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Partisan politics and Fed policy choices: A Taylor rule approach

Abstract

How do the President and the Congress affect the policy choices of the Federal Reserve System? I draw on a commonly used tool for estimating the sensitivity of Fed responses to output and inflation - the Tayor rule - to learn about the politics of monetary policy. The Taylor rule provides a convenient way to determine if Fed choices can be explained by the partisan makeup of Congress and the White House. Does the Fed respond more aggressively to inflation under a Republican President or if a Republican majority controls Congress? Does the Fed respond to recession sooner and with lower interest rates if the President is a Democrat? The results indicate changes in the pivotal legislator-- as described by Morris (2000) - influence monetary policy choices, rather than the President alone, appointment to the Board, or the Board chairman. Congress and the President jointly influence the policy choices of the Fed in ways that benefit the core constituencies of the major parties. The Fed is systematically more responsive to inflation when a Republicans control the White House and the Congress.

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Macroeconomic and Monetary Politics

A surprising number of recent efforts to link macroeconomic outcomes to politics suppress the institutions of monetary policy and existence of the central bank. Lohmann (1999) describes the perils of democratic control over monetary policy -- a combination of time consistency problems and electoral incentives -- that compel elected officials to manipulate the economy. But Lohmann assumes that incumbent elected officials control (albeit imperfectly) the level of inflation. This simplification of the political economy is deliberate and understandable. Introducing a highly uncertain or even mildly unresponsive mechanism of political control over economic outcomes would complicate the empirical evaluation of the model and also complicate the formal treatment. Williams (1990) adopts a similar strategy. Institutions of monetary politics -- appointments, hearings, informal mechanisms of -- are omitted in his approach and the Fed is presumed to respond to demands for monetary policy expansion or contraction -- "If the Federal Reserve understands the political needs of the Presidency, it may be willing to help the President" (Williams 1990:769). He finds weak evidence of partisan differences in monetary policy preferences, modest effects of elections on monetary policy outputs, but a significant link between declines in Presidential approval and declines in short-term interest rates. In a comprehensive joint model of election results and macroeconomic outcomes, Alesina, Londegran, and Rosenthal (1993) also adopt an approach free of the institutions of monetary policy. The President and the Congress jointly set the inflation rate. Each of these models is highly useful, in the sense that they instruct us about the importance of careful attention to the design of monetary institutions and highlight the temptations that seduce elected officials to engineer monetary surprises. But each relies on the assumption that elected officials control macroeconomic policy variables -- this assumption suggests that the empirical question of "who controls monetary policy" has been answered. In fact, the empirical debate is by no means settled.

Political science research frequently takes as a starting point the presumption that influence of the Fed is quite difficult -- institutions of monetary policy were originally crafted to frustrate political influence over monetary policy, precisely the type of influence that the macroeconomic models assume as a matter of fact. Morris (2000) provides the most systematic and nuanced account of relations between the Fed and political actors. His work builds on efforts to understand Presidential influence (notably Beck 1984 and Woolley 1988) and the impact of Congress (Grier 1991). Other work focuses on the impact of appointments to the FOMC (Chappell, Havrilesky and MacGregor 1993) and the influence of particular Chairmen of the Board of Governors of the Federal Reserve System (Woolley 1984; Kettl 1985).

One promising feature of the recent work on macroeconomic policy is the rich exchange of models across economics and political science. Williams (1990) extends the research agenda on Vector Autoregression (VAR) macroeconomic modelling outlined in Sims (1980). Londegran, Alesina, and Rosenthal (1993) integrate a canonical rational expectations model of the economy (Fischer 1977) with separated political institutions sharing powers and competitive two-party elections. Lohmann revives the classical Political Business Cycle model of Nordhaus (1975), but develops the model in a rational expectations framework that exploits recent advances in macroeconomics (Barro and Gordon 1983). An important omission in this exchange is a consideration of how the growing and influential literature on *monetary policy rules* can inform our understanding of the link between politics and the economy. The search for optimal policy rules has generated an extensive literature on "rules versus discretion." In a classic work, Kyland

and Prescott (1977) demonstrated that policy rules systematically outperform dynamic optimization strategies that leave discretion for future actors to update policy choices. Taylor (1993) applies this theoretical insight to practical monetary policy choices. The Taylor rule, explicated in the 1993 paper, prescribes a particular value for short-term interest rates contingent on inflation and output. Observed outcomes, short-term interest rates, can be used to estimate how the Fed responds to inflation and output shocks in particular periods. This framework provides an explicit (and simple) specification for modeling short-term interest rates and provides enormous empirical leverage over the question of who controls monetary policy.

Are Fed responses to shocks in inflation and output consistent with expectations rooted in theories of political control of the Fed? The objective of this paper is to exploit the Taylor rule framework to draw inferences about the influence of the President, the Congress, and individual Chairmen and members of the Board of Governors of the Fed on short-term interest rates. The paper proceeds in three parts. First, I describe the Taylor rule and the data and assumptions that are used in conventional applications. Second, I work through an example, an application of the rule based on Taylor (1999). Finally, I estimate Taylor rule adjustment parameters corresponding to periods of Democratic and Republican control of the White House, to periods of control by different Fed chairs, to periods where Democratic appointees were a distinct minority or nominal majority on the Board of Governors, and to periods where legislators pivotal to potential legislative sanction of the Fed are conservative or liberal. The results indicate that changes in the legislative pivot exert a tremendous influence on monetary policy choices at the central bank. This suggests that the assumptions of the macroeconomic politics literature are correct - incumbents influence policy instruments - but that influence is not strictly a function of the preferences of the President.

The Taylor rule

Taylor (notably 1993) develops a simple interest rate rule for evaluating monetary policy choices. The interest rate rule prescribes short-term changes in a target lending rate (in the U.S., the federal funds rate) as a function of deviations of observed inflation from target inflation and deviations of economic output from potential output. The short-term rate of interest (the federal funds rate, r) is a function of two observed quantities: the inflation rate (π) and deviation from real output (y). Four components of the model are treated as constants: a pair of adjustment parameters (h, the adjustment parameter that applies to inflation, and g, the adjustment parameter that applies to output), the equilibrium real rate of interest (r^f), and optimal level of inflation (π^*). The deviation from real potential output (y) is simply the percentage difference between potential GDP and actual GDP.

(1) $$r=\pi+gy+h(\pi - \pi^*)+ r^f$$

This model is not identified. Two assumptions are necessary to reduce the number of parameters to be estimated to two. In most applications of the rule (representative is Taylor 1999), the target inflation rate, π^*, is assumed to be at or near two percent and the real interest rate is also assumed to be at or near two percent. Substituting assumed constants ($\pi^*=2.0$, $r^f=2.0$) and rearranging terms from equation (1), a simple nonlinear model is identified. Adjustment parameters g and h can be estimated given data y}, p and r.

(2) $$r = 2.0-1.0h+(1.0+h)\pi+gy$$

Woodford (2001) provides an assessment of the Taylor rule framework and identifies open empirical questions related to the development of optimal policy rules. He develops micro-foundations for the Taylor rule framework, linking the behavior of interest rates under a Taylor rule to the loss function of a representative household. Woodford also considers the merits of assumptions such as a constant equilibrium rate of real interest and alternative measures of output deviations. There remains uncertainty over the utility of the Taylor rule as fixed rule for policy choice (Benhabib, Schmitt-Grohe, & Uribe, 2001) and about the value of adding real exchange rate shocks to the rule (Taylor 2001). Nevertheless, the simple Taylor rule is a workhorse policy rule for the evaluation and description of the monetary policy choices of the Fed (FRB-SF and Cleveland cites).

The Taylor rule provides a convenient tool for investigating the politics of monetary policy. In one sense, the rule greatly simplifies econometric investigation. One common strategy for estimating the impact of politics on monetary policy is to specify a reaction function for the nominal or real federal funds rate (Morris 2000; Woolley 1988) or other intermediate policy targets (Beck 1984; Grier 1991). The problem with this approach is that there is no consensus about the appropriate instrument or target or about what variables (and at what lags) should enter the reaction function on the right hand side -- does the Fed respond to net exports, unemployment, Gross Domestic Product (GDP) growth rate, inflation, elections, party control of Congress or other financial market or political variables? Specification of the reaction function requires fairly strong assumptions about what does or does not influence the decisions of FOMC members. Not surprisingly, evidence about Presidential and congressional influence over monetary policy choices is somewhat ambiguous -- different reaction functions suggest different dominant actors and different substantive effects of politics. The Taylor rule represents a set of broadly shared assumptions about what should and does affect the behavior of short-term interest rates. Assessment of the impact of political actors is therefore possible in a framework that is widely used in macroeconomics.

Fed responses to inflation and output shocks: expectations

Hibbs (1987) describes how the two major political parties in the United States approach macroeconomic policy choices with different preferences over inflation and output. Since the two major parties have constituents with different types of economic circumstances, the two parties adopt different approaches to managing the macroeconomy. Republican voters tend to be wealthier and more highly educated than Democratic voters, suggesting that Republicans are insecure about the erosion of wealth due to chronic inflation. Democratic voters are wary of unemployment due to the failure of the economy to grow. Republicans politicians are therefore inflation-averse and more willing than Democrats to tolerate downwards shocks in output (recession) in order to maintain price stability. Democrats are more likely to tolerate upwards shocks in inflation in order to maintain high output. Alesina and Sachs (1988) find strong empirical support for these partisan differences. Alesina, Londgran, and Rosenthal (1993) further suggest that, since inflation represents an implicit tax, the political party with the most interest in expanding public sector spending would prefer higher levels of inflation.

These preferences over macroeconomic outcomes have direct empirical analogues in the Taylor rule adjustment parameters. An inflation-averse central bank would respond aggressively to deviation of observed inflation from the target, implying a high value for *h*. A central bank fundamentally committed to output stabilization would respond aggressively to deviations from output, implying a high value for *g*. We would expect the influence of Republican politicians over central bank choices to be reflected in high values of *h* relative to *g*. We would expect the influence of Democratic politicians to be reflected in low values of *h* relative to *g*.

By estimating the adjustment parameters implied by a simple Taylor rule, the magnitude of Presidential influence, Congressional influence, and the preferences of the postwar Chairmen and the Board of Governors can be directly compared. Most empirical work on monetary politics models interest rates as a function of political variables and economic controls (recently, see Caporale and Grier 1998). A dummy variable for Presidential control of the White House and/or some measure of Congressional ideology is tested for influence over interest rates. This approach presumes that – all other beings equal – liberal members of Congress and Democratic prefer higher interest rates over lower interest rates. This does not adequately capture partisan preferences over monetary policy outcomes. In the Taylor rules framework, neither central bankers nor elected officials have preferences over interest rates per se, but instead over the way that the Fed responds to shocks in inflation and output. If theories of monetary politics are accurate, these adjustment parameters should reflect the preferences of the dominant political actors -- which might be the President, the Chairman of the Board of Governors, the broader Federal Open Market Committee, or members of Congress.

Data

Only three time series are required to estimate the adjustment parameters of a Taylor rule -- the nominal short-term interest rate targeted by the central bank (r), a measure of inflation (π), and a measure of output deviation (y). The short-term interest rate is the federal funds rate. There are a number of alternative inflation measures -- the annual percent change in the Consumer Price Index, the Personal Consumption Expenditure (PCE) deflator, or a Gross Domestic Product (GDP) deflator. The St. Louis Federal Reserve Bank relies on the PCE measure in their monthly Monetary Trends report of Taylor rule rate prescriptions. Taylor (1999) relies on the GDP deflator and that measure is adopted for this paper. Inflation is the year-over-year change in the GDP deflator. Output is real GDP. Output deviation is measured by smoothing the real GDP with a spline smoother (specifically, the Hodrick-Prescott filter) and calculating the percentage that actual GDP deviates from the smoothed series. There is still an active debate in macroeconomics over what output measures and what smoother are optimal (Woodford 2001, Orphanides and Norden 2001), but the approach adopted for this paper is fairly conventional.

In a departure from existing work, I use real-time or "vintage" data for output and inflation measures. GDP data and the price deflator are issued in preliminary form and subject to revision over time. Currently available data may not suggest the same direction or magnitude of economic growth or price inflation as the preliminary data.. Vintage data, described in detail in Croushore and Stark (2001), are published by the Philadelphia Federal Reserve Bank. Vintage data capture the most recent release of price and output data available to policy makers at the Fed. Orphanides (2003) reports important differences in estimates of Taylor rule parameters if real time date are used in the place of current series.

Evaluating policy choices: an example

Taylor (1999) proposes an optimal monetary rule that prescribes a value of 0.5 for the two adjustment parameters. Figure 1 plots the actual federal funds rate from the 1st quarter of 1965 through the 4th quarter of 2005 and the prescribed funds rate (solid line) for the same period. The prescribed fund rate is obtained via equation (2) with the prescribed values for *g* and *h* and observed quarterly data *y* and π. The discrepancy between the prescribed rule and the observed federal funds rate suggests that the Fed may have been following a much different policy rule in the 1970s. Taylor claims that Fed mistakes are apparent in the 1970s -- the federal funds rates remained consistently below the optimal level prescribed by the rule.

[Figure 1 about here]

Taylor (1999) estimates the Taylor rule adjustment parameters for three distinct periods. Estimates for the same periods, based on the data used for this paper (and roughly consistent with estimates reported by Taylor), are summarized in Table 1. The estimates indicate that Fed responses to inflation through the 1960s and 1970s were consistently in the wrong direction prescribed by the Taylor rule. Increases in inflation were accompanied by decreases in the federal funds rate. Taylor characterizes this response as "exactly the wrong policy response." (Taylor 1999: 331) This application of the Taylor rule used data for a relatively long period of time (40 quarters or more) to estimate the adjustment parameters. The sample period (first quarter, 1954 to third quarter, 1997) is somewhat arbitrary and the sample spans periods where we might expect quite different monetary policy choices. Choices made in the 1960s under Fed chair William Martin and President Lyndon Johnson are likely to be different than choices made under Fed chair Arthur Burns and President Richard Nixon in the 1970s.

[Table 1 about here]

As an alternative to Taylor's strategy of aggregating over discrete periods of time, I estimate the adjustment parameters using quarterly observations selected on the basis of shared sources of potential political influence. The intuition is that if the preferences and identity of the relevant political actors are fixed in each sample and if those actors influence the Fed, then estimated adjustment parameters should be stable and be an accurate indicator of the preferences of those actors. Consistent with the literature on the politics of macroeconomic policy, the expectation is that incumbents determine adjustment parameters and therefore exercise indirect and imperfect control of macroeconomic outcomes generated by monetary policy. If adjustment parameters do not vary as the identity of elected officials changes, then the assumption of incumbent control is, at best, suspect.

Modeling Fed responses to inflation and output shocks

Presidential influence

Presidents, via the bully pulpit and the simple power of appointment, are expected to influence the timing and degree of interest rate activity by the Fed. Presidents appoint members of the Board of Governors and, from that Board, the Chairman. Presidential selection of the central actor at the Fed, the Chairman, and a large minority (5/12) of the principal policymaking organization in the central bank (the Federal Open Market Committee or FOMC) leads to

opportunities for Presidents to influence monetary policy. Havrilesky (1988) investigates a second of avenue of influence -- moral suasion. He finds that Presidential statements over monetary policy preferences (as reported in the Wall Street Journal) influence the growth rate of the simply money aggregates, key intermediate targets of Fed monetary policy. Beck (1984) estimates the extent of Presidential influence using a reaction function for adjusted bank reserves and finds that Presidential influence is substantial and that monetary restraint is less likely under a Democratic President. He does not, however, find that the Fed responds differently to inflation and output under Democratic or Republican Presidents.

Using a simple Taylor rule, we would expect that adjustment parameters are updated as either new appointments reshape the Federal Open Market Committee or as the Fed accommodates the preferences of the White House. The empirical implication, in a Taylor rule framework, is clear. The Fed should raise the adjustment parameter on inflation when a Republican enters the White House or as Republican appointees appear on the FOMC. The Fed should raise the adjustment parameter on output when a Democrat enters the White House or as Democratic appointees appear on the FOMC. If the adjustment parameters do not change as the White House switches from Republican control to Democratic control and back again, then it is unlikely that Presidents influence monetary policy.

Estimated adjustment parameters for each party are reported in Table 2. Consistent with expectations, the adjustment parameter for inflation is higher when a Republican is in the White House. Paradoxically, Republicans respond more aggressively to shocks in output, contrary to expectations. The estimates indicate that responses to changes in output and inflation will be very small when a Democrat is in the White House.

[Table 2 about here.]

Figure 2 displays the predicted path of the federal funds rate under exclusive control of a Democratic or Republican President for the entire period. The series in the figure indicate how the Fed would respond to given levels of inflation and output at each quarter. The simulated path does not have any dynamic properties -- the interest rate in one period does not affect output or inflation in the next. Each path simply describes how the Fed under a Republican or Democratic President would respond to the combination of output and inflation observed at each quarter. Surprisingly (given the differences in the coefficients) the paths are not substantially different. The mean federal funds rate is 0.41 points higher under Republican Presidents and the variation slightly larger under Republican Presidents. There are periods when the simulated funds rate under Republican Presidents exceeds the rate under Democratic presidents by more than 3% (third quarter of 1985) but also periods when the simulated funds rate for Democratic Presidents is by more than 3% (first quarter of 1975). Overall, the differences in the simulated paths are small.

[Figure 2 about here.]

Congressional influence

Grier (1991) and Morris (2000) suggest that much of the work on monetary politics neglects the role of Congress in shaping monetary policy. Grier uses a statistical model of growth in the money aggregates to demonstrate the influence of the Senate Banking Committee on Fed policy choices. Morris develops a multiple-principal single-agent model of monetary policy choice

where Fed decision makers evaluate the preferences of the House, the Senate, and the President in making choices about real interest rates. Using a simple pair of assumptions -- FOMC members are more inflation-averse than Presidents and Republican Presidents are more-inflation-averse than Democratic Presidents, Morris demonstrates that the member of Congress with the veto power over legislative sanctions to the Fed varies both as a function of changing ideological make-up of Congress and the party of the President.

Adopting an approach similar in spirit to Krehbiel (1998), Morris identifies the individual legislator under Democratic and Republican Presidents that serves as the legislative *pivot* -- the member that can support or block a legislative sanction of the Fed. The most conservative of either the median voter in the House or the median voter in the Senate is the pivot under Democratic Presidents; the most conservative of either the potential veto override voter in the House or the Senate is the pivot under Republican Presidents. The presumption is that inflation-averse FOMC members will press for more aggressive monetary restraint, typically in the form of higher interest rates. Under a Democratic President, if the Fed increases interest rates to levels above those acceptable to the median legislator in the Congress, then legislation to discipline the Fed will be passed in the Congress and supported by the President. Under a Republican President, similar legislation would be vetoed. But if the Fed increased interest rates to levels above those acceptable to the legislator pivotal to the veto, then the veto would be sustained. The Fed therefore shifts toward greater restraint under Republican Presidents, but only to the extent that the veto pivot permits. Morris, using a reaction function for the real federal funds rate and measures of congressional preferences based on ADA scores, finds empirical support for this multiple-agent model of monetary policy making.

Using a measure of congressional ideology based on roll call votes (the first dimension Poole-Rosenthal common space coordinate), I construct a pivot measure to test the sensitivity of the Taylor rule adjustment parameters to changes this joint measure of congressional preferences and party control of the White House. The estimation technique for generating common space coordinates is described in Poole (1998). The common space coordinates - based on W-NOMINATE scores - permit comparison across chambers and across Congresses. The pivot variable takes on unique values for each Congress, which makes it difficult to estimate the direct relationship between the adjustment parameters and the pivot variable. The sample period is instead separated into three segments -- when the value of the pivot variable is high (indicating a highly conservative pivotal legislator), close to the mean (zero, indicating a moderate pivotal legislator) and low (indicating a liberal pivotal legislator). Estimated adjustment parameters at each level are reported in Table 9.

[Table 3 about here]

The pivot variable clearly captures a substantial amount of information about the variation in adjustment parameters. When the pivot is a conservative, the central bank is much more aggressive in responding to inflation and output shocks. Somewhat inconsistent with expectations, higher levels of sensitivity to inflation do not necessarily mean that output shocks will be neglected. Since both the inflation and output adjustment parameters are higher when the pivot is conservative, interest rates are somewhat more volatile interest rates when the pivot is conservative (see Table 8). The simulated paths of the federal funds rate under a conservative pivotal legislator and a liberal pivotal legislator are displayed as Figure 3.

[Figure 3 about here]

Interest rates would have been substantially higher and more volatile in the 1970s had the pivotal legislator been conservative. The pivot measure is highly correlated with indicators of party control of the White House. When the legislative pivot is liberal, the White House is occupied by a Democrat in 100% of the cases. When the pivot is conservative, the White House is occupied by a Republican in 87% of the cases. But, differences in the pivot account for much larger changes to adjustment parameters and much larger differences in simulated funds rates than changes in the party of the President alone. These results provide further empirical support for the findings of Morris (2000) and suggest that incumbents do have influence over monetary and macroeconomic policy, but that influence is not a direct function of the preferences of the President.

Impact of the Chairman and appointments to the Board

Kettl (1986) concludes that the Chairman of the Board of Governors of the Federal Reserve System, as the political leader of the central bank, exercises substantial influence over the decisions of the FOMC and the conduct of monetary policy. If this is the case, then we would expect to see variation in adjustment parameters consistent with changes in the identity of the chair. This assumes that the Fed chair can dominate or influence recent appointees to the Board. Chappell, Havrilesky, & MacGregor (1993) conclude that the voting behavior of members of the Board of Governors appointed by Republican and Democratic presidents differs systematically, with Democratic appointees favoring greater monetary ease and Republican appointees favoring greater monetary restraint. In later work, Chappell and MacGregor (2000) conclude that the differences across appointees from the same party may in fact be large. Instead of attempting to trace the influence of each new appointee on adjustment parameters, I appeal to the results of the 1993 work by Chappell et al and treat each appointee as a modal Democrat or modal Republican. If the policy bias of Republican and Democratic appointees conforms to the expected partisan differences outlined above and these appointees influence central bank operating practice, then adjustment parameters should reflect partisan composition of the Board, not the influence of an individual chair. Addition of Democratic nominees to the Board of Governors should reduce the sensitivity of the Fed to inflation (lowers values of h) and increase sensitivity of the Fed to deviations from output (higher values of g).

Estimates of adjustment parameters are reported below first for each of the postwar chairman and second by the number of Democratic appointees to the Board of Governors. There are no instances after 1954 when more than five Democratic appointees sat on the Board of Governors.

[Table 4 about here]

The identity of the Chairman influences adjustment parameters and the suggested effects are consistent with the observations of Taylor about differences in periods and with conventional descriptions of the orientations of the Chairmen toward inflation. Volcker and Greenspan are distinguished from previous chairs by their strong bias against inflation, but this is also accompanied by high adjustment parameters for output deviations. Under Volcker, Greenspan and Volcker, adjustment parameters loosely conform to the prescriptions of Taylor (positive responses in the federal funds rate to above trend growth in GDP or inflation exceeding the inflation target). During the tenure of Arthur Burns, the Fed responded in the opposite direction prescribed by the rule, lowering the federal funds rate in the face of inflation. Simulated paths for

the federal funds rate using adjustment parameters identical to Burns and Greenspan are displayed in Figure 4.

[Figure 4 about here]

Differences between the two paths are substantial, but limited mainly to periods of accelerating or high inflation from the late 1960s to the early 1980s. The large and statistically significant differences in adjustment parameters seem to indicate the substantial power and influence of the Chair. One surprising result that emerges from the each set of estimates is that not only are interest rates higher when the Fed is inflation-averse (values of *h* are large and positive) but interest rates are also more volatile. Since the values of the second adjustment parameter are positively correlated with the first, the standard deviation of the interest rate is much higher when the Fed is inflation-averse (see Table 8).

Estimates of adjustment parameters under different numbers of Democratic appointees are summarized in Table 5. The number of Democrat appointees to the Board has curious effects on the adjustment parameters. More Democratic appointees should lead to changes in the adjustment parameters that indicate more attention to output deviations and less attention to inflation above target levels. Instead, the inflation adjustment parameter increases, suggesting that responses to inflation are more consistent with anti-inflationary bias when the Board is made up of a majority of Democratic appointees. The only statistically significant and positive values of *h* are observed when there is a majority of Democrats on the seven member Board. Paradoxically, when the Board of Governors is split between four Democrats and three Republicans, the adjustment parameters conform precisely to the prescription for the federal funds rate proposed in Taylor (1999).

[Table 5 about here]

The simulated paths of the federal funds rate given a Board with zero and four Democratic appointees are displayed as Figure 6. The Democratic-majority Board of Governors would be expected to keep interest rates nearly a full point higher, on average, than a Republican dominated Board in nearly every quarter in the sample. This result is puzzling if we expect Board members to share the preferences of their appointing President and for Board members to influence policy choices at the Fed.

[Figure 5 about here]

Who controls the Fed?

Estimates of the shared influence of President and Congress and the impact of the Board members and the Chair suggest two competing explanations for variation in adjustment parameters over time. Do the Chair and the Board exercise control over central bank choices or does the Fed accommodate the Congress and the President? Inspection of the relationship between the preferences of the pivotal legislator, the composition of the Board, and the identity of the Chairman reveals that changes in the pivotal legislator may trigger changes in monetary policy choices.

The level of the pivot variable for each of the postwar chairs of the Fed is displayed in Table 6.

[Table 6 about here]

If the pivotal legislator constrains the otherwise inflation-averse Fed, then Paul Volcker had by far the greatest discretion to move the federal funds rate upward in response to inflation. Miller and Burns faced a liberal Congress and both ended their term under a Democratic President, Carter. It may be the case that individual Fed chairs have less discretion than meets the eye. Taylor rule adjustment parameters conform, for each Chair, to preferences of the pivotal legislator. High short-term interest rates persisted under Paul Volcker since political incumbents expected the Fed to control inflation (the Republican majority in the Senate and a Republican President).

The influence of the pivotal legislator also helps to explain the puzzling results observed for the effects of Democratic appointees. Why would the addition of more Democratic appointees increase the sensitivity of the Fed to inflation? Table 7 reports the distribution of the legislative pivot across boards as the number of Democratic appointees ranges from zero to five.

[Table 7 about here]

The table indicates that the lag of the appointment power (Board appointments are for fourteen year terms) creates a frequent clash between the party majority on the Board and the ideological orientation of the pivotal legislator. The pivotal legislator is, on average, most conservative when Democratic appointees occupy four seats (a simple majority) on the Board. This accounts for the puzzling result observed above where a Democratic majority Board responds in ways we would expect Republican appointees to respond.

The pivotal legislator, not the preferences of the Board members, accounts for changes in values of the adjustment parameters. When the pivotal legislator is conservative, the Fed responds more aggressively to deviations from the target inflation rate.

Conclusion

The Taylor rule framework provides a convenient and simple way to investigate the impact of politics on monetary policy. It is clear that central bank adjustment parameters -- which capture the way that the central bank balances adjustments to shocks in inflation and output - vary over time. Taylor (1999) uses a simple two period approach (comparing adjustment parameters in the 1950s to adjustment parameters in the 1980s) to identify monetary policy failure in the earlier period. By relying on features of the political environment to aggregate observations, rather than sample periods, mechanisms of political influence can be explored.

The estimated impact of Congress, the White House and the Fed Chair on adjustment parameters suggests a number of important results. First, assumptions of incumbent control over monetary policy, a hallmark of the literature on macroeconomics and politics, may be satisfied in practice. Incumbent control, however, does not represent the simple preferences of the President, but a more subtle construction (the pivot) that reflects the shared power of President and Congress to sanction the Fed via legislation. The pivotal legislator changed 24 times in the postwar period. The largest downward (more liberal) shifts in the value of the pivot (which places the Fed in jeopardy of legislative sanctions for excessively high interest rates) occurred in the first half of the Carter Administration and the first half of the Johnson Administration. Congress actively considered formal reform of the Fed in both periods and, in fact, passed both the Federal Reserve Reform Act of 1977 and the Humphrey-Hawkins Act during Carter's term. Two of the largest upward shocks in the pivotal legislator (implying opportunities for Fed action to increase rates to

combat inflation) occurred in 1953 and 1981. In fact, interest rates in these periods were consistently above those prescribed by a simple Taylor rule -- and the three highest values of the federal funds rate in the sample period were observed in the first three of quarters of 1981.

The explanatory power of changes in the pivotal legislator, first outlined in Morris (2000), is fairly broad: The observed effects of changes in the pivotal legislator are consistent with expectations grounded in standard accounts of partisan differences over macroeconomic and monetary policy. The Fed is more inflation-averse when the pivot is conservative. Changes in the pivotal legislator explain why different chairs appear to have important and distinctive preferences. Conservative pivots dominated the tenure of Volcker and Greenspan; liberal pivots dominated the tenure of Burns and Miller. Changes in the pivotal legislator explain why partisan differences in appointees are often difficult to identify. In the postwar period, the pivotal legislator and the Board majority are consistently mismatched. Boards dominated by Democrats face a conservative pivot; Boards dominated by Republicans face a liberal pivot. If the Taylor rule framework offers a useful way to discriminate between different types of monetary policy regimes that are observed in the United States after 1950, then the source of changes to these regimes must lie squarely in the partisan make-up of Congress and party control of the White House.

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Table 1. Taylor rule adjustment parameters

	1965.4-79.4	1987.1-97.3	1965.4-97.3
Inflation (*h*)	-0.17**	0.63**	0.15**
	(0.05)	(0.11)	(0.05)
Output (*g)*	0.50**	0.43**	0.50**
	(0.12)	(0.21)	(0.12)
R^2	0.82	0.91	0.81
N	57	34	119

Notes: sample periods similar to Taylor (1999), standard errors in parentheses

Table 2. Taylor rule adjustment parameters by party of the President.

	Republican President	Democratic President
Inflation (*h*)	0.24**	0.07
	(0.07)	(0.06)
Output (*g*)	0.74**	-0.01
	(0.15)	(0.17)
R^2	0.82	0.90
N	97	54

Table 3. Adjustment parameters by level of legislative pivot.

	Conservative Pivot	Moderate Pivot	Liberal Pivot
Inflation (*h*)	0.66**	0.23**	-0.17**
	(0.07)	(0.07)	(0.06)
Output (*g*)	0.43**	0.70**	0.35**
	(0.17)	(0.15)	(0.17)
R^2	0.92	0.90	0.85
N	53	53	45

Table 4. Adjustment parameters by Board Chairman

	Martin	Burns	Miller	Volcker	Greenspan
Inflation (*h*)	0.22**	-0.25**	0.01	0.60**	0.41**
	(0.10)	0.08)	(0.08)	(0.05)	(0.13)
Output (*g*)	0.16	0.49**	-0.42	0.76**	0.42**
	(0.31)	(0.14)	(0.33)	(0.17)	(0.20)
R^2	0.94	0.86	0.99	0.97	0.78
N	17	32	6	32	63

Notes: Standard errors in parentheses. ** designates $p<0.05$.
Martin estimates for 4th quarter 1965 to end of term. Others include data for the entire term.

Table 5. Adjustment parameters by number of Democratic appointees

	Number of Democratic appointees					
	0	1	2	3	4	5
Inflation (*h*)	-0.23**	0.09	-0.12	0.15*	0.52**	0.80**
	(0.10)	(0.13)	(0.14)	(0.08)	(0.10)	(0.27)
Output (*g*)	0.36**	-0.48	0.92**	0.87**	0.44	1.63
	(0.23)	(0.48)	(0.24)	(0.15)	(0.30)	(1.11)
R^2	0.76	0.95	0.92	0.92	0.96	0.97
N	37	8	27	31	20	7

Table 6. Distribution of legislative pivot, by chair

Chair	Conservative Pivot	Moderate Pivot	Liberal Pivot
Martin (from 65:4)	32.3%	16.1%	51.6%
Burns	0.0%	62.5%	37.5%
Miller	0.0%	0.0%	100.0%
Volcker	81.3%	0.0%	18.7%
Greenspan	35.2%	54.0%	10.8%

Table 7. Distribution of legislative pivot by number of Democratic appointees

Number of Democratic Appointments	Conservative Pivot	Moderate Pivot	Liberal Pivot
Zero	14.6%	43.9%	41.5%
One	9.4%	37.5%	53.3%
Two	13.5%	56.8%	29.7%
Three	20.9%	55.8%	23.2%
Four	57.7%	19.2%	23.0%
Five	66.7%	0.0%	33.3%

Table 8. Summary statistics, simulated federal funds rate (1965:4-2005:4)

	Mean	Standard deviation
Republican President	6.71	2.71
Democratic President	6.30	2.66
Conservative pivot	7.61	3.84
Moderate pivot	6.70	2.71
Liberal pivot	5.80	1.84
Arthur Burns	5.62	1.62
Alan Greenspan	7.06	3.22
1 Democratic appointee	6.34	3.20
4 Democratic appointees	7.32	3.50
Actual federal funds rate	6.54	3.31

Figure 1. Actual federal funds rate compared to Taylor rule prescription.

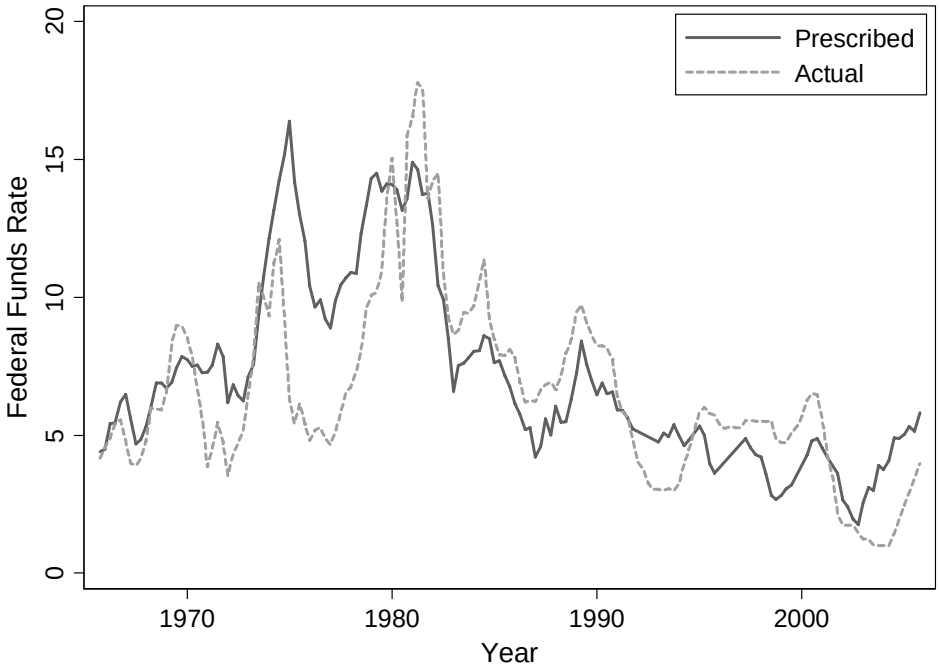

Figure 2. Simulated federal funds rate under Democratic and Republican Presidents

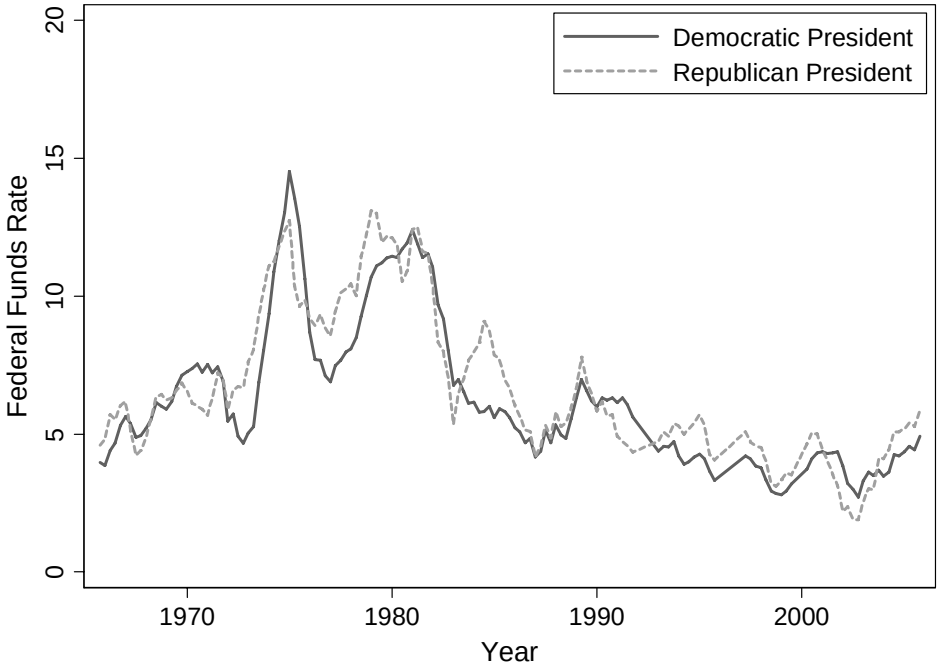

Figure 3. Simulated federal funds rate, liberal pivot versus conservative pivot

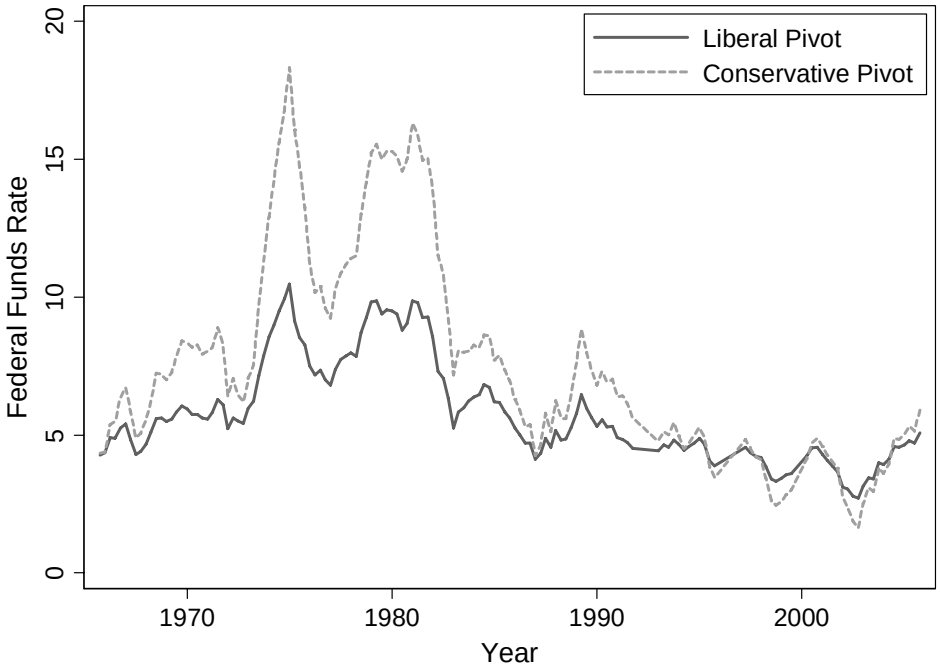

Figure 4. Simulated federal funds rate, Burns versus Greenspan.

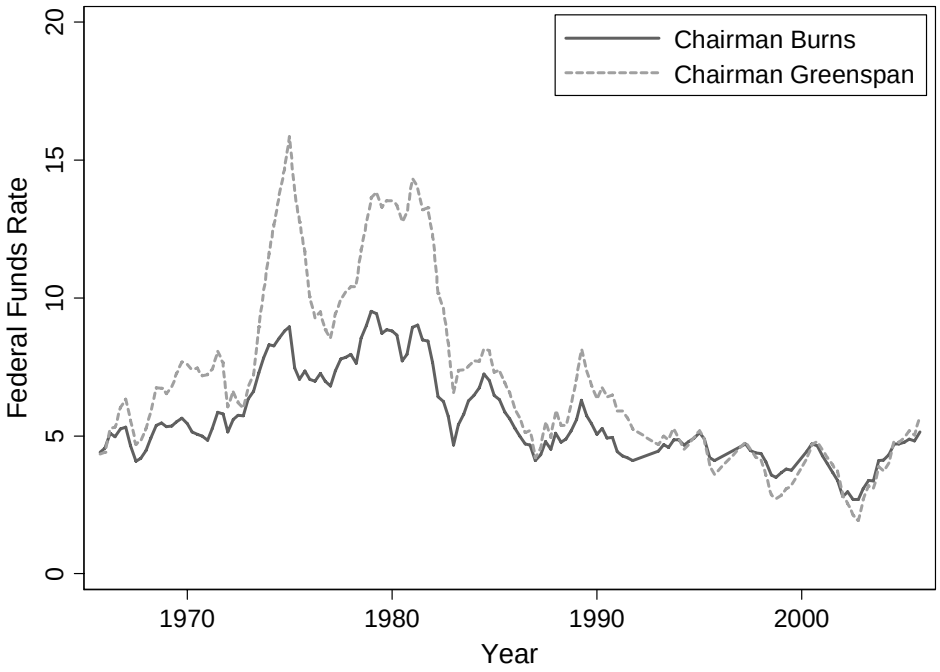

Figure 5. Simulated federal funds rate, four Democratic Board appointees versus one Democratic Board appointees