What Inflation Policy Do American Voters Want, and Do They Get It?

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For those scholars who have examined the impact of macroeconomic conditions on political support for the President, the 1992 election results were somewhat surprising. Inflation at the time of the election was at its lowest level in 20 years. The vast bulk of previous research regarding voters' economic preferences would have led one to expect that this achievement would have given the incumbent Administration a significant advantage.[1] A typical and oft-cited example is the Fair (1978a) model, which predicted reelection of the President in 1992, primarily because of the high level of voter aversion to inflation estimated in that study.[2] Thus, the 1992 Presidential election raises the possibility that voter preferences either have changed or were mistakenly estimated earlier. In turn, if the American electorate cannot be counted upon to support a policy of low inflation, the political feasibility, and hence, credibility, of announcing and implementing such a policy becomes questionable.[3]

The primary goal of this study is to obtain some estimates of the policies and inflation goals that voters deem optimal. Estimates of voters' preferred policy outcomes will then be used to determine the price that voters are willing to pay in order to achieve their desired inflation rate. The lower voters' long-run inflation target and the greater their willingness to pay for low inflation, the more politically feasible and credible will an anti-inflation policy be.

The empirical results are also used to explore, briefly, two additional issues. One of these is the role played by economic factors in the 1992 election. The second is whether or not macroeconomic policy is afflicted by a positive inflationary bias. Much recent theoretical literature, for example, Barro and Gordon (1983) and Canzoneri (1985), argues that discretionary policy will exhibit such a bias and persistently aim at producing more inflation than the electorate truly wants. A necessary step in testing this thesis is the actual determination of voter preferences.

The approach taken here is the "sophisticated voter" model pio-

neered by Chappell (1983) and Chappell and Keech (1985). This model does not require that voters be "super" rational. But it does assume that they have some rudimentary knowledge of the economy's structure and, as a result, are aware of some of the limitations of economic policy. Of course, as with all studies on the influence of economic events on political support, this approach also assumes that voters hold Presidents responsible for macroeconomic policy. It may be questioned whether or not it is sensible for voters to do this. Much research, however, does find that the incumbent Administration has an influence on policy.[4]

Two models of the sophisticated voter approach, described in the next section, will be used to examine the political feasibility of a policy of low inflation. The results suggest that the American electorate, at least in the past 30 years, would have supported a policy of maintaining inflation at roughly 3 percent, even if such a policy precluded attempts to stabilize output.

I. Two Models of "Sophisticated" Voters and Macroeconomic Outcomes

It is perhaps easiest to understand what is meant by a "sophisticated" voter model in the context of macroeconomic policy by first describing the "unsophisticated" voter approach implicitly taken by much of the work in this area. To this end, consider the following model, which is a simple, composite representation of a number of those used in prior research such as Fair (1978a) and Beck (1991):

$$POP_t = a_1 INF_t + a_2 \Delta GDP_t + X_t b + e_t. \qquad (1)$$

Here POP_t is a measure of political support for the incumbent President; INF_t is a measure of inflation; ΔGDP_t is a measure of GDP growth; X_t is a variety of other identifiable factors affecting Presidential popularity; and e_t reflects the influence of unidentifiable, random events, all at time t. As some consideration will reveal, such a model severely restricts voter preferences and implicitly treats voters as uninformed regarding basic macroeconomic relationships.

The model suggests a somewhat strange voter attitude regarding inflation. If, as is typical, the estimate of a_1 is negative, the equation implies that any positive inflation rate will decrease Presidential support and, conversely, that support will rise as inflation becomes more and more negative. Indeed, the model suggests that popularity could be maximized by achieving very large (in the limit, infinite) deflations. Yet nothing in economic theory suggests that a large rate of deflation is optimal.[5]

What theoretical research has done is to identify the considerations important for determining the optimal inflation rate. Society's preferred long-run inflation target will depend on the importance it attaches to these considerations. The researcher cannot know in advance the outcome of this complex judgment, and should not impose, a priori, any specific target, such as negative infinite inflation as in equation (1) or zero inflation, as is done in other models. Voters' preferred inflation target should be deduced from the data.

A further problem with equations such as (1) lies in the GDP term. As written, the equation does not permit voters to be aware of or respond to the fact that GDP cannot be indefinitely raised above potential. Not only is such a high level of GDP incapable of being sustained in the long run, but even achieving it in the short run may be suboptimal. A temporary surge of GDP above trend may bring painful inflation costs later. Moreover, in many macro models, outputs both above and below trend reflect decisions based on misperceived relative prices. That is, these decisions are suboptimal ones that, with hindsight, will be regretted. In short, models like equation (1) carry the implication that if inflation were at the voters' desired rate and GDP at its long-run potential, voters would still reward Administrations who raised GDP above potential. Reasonably sophisticated voters would instead recognize that such a policy is neither optimal nor sustainable.

If voters are to be treated as sensible, economi-

[1] See, for example, Fair (1978a); Hibbs (1979); Chappell (1983); Chappell and Keech (1985); Richards (1988); and Garman and Richards (1989).

[2] See, for example, the article by Schiller (1992).

[3] Technically, the analysis herein is limited to polling data on Presidential popularity and does not examine election results per se. However, such polls are quite close predictors of actual election outcomes. Indeed, Chappell (1990) finds that one cannot reject the hypothesis that election results can be treated as observations from the polling data series.

[4] See, for example, Kane (1980); Wooley (1984); and Havrilesky (1988).

[5] A small amount of deflation may be desirable, at least in a world with lump-sum taxes, as suggested by Milton Friedman's (1969) classic paper. But Phelps's (1973) equally classic work suggests that some positive amount of inflation may be appropriate when distortionary taxation is necessary. These two articles have spawned a number of subsequent papers, but none of this literature can be read as implying that large-scale deflation is optimal.

cally speaking, then voter support must be modeled so that it does not necessarily increase with every increase in GDP, as equation (1) implies. Such "sophisticated" voters understand the constraints under which the economy operates. They will not reward policymakers who attempt to push the economy beyond those bounds.

Note that none of the objections just mentioned rely on rational expectations and the ability of citizens both to forecast and to offset government policies. The informational requirements of such "super" rationality can be quite extensive and, perhaps, not realistic.[6] At the same time, the above arguments do strongly suggest the desirability of treating voters as at least somewhat knowledgeable about the economy, even if not super-rational. In other words, it is sensible at the outset to set the following conditions: 1) voters' long-run inflation target may be positive, or at least different from zero[7] or negative infinity; 2) voters understand the long-run requirement that GDP equal its potential; and 3) voters recognize the limited ability of policy to arbitrarily set the level of GDP independent of inflation considerations, even in the short run. This is the modeling perspective taken here.

The Sophisticated Voter Approach

One version of the sophisticated voter approach simply assigns voters a preference or utility function of exactly the same form that the theoretical literature assumes. An example of this approach is that of Garman and Richards (1989) in which voter preferences and, in turn, voters' perception of the President's economic performance, EP_t, are given by the following equation:

$$EP_t = -b_1(Q_t - QNAT_t)^2 - b_2(\Pi_t - \Pi^*)^2$$

$$= -b_1 VAR_t - b_2 BIAS;\ b_1, b_2 > 0 \quad (2)$$

where Q_t is real GDP (in logs); $QNAT_t$ is trend or natural GDP (again in logs);[8] Π_t is inflation; and Π^* is voters' preferred or desired inflation rate.

As noted, equation (2) is the loss or welfare function commonly used in macroeconomic literature. Using such a function in a political support equation is thus a way of allowing voters to form their evaluations in the same manner that economic theory often assumes. Using EP_t also avoids many of the problems that attend the "unsophisticated" voter models discussed earlier. An evaluation of performance based on (2) will penalize officials who fail to keep GDP close to trend, regardless of whether such deviations are above or below trend. Hence, this term permits voters to recognize that excessive output growth is neither sustainable nor desirable. This specification also focuses voter attention on the variance of GDP, which policy may well affect, rather than on the level of GDP, on which the effects of policy are more debatable.

"Sophisticated" voters understand the constraints under which the economy operates, and will not reward policymakers who attempt to push the economy beyond those bounds.

The second term in equation (2) implies that political support for an Administration will not continually increase as inflation gets lower and lower but, instead, will be (negatively) related to the deviation between actual inflation and that inflation rate deemed optimal by voters, Π^*. This term thus permits voters to have a preferred inflation rate other than negative infinity or zero. It also allows voters to recognize that too little inflation can be as bad as too much.

One difficulty remains, however, in assuming that EP_t as presented in equation (2) is the record that a sophisticated voter would use to evaluate economic performance. The measure ignores any preferences voters may have as to how quickly deviations of Π_t from Π^* are eliminated. If wages and prices are flexible, then this objection is irrelevant. But if prices

[6] See Beck (1991) for a discussion as to why assuming rational expectations in this context may impose considerable information burdens on voters.

[7] Neither Chappell (1983) nor Chappell and Keech (1985) permits the voters' preferred inflation rate to be determined by the data. Like much of the literature, they arbitrarily assume that this rate is zero. This may account for some of the estimation problems that they have encountered; for example, see Chappell and Keech (1991).

[8] The terms trend GDP, natural GDP, and potential GDP are used interchangeably in this paper. As described below, the actual measure of this value is taken from Gordon (1993). It is also worth noting that macro policy may affect potential GDP. Such effects are more or less ignored in this study.

are "sticky," so that a short-run trade-off exists between output and inflation, the speed with which policy brings Π_t in line with Π^* will matter to voters.

When an output–inflation trade-off exists in the short run but not in the long run, the determination of optimal policy may be viewed as the solution to an optimal control problem in which the control variable is output relative to potential. A solution to such a problem provided by MacRae (1977) is the following policy rule:[9]

$$Q_t - QNAT_t = -\alpha(\Pi_{t-1} - \Pi^*);\ \alpha > 0. \quad (3)$$

In words, the rule calls for policy to hold GDP below its long-run trend by a proportionate amount depending on the extent to which recent inflation has exceeded the long-run target. The key parameters of the rule are Π^*, the inflation rate desired in the long run, and α, the adjustment coefficient. If one assumes that such a rule makes sense, then it is equally sensible to assume that voters will base their evaluations of macroeconomic policy on such a yardstick. That is, sophisticated voters will form their opinion as to the appropriate values for α and Π^*, and then judge officials on the basis of how closely actual performance adheres to this preferred rule. Hence, an alternative to the EP_t measure above (equation 2), but one that may still be consistent with voter sophistication, is the measure EPA_t, given by:

$$EPA_t = -c[(Q_t - QNAT_t) - \alpha(\Pi^* - \Pi_{t-1})]^2$$

$$= -cDEV_t;\ c > 0. \quad (4)$$

The bracketed terms reflect the deviation of the actual output gap from that called for by voters' preferred policy. As before, squaring this term implies that voter support declines with deviations from that policy in either direction.

As with EP_t, voters who use EPA_t are sophisticated in that they recognize the long-run constraint that real GDP equal potential. Hence, the only true long-run issue is the optimal steady-state inflation rate, Π^*. As with the EP_t measure, the value of Π^* in EPA_t is not restricted a priori, but instead taken as one of the parameters to be revealed by the data. The EPA_t measure in equation (4) has an advantage relative to the EP_t measure in equation (2) in that it allows voters to consider adjustment costs associated with eliminating deviations of Π from Π^*. But the EPA_t measure also has a disadvantage in that it explicitly assumes an exploitable short-run trade-off between GDP and inflation—an issue of considerable debate in recent macroeconomic theory. In the empirical work below, both of these sophisticated voter approaches will be used to examine the political feasibility of a policy of low inflation.

II. Empirical Modeling and Evidence

Data and Initial Findings

The measure of Presidential popularity used in this study is the percentage of respondents answering "yes" to the Gallup Poll question, "Do you approve of the way President _____ is handling his job?" This is the variable most commonly used in political support studies. Quarterly data on this variable were collected for the period 1961:I through 1992:III.

The actual and trend real GDP variables used in constructing the EP_t and the EPA_t measures are taken from Gordon (1993). The actual inflation rate component of these measures is the quarterly measure of the annualized rate of change in the GDP deflator.[10] Two further adjustments were made on the grounds that, in evaluating a President's economic performance, voters will likely consider not just the current quarter, but the Administration's record since coming to office. The first adjustment recognizes that observations further in the past may receive less weight in the voters' evaluative process than more recent observations. In other words, voters may attach greater value to performance in the most recent quarter than to performance from 10 quarters earlier. A second and related adjustment assumes that voters consider a record based on, say, 14 quarters to be more informative than one based on, say, two. For these

[9] A number of optimal rules for macroeconomic policy have been derived over time. The one used here, taken from MacRae (1977), is only one of these. It is, however, similar to many others and, in particular, is a quite close approximation to the rule derived by Fair (1978b). Among the alternative policy rules would be one that targets nominal income, as suggested by McCallum (1984).

[10] Inflation was measured as the percentage change in the GDP deflator rather than the somewhat more familiar Consumer Price Index (CPI) because the GDP deflator is both a broader and a less volatile inflation measure. In any case, using the CPI measure would not materially change these results. Over any significant amount of time, the two measures are nearly identical. For example, the average inflation rate from 1960 through 1992 measured by the GDP deflator is 4.89 percent, while that measured by the CPI is 4.98 percent. Over this same period, the correlation ratio between the two measures is 0.96.

reasons, the VAR_t and $BIAS_t$ terms in EP_t and the DEV_t term in EPA_t are adjusted as follows:

$$VAR_t = 100 \cdot \sqrt{T} \cdot \left[\sum_{k=0}^{31} \delta^k (Q_{t-k} - QNAT_{t-k})^2 \cdot D_{t,t-k} \right] \Big/ \left[\sum_{k=0}^{31} \delta^k \cdot D_{t,t-k} \right]$$

$$BIAS_t = 100 \cdot \sqrt{T} \cdot \left[\sum_{k=0}^{31} \delta^k (\Pi_{t-k} - \Pi^*_{t-k})^2 \cdot D_{t,t-k} \right] \Big/ \left[\sum_{k=0}^{31} \delta^k \cdot D_{t,t-k} \right] \quad (5)$$

$$DEV_t = 100 \cdot \sqrt{T} \cdot \left[\sum_{k=0}^{31} \delta^k [(Q_{t-k} - QNAT_{t-k}) - \alpha(\Pi^* - \Pi_{t-k})]^2 \cdot D_{t,t-k} \right] \Big/ \left[\sum_{k=0}^{31} \delta^k \cdot D_{t,t-k} \right]$$

Here, δ is a decay parameter with a value presumably between 0 and 1. This parameter serves to give less weight to older observations. T is the number of quarters the current Administration has been in office and, hence, the number of observations voters have on which to judge the incumbent's economic performance. The inclusion of $\sqrt{T}$ thus permits voters to give increasing value to their evaluations as the number of observations on which those judgments are based increases. The $D_{t,t-k}$ term is a dummy variable equal to 1 if the current Administration was in office k quarters earlier and 0 otherwise. This term ensures that voters' evaluation of any Administration will be based only on economic outcomes occurring while that Administration is in office.

If economic variables were all that mattered for public opinion, one could simply estimate a voter support function based on VAR_t and $BIAS_t$, or on DEV_t, above, and leave it at that. But noneconomic factors are also important. Each President likely has a different appeal to voters based on his personality. Second, important "honeymoon" effects exist such that all Presidents appear to enjoy high popularity early in their time in office. Finally, events such as the Vietnam War, the Watergate crisis, the Iran-Contra affair, and Operation Desert Storm affect Presidential popularity independent of economic performance.

Table 1 shows two alternative specifications of a sophisticated voter support function, each of which attempts to include these various factors relevant to political support. The first specification assumes that voters use the EP_t criterion. The second specification assumes that the voters' evaluation is based on the alternative measure, EPA_t.

In evaluating a President's economic performance, voters will likely consider not just the current quarter, but the Administration's record since coming to office.

As stated above, POP_t is the percentage of respondents who approve of the way the current President is handling his job. The first seven variables in each specification are dummies intended to pick up differences in the personal appeal of each of the last seven Presidents. Similarly, H1 through H6 are dummy variables meant to pick up any "honeymoon" effects in the first six quarters of an Administration. The dummies $VIETNAM_t$, $WATERGATE_t$, $CONTRA_t$, and $STORM_t$ try to reveal the impact of important noneconomic events. The lagged popularity term, POP_{t-1}, is included to capture any dynamics in the popularity-generating process. However, including this term complicates the interpretation of the decay parameter, δ. The variables e_t and u_t are random error terms.

VAR_t, $BIAS_t$, and DEV_t are the economic variables defined exactly as in equation (5). VAR_t and $BIAS_t$ are the constituent elements of the sophisticated voter measure, EP_t. DEV_t is a direct representation of the alternative measure, EPA_t. By their definition in equation (5), each of the three variables includes the unknown decay parameter, δ. In addition, the definition in equation (5) implies that: 1) both $BIAS_t$ and DEV_t contain the unknown long-run inflation rate, Π^*; and 2) DEV_t includes an additional unknown parameter, α, from the voters' preferred policy rule. Because these parameters are not

Table 1

Two Alternative Specifications of a "Sophisticated" Voter Model of Presidential Popularity

Specification 1:

$$POP_t = a_1KENNEDY_t + a_2JOHNSON_t + a_3NIXON_t + a_4FORD_t + a_5CARTER_t + a_6REAGAN_t + a_7BUSH_t + a_8VIETNAM_t + a_9WATERGATE_t + a_{10}CONTRA_t + a_{11}STORM_t + b_1H1_t + b_2H2_t + b_3H3_t + b_4H4_t + b_5H5_t + b_6H6_t + c_1VAR_t + c_2BIAS_t + d_1POP_{t-1} + e_t. \quad (6)$$

Specification 2:

$$POP_t = a_1KENNEDY_t + a_2JOHNSON_t + a_3NIXON_t + a_4FORD_t + a_5CARTER_t + a_6REAGAN_t + a_7BUSH_t + a_8VIETNAM_t + a_9WATERGATE_t + a_{10}CONTRA_t + a_{11}STORM_t + b_1H1_t + b_2H2_t + b_3H3_t + b_4H4_t + b_5H5_t + b_6H6_t + c_1DEV_t + d_1POP_{t-1} + u_t. \quad (7)$$

POP_t	=	percentage of respondents who approve of the way that the current President is handling his job;
$KENNEDY_t$	=	a dummy variable equal to 1 when Kennedy is President and 0 otherwise;
$JOHNSON_t$	=	a dummy variable equal to 1 when Johnson is President and 0 otherwise;
$NIXON_t$	=	a dummy variable equal to 1 when Nixon is President and 0 otherwise;
$FORD_t$	=	a dummy variable equal to 1 when Ford is President and 0 otherwise;
$CARTER_t$	=	a dummy variable equal to 1 when Carter is President and 0 otherwise;
$REAGAN_t$	=	a dummy variable equal to 1 when Reagan is President and 0 otherwise;
$BUSH_t$	=	a dummy variable equal to 1 when Bush is President and 0 otherwise;
$H1_t$	=	a dummy variable equal to 1 in the first quarter of a new Administration, and 0 otherwise;
$H2_t$	=	a dummy variable equal to 1 in the second quarter of a new Administration, and 0 otherwise;
$H3_t$	=	a dummy variable equal to 1 in the third quarter of a new Administration, and 0 otherwise;
$H4_t$	=	a dummy variable equal to 1 in the fourth quarter of a new Administration, and 0 otherwise;
$H5_t$	=	a dummy variable equal to 1 in the fifth quarter of a new Administration, and 0 otherwise;
$H6_t$	=	a dummy variable equal to 1 in the sixth quarter of a new Administration, and 0 otherwise;
$VIETNAM_t$	=	number of U.S. soldiers (thousands) killed in Vietnam in quarter t;
$WATERGATE_t$	=	a dummy variable equal to 1 from the fourth quarter of 1973 (the time of the "Saturday Night massacre") through Nixon's resignation, and 0 otherwise;
$CONTRA_t$	=	a dummy variable equal to 1 in the last quarter of 1986 when the Iran-Contra scandal became public and 0 otherwise;
$STORM_t$	=	a dummy variable equal to 1 in the first quarter of 1991 at the time of Operation Desert Storm, and 0 otherwise;
VAR_t	=	the variance of actual GDP about its trend during the current Administration as defined in equation (5);
$BIAS_t$	=	the variance of actual inflation from voters' preferred long-run rate as defined in equation (5); and
DEV_t	=	the variance of actual GDP around the level called for by the voters' preferred short-run policy rule as defined in equation (5).

known, neither of the two specifications in Table 1 can be estimated directly by Ordinary Least Squares (OLS). Instead, these regressions are estimated by maximum likelihood, nonlinear least squares techniques. Such a procedure provides not only an estimate of the linear coefficients in these two specifications but also estimates of these unknown parameters, including the long-term inflation goal.

Table 2 presents the results of estimating both models of political support over the period 1961:I through 1992:III. In general, these results provide strong support for modeling voters as at least somewhat sophisticated when it comes to judging economic performance. All the variables enter with the correct sign and virtually all are significant. The goodness-of-fit statistics are reasonably high and comparable to those achieved in other studies.[11]

[11] Because of the presence of a lagged dependent variable, the Durbin-Watson statistic is not, strictly speaking, an appropriate test of serial correlation in the residuals. It is shown, nevertheless, because it so clearly implies that the residuals are serially uncorrelated. A more appropriate Lagrange Multiplier test confirms what the DW statistic suggests. The regression residuals are white noise. This too heightens confidence in these specifications.

Table 2
Results of Estimating "Sophisticated" Voter Models of Political Support, 1961:I to 1992:III

	Specification 1		Specification 2	
Variable	Coefficient	t-Statistic	Coefficient	t-Statistic
$KENNEDY_t$	34.121	(5.86)	28.410	(7.25)
$JOHNSON_t$	31.482	(5.54)	25.945	(5.30)
$NIXON_t$	28.921	(5.51)	23.459	(5.04)
$FORD_t$	36.500	(5.91)	28.058	(5.43)
$CARTER_t$	26.765	(5.32)	19.565	(4.76)
$REAGAN_t$	29.800	(6.10)	25.032	(5.65)
$BUSH_t$	28.000	(5.12)	23.002	(5.02)
$H1_t$	15.146	(6.38)	16.167	(6.94)
$H2_t$	6.587	(2.73)	6.037	(2.48)
$H3_t$	3.422	(1.40)	3.202	(1.28)
$H4_t$	5.347	(2.39)	4.940	(2.19)
$H5_t$	4.615	(2.07)	5.686	(2.46)
$H6_t$	.706	(.31)	.339	(.14)
$VIETNAM_t$	−.539	(−.65)	−.879	(−1.34)
$WATERGATE_t$	−8.108	(−1.95)	−12.082	(−2.91)
$CONTRA_t$	−4.266	(−.75)	−4.224	(−.74)
$STORM_t$	11.063	(3.54)	11.014	(3.42)
VAR_t	−.047	(−2.75)	...	...
$BIAS_t$	−.073	(−2.21)	...	...
DEV_t	...	...	−.034	(−2.31)
δ	.620	(1.90)	.275	(.75)
Π^*	3.286	(2.05)	3.000	(1.64)
α	...	...	.694	(2.37)
POP_{t-1}	.486	(5.86)	.557	(7.25)
Adjusted R^2	.79		.79	
Log-likelihood	−381.65		−383.46	
Durbin-Watson	1.95		1.98	

Presidents clearly enjoy significant popularity gains, or honeymoon effects, during the early quarters of their Administration and particularly the first quarter. These effects tend to diminish over time. By the sixth quarter, they are no longer either sizable or statistically significant.

The models indicate that political support for the President was seriously diminished by the Watergate crisis and considerably bolstered by the Desert Storm success. The impacts of the Vietnam War and the Iran-Contra scandal are less clear. Neither appears to have significantly diminished Presidential support. In part, this simply reflects the fact that the political fortunes of the two Presidents concerned were more powerfully influenced by other events, such as Watergate. Moreover, it is necessary to remember that the lagged popularity coefficient implies important dynamics in the political support process. That is, the coefficient on each event variable measures only the immediate, short-term effect. The long-run effects are typically more substantial.[12]

The second apparent anomaly shown in Table 2 is the small estimated value of the decay parameter, δ, especially in Specification 2. Previous researchers, including Chappell and Keech (1985) and Garman and Richards (1989), estimated δ values on the order of 0.8. The estimates here range from 0.27 to 0.62. The lower estimate of δ is to be expected given that, unlike the prior studies cited, the two models here include a lagged popularity term. In both regressions, the large and significant coefficient on POP_{t-1} implies that the political impact of economic performance continues to persist for several quarters despite the low estimates of δ. Indeed, accounting for the combined persistence effects of both δ and the coefficient on POP_{t-1} implies that, in either specification, it is over two years before the influence of economic events is eliminated.

The Importance of Economic Variables

The economic variables are, of course, of particular interest. The coefficients on VAR_t and $BIAS_t$ in Specification 1, and on DEV_t in Specification 2, have the predicted signs and are statistically significant. Administrations that fail to keep output near potential and inflation close to the voters' preferred long-run target, or fail to follow the voters' preferred policy rule, suffer significant loss in political support.

To obtain evidence on just how politically important the failure to achieve the economic results deemed optimal by voters has been, each specification was dynamically simulated under two alternative scenarios. In the first of these, each Administration was assumed to have achieved a perfect record with respect to voters' preferred outcomes; in other words, each maintained output at potential and inflation at the desired long-run target. In the second simulation, the model was used to generate a popularity series based on setting the economic variables at their actual values. The difference between the two simulations measures the loss in voter support due to economic misperformance.

For Specification 1, the average loss in political

[12] When the dynamic effects are fully counted, the results obtained here for the impact of the VIETNAM variable are similar to those found by Beck (1991). Incidentally, a dummy variable for the Iranian hostage crisis was originally included but later dropped because it received the wrong sign and was not statistically significant.

Table 3
Estimated Loss in Voter Support of Incumbent Administration because of Economic Performance at Time of Election
Percent

Year, Quarter	Specification 1	Specification 2
1964:IV	2.28	1.35
1968:IV	13.62	5.16
1972:IV	3.05	.26
1976:IV	15.76	12.84
1980:IV	25.02	15.99
1984:IV	5.80	4.38
1988:IV	2.02	.29
1992:III	2.08	1.27

support implied by the foregoing simulations is 6.1 percent. For Specification 2, it is 4.5 percent. That is, Administrations have on average lost on the order of 4.5 to 6.1 percentage points in political support as a result of economic misperformance. These loss estimates are sufficiently large to alter the outcome of virtually all of the last nine elections. Indeed, estimates of the Election Day impact of economic misperformance are often much larger than these mean values. Table 3 presents the results of the simulations with respect to the loss in voter support at the time of each election since 1964. A poor economic performance, as judged by voters, contributed substantially to the defeat of the incumbent party in 1968, in 1976, and again in 1980. The results also suggest that an absence of major errors in economic policy was a major reason for the re-election of the incumbent President in 1964 and 1972, and for the Republican Party's succession in 1988.[13]

The 1992 Election

The results shown in Table 3 suggest that the 1992 election was anomalous. Those results reveal that the incumbent entered the 1992 election with very nearly the best record of any President since 1960, in terms of achieving the economic outcomes preferred by voters. Hence, his defeat raises the possibility that the voter preferences estimated here are not stable. The alternative is that the election outcome was an outlier, the result of special events.

The stability of the estimates shown in Table 2 was checked using two statistical tests. In the first, the sample was split at its midpoint, 1976:III, and the popularity regression was estimated separately over each half of the data. These results were then used to perform a likelihood ratio test to determine whether constraining the coefficients to be constant over the entire sample was justified. The chi-square statistics for this test were 0.97 and 0.98 for Specifications 1 and 2, respectively. Neither is at all close to being statistically significant. Thus, on the basis of this test, the hypothesis that the regression parameters are constant throughout the sample cannot be rejected.

A second test of parameter stability was also conducted. This time the focus was exclusively on the long-run inflation target rather than on the stability of all parameters simultaneously. It is sometimes argued that the OPEC price shocks of the 1970s generated institutional changes that made it easier to live with inflation, such as bank deregulation, widespread use of cost-of-living adjustment clauses, and tax indexation. In turn, this may have led the public to raise its estimate of the acceptable long-run inflation target. To test this, Specifications 1 and 2 were reestimated after including a dummy variable to test for a switch in Π^* after 1976:III. The estimated effect is of the proper sign. It suggests that Π^* rose from 2.81 percent to 3.51 percent (Specification 1), or from 2.91 percent to 3.01 percent (Specification 2), between the first and second halves of the sample. But these results are far from statistically significant. The t-statistics for the estimates range from 0.04 (Specification 2) to 0.55 (Specification 1).

Dynamic simulation of either specification does overpredict the popular support for the Administration in 1992 by as much as 12 percentage points. But forecast errors of similar magnitude occasionally occur in the dynamic simulations for earlier Administrations. Of course, the stability tests discussed above cannot rule out the possibility that the more recent prediction errors reflect a change in voters' preferred policy settings that occurred in 1992. But in light of the strong evidence that voter preferences have been stable for 33 sample years, it seems more prudent to interpret the 1992 election as the result of economic and social factors not captured by the models used here.

[13] As noted earlier, election vote and popularity poll results are not identical. This is particularly the case for candidacies in which an incumbent Vice-President attempts to succeed his President since, strictly speaking, popularity polls only refer to an incumbent President. The election analysis here assumes that incumbent Vice-Presidents are, as Presidential candidates, held accountable for the macroeconomic policy that prevailed during their stay in office.

The Political Feasibility of Anti-Inflation Policy

Assuming that the regression estimates shown in Table 2 are stable, what do those estimates imply about the political will to pursue a policy of low inflation? The Table 2 estimates of the long-run inflation rate preferred by voters are 3.3 percent in Specification 1 and 3.0 percent in Specification 2. The first of these estimates is significantly different from zero. The second estimate does not quite achieve standard levels of significance, but it comes close. Overall, these findings suggest that the American electorate, at least in the past 30 years, has regarded roughly 3 percent as the optimal long-run rate of inflation. In fact, the insignificant difference of the second estimate from zero suggests that an even lower target may have been desired.

A further question is, how much pain is the public prepared to bear in order to achieve its long-run inflation target? Given the differences in the two specifications, this question must be answered separately for each. For Specification 1, some measure of the public's commitment to its inflation target is provided by the relative coefficients on VAR_t and $BIAS_t$. The latter is more than one and one-half times as large as the former, indicating that voters place considerably more weight on hitting the inflation goal than on achieving output stability. An indication of the actual magnitude of this trade-off is provided by the following calculation. For the sample period considered here, the variance of inflation around the desired rate of 3.29 percent is 11.76, the major part of which is made up of rates well above the target. Suppose a policy that could eliminate this suboptimal inflation were available, but it could do so only by increasing the output variance. What rise in the instability of output would leave the public evaluation of economic performance unchanged while eliminating the inflation variance? Given the estimated coefficients, the answer is that the public would have tolerated a rise in VAR of 18.23 percentage points, to a value of 27.51. That is, voters would have accepted a rise in the standard deviation of output from 3.13 to 5.24 percentage points, if it eliminated the typically excessive inflation of the past 30 years.

The foregoing result implies that voters would have supported a policy of maintaining inflation at roughly 3.0 percent constantly, even if such a policy precluded any and all attempts to stabilize output. This implication derives from the available evidence on the historic impact of stabilization policy. Using various detrending techniques and alternative data series, Backus and Kehoe (1992) found that, abstracting from the interwar years, the standard deviation of real GDP in the United States was anywhere from 1.29 to 1.9 times larger before World War I than it has been in the post-World War II years. Thus, if active stabilization policy is considered a phenomenon only of the postwar era, a good guess would be that without such a policy, the standard deviation of real GDP would have been 1.6 (the midpoint of the Backus-Kehoe estimates) times as great as in the sample used here. Similarly, the evidence reported by Modigliani (1977) suggests that the standard deviation of real GDP would have been 1.5 times its actual value absent active stabilization policy. Together, these estimates suggest that abandoning attempts to stabilize output would have raised the standard deviation of real GDP in the sample used here from 3.13 percent to 4.7 or possibly 5.0 percent. Either estimate is less than the 5.24 percent that the Specification 1 results show the electorate would have tolerated in order to achieve a constant 3.3 percent rate of inflation.

Specification 2 also gives a measure of the public's willingness to sacrifice in order to achieve its long-run inflation target of 3 percent. The estimate of the adjustment parameter, α, in voters' preferred short-run policy rule is 0.69. That is, the combined results for this alternative model imply that voters considered the following reaction function to be the appropriate guide for short-run macro policy:

$$Q_t - QNAT_t = -.69(\Pi_{t-1} - 3.0). \qquad (6)$$

Hence, voters regarded the optimal policy to be one that holds output seven-tenths of a percentage point below potential for every 1 percentage point by which inflation exceeds 3 percent.

To obtain some insight as to what these numbers might actually mean, the public's preferred disinflation path has been calculated starting from an inflation rate of 10.76 percent, the rate in the last quarter of 1980, assuming a natural rate of unemployment of 6.0 percent, an Okun's Law coefficient relating GDP movements to unemployment rates of 2.25, and Friedman's (1984) most optimistic view that each permanent reduction of 1 percentage point in inflation requires a rise in unemployment of 2 percentage points above the natural rate. Table 4 shows the output, unemployment, and inflation outcomes for the first eight years of this path.

As Table 4 shows, voters would have been prepared to tolerate a fairly prolonged slowdown in

Table 4
First Eight Years of Public's Preferred Disinflation Path, Starting from 10.76 Percent Inflation

Year	Percent Output Gap	Unemployment Rate	Inflation Rate
1	5.06	8.25	10.01
2	4.33	7.92	9.02
3	3.71	7.65	8.15
4	3.17	7.41	7.40
5	2.71	7.20	6.77
6	2.32	7.03	6.22
7	1.98	6.88	5.75
8	1.69	6.75	5.35

economic activity in order to bring inflation down from the high rates of the late 1970s. Based on the assumptions used here, the voters' preferred policy rule would not have entirely eliminated the excessive inflation with which the 1980s began, even after eight years. To do so would have required an even longer slowdown, over which the cumulative loss of GDP would have been 35 percent. In actuality, the cumulative GDP loss from 1981 to 1992—the point at which it appears the long-run preferred inflation rate was achieved—was only 21 percent. Thus, the results for Specification 2 suggest that voters would have regarded the actual cost of the 1980s disinflation, substantial though it was, to have been a bargain.

Evidence of a Pro-Inflation Policy Bias

An important question raised by the theoretical macroeconomic literature of the past 10 years concerns the existence of a policy bias in favor of an inflation rate greater than the public actually desires.[14] The above estimates of voter preferences may be used to provide some evidence on this point, as well.

A rough-and-ready test of the inflation bias hypothesis is a comparison of the actual average rate of inflation over the sample period with the long-run desired rate estimated here. Temporary shocks will, of course, make it impossible for policymakers to hit their own inflation target in each and every quarter. But over a period as long as the 127 quarters sampled here, such shocks can be expected to cancel out, and the average inflation rate achieved will predominantly reflect policy goals.

The evidence from such a test is mixed. The average inflation rate from 1961:I through 1992:III is 4.96 percent. This is higher than either model's estimate of the public's preferred rate, 3.29 and 3.00 percent, respectively, offering some support for the pro-inflation hypothesis. But the standard deviations on these estimates are sufficiently large that the differences are not statistically significant. Hence, this test is inconclusive.

Stronger evidence that an inflationary bias has characterized macro policy is provided by a number of alternative test statistics. For example, actual inflation has exceeded the Specification 1 estimate of the preferred inflation rate in 80 of the 127 sample quarters. It has exceeded the Specification 2 estimate 92 times. When the magnitude and frequency of these deviations are compared using a Mann-Whitney rank sum test, the results are significant at beyond the 1 percent level.

A further examination of the Specification 2 results also provides evidence of an inflationary policy bias. Recall that the public's preferred policy rule estimated for that specification is: $Q_t - QNAT_t = -.69(\Pi_t - 3.0)$. In this connection, a natural question is what the actual, historic relationship between the GDP gap and lagged inflation has been, and how this compares with the preferred relationship estimated above.

A regression of the quarterly GDP gap on the lagged inflation rate for the sample period produced the following results (t-statistics in parentheses):

$$Q_t - QNAT_t = \underset{(1.07)}{.613} - \underset{(-1.97)}{.2\Pi_{t-1}}. \qquad (7)$$

This may be rearranged to yield:

$$Q_t - QNAT_t = -.2(\Pi_{t-1} - 3.06). \qquad (8)$$

Equation (7) or its equivalent (8) may be taken to represent the systematic relationship of output and lagged inflation over the sample years. Again, it must be recognized that policymakers cannot accurately achieve their goals all of the time. However, their policy errors will be both positive and negative. Over a long period of time, such errors will cancel out. Hence, it is reasonable to expect the systematic relationship between the GDP gap and lagged inflation estimated over a substantial time period to reflect

[14] See, for example, Barro and Gordon (1983) and Canzoneri (1985).

primarily the influence of policy. That is, equation (8) may be viewed as the actual policy rule, to be compared with the voters' preferred rule as shown in equation (6).

Such a comparison reveals that the long-run inflation target of policymakers has been quite close to the 3.0 percent target desired by the electorate. Officials and voters differ, however, in terms of the short-run output sacrifice to be made to combat excessive inflation. While voters are willing to sacrifice 0.7 percentage points of output for every percentage point of excessive inflation, actual policy appears to have called for only a 0.2 percentage point output loss. The F-statistic from comparing these two rules is quite high, 8.97. Its value implies that one can decisively reject the hypothesis that the public's preferred rule and the policymakers' actual rule are the same, at the 1 percent significance level. In short, the evidence from Specification 2 strongly suggests that in the past policy has responded to inflation with a smaller reduction in aggregate demand than voters wished. As a result, inflation has persistently been greater than the electorate desired. The extent of this excess can be estimated, again relying on the assumptions used to generate Table 4. Such a calculation reveals that, typically, the short-run inflation target has been about 0.6 percentage points higher than the public wanted. One may regard this as a lower estimate, while the upper estimate would be the 1.9 percentage point difference found earlier between actual average inflation over the sample and the 3.0 percent target that voters have preferred over the past 30 years.

III. Summary and Conclusions

Economic theory typically assumes rational and knowledgeable agents. In the context of examining voter preferences, this assumption should imply voters who understand some basic macroeconomic relationships. This is not to say that voters need be as fully informed about both the economy and policy as some rational expectations models assume. But they will understand that output must, in the long run, equal potential, so that any deviation from trend GDP is not sustainable. Reasonably sophisticated voters will also understand that the optimal long-run inflation rate may not be zero.

This study has assumed that the electorate is sophisticated in the foregoing sense. Consequently, if the electorate regards the Administration as ultimately responsible for macroeconomic policy, then measures of voter approval of the President should be related to how closely the Administration achieves the inflation and output targets that voters consider optimal. Two alternative models of such sophisticated voters have been estimated. Both sets of results fit the data well. They also reveal much regarding the American electorate's attitude toward inflation and cyclical stability.

The findings of this study suggest that strong anti-inflation policies are politically quite feasible.

The findings suggest that strong anti-inflation policies are politically quite feasible. The results for either model indicate that, at least in the past, voters have considered about 3 percent to be the optimal long-run inflation rate. The results also indicate a considerable willingness to tolerate output instability and temporary recession in order to achieve this target. Such evidence in support of the political feasibility of a strong anti-inflation policy also suggests that the announcement of such a policy is credible. This credibility is important. The costs of any disinflation are likely to be smaller, the more agents believe that such a policy will truly be enacted.

The results also suggest that the 1992 election results should not necessarily be attributed to voter dissatisfaction with the Administration's record on inflation and GDP growth. Judged by the standards that voters are typically found to use, the incumbent Administration's performance regarding these targets was good. Since substantial evidence that voter preferences have been stable was also presented, it seems that the 1992 election probably turned on other economic and social issues.

The findings also tend to support the hypothesis that macroeconomic policy has been characterized by a pro-inflation bias. Actual inflation has exceeded the voters' long-run target in anywhere from two-thirds to three-fourths of the 127 sample quarters. On a systematic basis, this difference is between 0.6 and 1.9 percentage points. Why Administrations do not maximize voter support by eliminating this bias is an item of future research.

References

Backus, David and Patrick Kehoe. 1992. "International Evidence on the Historical Properties of Business Cycles." *American Economic Review*, vol. 82, no. 3, pp. 864–88.

Barro, Robert and David Gordon. 1983. "Rules, Discretion, and Reputation in a Positive Model of Monetary Policy." *Journal of Monetary Economics*, vol. 12, no. 2, pp. 101–21.

Beck, Nathaniel. 1991. "The Economy and Presidential Approval: An Information Theoretic Approach." In H. Norpoth, M. Lewis-Beck, and J. Lafay, editors, *Economics and Politics: The Calculus of Support*, pp. 85–101. Ann Arbor: University of Michigan Press.

Canzoneri, Matthew. 1985. "Monetary Policy Games and the Role of Private Information." *American Economic Review*, vol. 75, no. 4, pp. 1056–70.

Chappell, Henry W., Jr. 1983. "Presidential Popularity and Macroeconomic Performance: Are Voters Really So Naive?" *Review of Economics and Statistics*, vol. 65, no. 3, pp. 385–92.

———. 1990. "Economic Performance, Voting, and Political Support." *Review of Economics and Statistics*, vol. 72, no. 2, pp. 313–20.

Chappell, Henry and William Keech. 1985. "A New View of Political Accountability for Economic Performance." *American Political Science Review*, vol. 79, no. 2, pp. 10–27.

———. 1991. "Explaining Aggregate Evaluation of Economic Performance." In H. Norpoth, M. Lewis-Beck, and J. Lafay, editors, *Economics and Politics: The Calculus of Support*, pp. 207–220. Ann Arbor: University of Michigan Press.

Fair, Ray C. 1978a. "The Effects of Economic Events on Votes for President." *Review of Economics and Statistics*, vol. 69, no. 2, pp. 159–73.

———. 1978b. "The Use of Optimal Control Techniques to Evaluate Economic Performance." *International Economic Review*, vol. 19, no. 2, pp. 289–309.

Friedman, Benjamin. 1984. "Lessons from the 1979–82 Monetary Policy Experiment." *American Economic Review, Papers and Proceedings*, vol. 74, pp. 382–87.

Friedman, Milton. 1969. *The Optimum Quantity of Money and Other Essays*. Chicago: Aldine Press.

Garman, David and Daniel J. Richards. 1989. "Policy Rules, Inflationary Bias, and Cyclical Stability." *Journal of Money, Credit and Banking*, vol. 21, no. 4, pp. 409–21.

Gordon, Robert. 1993. *Macroeconomics*. Sixth Edition. New York: HarperCollins Publishers.

Havrilesky, Thomas. 1988. "Monetary Policy Signaling from the Administration to the Federal Reserve." *Journal of Money, Credit and Banking*, vol. 20, no. 1, pp. 83–101.

Hibbs, Douglas. 1979. "The Mass Public and Macroeconomic Performance: Dynamics of Public Opinion Toward Unemployment and Inflation." *American Journal of Political Science*, vol. 26, no. 4, pp. 705–31.

Kane, Edward J. 1980. "Politics and Fed Policy-Making: The More Things Change, The More They Remain The Same." *Journal of Monetary Economics*, vol. 6, no. 2, pp. 199–211.

MacRae, C. Duncan. 1977. "A Political Model of the Business Cycle." *Journal of Political Economy*, vol. 85, no. 2, pp. 239–63.

McCallum, Bennet. 1984. "Monetarist Rules in the Light of Recent Experience." *American Economic Review, Papers and Proceedings*, vol. 74, pp. 388–91.

Modigliani, Franco. 1977. "The Monetarist Controversy, Or Should We Forsake Stabilization Policies." *American Economic Review*, vol. 67, no. 1, pp. 1–19.

Phelps, Edward S. 1973. "Inflation in the Theory of Finance." *Swedish Journal of Economics*, vol. 75, no. 1, pp. 67–82.

Richards, Daniel J. 1988. "Some Evidence on the Inflationary Bias of Macroeconomic Policy." *Journal of Macroeconomics*, vol. 10, no. 2, pp. 435–47.

Schiller, Bradley. 1992. "The Forecasts That Favor Bush." *The Wall Street Journal*, October 19, p. A14.

Wooley, John T. 1984. *Monetary Politics: The Federal Reserve and the Politics of Monetary Policy*. Cambridge: Cambridge University Press.