1. Introduction

In the last twenty-five years, there has been a significant amount of work on political business cycles, that is, on political determinants of macroeconomic cycles. Nordhaus (1975) presented a formal model of the political business cycle (PBC) due to opportunistic pre-electoral manipulation that became a standard reference. Soon after, Hibbs (1977) presented a model of a post-electoral cycle due to policymakers having different macroeconomic goals. This “partisan” model was subsequently extended by Chappell and Keech (1986) and Alesina (1987, 1988) to a rational expectations framework.

These models of the PBC, whether opportunistic or partisan, are based on monetary policy as the driving force. Expansionary monetary policy leads to a temporary increase in economic activity, followed with a lag by an increase in inflation. The models differ in the motivation of policymakers, as well as in the modeling of formation of expectations, and these differences led to very different types of politically induced economic cycles, but share a reliance on monetary surprises as the driving force.

As argued in Drazen (2000a, 2000b), PBC models that are based on manipulating the economy via surprise monetary policy are unconvincing both theoretically and empirically, and I review that evidence here. I further argued that for many cases explanations based on fiscal policy conform much better to the data and

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1 Rogoff and Sibert (1988) and Rogoff (1990) are exceptions.
form a stronger basis for a convincing theoretical model of electoral effects on economic outcomes. The story however is somewhat more complicated. While monetary-based models are unconvincing explanations of the political business cycle in countries with independent central banks, we sometimes see pre-electoral monetary cycles in such countries over certain time periods, with money growth expanding before elections and inflation rising after elections. Hence, a key question is how such effects can be made consistent both with independent central banks and with the apparent importance of fiscal policy in the pre-electoral behavior of incumbents.

The purpose of this paper is to present a model of the interaction of monetary and fiscal policy over an election cycle to address the theoretical and empirical shortcomings of existing models. The model is the first to incorporate separate monetary and fiscal authorities. This separation, implying that politicians no longer control monetary policy as in existing monetary-based models, is crucial for a number of reasons. It is both in sharp contrast to existing PBC models and far more institutionally realistic than the policymaking structure in those models. Moreover, it is crucial to the nature of the electoral cycle which depend on the interaction between the incumbent politician who can influence fiscal policy and an independent central bank that controls monetary aggregates and interest rates, but often faces pressure to accommodate fiscal shocks. Such pressure may account for what appears to be a monetary PBC, but may instead be a reaction to fiscal policy, leading me to term the approach the \textit{active fiscal-passive monetary} (AFPM) model of the opportunistic political business cycle.

The plan of the paper is as follows. In the next section I summarize what appear to be the principal theoretical and empirical shortcomings of PBC models based on monetary policy as the main driving force, and I present evidence in favor of a fiscal based model. In section 3, recent work on political fiscal cycles, especially in developing countries, is summarized, supporting the importance of fiscal influences in political business cycles in a wide range of countries. In section 4 I present a model of
separate monetary and fiscal authorities that combines election-influenced fiscal policy with accommodating monetary policy. Section 5 contains concluding comments. An Appendix reviews the econometric evidence.

2. An Assessment of Monetary-Based Opportunistic Political Business Cycle Models
All of the monetary-based PBC models are based on some variant of a basic three-equation framework. First, there is an equation giving the relation between changes in the rate of money growth or inflation on the one hand and economic activity on the other (a Phillips curve), where it is generally unanticipated inflation which induces changes in economic activity. Second, there is a specification of how expectations of inflation are formed. Finally, there is a specification of the policymaker's objectives, often a loss function representing the relative costs assigned to inflation versus output fluctuations. In an opportunistic model, the objective of the policymaker is to get re-elected, with this loss function representing the loss voters assign to inflation and economic activity fluctuations. Since voters decide whether or not to re-elect the incumbent on the basis of economic performance as measured by this loss function, an opportunistic incumbent chooses policy to minimize this loss in periods before the election. Hence, if voters vote on the basis of most recent economic performance, an opportunistic incumbent has the incentive to engineer a monetary surprise before an election in order to make the economy look strong when voters go to the polls. Inflation may appear only with a lag (that is, after the election), at which point contractionary policy can be used to bring down inflation and inflation expectations. This is a thumbnail characterization of political-economic dynamics in the Nordhaus model, which I will use as a prototype in this summary critique of monetary-based PBC.

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2 In a partisan model, policymakers differ in their objectives (and hence in what policies they would choose if elected), so that formation of inflation expectations reflect probabilities assigned to each party winning the election, and inflation surprises reflect pre-electoral uncertainty about election outcomes.
models.

2.1 Conceptual Criticisms

Equations like these – Phillips curve, expectation formation, and policymaker objective – are found in many non-political models of the monetary mechanism. The first problem with monetary-based models of the PBC is not the inclusion of such equations, but the way they are used in inducing a political business cycle.

First and foremost, the crucial assumption is that the incumbent running for re-election controls monetary policy, an assumption that is inconsistent with independence of central banks. Take, for example, the U.S. and the independence of the Federal Reserve. There is evidence that decisions on monetary policy in the U.S. are influenced by the executive branch (see for example, the discussion in Woolley [1984], Havrilesky [1993], or Caporale and Grier [1998]), the notion that the President can easily use monetary policy as an electoral tool simply does not fit the institutional or observed behavioral facts. However, an independent central bank cannot totally ignore the political environment in which it finds itself. A central bank may find it prudent (or "political," if you wish) to be cognizant of political pressures, especially in election years in democracies. Hence, an independent central bank may be more willing to accommodate partially the executive branch’s pressures for monetary policy during election years in order to avoid criticism. This observation is central to my whole approach.

Second, one may question the central role assigned to moving along the Phillips curve to reduce unemployment via inflation surprises. On a general level, arguing that the main cause of fluctuations in economic activity is inflation surprises does not square with our current views of determinants of economic activity (if such a view ever did). More specifically, inflation surprises are not the sole, or even the primary factor in political business cycles. The monetary-based model gives no role to fiscal policy, while, in fact, transfers and other types of fiscal policy appear to play an important role
in many episodes of pre-electoral policy manipulation. On a conceptual level, the lack of fiscal policy in an opportunistic PBC model would be surprising, as both discussions and many models of gaining political influence assign a central role to explicit or not-so-explicit transfers. The point is also empirical, for as we shall argue below, it is apparent manipulation of fiscal policy that is observed before elections.

A third problem specific to the Nordhaus model is its reliance on *irrational* behavior on the part of voters. Voters are naive, not simply in the way they form expectations of inflation (inflation expectations are backward-looking, that is, adaptive, which is what allows an opportunistic policymaker in the model to engineer an inflation surprise to increase economic activity before an election), but also in the way they assess government performance. Any voter who has lived through an election cycle in Nordhaus's world should not be fooled into voting for an opportunistic, manipulative policymaker. He will know that the pre-election period of low inflation and high economic activity will be followed by a post-election period of both high inflation and high unemployment.

Having said this, I note that the whole issue of why voters vote might respond to apparent manipulation is still very much an open research question. (This is not identical to asking why they vote on the basis of election year performance, if the latter is seen as genuine rather than simply “election-year economics.”) The fact that economic activity in the year of an election influences voters is empirically clear. Fair (1978, 1982, 1988) found that the change in real economic activity in the year of the election has a significant effect on votes for President in the United States. Looking at voting or popularity functions, Lewis-Beck (1988) found analogous results for Britain, France, West Germany, Italy and Spain, and Madsen (1980) for Denmark, Norway, and Sweden. However, as we shall see below, this isn't reflected in pre-electoral cycles.

More recent research has focused on less aggregate ways of influencing voting, for example, in Rogoff (1990), on fiscal expansion before an election as a signal of incumbent competence, or on targeted transfers aimed at specific voting groups. The
stress on fiscal policy in this paper is consistent with this approach. However, as in the case of aggregate economic activity, it is quite important in discussing pre-electoral expansion in transfers or other fiscal indicators to distinguish between the fact of pre-electoral fiscal "bulges", observed in many countries, and the explanation of why they are undertaken. That is, one can consider the monetary implications of pre-electoral fiscal expansion and election-year pressures in general without having a full model of how they affect voting patterns or even if they are opportunistically motivated. (Technically, all that the monetary authority needs to know is the “time series process” of political influences.) This is the approach of this paper.

2.2 Empirical Assessment

There have been numerous tests of the predictions of Nordhaus's opportunistic PBC model. See Drazen (2000a) for a detailed description of the econometric results or Drazen (2000b) for a shorter summary. Here, I simply summarize some key “regularities.” First, there is a general consensus that the opportunistic PBC receives little support in the pre-electoral behavior of GNP or unemployment in developed countries. There is no significant pre-electoral increase in aggregate economic activity prior to elections in either the U.S. or the OECD countries. (Figure 1 suggests one way to summarize the evidence for the U.S., though the regularities reported here are based on sifting through a large number of empirical studies.) Hence, though voters are influenced by economic conditions before an election, there is no evidence that policymakers successfully try to take advantage of this fact. (Note also that we observe the net effect of the interaction between the fiscal and the monetary authority, a point to

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3 Niskanen (1975) and Peltzman (1992) argue that voters actually punish pre-electoral fiscal expansions at the polls. Brender (1999) argues that deficits before elections may reflect poor budgeting practices as opposed to attempts to manipulate election outcomes.
which we return at the end of section 4.

The evidence on inflation and monetary instruments is less clear-cut in its rejection of the basic predictions of the opportunistic model. In many OECD countries there is a clear post-electoral increase in inflation. In the U.S., there is mixed evidence of such a post-electoral increase in inflation prior to 1979, but no evidence thereafter. Not surprisingly, the results for expansionary monetary policy before elections mirror those for inflation after elections. There is evidence of a pre-electoral increase in money growth rates in many countries (see Alesina, Cohen, and Roubini [1992]). In the U.S., there is some evidence of such an effect prior to 1980, but little evidence thereafter (Figures 2 and 3). Interestingly, there appears to be no similar electoral cycle in monetary instruments, such as reserves or the Federal Fund rate (Figure 4). For example, over the period 1960-80 Beck (1987) finds a pre-electoral cycle for M1 growth rates in the U.S., quarters before an election, but no similar statistically significant evidence of a pre-electoral effect on nonborrowed reserves or the Fed Funds rate.

To summarize this section, two central characteristics of monetary-based PBC models – active monetary policy as the key driving force; and, monetary policy that is basically chosen by politicians according to their desires – do not very well describe

4 If voters are motivated by economic benefits and governments want to win re-election, why don’t we observe attempts to influence outcomes? One reason is that it is exceedingly hard to time economic manipulation. Monetary and fiscal policy can be used only with great imprecision, so that politicians cannot expect to time the stimulus to come right before an election, with the risks associated with the benefits of expansion reaching the voters too early or too late being unacceptably high. Hence, opportunistic politicians may try to provide for continual good economic news, suggesting how to reconcile the sensitivity of voters to macroeconomic outcomes with the failure to observe pre-electoral manipulation, except perhaps by the most desperate incumbents.

5 Walsh (2000) argues that the lack of pre-electoral cycle in the Fed Funds rate averaged over postwar administrations masks significant variations across administrations, but concludes that the behavior of the real Fed Funds rate before elections is not consistent with an opportunistic PBC driven by monetary policy.
either political business cycles or central bank behavior. Countries in which political cycles are observed are often countries seen as having highly independent central banks. Hence, the view of monetary policy as being dictated by politicians doesn’t sound right. Nor does the main empirical prediction – monetary policy increasing economic activity before an election and reducing it thereafter – receive support in the data. Something else is going on, though there do appear to be monetary effects.

3. From Monetary to Fiscal Policy
An alternative approach is that fiscal policy is the key driving force in pre-electoral manipulation in many countries. Tufte (1978) documents a number of clear incidents of pre-electoral opportunistic manipulation of fiscal transfers, both social security payments and veterans’ benefits. Keech and Pak (1989) found an electoral cycle for veterans’ benefits in the United States between 1961 and 1978, but argue that it has subsequently disappeared. Similarly, Alesina (1988) shows that there was an electoral cycle in net transfers relative to GNP over the period 1961 to 1985, but that the electoral effect disappears if one extends the sample back to 1949. Alesina, Cohen, and Roubini (1992), as well as Alesina and Roubini (1990), find evidence for an opportunistic cycle in transfers, though they argue that there is no evidence of fiscal cycle for instruments other than transfers. In short, there is evidence of pre-electoral increases in transfers and other fiscal policy instruments in a number of countries. In the U.S., this appears strongest prior to 1980.

This effect appears especially strong in developing countries. In Israel, Ben-Porath (1975) shows convincingly that opportunistic policymaking in light of elections was quite consistent over the period 1952-73, with tax cuts implemented before elections, but tax increases only after. Pre-electoral fiscal manipulation was especially strong in the 1982 elections. Krueger and Turan (1993) argue that pre-electoral fiscal manipulation was common in Turkey in the period 1950-1980. Pre-electoral fiscal manipulation is common in Latin America, the increase in the quasi-fiscal deficit in
Mexico before the 1994 elections being but one of many examples. (Gonzalez [1999] shows the existence of an electoral cycle in government spending in Mexico over the period 1958-1997 in both presidential and congressional elections.) Several studies have found significant pre-electoral increases in public spending in India before elections.

Cross-country studies yield similar results. Ames (1987) presents a panel study of 17 Latin American countries in which he shows that over the period 1947-1982, government expenditures increased by 6.3% in the pre-election year and decreased by 7.6% in the year after the election. Schuknecht (1996) presents a comprehensive study of the political business cycle in 35 developing countries over the period 1970-92 and finds a clear significant effect of elections on the fiscal balance, but no significant effect on output. Block (2000) presents evidence of a political business cycle in both fiscal and monetary policy in a cross-section of 44 Sub-Saharan African countries. Gonzalez (1999) considers the relation between the level of democracy and the strength of the political cycle in a sample of 43 countries over the period 1950-97 and finds that the cycle is strongest in countries with intermediate levels of democracy. Shi and Svensson (2000) consider a sample of 123 developed and developing countries over the period 1975-95 and also find that a fiscal political business cycle is especially strong in developing countries.

Basing PBC models on fiscal rather than monetary policy addresses some basic problems for which monetary PBC models have been criticized. Fiscal policy has real effects on economic activity even if anticipated. Moreover, it can affect voting behavior even if there are no aggregate effects. Since monetary policy is not the driving force, one need not assume that the incumbent controls monetary policy. It also raises two key questions. First, how can the monetary effects that are observed be made consistent with a PBC driven by fiscal policy? Second, why do rational voters respond to pre-electoral manipulation? The model of fiscal-monetary interaction in this paper concentrates on the first question. That is, independent of explaining why fiscal policy
is used, one can try to understand the interaction of monetary and fiscal authorities to understand the monetary effects that are observed when fiscal effects are present.  

The argument explored here on reconciling fiscal and monetary effects follows Woolley (1984) and Beck (1987). They have argued that an independent central bank may be willing to accommodate the executive branch’s pressures for monetary policy during election years in order to prevent sharp movements in interest rates. They do so in order to avoid any appearance of interfering politically in the election process. Woolley, who has studied the political relation between the U.S. President and the Federal Reserve in great detail, puts it as follows: (1984, p.127)

Sherman Maisel wrote that “Federal Reserve policy has always been to avoid, if possible, taking any major monetary actions as elections approach.” This conclusion was echoed in several interviews with Federal Reserve officials. As Governor Partee put it, “if you were to ask a central banker about what he would want to see in a period prior to an election, he would say he wanted to have stability.” Stability in interest rates and the money supply would presumably keep the central bank from being dragged into partisan politics.

The Fed is not so much interested in pushing the re-election of the incumbent as in simply “laying low” during the election so as not to be subsequently criticized.

The role of monetary policy in a political cycle is more probably passive rather than active, accommodating fiscal stimuli that opportunistic policymakers may employ to affect election outcomes. The reason is that the Federal Reserve accommodates fiscal policy in an election year, so that there is a passive political monetary cycle caused by a political cycle in fiscal instruments, but the Fed does not actively induce a political cycle. As noted, Beck (1987) found a political cycle in the money supply in the United States, but no cycle in monetary instruments, and several researchers found a political cycle.

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6 In Drazen (2000b) I combine a preliminary version of the AFPM model with a Rogoff (1900) model of fiscal signaling.
fiscal cycle over the same period. Following these results, Beck regressed M1 on its on lags and on fiscal indicators and found the political cycle in the latter helped explain the cycle in the former. (Beck and Grier (1989) found that the monetary aggregate cycle peaks in the election quarter itself, when the monetary expansion shouldn’t affect outcomes. Beck argues that this is further evidence the monetary cycle reflecting accommodation rather than an attempt to actively influence election outcomes.)

I have managed to reproduce many of Beck’s result on the presence of an M1 cycle and the absence of a monetary cycle over 1960-80 in the U.S., as well as the monetary cycle peaking in the election quarter, though the results are somewhat sensitive to how one specifies the political dummy. However, the result that the pre-electoral fiscal cycle observed over the time period can explain the monetary cycle and “knocks out” the political dummy can be found, but is very sensitive to which measure of fiscal policy, which political dummy, and what lag structure is used. I discuss these results in Appendix 1 on the data, as well as results for Israel showing analogous problems in finding a fiscal-monetary cycle.

4. A Model of Monetary Accommodation of Fiscal Policy and Political Pressures

In this section, I present a model of the political business cycle illustrating the approach suggested in the previous section. A first version of this type of model was presented in Drazen (2000b), but where the key interaction between the politicians influencing fiscal policy and the monetary authority was modeled in a very simple, ad hoc manner. Here, I concentrate on more carefully modeling this interaction, the heart of the approach to the political business cycle. An incumbent politician running for re-election has some control over fiscal policy, which he will use to help his re-election prospects. (I loosely use incumbent politician", "executive", and sometimes "fiscal authority" synonymously.) The incumbent also cares about the setting of monetary policy for its implications both about social welfare and about re-election. Monetary policy is controlled by a separate monetary authority, also referred to as the "central bank". On a
conceptual level the model differs from existing models in that political cycles reflect not a single authority that controls all macroeconomic policy, but elected officials who determine fiscal policy and an independent monetary authority that controls monetary policy. This distinction is crucial, for the political cycle reflects the interaction of these separate authorities. I begin by specifying the stochastic economic environment and then the electoral environment, in which an election is held every other period. I present, as a benchmark, what monetary policy the central bank would find optimal in this stochastic environment in the absence of political constraints. I then consider desired monetary policy of both the incumbent politician and the central bank when their objective functions over inflation and economic activity differ. With the fiscal and monetary authorities desiring different monetary policy responses to supply and demand shocks, one may ask how their interaction determines what policy will be chosen in political-economic equilibrium. I consider a simple bargaining framework that yields an equilibrium in which the monetary authority accommodates the incumbent's policy desires (sometimes fully, sometimes partially) in an election period due to executive pressure and to the expectation of being allowed to carry out its preferred monetary policy in non-election periods.

4.1 Aggregate Supply of and Demand for Goods

The economy is modeled by two equations – an aggregate supply relation and an aggregate demand relation – where both demand and supply are subject to stochastic shocks. The aggregate output gap $x_t$ (the deviation of actual from potential output) is a function of unanticipated inflation:

$$x_t = \pi_t - E_t \pi_{t+1} + s_t$$  \hspace{1cm} (1)$$

where $s_t$ is a supply shock described by $s_t = \rho s_{t-1} + \varepsilon_t$, where $0 \leq \rho \leq 1$ and, where $\varepsilon_t$ is an i.i.d. mean-zero random variable. Note that it is expected future inflation, rather than
current inflation, that enters into the supply relation. This implies that inflation depends entirely on current and expected future events and displays no inertia. This formulation is consistent with (more exactly, follows from) recent work on interest rate rules, as in Clarida, Gali, and Gertler (1999). Following Calvo (1983), they show that it can be derived from optimizing behavior of monopolistically competitive firms maximizing profits subject to costs on the frequency of future price adjustments, where (1) reflects staggered price adjustment by such firms.

Aggregate demand for output (relative to potential output) is a decreasing linear function of the ex-ante real interest rate with a stochastic term $\eta_t$:

$$x_t = -\varphi(i_t - E_t\pi_{t+1}) + \eta_t$$

where $\varphi > 0$ and where $\eta_t = d_t + g_t$, where $d_t$ is an i.i.d. mean-zero random variable, and $g_t$ is fiscal policy, which depends on whether $t$ is an election or non-election period, as will be made clear below.

4.2 Electoral Structure

There is an election held at the end of every other period, with an electoral period denoted by $E$ and a non-election period denoted by $O$. The nature of the election cycle itself affects monetary policy in two ways. First, the setting of monetary policy will depend on whether the economy is in an election or non-election period. Moreover, the willingness of the monetary authority to accommodate election ($E$) period pressures and the willingness of the executive not to interfere with monetary policy in non-election ($O$) periods will depend on the expectation that $E$ periods are followed by $O$ periods and vice-versa. Hence, the specification of the electoral cycle. The absence of deviations from the cooperative equilibrium that we derive reflects an infinite horizon for the usual reasons to prevent "unravelling". (Handling this problem by introducing uncertainty about the type of policymaker that the opposing authority faces or about the probability of elections introduces complications of its own.)
The second way in which the nature of the election cycle itself affects monetary policy is due to the forward-looking nature of the supply and demand functions, which imply that policy in any period is forward-looking. Current optimal policy depends on next period's expected inflation, which depends on next period's monetary policy-setting regime. Inflation policy next period depends on the following period's regime, and so on. This makes solving a forward-looking problem in which there are expected to be elections every other period is quite complicated when the nature of election-year interaction depends on the realization of both supply and demand shocks and when shocks display persistence over time. Specifically, whether the executive's desired monetary policy is fully or partially accommodated depends on the realization of these shocks, as it should in a realistic model. This means that the monetary authority in an $O$ period must base its choices on the probability that it will partially or fully accommodate period in the subsequent $E$ period, which in turn depends on expectations of accommodation in the next election cycle, and so on.

When there is any serial dependence to shocks, this problem is intractable when there are two shocks with general distributions. To illustrate the nature of the interaction between the monetary authority and the incumbent politician in $E$ and $O$ periods with closed form solutions, I will therefore use the case of no serial correlation of supply shocks. This allows calculation of the solution for an infinitely repeated game where behavior depends on the realization of both demand and supply shocks (as well as expected future realizations). In future versions of this paper, I will explore other simplifications as well.

I begin with the benchmark case of the central bank's desired monetary policy when it faces no political pressure. This will also be useful not only as a point of comparison, but also to understand the solution method, as well as a solution aid for the other cases.
4.3 Optimal Monetary Policy without Political Constraints

The central bank assigns a loss to both inflation and output fluctuations around a target, where its target for economic activity is potential output (the natural rate of economic activity), that is, \( x = 0 \), and the target for inflation is also zero. The central bank wants to minimize the expected present discounted value of losses, represented by \( \Lambda_{CB} \), where the discount rate is \( \beta \):

\[
\Lambda_{CB} = L_{CB} + E_t(\beta L_{CB}^{t+1} + \beta^2 L_{CB}^{t+2} + \beta^3 L_{CB}^{t+3} + \ldots )
\]

where the central bank’s single-period loss function is given by:

\[
L_{CB} = \frac{\gamma x_t^2}{2} + \frac{\pi_t^2}{2}
\]

where \( \gamma > 0 \). I model central bank behavior (and voter behavior below) in terms of a loss function in part to make these results easily comparable to the existing literature on opportunistic political business cycles, which use such a set-up, and to recent work on monetary policy rules by Clarida, Gali and Gertler (1999, 2000).7

Since current policy puts no constraints on future policy, minimizing (3) subject to (1) is equivalent to minimizing \( \Lambda_{CB} \) over \( x_t \) and \( \pi_t \). This minimization yields the optimal relation between \( x_t \) and \( \pi_t \) of the form \( \pi_t = -\gamma x_t \). Combining this condition with the aggregate supply relation (1), and imposing rational expectations about future shocks and the use of the same rule at all future dates, yields \( x_t \) and \( \pi_t \) as functions of the supply shock \( s_t \), namely:

\[
\begin{align*}
\pi^B_t &= -\gamma h s_t \\
x^B_t &= h s_t
\end{align*}
\]

where \( h = (1 + \gamma(1-\rho))^{-1} = 1/(1+\gamma) \) when there is no serial correlation of shocks. The superscript “\( B \)” indicates the central bank’s first best policy. The associated interest rate

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7 Rotemberg and Woodford (1999) suggest how loss functions of the general form of (3) may be derived from utility maximization as an approximation.
This rule gives the central bank’s preferred interest rate response to supply shocks $s_t$ and demand shocks $\eta_t$ consistent with the desired output and inflation rates. This is the policy rule for interest rates derived by Clarida, Gali, and Gertler (1999). Note that demand shocks are fully offset by interest rate changes, with there being no effect on $x_t$ and on $\pi_t$.

4.4 Political Pressure (and Counter-Pressure)

With this as a background, we now consider monetary (and fiscal) policy when the incumbent politician has different policy goals than the monetary authority. What equilibrium monetary policy will be depends on the pressure the politician can place on the monetary authority to follow a policy closer to the politician’s preferences. Formally, the policy outcome depends on the nature of bargaining between the politician and the monetary authority.

There are numerous bargaining concepts. I adopt a simple framework in which it is assumed that the politician can push the monetary authority to its indifference point. The qualitative nature of the solution would not be affected by assuming that the politician and the monetary authority split the surplus from cooperation more equally. What is more important is a framework that reflects the fact that politicians care more about monetary policy in election periods (as it affects their re-election chances) than in non-election periods and the implications of this for the nature of the interaction between politician and monetary authority.

Consider the following specification of threats by politicians and possible

\[ i_t^p = - (\gamma\varphi + \frac{1}{\varphi}) hs_t + \frac{1}{\varphi} \eta_t \] (5)
“counter-pressure” by the monetary authority. To model the pressure an incumbent can impose on the monetary authority, I assume that the incumbent can threaten to impose a private cost $C$ on the central bank if desired policy is not followed. Under certain conditions (described in the next paragraph), the central bank's loss would be $L_{CB} + C$. This may represent the ability of the incumbent to criticize central bank actions and hence induce the central bank to follow a policy closer to the incumbent's desires in order to avoid criticism. I assume, to simplify the calculations, that the direct cost to the politician of imposing such pressure is zero. Making such pressure directly costly to the politician would change some of the quantitative results in ways that will probably be obvious, but have no qualitative effect on the nature of the solution. As the next paragraph makes clear, there are other costs to imposing pressure on the central bank. For ease of exposition, I use an index variable $P_t$ to indicate the politician’s choice in period $t$, where $P_t = C$ represents (the threat of) pressure in $t$, and $P_t = 0$ a policy of no pressure.

I further assume that such pressure, if applied too often, becomes ineffective. This is modeled simply as follows. In any period in which the politician applies pressure, the central bank can respond with a "complaint" $K$, which is assumed to have non-zero, but small cost to the bank, “small” to be made more explicit below. (See (A3) in Appendix 2.) Using an analogous representation to politician’s choice of whether to impose pressure, I let $CB_t$ indicate the central bank’s choice of response in period $t$, where $CB_t = K$ represents a complaint in response to pressure in $t$, and $CB_t = 0$ represents no complaint. Such a "complaint" has no effect on policy outcomes in the current period, but neutralizes political pressure in the following period, if it is applied. That is, the threat of political pressure $C$ is effective in period $t$ only if $CB_{t-1} = 0$. Hence, the cost to the politician of applying political pressure on the central bank to follow a given policy is that the bank will respond, rendering pressure ineffective if applied in the following period. Therefore, the politician must choose when to apply pressure
and not overuse it. I further assume that a central bank complaint about pressure cannot be made if no political pressure was applied in that period. That is, \( I_p = 0 \) implies that \( I_{cb} = 0 \) necessarily, meaning that the central bank cannot complain “pre-emptively.” (One could also say that complaints about pressure that has not been applied does not effectively stop the use of future pressure.)

To summarize, when the central bank is criticized or threatened with criticism, it can complain, at some cost to itself, to deflect future criticism. This formulation of criticism and response is meant to capture in a stylized way a realistic component of the interaction of politicians and the central bank in the latter's choice of monetary policy. It will also be sufficient to deliver the result that politician's influence monetary policy in election years when it is most important to them not simply by threats of criticism, but also by constraining themselves not to interfere on a regular basis.

4.5 The Incumbent’s Objectives

An incumbent cares about the social welfare of voters, but also cares about getting re-elected. We assume that the probability of getting re-elected depends on two factors: the general state of the economy and on fiscal policy directed at specific voters (“targeted expenditures”). The incumbent politician can determine these expenditures, denoted \( g \).

The implicit assumption of heterogeneous voters is made to highlight three issues crucial to a fiscal model of the PBC and to PBC models in general. First, heterogeneity of the population means that we cannot think of a policymaker as maximizing the utility of a “representative” agent. As I argue in Drazen (2000a), heterogeneity of interests is the central concept of political economy. Second, transfers can be targeted to specific groups, so that there can be a significant effect on voting as a result of fiscal manipulation without there necessarily being an effect on aggregate economic activity. Third, whether any fiscal electoral cycle has aggregate effects will
depend, among other things on the possible size of politically motivated fiscal expenditures relative to the economy as a whole and on the strength of the monetary authority relative to elected politicians.

Consider first the role of the overall state of the economy. Voters are forward looking and care about the present discounted value of the loss function, namely,

$$\Lambda_t^V = L_t^V + E_t(\beta L_{t+1}^V + \beta^2 L_{t+2}^V + \beta^3 L_{t+3}^V + \ldots)$$

(6)

The single-period loss function of average voter from macroeconomic fluctuations is:

$$L_t^V = \alpha \left(\frac{x - x^T}{2}\right)^2 + \frac{\pi_t^2}{2}$$

(7)

where $\alpha \geq \gamma$ and $x^T \geq 0$.

The first assumption means simply that voters assign a generally greater loss to output fluctuations relative to inflation fluctuations than does the central bank. This will be one of the sources of conflict between the incumbent and the monetary authority. Among other things, strict inequality will mean that the incumbent wants smaller interest rate fluctuations in response to supply shocks, consistent with the discussion of pressures on monetary policy at the end of section 3.

The difference in objectives between the central bank and voters (and hence politicians running for office who want to attract their votes) reflects the above argument on the underlying heterogeneity of interests in the economy. Different individuals could have different preferences over inflation and unemployment because of differences, for example, in relative capital and labor endowments. The differences in objectives between politicians and the central bank thus flows from the fact that they view themselves as representing different constituencies.

The second assumption is that the voters prefer a possibly higher level of economic activity than does the central bank. In many models of monetary policy controlled by an authority other than the central bank (both non-political models, such as Barro and Gordon [1983] and political models such as the Nordhaus model discussed
above), \( x^T > 0 \) imparts an inflationary bias to monetary policy. Here, there is a different purpose to including this possibility, namely to generate a desire by the incumbent for a lower interest rate response to demand shocks than the central bank would desire. (Remember that (5) implies that demand shocks are fully offset by interest rate changes. To explore this, we note first that if \( x^T \) were a constant greater than 0, one can show that the incumbent would want a higher level of economic activity on average, but would want the same response to interest rate shocks. When however \( x^T \) is a positive function of the level of the demand shock \( \eta \) (so for example, the incumbent would want the central bank not to fully offset a positive demand shock to economic activity), we will see that the incumbent desires less of an interest rate response to a demand shock than the central bank. To model this simply we assume that

\[
x^T = a \eta_i
\]

where \( 0 \leq a \leq 1 \).  

A second component of social welfare is the loss to the general voter from targeted expenditures \( g \). We represent this simply as \( \Delta(g) \), where \( \Delta' > 0 \).

The probability of re-election \( q \) depends positively on the targeted expenditures made to politically sensitive voters and negatively on the loss \( \Lambda^V \) that average voters associate with economic conditions. As discussed above, I do not investigate the microfoundations of this voter behavior. The first can be derived from a competence argument, as in Rogoff (1990), though Rogoff’s explanation is not uncontroversial. It may also reflect the effectiveness of targeted transfers aimed at specific constituencies,

---

9 An alternative assumption is that the response to demand shocks is asymmetric, that is, that the public wants positive shocks accommodated more than negative ones, so that \( x^T = \eta_i \) for \( \eta_i \geq 0 \) and \( |x^T| \leq |\eta_i| \) for \( \eta_i < 0 \).

10 Allowing this probability to depend negatively on the social loss from targeted expenditures would not change the story, as long as the net effect of such expenditures is to increase the probability of re-election.
as in Dixit and Londregan (1996). The second argument is based on the empirical findings reported above, such as Fair (1978). We write \( q \) as:

\[ q_t = q(g_t, \Lambda_t^\nu), \tag{9} \]

where the partial derivatives are \( q_g > 0 \) and \( q_{\Lambda} < 0 \). Allowing re-election probabilities to depend on past \( g \) would not change the qualitative structure of our arguments, as long as non-election period expenditures affect \( q \) by less than election period expenditures.

Denoting by \( \theta \) the value of holding office, the incumbent’s current-period objective function may then be written:

\[ \Omega_t^r = (1-\theta) (-\Lambda_t^\nu - \Delta(g_t)) + q(g_t, \Lambda_t^\nu) \theta, \tag{10} \]

in an election period \( E \) and

\[ \Omega_t^r = (1-\theta) (-\Lambda_t^\nu - \Delta(g_t)) + \theta, \tag{11} \]

in a non-election period. (A non-opportunistic policymaker, for whom \( \theta = 0 \) would maximize social welfare, with the same objective in both election and non-election years.) For simplicity, I assume that a politician looks forward only one period (for simplicity, with no discounting), so that an incumbent running for re-election does not consider how his behavior may affect elections after the upcoming one, while in an \( O \) period, the politician considers the next election. This formulation is consistent with the specification of the economy, the variables the politician controls, and the effect of pressure and counterpressure. The horizon is important only in the decision of whether or not to apply pressure on the central bank, which is discussed in section 4.8.

Since inflation is forward-looking, current economic policy cannot affect future losses directly. Note that the dependence of re-election probability on \( \Lambda^\nu \) does not in itself imply a Nordhaus cycle. First of all, inflation expectations are forward-looking (and rational), so that even if an incumbent could control monetary policy directly, he could not manipulate expectations in the way that backward-looking expectations would
imply. Second, since the monetary authority controls inflation in O period, even backward-looking expectations would not easily allow electoral manipulation.

4.6 Incumbent’s Desired Policy in an Election Year and Central Bank Accommodation

We now derive desired policy of an incumbent politician running for re-election. We begin with fiscal policy. We assume the incumbent ignores the effect of such expenditures on aggregate demand (that is, on $\eta_t$); including this effect would not change the basic point about the use of expenditures to affect re-election prospects in an election year. Differentiating (10) with respect to $g$, one obtains:

$$\theta q_g(\cdot) = (1-\theta)\Lambda'(g),$$  \hfill (12)

where we denote the solution to this as $g_P^P > 0$. Given our formulation, desired targeted expenditures in a non-election period will be zero. (We leave open the size of $g_P^P$ relative to aggregate demand and return to it as an empirical question in section 4.9.) Hence, using the definition of the demand shock $\eta_t = d_t + g_t$ given after (2), one derives $E(\eta_t) = g_P^P > 0$ in an election period and $E(\eta_t) = 0$ in a non-election period.

Desired monetary policy is found by differentiating (9) with respect to a monetary variable such as $\pi$, with the associated desired value of $x$ following from (1). This may be written:

$$\frac{\partial \Omega_t^\pi}{\partial \pi} = (\theta q_\Lambda - (1-\theta)) \frac{\partial \Lambda_t^V}{\partial \pi} = 0$$  \hfill (13)

Hence, maximizing the politician’s objective with respect to monetary policy is the same as minimizing the voter’s loss function. Note that in a non-election period, the politician also wants to minimize the loss function $\Lambda_t^V$, but with a smaller (in absolute value) weight, namely $1-\theta$, implying a lesser payoff to his desired monetary policy, as it has no re-election implications. This intuitive observation is crucial to the nature of the cooperative equilibrium across periods derived below. Note further that given the
forward-looking nature of aggregate supply and demand functions and of inflation expectations, minimizing $\Lambda^V$ is minimizing $L^V$.

We now solve for the politician’s desired monetary policy in an $E$ period on the assumption that supply shocks are serially uncorrelated ($\rho = 0$, so that $s_t = \varepsilon_t$). Given the forward-looking nature of (1), this policy will depend on the expectation of next period’s policy rule and expectations of shocks. Since the following period is an $O$ period, in which the monetary authority can choose monetary policy to minimize (3), there will be no direct effect of $\eta_{t+1}$. However, since policy in $t+1$ depends on expectations of policy in $t+2$ (another $E$ period), $E_t(\eta_{t+2}) = g^p$ will enter in, so that monetary policy in $t+1$ will depend on $g^p$. We therefore conjecture a policy rule for $t+1$ of the form:

$$\pi^o_{t+1} = -\frac{\gamma}{1+\gamma} s_{t+1} + \kappa'^o a g^p$$

where $\kappa'^o$ is a coefficient to be determined. As indicated, $g^p$ enters in because of expectations of policy at $t+2$.

Using the same methodology as in section 4.3 above, and using (14) to form $E_t(\pi_{t+1}) = \kappa'^o a g^p$, one may then derive the incumbent politician’s desired monetary policy as a function of the demand and supply shocks, namely:

$$\pi^o_t = -\frac{\alpha}{1+\alpha} (s_t - \kappa'^o a g^p) + \frac{\alpha}{1+\alpha} a \eta_t$$

$$x^o_t = \frac{1}{1+\alpha} (s_t - \kappa'^o a g^p) + \frac{\alpha}{1+\alpha} a \eta_t$$

where the $P$ superscript represents the politician's most preferred policy. Note that the politician’s desired monetary policy has a greater response of inflation to supply shocks and a lesser response of output to supply shocks than the central bank’s desired policy, as well as a greater output response to demand shocks. The associated interest rate is:
\[ i_t^p = -\frac{1}{\phi} \frac{1}{1+\alpha} s_t + \frac{1}{\phi} \frac{1+\alpha(1-\alpha)}{1+\alpha} \eta_t + (1 + \frac{1}{\phi} \frac{1}{1+\alpha}) \kappa^p a g^p \]  

(16)

Note that both terms in parentheses are lower than the analogous terms for the central bank's interest rate rule. That is, an incumbent whose behavior represents the preferences of the average voter will desire lower interest rate fluctuations in response to supply and demand shocks than would the central bank. The last term represents the interest rate response to expected future inflation.

Consistent with the discussion in section 4.4, the incumbent politician will try to induce the central bank to follow this policy by threatening to impose a cost $C$ on it if it fails to do so. We begin with the effect of political pressure on monetary policy in an election period on monetary policy when no pressure was applied in the previous period (so that the current threat is effective). Call the policy chosen by the politician $x^*, \pi^*$, where in equilibrium, it is the politician who chooses monetary policy in an election period. If the central bank follows the policy $x^*, \pi^*$, its current-period loss is $L_{CB}(x^*, \pi^*)$, while if it follows some other policy denoted $(x^D, \pi^D)$ (for deviation), the current period loss is $L_{CB}(x^D, \pi^D) + C$. The central bank’s optimal deviation is to choose a policy that minimizes (3), subject to

\[ \pi_t = \frac{\gamma}{1+\gamma} (s_t - \kappa^p a g^p) \]

(17)

\[ x_t^D = \frac{1}{1+\gamma} (s_t - \kappa^p a g^p) \]

The policy $x^*, \pi^*$ must therefore satisfy:

\[ L_{CB}(x^*, \pi^*) \leq L_{CB}(x^D, \pi^D) + C \]  

(18)

If $(x^*, \pi^*) = (x^p, \pi^p)$ satisfies this constraint, then it will be the election year policy and the central bank is said to fully accommodate political pressure on monetary policy. Substituting the definitions of $(x^p, \pi^p)$ and $(x^D, \pi^D)$ into (18), some algebra reveals that
this will be the case when:

\[
\left(\frac{\alpha}{1+\alpha}\right)^2 \left[a\eta_i - \frac{\alpha - \gamma}{\alpha(1+\gamma)}(s_i - \kappa^\alpha a^p)\right] \leq \frac{2C}{1+\gamma} \tag{19a}
\]

or:

\[
-\sqrt{\frac{2C}{1+\gamma}} \leq \left(\frac{\alpha}{1+\alpha}\right)Z_t \leq \sqrt{\frac{2C}{1+\gamma}} \tag{19b}
\]

where \(Z_t = a\eta_i - \frac{\alpha - \gamma}{\alpha(1+\gamma)}(s_i - \kappa^\alpha a^p)\) and \(\delta\) is be determined. In words, when supply and demand shocks are small enough so that the politicians desired policy is close enough to the central bank's desired policy, the threat of pressure will induce the central bank to follow \((x^p, \pi^p)\).

When (18) is violated at \((x^p, \pi^p)\), the equilibrium "compromise" policy \((x^{CO}, \pi^{CO})\) is the policy that just satisfies (18) with equality, that is:

\[L^CB_{\pi}(x^{CO}, \pi^{CO}) = L^CB_{\pi}(x^D, \pi^D) + C\] \tag{20}

Using the definition of \((x^D, \pi^D)\) and the supply function (1), this condition yields a simple expression for \(\pi^{CO}\), namely:

\[
\pi^{CO} = -\frac{\gamma}{1+\gamma}(s_i - \kappa^\alpha a^p) - \sqrt{\frac{2C}{1+\gamma}} \quad \text{for} \quad \left(\frac{\alpha}{1+\alpha}\right)Z_t > \sqrt{\frac{2C}{1+\gamma}}
\]

\[
\pi^{CO} = -\frac{\gamma}{1+\gamma}(s_i - \kappa^\alpha a^p) + \sqrt{\frac{2C}{1+\gamma}} \quad \text{for} \quad \left(\frac{\alpha}{1+\alpha}\right)Z_t < -\sqrt{\frac{2C}{1+\gamma}}
\] \tag{21}

(with the analogous expressions for \(x^{CO}\) in the two cases), where \(Z_t\) is defined after

\[L^CB_{\pi}(x^D, \pi^D) = \frac{1}{2} \frac{\gamma}{1+\gamma}(s_i - \kappa^\alpha a^p)^2\]

\[L^CB_{\pi}(x^p, \pi^p)\]
These correspond to the two branches of (19b) and are found by solving (20) and taking the relevant root. In this case we say that the central bank partially accommodates political pressure in an election period. Call these two cases $\pi^{CO-}$ and $\pi^{CO+}$ respectively. The choice of inflation in an election period in (15) and (21) as a function of the realizations of $s_t$ and $\eta_t$ is illustrated in Figure 1, where $\eta_t$ is held constant (at $\eta_t = 0$), and where $\hat{s}_t \equiv s_t - \kappa^a g^p$, showing the relation between $\pi_t$ and $s_t$. (A realization of $\eta_t > 0$ would shift all the curves to the right.)

The probability that election-period monetary policy is $(x^P, \pi^P)$ is simply the probability that (19) is satisfied, which depends on the joint distribution of $s_t$ (that is, $\varepsilon$, when there is no serial correlation of $s_t$) and $\eta_t$. Let’s assume these distributions are independent. With no serial correlation of supply shocks, this probability as seen from the previous period is a constant. Let us denote this probability of full accommodation by $p$. If the distributions of $\varepsilon_t$ and $\eta_t$ are symmetric around their means, then the probability that the solution is one of the branches of (21) is equal and equal to $\frac{1 - p}{2}$.

We now turn to monetary policy in the year before an election as chosen by the monetary authority with no political pressure. This will also allow us to solve for the as yet undetermined coefficient $\kappa^a$.

### 4.7 The Central Bank’s Desired Policy in a Non-Election Period

In a non-election period there will be no political pressure on monetary policy in equilibrium, so that the central bank chooses policy to minimize (3) subject to its expectations of monetary policy in the following (that is, $E$) period. The central bank’s desired policy in an $O$ period, denoted $(x^O, \pi^O)$, is simply:

---

12 In equilibrium the cost $C$ is not imposed on the central bank, but the threat of pressure induces accommodation of the incumbent in choice of monetary policy.
\[ \pi^0_t = -\frac{\gamma}{1 + \gamma} s^t + \frac{\gamma}{1 + \gamma} \E \pi^e_{t+1} \]
\[ x^0_t = \frac{1}{1 + \gamma} s^t - \frac{1}{1 + \gamma} \E \pi^e_{t+1} \]  

(22)

Given the probabilities of full and partial accommodation as derived in the previous subsection, this expectation may be written

\[ \E \pi^e_{t+1} = p \E_z (\pi^p_{t+1}) - \left[ \frac{2 C}{1 + \gamma} \leq \left( \frac{\alpha}{1 + \alpha} \right) Z^t \leq \frac{2 C}{1 + \gamma} \right] + \frac{(1-p)}{2} \E_z (\pi^{co+}_{t+1} | Z^t) + \frac{(1-p)}{2} \E_z (\pi^{co-}_{t+1} | Z^t) = \left( p \frac{\alpha}{1 + \alpha} + (1-p) \frac{\gamma}{1 + \gamma} \right) \kappa^p ag^p + \frac{\alpha p}{1 + \alpha} g^p \]

(23)

where each of the three expectations in the first line is taken conditional on the shocks lying in a certain region (as made explicit in the first term). Here, we see the importance of the simplification of i.i.d. supply shocks. With serial correlation, not only would \( \pi^p_{t+1} \) depend on policy in \( t+2 \) (which would depend on policy in \( t+3 \), and so on), but the probabilities of the regimes would also depend on the current shocks in a complicated way.

Substituting this into (22) and equating the resulting coefficients with the expression for \( \pi^0 \) in (14), one obtains:

\[ \kappa^p = \frac{\alpha}{1 + (1-p) \frac{\alpha - \gamma}{1 + \gamma}} \]

(24)

We rewrite (22) as:

\[ \pi^0_t = -\frac{\gamma}{1 + \gamma} s^t + \kappa^p ag^p \]
\[ x^0_t = \frac{1}{1 + \gamma} s^t - \frac{1}{1 + \gamma} \kappa^p ag^p \]  

(25)

This completes the derivation of monetary in election and non-election periods, as given
by (15), (21), and (25), with \( \kappa^o \) given by (24).

### 4.8 Equilibrium Interaction of Incumbent Politicians and the Monetary Authority

We now demonstrate that there is an equilibrium over the electoral cycle with the following properties, as long as the politician cares enough about re-election (\( \theta \) high enough) and re-election prospects are sufficiently sensitive to macroeconomic outcomes (and \( q_L \) sufficiently negative). In an electoral (\( E \)) period the central bank accommodates the desires of the incumbent politician, choosing either \( \pi^p \) or \( \pi^{CO} \) (depending on the realization of the shocks), with this outcome enforced by a threat of \( C \) by the politician (which is not carried out) and no counter-pressure \( K \) from the central bank. In an non-electoral (\( O \)) period, the central bank chooses its preferred policy conditional on there being an election in the following period, namely \( \pi^O \), with the politician putting no pressure \( C \) on the central bank and the central bank choosing no counter-pressure \( K \).

That is, in this equilibrium, the central bank accommodates the desires of an incumbent running for re-election by smoothing interest rates in an election period, but chooses its optimal policy in a non-election period (“constrained” only by expectations of expected future inflation policy) with no pressure from politicians.

One can demonstrate that this is an equilibrium, by considering deviations in any period and show they are not profitable for either side. This is shown formally in Appendix 2. In the text, I present the argument more intuitively. Consider first an \( E \) period, which is followed by an \( O \) period. The politician clearly prefers his best attainable monetary policy outcome to any other policy outcome and perceives no cost to a threat of \( C \) in the current period. Since we assume that the central bank is indifferent when (18) or (19) hold with equality, they will carry out this policy. Moreover, anticipating being able to carry out its preferred policy in the subsequent period with no threat \( C \) from the politician, it will not respond to the threat of \( C \) today with counter-pressure \( K \).

Consider then an \( O \) period, which is followed by an \( E \) period. The central bank
carries out its preferred policy. The politician prefers this policy and no threat $C$ to a deviation to a policy of $\pi^P$ or $\pi^{CO}$ enforced by a threat of $C$. To see this, note that a threat of $C$ will be countered by counter-pressure of $K$ by the central bank, since this allows the bank to achieve a far better outcome in the following period $E$ when the politician will pressure the central bank in equilibrium. That is, by responding to pressure in $O$, the bank would achieve $\pi^O$ in $E$, rather than $\pi^P$ or $\pi^{CO}$. In essence, this deviation implies that the politician achieves his desired monetary policy in the current $(O)$ period at the expense of not achieving his desired monetary policy in the following $(E)$ period, just the opposite of what he desires if he cares about re-election and chances of re-election are sensitive to macroeconomic outcomes. Hence, the politician puts no pressure on the central bank in $O$. Intuitively, the politician forgoes the use of pressure in a non-election period in order to use it in an election period, when it is more valuable. In the absence of pressure from the politician, the central bank applies no counter-pressure.

This completes our discussion of the interaction of politicians and the central bank over the electoral cycle. We now turn to the implications for money growth over the electoral cycle to consider the monetary cycle such interaction implies.

### 4.9 Money Growth in Election Years

Money supply growth rate consistent with equilibrium interest rates is given by the money market equilibrium condition (an “LM curve”), given the current inflation rate. In the absence of money demand shocks, this may be represented by a simple relation between money growth and interest rates, namely:

$$\mu_t = M(i_t, x_t)$$  \hspace{1cm} (26)

where, given $x_t$, the money growth rate will be an increasing function of the interest rate.

To see that fiscal shocks and accommodation can induce a monetary cycle,
consider for a moment the hypothetical case in which the politician prefers no interest rate movements in response to demand shocks in election periods (that is, the coefficient on $\eta_t$ in (15) is zero, due, say, to infinite $\alpha$). A high value of $g^p$ in an election period relative to a non-election period will then induce, all else equal, a sufficiently high increase in the money supply to keep the current interest rate $i_t$ (and the current level of economic activity $x_t$) constant in the face of the expansionary fiscal impulse. The size of the fiscal impulse, the elasticity of aggregate demand with respect to interest rates in (2) (determining how much interest rate pressure a given size fiscal impulse induces), and the interest elasticity of money demand (determining how much money supply must rise to keep interest rates constant) will determine the magnitude of the money supply response to the fiscal impulse. However, the combination of higher expenditures and political pressure for interest rate smoothing (here, complete smoothing) in election periods will yield a monetary cycle corresponding to the electoral cycle, which could be statistically significant no matter how large it is in magnitude. Hence, we would observe an electoral cycle in money growth rates, with no corresponding cycle in interest rates or economic activity, induced by the fiscal cycle. This, in a nutshell, is the essential empirical characteristic of the model of fiscal-monetary interaction presented here, which I have termed the “AFPM model”.

When the politician’s preferred interest rate rule (15) implies a muted response to demand shocks relative to the central bank’s interest rate rule in non-election periods, the results will not be as transparent, but the same effect will be operating. This differential interest rate response combined with higher fiscal pressure in election periods implies an electoral cycle in monetary aggregates that simply reflects equilibrium accommodation of fiscal pressure. The size of the effect depends on the size of the fiscal impulse and the elasticities discussed in the previous paragraph, but the possibility of a statistically significant monetary cycle with corresponding statistically significant cycles in output or interest rates should be clear.
5. Concluding Comments

A clear difference between a money-based PBC model and the model of fiscal-monetary interaction presented here is that in the former monetary effects are the driving force of the political-economic cycle, while in the latter they are induced effects, due to the monetary authority wanting to offset fiscal effects that would otherwise drive up interest rates. Hence, the monetary expansion in a money-driven model should be reflected in changes in the instruments of monetary policy in an expansionary direction, while in this model of accommodative monetary policy, we should see an expansion only in broad monetary aggregates, but not in instruments of policy. Beck (1987) found that the pre-electoral monetary growth cycle in the U.S. from 1960 to about 1980 was characterized by this difference, with no political effects on the Fed Funds rate to match the M1 political cycle.

A second broad prediction of the approach in this paper is that monetary growth before an election should reflect fiscal impulses. Note that one is not testing whether fiscal manipulation or voters’ responses are rational, but whether there is a causal connection between the fiscal and the monetary cycle. As reported in section 3, both Keech and Pak (1989) and Alesina (1988) found an electoral cycle for transfers between 1961 and the late 1970's or early 1980's, which has since disappeared. The strongest evidence for a M1 growth rate electoral cycle is over the same period, while there is no such cycle after 1980.

Correlation is not causation. A stronger test is to show whether when an electoral monetary cycle exists, it can be explained by the fiscal cycle, as opposed to simply a political dummy. As reported earlier in the paper, Beck (1987) performs such a test and argues that fiscal variables can in fact explain the 1960-78 electoral cycle in M1 growth rates. As I discuss in Appendix 1, though I was able to reproduce some of Beck’s results, they do not appear to be robust, once one considers alternative specifications. Hence, the evidence for the U.S. is far from conclusive. Work for other countries also appears inconclusive. Hence, though various pieces of evidence are
consistent with the fiscal-monetary approach presented here, the data do not present robust evidence of such a PBC in developed countries. For less developed countries, the problem is finding one with both a fiscal cycle and an independent central bank. Colombia is one possibility, though any conclusions await the collection of better data.

The lack of aggregate empirical evidence of a fiscal-monetary PBC should not however, in my opinion, negate the more general lessons of the paper about how fiscal and monetary authorities may interact over the electoral cycle. On a conceptual level, the approach presented in this paper should induce us to rethink monetary phenomena in political business cycles. And, it should force us to focus on the interactions between politicians and central banks in understanding such cycles. This direction of research is in its infancy, but in my opinion, deserves much attention.
APPENDIX 1: Empirical Results

In this Appendix I review some of the empirical work that has been done to test the active fiscal-passive monetary (AFPM) model for the U.S., Israel, and other countries, concentrating on my own work. I present this material in an appendix because, to my regret, it does not present sufficient evidence of an AFPM cycle to warrant publication, but it is suggestive in such a way that the approach cannot be rejected.

One may think of the hypothesis that fiscal policy drives monetary expansions as having basically three testable implications: first, that there is a pre-electoral fiscal cycle; second, that there is a simultaneous monetary cycle, but only in broad monetary aggregates, but not in instruments of policy; and, third and most importantly, that the monetary cycle may be explained econometrically by the fiscal cycle, as opposed to simply political dummy variables.

A. United States

The bulk of previous work relating fiscal and monetary variables in electoral cycles has been done for the United States. I also did by far the most work for the U.S. (the country that originally led me to think in this direction), and I report those results in greatest detail. I tested for a cycle in the U.S. using the standard PBC methodology of running an autoregressive representation of the variable in question including political dummy variables. (See Drazen [2000a], chapter 7 for a fuller discussion of this methodology.) I considered a number of political dummy variables to test for opportunistic political effects on fiscal policy. The three best performers were $D_4 = 1$ in the election quarter and the 4 previous quarters 0 otherwise; $D_1 = 1$ in the election quarter and 0 otherwise; and $D_{1-1} = 1$ in the election quarter and the previous quarter, -1 in the two quarters after the election (to capture the policy reversal that characterizes many models), and 0 otherwise. I used lagged unemployment as a control.

Beck (1987), Keech and Pak (1989), and Alesina (1988) all found an electoral
cycle for transfers between 1961 and the late 1970's or early 1980's, which has since disappeared. I found a fiscal cycle in the US in terms of the fiscal surplus (in nominal terms detrended and seasonally adjusted) for all three political variables over the period 1960 to 1980, but none for other subperiods. I also considered more disaggregated measures of fiscal stimulus. I found strong evidence of a political cycle for transfers net of social insurance contributions over the subperiod 1960-1980, but not over 1980-1998 or over the whole sample. These results mirror what Beck (1987), Keech and Pak (1989), and Alesina, Cohen, and Roubini (1997) find. (Looking at specific transfer programs gave no evidence of a fiscal cycle. I could not reproduce the cycle in veterans benefits that Keech and Pak found.)

Following Grier (1989), Beck (1987) argued that there was a political cycle in M1 growth in the U.S., in his data, from 1960 until 1984. I next considered a cycle in monetary aggregates. To test for an M1 cycle, I ran autoregressions of the same over the period 1960 to 1998, as well as for various subsamples, with political dummies. I found a political cycle in M1 growth in the first half of the sample (till the end of 1980) for the political dummies D1 and D1-1, but not for the second half or for the sample as a whole. This corresponds to results found by Beck and Grier, as summarized by Alesina, Roubini, and Cohen, namely that there is evidence of a monetary cycle from the early 1960's to the early 1980s, which subsequently disappeared.

To test whether this cycle reflected activist pre-electoral monetary policy, I ran analogous autoregressions for the Federal Funds rate over the same time period and subperiods. I found no significant political cycle in the Fed Funds rate and including the first subperiod. On the other hand, Walsh (2000) argues that the lack of pre-electoral cycle in the Fed Funds rate averaged over postwar administrations masks significant variations across administrations. He suggests that one cannot draw firm conclusions one way or the other, but concludes that the behavior of the real Fed Funds rate before elections is not consistent with an opportunistic PBC driven by monetary policy.
The problems of robustness appear in the attempt to link fiscal and monetary variables. Beck (1987) found that a fiscal surplus variable was highly significant in an M1 autoregression and it significantly reduced the explanatory power of the electoral variables. I repeated his tests, both for the ratio of the fiscal surplus to GNP and for the nominal fiscal surplus detrended and seasonally adjusted. The results were quite mixed, and not really supportive of the view that the political monetary cycle is fully explained by accommodation of expansionary fiscal policy. For D1, the fiscal ratio has the correct sign and is significant at the 10% level, but the detrended level of the surplus has no explanatory power for the monetary cycle. Nor does the inclusion of a fiscal variable reduce the sign of the electoral variable. The most promising results were for Beck’s lag structure (introducing the lagged dependent variable at lags of 1, 4, 5, and 9 quarters, but this does not reflect an optimizing procedure for choosing lag length, used in my other regressions). The results suggest that finding a fiscal-monetary political business cycle depends crucially on which the fiscal variable and what lag structure is used. Hence, the choice of specification may be crucial for the results.

**B. Europe**

I also ran these sorts of regressions for a number of European countries such as France, Greece, and Portugal where other evidence suggested that an AFPM cycle might be present. I found no strong evidence for fiscal cycles. The best results were for Portugal, where there appears to be a political cycle in the composition of government expenditure that matches the monetary cycle in timing. However, I could find no econometric evidence linking the two.

**C. Israel**

The project was originally conceived as testing the AFPM model on the United States and Israel. For Israel, I found less support than for the United States. As for a fiscal cycle, I found no robust evidence of a fiscal cycle using the variables (fiscal deficit and
various definitions of transfers) that I used for the United States. Klein (2000), using the standard autoregressive representation with an electoral dummy, similarly finds no political fiscal cycle for various definitions of transfer payments. He does find a political cycle for the deviation of government expenditures net of imports of military goods around trend in constant prices, the trend calculated by an HP filter. (It was unclear to me what sort of cycle is really in the data, since this procedure has the effect of “double” filtering the data, since the autoregressive representation will already remove some of the trend.)

I found no robust electoral cycle in monetary aggregates, though this may be due to definitional problems in my reading of the data. Klein (2000) does not report tests for a monetary aggregate. He estimates a monetary policy reaction function with the marginal nominal interest rate as the dependent variable. He finds a weak electoral effect. However his specification, with a large number of dummies, raises questions about the robustness of the effect.

Because of the lack of an econometrically robust fiscal or monetary cycle, I did not test for their interaction. Klein’s results may be informative here. To test for a fiscal-monetary interaction, he runs a number of specifications, with mixed results. For example, he includes a fiscal variable in his monetary reaction function and finds that HP filtered government expenditures net of imports of military goods lagged three quarters has a significant (at the 5% level) positive effect of the nominal marginal interest rate. He conjectures that the effect may appear with a three-quarter lag for one of two reasons. Either the monetary authorities learn of the fiscal impulse with a three quarter lag or that the fiscal impulse affects economic activity with a three quarter lag (combined apparently with the assumption that the monetary authority wants to offset impulses to economic activity). As in some of the regressions for the U.S> reported above, this variable does not reduce the significance of the electoral dummy, indicating that the fiscal impulse does not explain a political monetary cycle. In short, there seems to be no strong evidence of an AFPM cycle in the Israeli data.
APPENDIX 2: The Political Equilibrium

In this appendix I show formally the nature of the equilibrium described in section 4.8. The choice for the politician is whether to exert pressure $C$ or not in a given period, where this choice will depend on the central bank’s actions in the previous period, namely, whether counterpressure $K$ was exerted. In response to pressure $C$, the central bank will always choose an accommodating policy defined by either (15) or (21). Hence, the choice for the central bank in a period is whether to exert counterpressure $K$. Denoting the actions of agent $j$, where $j = P$ for politician and $B$ for central bank, in period $t$ by the indicator $I^j_t$ where $t = E, O$, the central bank thus has a choice of actions $I^B_t = \{K, 0\}$ depending on $I^P_t$, while the politician has a choice of actions $I^P_t = \{C, 0\}$ depending on $I^B_{t-1}$.

One may then represent the equilibrium strategies by:

\begin{align*}
I^B_E \{I^P_t = C, I^P_{t-1} = 0\} & \rightarrow \{0, 0\} & I^B_O \{I^P_t = C, I^P_{t-1} = 0\} & \rightarrow \{K, 0\} \\
I^P_E \{I^B_{t-1} = K, I^B_{t-1} = 0\} & \rightarrow \{0, C\} & I^P_O \{I^B_{t-1} = K, I^B_{t-1} = K\} & \rightarrow \{0, 0\}
\end{align*}

(A1)

for the central bank if $t$ is an election and non-election period respectively and by:

\begin{align*}
I^P_E \{I^B_{t-1} = K, I^B_{t-1} = 0\} & \rightarrow \{0, C\} & I^P_O \{I^B_{t-1} = K, I^B_{t-1} = K\} & \rightarrow \{0, 0\}
\end{align*}

(A2)

for the politician if $t$ is an election and non-election period respectively.

I first show that the central bank’s strategy as summarized by (A1) is optimal given the politician’s strategy (A2). First, by assumption, the bank cannot apply counterpressure $K$ is the politician applies no pressure, so that $I^B_E \{I^P_t = 0\} = I^B_O \{I^P_t = 0\} = 0$ necessarily. Second, since the politician applies no pressure in a non-election period according to (A2), there is no gain to the central bank from “complaining” about pressure in an election period, as the bank will be able to follow its preferred strategy in a following non-election period whether or not they
chose to complain in the previous period. Since $K$ is costly, the central bank will choose not to complain, that is $I_E^B(I_F^C = C) = 0$. Finally, consider the optimal response to political pressure $C$ in a non-election period. If the central bank does not complain, in the following (election) period the politician will be able to successfully apply pressure, which he will do according to (A2), and the equilibrium monetary policy will be that favored by the politician. If the bank complains, the politician will apply no pressure in the following period, so that the equilibrium monetary policy will be that favored by the central bank. That is, more preferred policy next period is obtainable at the cost of $K$ today. Since policy is the same in the current period and in all periods after the next period, complaining will be optimal as long as:

$$K \leq \beta E_t(\ell_t^C (x^P, \pi^P)) - E_t(\ell_t^C (x^O, \pi^O)) \tag{A3}$$

(where for simplicity of exposition I have written the policy under political pressure as the politician’s first-best rather than the compromise policy.) I assume that (A3) holds, that is that $K$ is not too large.

I now show that the politician’s strategy as summarized by (A2) is optimal given the central bank’s strategy (A1). When the central bank applies counterpressure in the previous period, pressure is ineffective in $t$, so the politician will apply no pressure. Hence, $I_E^P(I_{t-1}^B = K) = I_O^P(I_{t-1}^B = K) = 0$. Now, suppose there was no pressure in the previous period. Given that there will be no complaint about political pressure in an election period, the politician can apply pressure costlessly, that is, $I_E^P(I_{t-1}^B = 0) = C$.

What about pressure in a non-election period if it would be effective? According to (A1), pressure in a non-election period will induce counterpressure, so that pressure in the following period will be ineffective. Therefore, $I_O^P(I_{t-1}^B = 0) = C$ implies that the politician will get his preferred policy in the current $(O)$ period at the expense of the central bank getting its preferred policy in the following $(E)$ period, while, $I_O^P(I_{t-1}^B = 0) = 0$ implies the opposite, namely that the politician will get his preferred
policy in the following (E) period at the expense of the central bank getting its preferred policy in the current (O) period. The value of these two strategies can be computed from evaluating (10) and (11) under the two cases, where the electoral value of the latter over the former depends on the excess of \( q(g^p, \Lambda^E_0(\pi^p)) \) over \( q(g^p, \Lambda^O_0(\pi^p)) \), that is, on its effects on election prospects. For any value of \( \theta > 0 \), there exists some value of this difference such that \( I^p_O \{ I^B_{t-1} = 0 \} = 0 \) is preferred to \( I^p_O \{ I^B_{t-1} = 0 \} = C \).
References


Figure 5: Monetary Policy in Election and Non-Election Years ($\eta_t = 0$)