

Close examination of policy during the Great Inflation suggests that actual policy decisions were consistent with application of a "modern" systematic, activist, forward-looking approach to policy. Policy was consistent with an inflation target of 2 percent, which should have safeguarded the goal of reasonable price stability. Policy responded strongly to forecasts of inflation and the unemployment gap, which could have been reasonably expected to result in

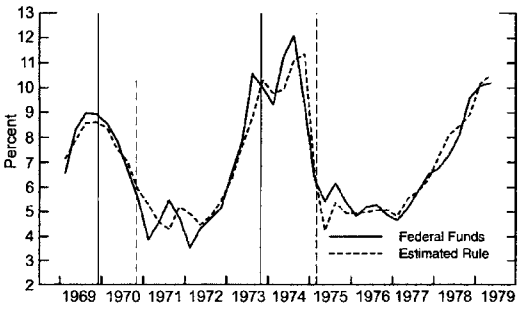

FIGURE 4. AN ESTIMATED REAL-TIME RULE

a high degree of economic stability. Policy was meant to guide the economy to its "optimum feasible path," consistent with what some "modern" research emphasizing activist policy design would suggest would be the "optimal" strategy to follow. Yet economic outcomes were disastrous.

An unpleasant observation is that the resemblance of actual policy during this unfortunate episode to such a modern policy approach was not accidental. The innovation during the 1960's, as Heller (1966 p. 116) emphasized, was that "modern economic policy . . . harnessed the existing economics—the economics that has been taught in the nation's college classrooms for some twenty years—to the purposes of prosperity, stability, and growth." Policy was heavily influenced by the latest perceived methodological advances in business-cycle theory and stabilization policy. The latest techniques on model-based policy design offered the promise that an activist policy could yield a high degree of economic stability without compromising reasonable price stability. This, unfortunately, proved too tempting to ignore. Thus, as Stein (1984) recounts, a "gradualist" approach to the emerging inflation problem at end of the 1960's appeared best for guiding the economy to its "optimum feasible path." Consistent with the natural-rate hypothesis, maintaining the unemployment rate slightly above the perceived natural rate was meant to be the optimal approach for restoring price stability. The "optimum feasible path," of course, became the Great Inflation. Accepting that this activist policy was optimal, the policy disaster of the 1970's, could be attributed to bad luck—an adverse shift in the "natural" rate of unemployment that could not have reasonably been expected to be correctly assessed for some time. But a more fundamental flaw can be readily identified: concentrating policy efforts toward targeting the economy's elusive full employment potential. Paradoxically, had policymakers concentrated their efforts on safeguarding price stability alone, better outcomes for both employment and price stability would have been likely. As long as "we have as yet devised no method to estimate accurately and readily the natural rate" (Friedman, 1968 p. 10), it would appear wise to simply accept that the scope for stabilization policy remains limited.

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