Is There a Dead Spot? New Evidence on FOMC Votes Before Elections

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October 2003

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Abstract

Do political pressures affect the conduct of monetary policy? Little is known about how independent central banks like the Federal Reserve negotiate the political pressures that are inevitably brought to bear on monetary policymakers. The incumbent president of the United States has clear incentives to try to influence monetary policy before each presidential election. But how presidential politics affects the conduct of the Fed's policymaking body, the Federal Open Market Committee (*FOMC*) remains an open question. Using new data that chronicle the Fed's internal forecasts from 1973 through 1994, this paper tests for an electoral cycle in the voting behavior of *FOMC* members. The paper provides evidence of a dead spot in the voting behavior of *FOMC* members before presidential elections. For given values of their internal forecasts, *FOMC* members are less likely to vote to tighten monetary policy in the year preceding a presidential election than in other periods.

JEL Classification: *E0, E58.*

Keywords: *Political-business-cycle models, electoral cycles, Federal Reserve, central banks, political economy.*

1 Introduction

"Tightening doesn't affect our credibility the same way that easing might. We've usually been accused of doing things to help the incumbent, I believe."

Robert McTeer, President, Federal Reserve Bank of Dallas, October 1992[1]

Do political pressures affect the conduct of monetary policy? Little is known about how independent central banks like the Federal Reserve negotiate the political pressures that are inevitably brought to bear on monetary policymakers. The incumbent president of the United States has clear incentives to try to influence monetary policy before each presidential election.[2] But how presidential politics affects the conduct of the Fed's policymaking body, the Federal Open Market Committee (*FOMC*), remains an open empirical question. Using new data that chronicle the Fed's internal forecasts from 1973 through 1994, this paper tests for an electoral cycle in the voting behavior of *FOMC* members. The paper provides evidence of a dead spot in the voting behavior of *FOMC* members before presidential elections. A dead spot is defined as an act of omission, a lack of action where one would normally expect some. For given values of their internal forecasts, *FOMC* members are less likely to vote to tighten monetary policy in the year preceding a presidential election than in other periods. These results build on theoretical work by Drazen (2001) and on empirical work by Beck (1987) both of whom hypothesized that the Fed has accommodated an active electoral cycle

[1] *FOMC* Transcript, October 6, 1992.

[2] There is clear evidence that the performance of pre-electoral macroeconomic aggregates helps predict whether voters will re-elect an incumbent. Fair (1978) finds that a 1-percent rise in real GDP in the year preceding a U.S. Presidential election (and, in particular, in the second and third quarter of the election year) corresponds to a 1-percent rise in the incumbent party's vote total. Similar findings exist for many OECD countries (Lewis-Beck 1988).

in fiscal policy. This paper adds to that literature by providing evidence of a passive electoral cycle in the instruments of U.S. monetary policy, that is, in *FOMC* votes.[3]

It is generally accepted that the Fed acted to assist the incumbent's re-election effort in the 1972 presidential election.[4] There is less agreement on whether or not the Fed has responded to political pressures in the post-1972 period. One school of thought in the literature, the "independents," argues that the Fed has acted more or less independently of political pressure from the president or from congress in the post-1972 period. Alesina, Roubini, and Cohen (1997) argue for example, that there is very little evidence of an opportunistic electoral cycle in monetary policy's intermediate targets in the post-1972 era.[5] A second school of thought, the "accommodators," argues that the Fed has responded to political pressure from the president or from congress by passively accommodating an active electoral cycle in fiscal policy. This position is articulated in Drazen's (2001) review of the literature, which highlights evidence that the Fed helped create an observed electoral cycle in monetary

[3]This passivity has two aspects. First, the Fed reacts passively by accommodating, that is, by not acting to counter an electoral cycle in fiscal policy created by elected officials. Second, the Fed reacts passively in the manner in which it accommodates the fiscal authorities: It is less likely to tighten, to act, than it otherwise would be, rather than being as likely to loosen, to act, as it otherwise would be. The literature that tests for electoral cycles in fiscal and monetary policy is known as the political-business-cycle (*PBC*) literature. See Drazen (2001) for a review. The theory of political business cycles, originally formulated by William Nordhaus (1975), posits a policymaker who manipulates monetary policy before an election to ensure the re-election of the incumbent. The economy is stimulated preceding the election: a surge in inflation follows the election. A substantial literature on political business cycles developed in the late 1970s and 1980s following Nordhaus's seminal article, most notably the rational partisan model of Alesina (1988) and various models of fiscal policy (e.g., Rogoff (1990) and Rogoff and Sibert (1988)).

[4]See Rogoff (1990) and Drazen (2001).

[5]Alesina, Roubini, and Cohen (1997) test for an electoral cycle in monetary policy before elections by constructing a dummy variable for the quarters preceding a Presidential election and regressing the growth rates of various monetary aggregates or the level of interest rates on it alone. Using data from 1947 to 1994, they find some evidence of expansionary monetary policy before U.S. Presidential elections in the pre-1972 period but no evidence in the post-1972 period. They run similar regressions with output and unemployment as the dependent variable and get coefficients that are correctly signed to confirm an opportunistic political business cycle in the post-1972 era but insignificant. Their approach does not control for other things happening in the economy, so an electoral cycle in even the intermediate targets of monetary policy (monetary aggregates or interest rates) is difficult to identify.

aggregates in the 1970s and 1980s by passively accommodating an active electoral cycle in fiscal policy.[6]

Empirical evidence to support the accommodators' position comes from Beck (1987), who finds that "While there is a cycle in the money supply, there is no cycle in monetary instruments. The monetary cycle disappears when fiscal policy is held constant. It appears as though the Fed passively accommodates fiscally induced political monetary cycles, but does not actively cause such cycles."[7] Drawing on this evidence, Drazen (2001) proposes a political-business-cycle model in which the interaction between a fiscal and monetary authority causes an electoral cycle in monetary aggregates: The monetary authority passively accommodates an electoral cycle in fiscal policy. Drazen calls this model the "active-fiscal-passive-monetary" ($AFPM$) political-business-cycle model.

[6]The empirical PBC literature distinguishes between tests for electoral cycles in the outcomes and in the instruments of policy. A large literature has tested for electoral cycles in macroeconomic aggregate outcomes and has found evidence supporting the Nordhaus model in many countries. Alesina et al (1997) find post-electoral increases in inflation for a number of OECD countries in the post-war period. Tests of the Nordhaus model in the United States produce more mixed results. See Alesina et al (1997) and Drazen (2000). The evidence on macroeconomic outcomes shows a partisan effect in real GDP growth, but as my sample contains an equal number of republican and democratic administrations, this is unlikely to bias my results. That is, from 1949 through 1996, GDP growth has almost invariably been higher in the second and third year of a democratic administration than of a republican administration (with the exception of Reagan's second term). The evidence on other macroeconomic outcomes, most notably, the variation in inflation across democratic or republican administrations, does not support the predictions of the partisan effects model. In my data, the partisan affiliation of the administrations considered is split equally between democrats and republicans with one ambiguous case, a republican administration whose macroeconomic outcomes look much like those of a democratic administration, that is, the second term of Ronald Reagan from 1984 through 1988. Hence, partisan effects in macroeconomic outcomes should be quite weak in the sample as a whole, and are unlikely to affect the central result.

[7]Beck (1987), p. 194. Other tests for electoral cycles in the instruments of U.S. fiscal and monetary policy give mixed results. Several papers find evidence of an electoral cycle in U.S. monetary aggregates. Grier (1989) and Williams (1990) find that growth in U.S. monetary aggregates follows an electoral cycle through the mid-1980s. For fiscal policy, Alesina et al (1997) provide evidence that federal transfers to individuals (net of contributions to social insurance) exhibit an electoral cycle in the 1960-to-1994 period. The literature finds no evidence of partisan effects in monetary or fiscal policy instruments over the time period of my sample. Alesina, Roubini, and Cohen (1997) find no evidence of partisan electoral effects in money growth or in fiscal policy in the 1961-1994 period. Faust and Irons (1999) and Sheffrin (1989) also find little or no support for partisan effects operating through U.S. monetary policy in the post-WWII period.

This paper tests Drazen's *AFPM* model using the Fed's internal forecasts as a benchmark for monetary policy. That is, the Fed should respond to its own internal forecasts in the same way before an election as at other times. And because the Fed's forecasts incorporate a sophisticated forecast of the future path of fiscal policy, as well as information about other macroeconomic variables, they give us a unique control for other things happening in the economy that is missing from previous studies. Finally, using *FOMC* members' votes allows a more direct test for an electoral cycle in monetary instruments than previous tests on those instruments' intermediate targets such as monetary aggregates or interest rates. *FOMC* votes represent the most direct measure of the intentions of monetary policymakers. By contrast, the monetary aggregates and interest rates used by Beck (1987), Alesina, Roubini, and Cohen (1997), and others can be affected by factors other than Fed intentions such as shifts in bond-market expectations or changes in banking regulations.

I focus on the post-1972 period to address the most interesting unanswered question in the literature: to what extent has the Fed responded to political pressure in the post-1972 era? I find evidence to support the accommodators' position in the full sample and in the post-1972 period: for a given set of values of their internal forecasts, the *FOMC* appears less likely to vote to tighten monetary policy in the period preceding a presidential election than at other times. These results hold both for individual committee members' votes and for votes of the committee as a whole.

2 A Simple Model of *FOMC* Voting Behavior

A simple economic model of the voting behavior of *FOMC* members serves as a basis for a probit estimation. Suppose we observe *t=1,...,T* committee votes. *FOMC* committee member i maximizes a social welfare function W by choosing an optimal monetary policy ω_i at vote t given the current forecasted values of inflation and real output growth:

$$\max_{\omega_{it}} W(x_t, \pi_t, z_t, \varepsilon_{it}) = x_t\beta + \phi\pi_t + \alpha z_t + \varepsilon_{it} \tag{1}$$

where x_t and π_t represent the forecast for real output growth and inflation at committee vote t, respectively, z_t represents a political externality that affects the social-welfare calculation in the period preceding a presidential election, and ε_{it} captures idiosyncratic factors that may affect the social-welfare calculation but that are not included in the other variables.

Transcripts of *FOMC* meetings reveal that the committee almost never considers a vote to tighten and a vote to loosen at the same meeting. The committee invariably limits itself to a binary choice: either to tighten or leave policy unchanged or to loosen or leave policy unchanged. This narrative evidence motivates estimation of the model's coefficients in two separate procedures: one to obtain coefficients for the determinants of votes to tighten and a second to obtain coefficients for votes to loosen.

I model the vote of member i on committee vote t as a discrete dependent variable y_{it} with $Prob(y_{it} = 1|x_t, \pi_t, z_t, \varepsilon_{it}) = F(x_t\beta + \phi\pi_t + \alpha z_t + \varepsilon_{it})$. There are two alternative policy responses in each of two voting regimes: to tighten policy or to leave policy unchanged in the first regime, and to loosen policy or to leave policy unchanged in the second regime.

Coefficients in the model represent changes in the probability of a vote to tighten (or loosen) relative to a vote not to change for given values of the independent variables. To test for political-business-cycle effects in the committee's voting behavior, I identify z_t as an election dummy for the year leading up to each presidential election in the sample.

3 Data

My data consist of the voting histories of individual *FOMC* members from 1973 through 1994 and the *FOMC*'s internal forecasts for real GNP growth and inflation.[8] The data represent the nineteen potential voting members at each *FOMC* meeting: the twelve regional Federal Reserve Bank presidents and the seven Board governors.[9] On average there are ten meetings per year at which twelve voting members choose to raise, lower, or maintain the prevailing federal-funds rate in open-market operations. Members' votes are recorded as two dichotomous variables: a loosening vote equals 1 if the member votes to loosen and 0 otherwise: a tightening vote equals 1 if the member votes to tighten and 0 otherwise.

Over the sample period four individuals served as chairman: Arthur Burns from 1970 through 1977; C. William Miller from January 1978 through mid-1979; Paul Volcker from June 1979 through July 1987, and Alan Greenspan from July 1987 to the present. Table 1 reports the exact dates of each chairman's term and the dates of presidential elections in the

[8]The data also contain real-GDP-growth forecasts, but for a much shorter time period, and employment forecasts, which give very similar results when substituted for real-GNP-growth forecasts in the estimation.

[9]I thank Geoff Tootell of the Federal Reserve Bank of Boston for graciously making the data available to me. The seven board governors (including the chairman) and the president of the New York Fed vote at each meeting. The other four voting slots rotate between the presidents of the other eleven regional banks.

Table 1: *Terms of Recent FOMC Chairmen and the Dates of Presidential Elections*

Chair	Dates of Tenure	Presidential Elections
Arthur Burns	February 1970 to January 1978	November 1972 & 1976
C. William Miller	January 1978 to June 1979	
Paul Volcker	June 1979 to July 1987	November 1980 & 1984
Alan Greenspan	July 1987 to present	November 1988 & 1992

sample. There are five elections in the post-1972 sample.[10]

3.1 Forecasts

The *FOMC*'s internal forecast, known as "*the Green Book*", is circulated before each *FOMC* meeting. It contains the Board staff's projections of the time path of such macroeconomic variables as inflation, real GNP growth, and unemployment for one to four quarters in the future. As a historical document, the *Green Book* is a record in real time of the Board staff's expectations of the future course of domestic economic variables. *FOMC* members receive the latest *Green Book* forecast several days before each *FOMC* meeting and the Board's staff of economists also presents the key points at the *FOMC* meeting.

Using the *Green Book* forecasts as a benchmark against which to measure the votes of the *FOMC* lets us determine whether voting behavior differs in periods preceding an election relative to other periods for given values of the internal forecasts. *Green Book* forecasts are not a mechanical extrapolation from a simple macroeconomic model; they draw on a

[10] The time period I can consider is limited by availability of the *Green Book* forecasts.

wide array of information, both quantitative and qualitative, and they include a detailed projection of the future path of fiscal policy. Although the *Green Book* forecasts do not necessarily replicate each committee member's expectations with respect to future economic activity, they are the best existing proxy for members' information set. Several authors have used the *Green Book* forecasts to proxy for the collective expectations of *FOMC* members, notably Tootell (1991, 1996) and Chappell and McGregor (2000).

My use of the *Green Book* forecasts as a benchmark for monetary policy builds on the political-business-cycle literature in several ways. First, a forecast made in real time is a better proxy for the information available to *FOMC* members than is a forecast based on ex-post data.[11] A real-time forecast captures aspects of the committee's expectations that are conditional on the information available to them and possibly difficult to capture later. A sophisticated forecast should also be a better proxy for the committee's collective expectations than a mechanical extrapolation from a simple macroeconomic model, which some previous studies use.[12] The *Green Book* forecasts incorporate a sophisticated model of expected future changes in fiscal policy that a mechanical extrapolation cannot hope to capture.[13]

[11] Stark and Croushore (2002) describe the shortcomings of forecasts based on "the final, revised data, rather than the data that were available to economic agents who were making forecasts in real time" (p. 1).

[12] For example, Chappell et al (1993) proxy for committee members' expectations with the "predicted values from a rolling regression of equations explaining each of the target variables from 1960 to 1987" (p. 193).

[13] Even among sophisticated forecasts, the *Green Book* forecasts are quite good. Recent empirical work finds that *Green Book* forecasts capture the time path of key macroeconomic variables more accurately than do private forecasts. Romer and Romer (2000) find that *Green Book* inflation forecasts were more accurate than private inflation forecasts from 1965 through 1991. They find somewhat weaker evidence that the *Green Book* output forecasts were more accurate than private output forecasts over the same period. Similarly, Gavin and Mandal (2001) find that private-sector blue-chip consensus forecasts stand in well for the *Green Book*'s forecasts for output growth, but not for inflation over the 1965-to-1995 period. To the extent that FOMC members have had anecdotal evidence of the superior performance of the *Green Book* relative to private-sector forecasts, they were likely to view its predictions as more accurate than than outside forecasts.

Table 2: *Summary Statistics from the Green Book*

	Mean	Median	Standard Deviation	Min	Max
Real-GNP-Growth Forecast	2.3	2.6	2.7	-6.1	8.5
Inflation Forecast	5.6	5.1	2.0	2.7	11.5
Votes to Tighten	.22	0	.41	0	1
Votes to Loosen	.15	0	.36	0	1

Table 2 summarizes the *Green Book* data. The forecast variables generally appear to have reasonable magnitudes. I use the two-quarter-ahead forecast, considered more accurate than longer-term forecasts and more relevant than shorter-term forecasts that fail to capture the long lags with which monetary policy affects the economy. The real-GNP-growth forecast has a mean of 2.3 percent with a standard deviation of 2.7 percent, while the inflation forecast has a mean of 5.6 with a standard deviation of 2 percent. For the committee as a whole, 22 percent of votes tighten monetary policy, 15 percent loosen monetary policy, and the remaining 63 percent make no change in policy.

4 Econometric Model

This section describes the econometric procedures used the estimate the model's parameters.

4.1 Probit Model

I identify the model as a probit model, using a simple probit specification to analyze the committee's voting behavior. This means the committee's choice probabilities are derived

under the assumption that the error term ε_t from equation (1) is distributed normal with a mean vector of zero and covariance matrix Ω. That is, idiosyncratic factors that may affect the committee's voting probabilities but that are not directly observable by the econometrician are assumed to be normally distributed: $\varepsilon = (\varepsilon_{1,\ldots,}\varepsilon_T) \sim \Phi(0, \Omega)$where $\Phi(\cdot)$ is the cumulative normal distribution. The probability that the committee on vote t chooses to tighten (or, in the second estimation, to loosen) policy is given by $F(x_t\beta + \phi\pi_t + \alpha z_t + \varepsilon_t) = \Phi(x_t\beta + \phi\pi_t + \alpha z_t + \varepsilon_t)$ and the log-likelihood function is:

$$\ln L = \sum_{y_t=0} \ln\left[1 - \Phi(x_t\beta + \phi\pi_t + \alpha z_t + \varepsilon_t)\right] + \sum_{y_t=1} \ln \Phi(x_t\beta + \phi\pi_t + \alpha z_t + \varepsilon_t)$$

Because the Fed moves gradually, one might expect to observe some serial correlation in the error term, even after controlling for the information available to *FOMC* members before each vote. To address this issue, I obtain the Newey-West estimate of the covariance matrix of the parameters which is efficient in the presence of heteroscedastic and first-order autocorrelated residuals.

I use a pooled estimator to analyze the panel data with the individual *FOMC* members' votes. Likelihood-ratio tests for panel-level variability indicate that estimation using a pooled estimator – that is, a simple probit – is efficient.[14] A question that arises with the panel

[14]The estimates of the Wald test statistic for the joint null hypothesis of identical intercept coefficients across voting members of 30.68 and 26.68, for the tightening and loosening regressions respectively, do not exceed the 99% critical value of 33.41 for the chi-square cumulative distribution function with 17 degrees of freedom. Wald tests do not reject the joint null hypotheses of identical slope coefficients across *FOMC* members on each of the forecast variables either. For the loosening regression, the estimates for the Wald test statistics of 9.23 and 23.57, for the real-GNP-growth and inflation forecasts respectively, do not exceed the $\chi^2(17)$ 95% critical value of 27.59. For the tightening regression, the estimates of the Wald test statistics of 18.61 and 24.07, for the real-GNP-growth and inflation forecasts respectively, do not exceed the $\chi^2(17)$ 95% critical value of 27.59. Wald tests of the election dummies do not reject the null hypothesis of identical member coefficients in any of the regressions.

data is whether individual *FOMC* members vote independently of the chairman. To address this issue, I correct the standard errors for clustering of the observations at each vote, thus allowing for correlation across members' behavior at an individual vote.

Why consider the votes of individual *FOMC* members at all? While the chairman clearly exerts influence over other *FOMC* members, the frequency of dissenting votes indicates that they retain some independence. It is thus of interest to consider the determinants of individual members' votes, as well as those of the chairman, to see if they differ, particularly in the period before an election.

5 Results

Table 3 presents the marginal effects of the forecast variables and the election dummy on committee votes. Each column corresponds to a separate probit regression in which I regress an *FOMC* voting dummy on the two-quarter-ahead forecasts of real GNP growth and inflation and on an election dummy. The coefficients represent the partial effect of the variable x_j on the probability of a vote to tighten (or to loosen) – that is, the estimated marginal change in the probability of a vote for the continuous variables (the forecasts of inflation and real GNP growth) and the estimated discrete change in the probability of a vote for the dummy variable (the election dummy). Because the probit model is a nonlinear model, each regressor's partial effect depends on the values of all the regressors x. The sample averages of the regressors are used to calculate the marginal effects reported in Table 3.

The coefficients are generally significant and signed as one would expect for the behavioral model of *FOMC* members presented above. As inflation or real-GNP-growth forecasts rise,

the probability rises that the committee will vote to tighten policy. At the mean values of the forecast variables, a 1-percent rise in the inflation forecast makes the committee about 3.5 percent more likely to vote to tighten policy, and a 1-percent rise in the real-GNP-growth forecast makes the committee about 2.2 percent more likely to vote to tighten policy. Similarly, a small rise in the inflation or real-GNP-growth forecast diminishes the probability that the committee will vote to loosen policy. At the mean values of the forecast variables, a 1-percent rise in the inflation forecast makes the committee 3.4 percent less likely to vote to loosen policy, and a 1-percent rise in the real-GNP-growth forecast makes the committee almost 5 percent less likely to vote to loosen policy.

These marginal effects can vary considerably as each regressor becomes very small or very large. As the inflation forecast rises from its minimum value of 2.7 to its maximum value of 11.5, it contributes 28 percent to the voting probability when the real-GNP-growth forecast is at its median value, and 35 percent when it is at its maximum value. Similarly, as the real-GNP-growth forecast rises from its minimum value of -6.1 to its maximum value of 8.5 it contributes 22 percent to the voting probability when the inflation forecast is at its median value and 36 percent when it is at its maximum value.

Votes to tighten policy exhibit an electoral cycle that is statistically significant. Committee members are 12.3 percent less likely to vote to tighten policy in the year preceding an election than at other times for given values of their internal forecasts. That is, the discrete effect of the election dummy switching from 0 to 1 reduces the probability of a vote to tighten by 12.3 percent in the year before an election when the two forecast variables are at their mean values. The election dummy's coefficient is significant at the $p<10$-percent

level. When both forecast variables are at their maximum values, the discrete effect of the year-ahead election dummy is -18.6 percent on the probability of a vote to tighten. When both forecast variables are at their minimum values, the discrete effect of the year-ahead election dummy is -9.2 percent.

Votes to loosen policy do not exhibit an electoral cycle that is statistically significant. Column (2) of Table 3 reports that the marginal-effects coefficient on the electoral-cycle dummy in the loosening estimation is positively signed for the year preceding the election, at 4.2 percent but is not significant.

Table 4 reports results from estimation of the voting model for individual committee members. The marginal effects of each of the variables on members' voting probabilities appear roughly equal to their effects on the committee as a whole. The increase in statistical power from the larger sample size is reflected in the fact that all three variables are now significant at the $p<1$-percent level for votes to tighten.[15] Committee members are 13.7 percent less likely to vote to tighten policy in the year before a presidential election than at other times for given values of the *Green Book* forecasts. That is, the votes of individual *FOMC* members exhibit a dead spot before presidential elections.[16]

While suggestive, these results may be an artifact of macroeconomic variables left uncontrolled that could affect voting behavior, such as fiscal policy or oil-price shocks. As

[15] The sample size for the committee as a whole is 203 observations, while that for the individual committee members is 2319 observations.

[16] The committee's voting behavior may differ in the period following an election as well. If the committee is less likely to vote to tighten policy in the period preceding an election than at other times, then it may be more likely to vote to tighten policy following the election. The voting model indicates that committee members are 4.7 percent more likely to tighten policy in the year following an election than at other times for given values of their internal forecasts. This result is not robust to the addition of other fiscal-policy variables to the regression, however.

the *Green Book* forecasts control for important trends in other macroeconomic variables, adding additional macroeconomic variables to the model should affect the coefficients on the forecast variables due to collinearity, but not the election dummy's coefficients. To test the robustness of the results of interest in Tables 3 and 4, I re-estimate the model for votes to tighten with variables that should affect voting behavior if they are not already controlled for in the forecasts. The results support the contention that the Fed's staff incorporates a range of macroeconomic shocks into their forecasts of inflation and real-GNP growth. Columns (1) and (3) of Table 5 report results with an oil-price-shock dummy and columns (2) and (4) report results with the only measure of fiscal policy that clearly exhibits an electoral cycle over the sample period, the federal government's net transfers to individuals relative to GNP.[17]

These additional variables do not affect the significance (or the sign) of the election dummy in any of the regressions reported in Table 5. The oil-price-shock variable is not significant in either of the regressions reported in columns (1) and (3). Including the oil-price-shock dummy causes the standard error on the inflation forecast to rise slightly in both the committee and the panel data. The fiscal-policy variable has little effect on any of the variables' coefficients or significance. It is negatively signed at -.047 and significant at the 5-percent level for the panel data. As net transfers to individuals rise as a share of GNP, the committee is less likely to vote to tighten. However, it is still less likely to vote to tighten in the year before an election than at other times, for given values of its internal forecasts.

A final robustness check considers the econometric implications of a possible feedback

[17] Alesina, Roubini, and Cohen (1997) find evidence of an electoral cycle in this variable in the 1961-1994 period.

effect from *FOMC* votes to the *Green Book* forecast. That is, the regressors may be weakly exogenous. Dealing with weakly exogenous regressors is not trivial given the nonlinear structure of the model. One can test for weak exogeneity of the regressors using a procedure developed by Smith and Blundell (1986).[18] Using the Smith-Blundell procedure, I am able to reject the null hypothesis of weak exogeneity for both the inflation forecast and the real-GNP-growth forecast. The appendix reports these results with an explanation of the Smith-Blundell procedure.

The main empirical finding is consistent with Drazen's *AFPM* political-business-cycle model. The results also support the empirical findings of Beck (1987) who argued that the Fed accommodated an electoral cycle in fiscal spending over the 1961-to-1984 period.

5.1 Discussion

What institutional practice generates this passive electoral cycle in monetary policy? As others have speculated, the *FOMC* may be less willing to act to tighten policy preceding a presidential election to avoid accusations of meddling in the political process. As Beck notes, *FOMC* members may regard it as improper for the Fed to counter an electoral cycle in fiscal policy created by elected officials. Alternatively, *FOMC* members may be averse to the type of fine-tuning policy that would be necessary to compensate for the electoral cycle in net transfers. Finally, the timing of the chairman's appointment to four-year terms may leave the *FOMC* vulnerable to presidential political pressure. Starting with the appointment of

[18] Smith and Blundell substitute residuals ν from a first-stage regression of a potentially endogenous variable x on suitable instruments (for example, its own lagged value) into a structural nonlinear function. This procedure yields a simple test for weak exogeneity of the regressors.

Paul Volcker by President Carter in 1979, *FOMC* chairmen have been appointed to terms that conclude in the period preceding a presidential election. A sitting chairman could conceivably seek to help an incumbent by exploiting the short-term Phillips-curve trade-off in the period before his possible reappointment.

6 Conclusion

The large theoretical literature on political business cycles dates back to the 1970s. The theory has not previously been tested using *FOMC* votes, in part because there was little information available about the determinants of such votes. By estimating a model of *FOMC* voting functions using new data that have become available only in the past few years, this paper provides a more direct test of an electoral cycle in monetary instruments than previous studies' tests on those instruments' intermediate targets, such as monetary aggregates or interest rates. The model shows that *FOMC* members are less likely to vote to tighten monetary policy in the year preceding a presidential election than in other years for given values of their internal forecasts. These results build on the work of Drazen (2001) and Beck (1987) arguing that the Fed accommodated an active electoral cycle in fiscal policy in the post-1972 period.

Table 3: *FOMC Votes Exhibit a Dead Spot Before Presidential Elections, 1973-1994*[1,2]

Vote	Tighten	Loosen
Before the Election	1 year	1 year
Real-GNP-Growth Forecast	.022	−.048
	(1.78)*	(3.16)**
Inflation Forecast	.033	−.034
	(1.69)*	(2.43)**
Electoral-Cycle Dummy	−.123	.042
	(1.84)*	(.76)
Pseudo R^2	.04	.13
Log Likelihood	−102.03	−74.43

[1] *Each column presents the results of a probit regression in which the dependent variable is a voting dummy. The tables report the estimated marginal change in the probability for the continuous variables (the forecasts of inflation and real GNP growth) and the estimated discrete change for the dummy variable (the electoral-cycle dummy).*

[2] *The sample size in all regressions is 203 observations. The absolute values of Z-statistics are reported in parentheses and are calculated using Newey-West robust standard errors which are corrected for first-order autocorrelation. Those starred are significant at the *10-percent or **5-percent level.*

Table 4: *FOMC Members' Votes Exhibit a Dead Spot Before Elections, 1973-1994*[1,2]

Vote	Tighten	Loosen
Before the Election	1 year	1 year
Real-GNP-Growth Forecast	.020	−.046
	(4.45)**	(8.60)**
Inflation Forecast	.036	−.031
	(5.16)**	(5.98)**
Electoral-Cycle Dummy	−.137	.033
	(5.41)**	(1.35)
Pseudo R^2	.04	.11
Log Likelihood	−1212.34	−887.79

[1] *Each column presents the results of a probit regression in which the dependent variable is a voting dummy. The tables report the estimated marginal change in the probability for the continuous variables (the forecasts of inflation and real GNP growth) and the estimated discrete change for the dummy variable (the electoral-cycle dummy).*

[2] *The sample size in all regressions is 2319 observations. The absolute values of Z-statistics are reported in parentheses and are calculated using Newey-West robust standard errors which are corrected for first-order autocorrelation and for clustering of the observations at each vote. Those starred are significant at the *5-percent or **1-percent level.*

Table 5: *Robustness Checks on Votes to Tighten Before Elections, 1973-1994*[1,2]

	(1)	(2)	(3)	(4)
Before the Election	1 year	1 year	1 year	1 year
Real-GNP-Growth Forecast	.022	.025	.022	.023
	(1.68)*	(1.92)*	(4.53)**	(4.88)**
Inflation Forecast	.034	.034	.033	.037
	(1.52)	(1.69)*	(3.98)**	(5.18)**
Electoral-Cycle Dummy	−.122	−.122	−.138	−.137
	(1.83)*	(1.86)*	(5.43)**	(5.46)**
Oil-Price-Shock Dummy	−.013		.031	
	(.12)		(.73)	
Fiscal Policy		−.040		−.047
		(1.00)		(3.09)**
Pseudo R^2	.04	.04	.04	.05
Log Likelihood	−102.03	−101.52	−1211.97	−1204.79
Observations	203	203	2319	2319

[1] *Each column presents the results of a probit regression in which the dependent variable is a voting dummy. The tables report the estimated marginal change in the probability for the continuous variables (the forecasts of inflation and real GNP growth and the fiscal-policy variable) and the estimated discrete change for the dummy variable (the electoral-cycle dummy). The fiscal-policy variable is federal transfers to individuals net of contributions to social insurance relative to GNP. Data are annual and detrended. Source: Bureau of Economic Analysis, U.S. Department of Commerce. The oil-price-shock dummy is 1 in the periods of rapid increases in oil prices, that is, the last three months of 1973 and the years of 1974, 1979, and 1980.*

[2] *The absolute values of Z-statistics are reported in parentheses and are calculated using Newey-West robust standard errors which are corrected for first-order autocorrelation for both samples and for clustering of observations at votes for the panel data. Those starred are significant at the *10-percent or **5-percent level.*

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A Smith-Blundell Test

This appendix describes the Smith-Blundell (1986) procedure to test for weak exogeneity of the regressors. The Smith-Blundell estimator is computed in a two-step procedure in which one model is embedded in another:

$$\text{Model 1:} \qquad E\left\{y_1|x_{,}\theta_1\right\}$$

$$\text{Model 2:} \qquad E\left\{y_2|w_{,}v,\theta_2,E\left(y_1|x_{,}\theta_1\right)\right\}$$

where θ_1 is a $q \times 1$ vector of parameters associated with the $n \times q$ matrix of variables $X = \{x_1,...x_q\}$, θ_2 is a $p \times 1$ vector of parameters associated with the $n \times p-1$ matrix of variables $W = \{w_1,...w_p\}$, v is an $n \times 1$ regressor estimated in the first stage and used in the second stage, that is, the Smith-Blundell (hereafter, SB) estimator, and $\delta = \{W, v\}$ is an $n \times p$ matrix of variables. SB (1986) show that one can substitute the residuals from a first-stage regression of a potentially weakly exogenous variable x on its lagged value into a structural nonlinear function. The procedure yields a simple test for weak exogeneity of the regressors, that is, the t-test significance on the residuals in the second-estimation, as well as identification of nonlinear structural parameters in the case of weak exogeneity. Table 6 reports the SB weak-exogeneity tests for the inflation and real-output-growth forecast variables. I am able to reject the null hypothesis of weak exogeneity for both the inflation and the real-output-growth forecasts.

The Variance-Covariance Matrix for the SB Estimator

In the two-step procedure, one estimates the parameters of the first model θ_1, and then the parameters of the second model θ_2 conditional on the results of the initial estimation by maximizing the conditional log-likelihood:

$$\pounds_{2|1} = \sum_{i=1}^{n} \ln f \left\{ y_{2i} | \delta_i, \theta_2, \left(x_i, \widehat{\theta}_1 \right) \right\}$$

The variance estimator for the second-stage model must reflect the fact that one of the regressors has been estimated using $\left(x_i, \widehat{\theta}_1 \right)$. Let $\pounds_1$ specify the marginal log-likelihood function for the first-stage model, a normal linear regression model, and $\pounds_{2|1}$ the conditional log-likelihood function for the second-stage model, a probit model. The log-likelihood function for the first-stage model is $\pounds_1 = \sum_{i=1}^{n} \ln(\phi(x_i\theta_1))$ where ϕ is the normal density and for the second-stage model is $\pounds_{2|1} = \sum_{y_{2i}=0} \ln(\Phi(\delta_i\theta_2)) + \sum_{y_{2i}=1} \ln(1 - \Phi(\delta_i\theta_2))$ where Φ is the cumulative normal distribution. The adjusted variance matrix V_{2a} for the second-stage model is given by:

$$V_{2a} = V_2 + V_2 (C V_1 C') V_2$$

where $V_1 = \left[E \left\{ \left(\frac{\partial \pounds_1}{\partial \theta_1} \right) \left(\frac{\partial \pounds_1}{\partial \theta_1'} \right) \right\} \right]^{-1}$ is the $q \times q$ asymptotic variance matrix of $\widehat{\theta}_1$, $V_2 = \left[E \left\{ \left(\frac{\partial \pounds_2}{\partial \theta_2} \right) \left(\frac{\partial \pounds_2}{\partial \theta_2'} \right) \right\} \right]^{-1}$ is the $p \times p$ asymptotic variance matrix of $\widehat{\theta}_2$, and $C = E \left\{ \left(\frac{\partial \pounds_2}{\partial \theta_2} \right) \left(\frac{\partial \pounds_2}{\partial \theta_1'} \right) \right\}$ is a $p \times q$ matrix. These matrices are given by,

$$
\begin{aligned}
C &= \theta_{2v_i} \frac{1}{N} \sum_{i=1}^{n} \frac{\phi^2}{\Phi\left(1-\Phi\right)} \begin{pmatrix} x_i w_i' \\ \widehat{v}_i w_i' \end{pmatrix} \\
V_2 &= \frac{1}{N} \sum_{i=1}^{n} \frac{\phi^2}{\Phi\left(1-\Phi\right)} \begin{pmatrix} w_i w_i' & w_i' \widehat{v}_i \\ w_i' \widehat{v}_i & \widehat{v}_i' \widehat{v}_i \end{pmatrix} \\
V_1 &= \left(X'X\right)^{-1} \left(\frac{N}{(N-1)} \sum_{i=1}^{n} u_i' u_i x_i' x_i \right) \left(X'X\right)^{-1}
\end{aligned}
$$

where θ_{2vi} is the estimated coefficient on the generated regressor $\widehat{v}$ in the second stage and V_1 is computed using the robust sandwich variance estimator with $u_i = y_{1i} - \widehat{y}_{1i}$.

Table 6: *Smith-Blundell Test for Weak Exogeneity of Forecast Variables, 1973-1994*[1,2]

Vote	Tighten		Loosen	
Real GNP Growth Forecast	.021	.022	−.047	−.038
	(1.62)	(1.65)*	(3.01)**	(2.30)**
Inflation Forecast	.025	.033	−.033	−.033
	(1.20)	(1.69)*	(2.17)**	(2.39)**
Inflation BS Residual	.066		−.008	
	(1.56)		(.21)	
GNP BS Residual		.003		−.042
		(.13)		(1.58)
Electoral-Cycle Dummy	−.121	−.123	.041	.039
	(1.81)*	(1.85)*	(.75)	(.75)
Pseudo R^2	.05	.04	.13	.15
Log Likelihood	−101.17	−102.03	−74.41	−72.55

[18] *Each column gives the marginal effects coefficients from a probit regression where the dependent variable is a voting dummy. The tables report the estimated marginal change in the probability for the continuous variables (the forecasts of inflation and real GNP growth and the residual variable) and the estimated discrete change for the dummy variable (the electoral-cycle dummy).*

[18] *The sample size in all regressions is 203 observations. The absolute values of Z-statistics are reported in parentheses and are calculated using Newey-West robust standard errors which are corrected for first-order autocorrelation. Those starred are significant at the *10-percent or **5-percent level.*