Political Parties and the Business Cycle in the United States, 1948-1984

Author(s): Alberto Alesina and Jeffrey Sachs

Source: *Journal of Money, Credit and Banking*, Feb., 1988, Vol. 20, No. 1 (Feb., 1988), pp. 63-82

Published by: Ohio State University Press

Stable URL: https://www.jstor.org/stable/1992667

ALBERTO ALESINA
JEFFREY SACHS

Political Parties and the Business Cycle in the United States, 1948–1984

THE MOST FAMOUS ATTEMPT TO MODEL the relationship between political and economic cycles is the "political business cycle" theory formulated by Nordhaus (1975) and MacRae (1977). Three crucial assumptions underlie this approach: (i) the parties care only about winning the elections, as in Downs (1957); (ii) the voters have short memories and can be systematically fooled;[1] and (iii) the economy is described by an exploitable Phillips curve and the rational expectations critique is not taken into account.

The results derived by Nordhaus from these assumptions are well known. The incumbent stimulates the economy close to election time in order to increase its chances of reelection. At the beginning of the new term, the inflationary effects of the pre-electoral expansion are eliminated with a recession. The behavior of the two parties is identical, and a cycle results in equilibrium. The empirical evidence in support of the "political business cycle" theory is inconclusive for the United States case: several empirical studies have rejected this theory.

The authors are greatly indebted to two anonymous referees for very useful comments. An earlier version of this paper was circulated as National Bureau of Economic Research Working Paper #1940.

[1]Rogoff and Sibert (1986) have obtained some results along the same lines of Nordhaus and MacRae in a model with rational but imperfectly informed voters.

ALBERTO ALESINA *is assistant professor of economics, Graduate School of Industrial Administration, Carnegie-Mellon University, and research fellow, National Bureau of Economic Research.* JEFFREY SACHS *is professor of economics, Harvard University, and research associate, National Bureau of Economic Research.*

Journal of Money, Credit, and Banking, Vol. 20, No. 1 (February 1988)

Given these rejections, some authors have moved toward a "partisan theory" of macroeconomic policy. The original proponent of this view was Hibbs (1977), who argued that the Democratic party in the United States and socialist parties in Europe have been more averse to unemployment and less averse to inflation than the Republican party in the United States and conservative parties in Europe. This theory has been tested empirically by Hibbs and others, using models based on an exploitable Phillips curve with very little consideration for the rational expectations critique.

In this paper a model closely related to that of Alesina (1987) is presented and tested on post–Second World War United States data. The model is based on a "partisan view" of political parties and it accounts for rational and forward-looking expectations. In our model only "unexpected policy" matters: the economy would exhibit complete policy neutrality in a one-party system with no elections. However, the elections create an important source of uncertainty: the public does not know which party will be in office in the future. If the relevant expectations about monetary policy and inflation have to be formed before the elections, then they are based on the average of the policies that the two parties are expected to follow if elected. If these policies are different, the elected party creates a "surprise," in the sense that its policy was not correctly predicted, since expectations accounted for the possibility of the election of the other party. The model, then, predicts that at the beginning of the term of office of the more expansionary party one should observe an output expansion above trend with high money growth; when the less expansionary party is elected, a recession with low money growth should be observed. There are no electoral surprises in the second part of the terms of office; hence, in the second part of both types of administrations real variables should exhibit the same behavior (ceteris paribus).

Starting from an explicit maximization problem, we derive the reaction functions of the two parties and their time-consistent policies and test the nonlinear restrictions on the parameters imposed by the theory. The data reject the hypothesis that macroeconomic outcomes have been the same under the two types of administration. The Democratic party has been relatively more concerned than the Republican party about the output target rather than the inflation/money creation target. Furthermore, the empirical results are consistent with the hypothesis that systematic differences in output growth have occurred in the first half of the administrations and not in the second, in accordance with the theory. Thus, these results are consistent with a partisan view of monetary policy. An exception to this conclusion is perhaps the first Nixon administration, the behavior of which is probably better explained by a "political business cycle" view.

This paper is organized in four sections and the final summary. Section 1 briefly reviews some of the recent empirical literature on the subject. Section 2 presents the model. Section 3 provides empirical evidence in accordance with the qualitative implications of the model. In section 4 the empirical estimates of the parameters of the model are presented and discussed.

1. POLITICAL BUSINESS CYCLE THEORY AND PARTISAN THEORY

In his seminal article, Nordhaus (1975) provides suggestive empirical evidence in favor of the "political business cycle" hypothesis (henceforth PBC) for the United States. The first Nixon administration fits particularly well Nordhaus' predictions. However, the empirical work that followed has suggested that this administration was probably the only clear case of PBC in the post–Second World War period. McCallum (1978), Golden and Poterba (1980), Abrams et al. (1980), Beck (1982, 1984), Hibbs (1977, 1988), Chapell and Keech (1986), Tabellini and La Via (1986), Richards (1986), and Havrilesky (1987) reject explicitly or implicitly the pure PBC hypothesis. On the other hand, some evidence in favor of the PBC hypothesis is found by Tufte (1978), Frey and Schneider (1978), Laney and Willett (1983), Soh (1986), and Haynes and Stone (1988). The evidence in favor of the PBC is found mostly on disposable income and transfers, rather than on inflation and unemployment.

The lack of persuasive empirical support for the pure PBC hypothesis has renewed interest for a "partisan theory" (henceforth PT) of macroeconomic policy and, in particular, of monetary policy. Hibbs (1977 and 1988) present empirical results suggesting that the Democratic party prefers a point on the Phillips curve with higher inflation and less unemployment than the Republican party.[2] However, Beck (1984) qualifies Hibbs' results by pointing out that the administrations of Presidents Kennedy and Nixon are exceptions to the PT as formulated by Hibbs. Beck's findings confirm earlier results by Friedlaender (1973) and Havrilesky et al. (1975). [See also Havrilesky (1987) on this point.]

Chapell and Keech (1986) relate changes in unemployment to unexpected monetary shocks in a model with labor contracts and find evidence of differences in parties' policies that are "quite similar" in magnitude to those reported by Hibbs.[3]

Havrilesky (1987) provides an interesting formalization of the PT based upon income redistribution and the associated disincentive to work. In Havrilesky's model, liberal administrations want to redistribute income toward the unskilled, lower-income labor force. To compensate for disincentive effects, liberal governments engage in "monetary surprises" in order to increase real output. Havrilesky presents empirical results which are consistent with the prediction of his theory.[4]

[2]Very similar views are expressed by Samuelson (1977), Stein (1985), and Okun (1973) in disagreement with Stigler (1973).

[3]Their approach is related to ours, however, they do not explicitly derive parties' policy rules from a maximization problem. They also model expectations differently and focus on unemployment rather than output.

[4]In this paper we provide a different formalization of a PT of monetary policy; these two approaches have to be viewed as complementary. Also, the empirical implications of Havrilesky's model are not identical to those of our model. For example, in Havrilesky's model monetary surprise should be observed only when there is a change from a Republican to a Democratic administration (and vice versa). Our model predicts that monetary surprises should be observed even if the same party is reappointed for a second term.

2. THE MODEL

We consider an economy with two parties, denoted with obvious reference, party D and party R. The two parties assign different weights to two policy targets: an inflation rate or money growth target and an output growth target. The policy instrument controlled by the policymaker is the rate of money creation. A quadratic specification for the objective functions of the two parties is adopted: the loss function of the two parties can be written as (the superscripts identify the party)

$$Z^D = \sum_{t=0}^{\infty} q^t \left[\frac{a}{2} (m_t - \Psi(t))^2 + \frac{\tilde{b}}{2} (y_t - \phi)^2 \right] ; \qquad (1)$$

$$Z^R = \sum_{t=0}^{\infty} q^t \left[\frac{c}{2} (m_t - \Psi(t))^2 + \frac{\tilde{d}}{2} (y_t - \phi)^2 \right] \qquad (2)$$

where m = rate of money growth; y = rate of growth of GNP; $a, \tilde{b}, c, \phi$, and $\tilde{d}$ are non-negative parameters; and q is the discount factor, positive but less than one. The "partisan theory" of monetary policy implies that the objective functions of the two parties are different. The basic idea is that the two parties represent the views and interests of different constituencies or "pressure groups." Conflicts on income distribution may also explain different views on the inflation/unemployment trade-off (see Hibbs 1977, Minford and Peel 1982, and Havrilesky 1987). The difference in the objective functions of the two parties is constrained to be in the weights attributed to identical targets, $\Psi(t)$ and ϕ [see (1) and (2)]. This restriction, imposed to save degrees of freedom, does not affect the nature of the results. The targeted level of money growth, $\Psi(t)$, is allowed to change over time, to reflect, for example, velocity shifts.[5] The economy is described by the following equation for output growth:

$$y_t = \bar{y}(t) + \gamma(m_t - m_t^e); \qquad \gamma > 0 . \qquad (3)$$

Equation (3) incorporates the basic properties of a Lucas supply function in which only unexpected nominal shocks affect real variables. In (3) we indicated with $\bar{y}(t)$ the rate of growth generated by the economy in the absence of monetary shocks; this rate is not constrained to be constant. Also, m_t^e is the rational expectation of m_t formed in period t-1 based upon the information available at that time. We assume that the objective functions (1) and (2) are known by the public. An alternative specification of the model could be obtained by specifying the objective functions of the two parties with an inflation target and the supply equation as a function of unexpected inflation. This alternative specification could be closed by a simple "quantity" equation. The shortcut adopted here

[5]The targeted level of output (ϕ) could also be allowed to change over time, but this would not affect the results [see equations (5) and (6) below].

keeps the algebra simpler, saves degrees of freedom, and it should not affect qualitatively the empirical results. The choice of a target and the specification of the model in terms of rate of growth instead of level of GNP is imposed by theoretical and empirical considerations. If a target in level of output were chosen, we would need a more complex dynamic structure for the supply equations, involving one or more lags, for example. This procedure would be too costly in terms of degrees of freedom. Finally, no distinction is made between the "administration" and the Central Bank. The implicit assumption is that the administration has some direct or indirect control over monetary policy, despite the relative independence of the Federal Reserve.[6]

As long as $\phi > \bar{y}(t)$ and $\tilde{b}$ and $\tilde{d}$ are positive, both parties face the problem of dynamic inconsistency of optimal monetary policy, as pointed out originally by Kydland and Prescott (1977). If the targeted level of output growth, ϕ, is higher than the growth rate generated by the market, $\bar{y}(t)$, the policymaker has an incentive to create policy surprises in order to approach the target. In fact, by substituting (3) into (1) and (2), one gets, after rearranging,

$$Z^D = \sum_{t=0}^{\infty} q^t \left[\frac{a}{2} (m_t - \Psi(t))^2 + \frac{b}{2} (m_t - m_t^e - k(t))^2\right] ; \quad (4)$$

$$Z^R = \sum_{t=0}^{\infty} q^t \left[\frac{c}{2} (m_t - \Psi(t))^2 + \frac{d}{2} (m_t - m_t^e - k(t))^2\right] \quad (5)$$

where $b = \tilde{b}\gamma^2$, $d = \tilde{d}\gamma^2$, and $k(t) = (\phi - \bar{y}(t))/\gamma$. In (4) and (5) $k(t)$ represents the difference between the rate of output growth targeted by the policymakers and the rate of growth generated by the economy. The former is likely to be greater than the latter if the latter is "too low" because of distortions in the labor market.[7]

In order to identify the problem of dynamic inconsistency, consider, for example, party D acting as a social planner with no elections. If this party could make a binding commitment, it would choose to commit to the rule: $m_t = \Psi(t)$. This rule is obtained by minimizing (4), taking account of the rationality of expectations, i.e., $m_t = m_t^e$. However, binding commitments are hardly available: the policymaker can always change both its mind and the law. Then the time consistent rate of money growth has to be found by minimizing (4) taking expectations as given. This procedure leads to

[6]The degree of independence of the Federal Reserve from the administration is an important and open question which deserves a separate treatment. There are two channels through which the administration can influence the Federal Reserve: 1) direct political pressure; 2) indirect control achieved by forcing the Federal Reserve to respond to variables controlled by the administration such as the budget deficit. Weintraub (1978), Stein (1985), and Havrilesky (1988), for example, have shown that the first channel is operative. Laney and Willett (1983), Tabellini and La Via (1986), and Allen (1986) have documented the second channel.

[7]These distortions may arise from taxation as emphasized in Barro and Gordon (1983a,b).

$$m_t = \frac{a}{a+b}\Psi(t) + \frac{b}{a+b}(m_t^e + k(t)) . \quad (6)$$

Since the public knows the objective function of the policymaker, by solving for rational expectations, we obtain

$$m_t^e = m_t = \Psi(t) + \frac{b}{a}k(t) . \quad (7)$$

In (7) the term $(b/a)k(t)$ is the inflationary bias introduced into the economy by the absence of binding commitments. This bias is zero if and only if either $b = 0$ and/or $\bar{y}(t) = \phi$ (that is, $k(t) = 0$). Namely, there is no bias if the policymaker does not care about the output target ($b=0$) or if the targeted level of output is identical to the level generated by the market without policy intervention ($k(t) = 0$). Note that, irrespective of the level of the time-consistent rate of money growth, output growth is at the level determined by the economy ($\bar{y}(t)$), because money growth is perfectly anticipated. Furthermore as Barro and Gordon (1983b) pointed out, a fall in the rate of growth of output generated by the market implies a higher rate of money growth, if the preferences of the policymakers do not change.

Let us now consider the interaction of the two parties. We assume that elections take place every two periods and are held at the beginning of the period. After the elections of, say, time t, the elected party chooses its policy for period t, i.e., m_t^D for party D and m_t^R for party R. Voters are rational and informed about the objectives of the two parties, i.e., they know (4) and (5). A rational citizen votes for the party that is expected to deliver the highest utility for himself; thus, every voter forms expectations about the policies that the two parties would follow if elected and votes accordingly. Since the voters know the objectives of the two parties, they know with certainty how the two parties would act when in office. However, even if voters have perfect foresight, electoral outcomes remain uncertain if there is uncertainty about the distribution of voters preferences. We indicate with P and $(1-P)$ the probability of electing party D and R respectively given that voters have perfect foresight about the two parties' policies. We also assume that the value of P is known by the public. It is important to stress that P is not a function of current or past policies because the voters do not need this information to form expectations about future policies: all they need is the knowledge of the parties preferences [(1) and (2)] and of the structure of the economy (3). Thus, for the purpose of this paper P can be considered an exogenous parameter, related to the underlying information about voters' preferences. Alesina (1986) provides a more detailed treatment of this model of political competition.[8]

[8]An additional source of uncertainty about electoral outcome may be due to uncertainty about the number of abstentions. Note also that we are assuming that electoral uncertainty does not disappear over time.

If party D is elected, it minimizes (4). The first-order condition is

$$m_t^D = (1-g)\Psi(t) + g(m_t^e + k(t)) \tag{8}$$

where $g = b/(b+a)$. If party R is elected, it minimizes (5). The corresponding first-order condition is

$$m_t^R = (1-h)\Psi(t) + h(m_t^e + k(t)) \tag{9}$$

where $h = d/(c+d)$. Since P is known, and the public can compute which policy is followed by the two parties when in office, we obtain that

$$m_t^e = Pm_t^D + (1-P)m_t^R \qquad \text{if } t \text{ is an election year ;} \tag{10a}$$

$$m_{t+1}^e = m_{t+1}^D \qquad \text{if party } D \text{ is elected at time } t \text{ ;} \tag{10b}$$

$$m_{t+1}^e = m_{t+1}^R \qquad \text{if party } R \text{ is elected at time } t \text{ .} \tag{10c}$$

Equations (10) underscore the idea that there is uncertainty in expectation formation only in the first period of an administration.

The assumption that administrations last two periods implies for the United States that a "period" is of two years. This assumption is consistent, for example, with labor contracts of an average length of two years (see Taylor 1980 or Fischer 1977). In more general terms, this assumption requires enough stickiness in the price system such that the economy does not adjust "too quickly" to unexpected monetary shocks.

For the empirical estimation of the model it is assumed that both $\bar{y}(t)$ and $\Psi(t)$ are linear trends, namely,

$$\Psi(t) = \bar{m} + \sigma t \text{ ;} \tag{11}$$

$$\bar{m} \geqslant 0; \sigma \geqslant 0 \text{ ;}$$

$$\bar{y}(t) = \bar{y} - \tilde{\beta} t \text{ ;} \tag{12}$$

$$\bar{y} \geqslant 0 \, \tilde{\beta} \geqslant 0 \text{ .}$$

Both σ and $\tilde{\beta}$ are expected to be non-negative. The model can now be solved by substituting (10), (11), and (12) into (8) and (9). From these substitutions one obtains the money growth equations for the two parties in the two periods. Then, using (3) one obtains output growth. The result is the following system of equations: (the superscripts $D1$, $D2$, $R1$, and $R2$ stand for first and second period of D and R administrations).

$$y_t^{D1} = \bar{y} + \gamma(1-P)\frac{(g-h)\bar{k}}{1-Pg-(1-P)h} + \gamma\frac{(g-1)\beta t}{1-Pg-(1-P)h}; \quad (13)$$

$$y_t^{R1} = \bar{y} + \gamma P\frac{(h-g)\bar{k}}{1-Pg-(1-P)h} + \gamma\frac{(h-1)\beta t}{1-Pg-(1-P)h}; \quad (14)$$

$$y_t^{D2} = \bar{y} - \gamma\beta t; \quad (15)$$

$$y_t^{R2} = \bar{y} - \gamma\beta t; \quad (16)$$

$$m_t^{D1} = \bar{m} + \sigma t + \frac{g\bar{k}}{1-Pg-(1-P)h} + \frac{g}{1-Pg-(1-P)h}\beta t; \quad (17)$$

$$m_t^{R1} = \bar{m} + \sigma t + \frac{h\bar{k}}{1-Pg-(1-P)h} + \gamma\frac{h}{1-Pg-(1-P)h}\beta t; \quad (18)$$

$$m_t^{D2} = \bar{m} + \sigma t + \frac{g}{1-g}\bar{k} + \frac{g}{1-g}\beta t; \quad (19)$$

$$m_t^{R2} = \bar{m} + \sigma t + \frac{h}{1-h}\bar{k} + \frac{h}{1-h}\beta t \quad (20)$$

where $\bar{k} \equiv (\phi - \bar{y})/\gamma$ and $\beta \equiv \tilde{\beta}/\gamma$. Equations (13) to (20) embody several empirical implications:

1. In the second half of both administrations there are no policy surprises; therefore, output growth is at the level determined by the market without policy intervention, $\bar{y} - \tilde{\beta}t$ [equations (15) and (16)].
2. If $g > h$, namely, if the relative weight attributed to the output target is higher for party D than for party R, there is a recession in the first half of an R administration and an expansion above trend in the first half of a D administration [equations (13) and (14)]. The deviations of output growth from trend, $\bar{y} - \tilde{\beta}t$, are larger the greater is the difference in the relative weights attributed by the two parties to the two targets (i.e., g and h). Note that party R does not "like" recessions but it is forced to create them because of the inflationary expectations kept high by party D. Conversely, party D can generate an expansion because inflationary expectations are kept low by party R.
3. The more surprising is the electoral result, the greater is the discrepancy between the expected money growth and its actual value, thus the bigger is the deviation of output growth from trend. For example, if P is high and party R wins the election, the model predicts a deep recession.
4. If $g > h$, the time-consistent rate of money growth is higher for party D than for party R in both periods [equations (17) to (20)].
5. If $g > h > 0$, in a D administration the rate of money creation deviates from trend more in the second period than in the first; the opposite holds

for the administrations of party R. If $h = 0$ [that is, $\tilde{d} = 0$ in (2)] there are no deviations from trend in money growth in both periods of a Republican administration. If $h = 0$, party R is not affected by the problem of dynamic inconsistency of monetary policy: in this case the optimal policy is also time-consistent for this party [i.e., $m_t^R = \Psi(t)$].

Our assumptions about voting makes it impossible for the two parties to engage in PBC policies à la Nordhaus. Rational and informed voters would not be "fooled" into voting for the incumbent by an expansion placed close to election time. The two parties cannot even take advantage of superior information as in Rogoff and Sibert (1986), since voters are assumed to be perfectly informed about the state of the economy. Thus, our formulation implies that the two parties are "locked" into following their partisan policies.

Frey and Schneider (1978) present an interesting blend of the PT and the PBC approach. They assume that each administration follows its own ideological policy only when its popularity is high; when popularity is low, the policymakers react by choosing policies that increase voters' support, regardless of "ideology." Furthermore, popularity tends to be preferred to ideology close to elections. The approach of Frey and Schneider differs from ours in two crucial respects: first, they assume that voters are not fully informed about the government's performance and objectives and that simple "rules" govern voting behavior.[9] The second difference is that Frey and Schneider assume that parties follow a "satisficing" rather then an optimizing behavior.

3. PRELIMINARY EVIDENCE

This section shows that the qualitative empirical implications of our model are consistent with United States data for the post–Second World War period. Table 1 displays the average rate of growth of GNP at 1972 prices per year for the first and second half of the administrations of the two parties. The averages are taken over the period 1949–1984, thus including the nine completed administrations after the Second World War (from President Truman to the first term of President Reagan). In the second half of the administrations of both parties the average rate of growth is almost identical, around 4 percent. The rate of growth in the first half of Democratic administrations has been higher than in the second half, while the rate of growth in the first half of Republican administrations has been much lower than that of the second half. Table 2 shows the rate of growth of GNP for each year considered in the sample. The difference in the performance of the two parties in the first half of the term and particularly in the second year is rather striking. All the second years of the Republican administrations show a negative GNP growth. The only two other years of negative growth in the period

[9]In the model of Frey and Schneider the voters are not "rational" in the usual sense. Their behavior might be justified by costs in gathering information, but the voting function assumed by Frey and Schneider is not derived by an explicit maximization problem.

TABLE 1

AVERAGE RATE OF GROWTH OF GNP PER YEAR (CONSTANT PRICES), 1949–1984

	First Half	Second Half
Democratic Administrations	5.0	3.9
Republican Administrations	1.2	4.0

SOURCE: Economic Report of the President (1985), Table B–5, p. 227.

TABLE 2

RATE OF GROWTH OF GNP (CONSTANT PRICES), 1949–1984

Democratic Administrations

	Year			
	First	Second	Third	Fourth
Truman	0.5	8.7	8.3	3.7
Kennedy	2.6	5.8	4.0	5.3
Johnson	6.0	6.0	2.7	4.6
Carter	5.5	5.0	2.8	−0.3*
Average	3.7	6.4	4.5	3.3
Average First/Second Halves	5.0		3.9	

Republican Administrations

	Year			
	First	Second	Third	Fourth
Eisenhower I	3.8	−1.2	6.7	2.1
Eisenhower II	1.8	−0.4	6.0	2.2
Nixon I	2.8	−0.2	3.4	5.7
Nixon/Ford	5.8	−0.6	−1.2*	5.4
Reagan	2.5	−2.1	3.7	6.8
Average	3.3	−0.9	3.7	4.4
Average First/Second Halves	1.2		4.0	

SOURCE: See Table 1
*Oil shocks

have been 1974 and 1980, both years affected by the oil shocks. On the contrary, the second years of Democratic administrations show sustained growth well above the second half of the term. This table suggests that there might be lags in the effect of changes in policies since in the second more than in the first year the difference between the two types of administration is more evident.

The following simple regression accounts for the preceding observations. The average real GNP growth per year is regressed over the four dummies for the four periods considered, first and second half of Democratic administrations, first and second half of Republican administrations, and a time trend. The variable $D1$ is a dummy assuming the value of 1 in the first half of a Democratic administration and zero otherwise, and $R1$ ($R2$) are dummies assuming the value of 1 in the first (second) half of a Republican administration. We obtain (the t-statistics are in parentheses)

$$y_t = 4.46 + 1.05\,D1 - 2.64\,R1 + 0.29\,R2 - 0.06t\ , \qquad (21)$$
$$(5.41)\quad (1.17)\quad (-3.10)\quad (0.34)\quad (-1.05)$$
$$R^2 = 0.65, \qquad \text{D-W} = 2.39\ .$$

The coefficient on $R2$ is insignificant: the data do not show any difference between the second halves of the two types of administrations. The dummy for the first half of Republican administrations has, instead, a strongly significant negative coefficient, as predicted by the theory. The dummy for the first half of Democrat administrations ($D1$) has the right sign even though is not statistically strongly significant. There is a negative but not strongly significant trend. The following regression confirms that these results are robust to the introduction of a dummy accounting for the two oil shocks.[10]

$$y_t = 4.45 + 0.78D1 - 2.73\,R1 + 0.16\,R2 - 0.02\,t - 1.22\,OIL\ , \qquad (22)$$
$$(5.59)\quad (0.88)\quad (-3.31)\quad (0.20)\quad (-0.42)\quad (-1.40)$$
$$R^2 = 0.70, \qquad \text{D-W} = 2.30\ .$$

Analogous results are obtained by this additional test. The quarterly GNP at 1972 prices has been regressed on eight lagged values, a time trend, a dummy for the oil shocks (*OILSH*), and two dummies for the first half of the administrations of the two parties. In Table 3 the results are displayed. The dummy *REL* assumes the value of 1 in the first eight quarters of each Republican administration and zero otherwise. The coefficient of this variable is negative and significant at the 1 percent level. The dummy *DEL* assumes the value of 1 in the first eight quarters of each Democratic administration and zero otherwise. The coefficient

TABLE 3

QUARTERLY GNP (CONSTANT PRICES), 1949–1984

Variables	Coefficients	*t*-Statistics
C	13.50	1.44
GNP(−1)	1.25	14.7
GNP(−2)	−0.2	−1.45
GNP(−3)	−0.16	−1.13
GNP(−4)	−0.06	0.44
GNP(−5)	−0.004	−0.31
GNP(−6)	0.10	0.73
GNP(−7)	−0.04	−0.29
GNP(−8)	0.007	0.08
TIME	0.23	1.29
OILSH	−4.88	−1.61
REL	−6.08	−2.79
DEL	2.21	0.96

SOURCE: Citibank database
D–W = 2.05, R^2 = 0.99

[10]The dummy *OIL* assumes the values of 1 in the periods 1972–73, 1974–75, and 1979–80 and zero otherwise. These results are robust to alternative specification of this dummy.

of this variable is positive as predicted by the theory, although not strongly significant.

Table 4 displays the timing of the beginning of all the recessions in relation to the preceding elections. A few months after the election of every Republican administration a recession started. Contrary to the predictions of the PBC, there have been no recessions in the first halves of a Democratic administrations. A recession started the same month of the election of Truman in November 1948, and, therefore, two months before this administration took office. The other two recessions started in the second half of the Carter administration, at the time of the second oil shock, and in the last year of the second administration of President Eisenhower. Leaving aside the Truman recession, of dubious origin, five of the seven recessions fit the theory and two do not. Note that the two that do not fit also contradict the PBC approach since they have occurred in the second halves of two administrations.

Let us now turn to money growth. The most important implication of the model for money growth is that the time-consistent rate of money creation of Republican administrations is lower than that of Democratic administrations, in both periods. The following regression, allowing for a linear trend in money growth, does not reject this implication [m = average rate of growth of $M1$ per year (biannual averages)]:

$$m_t = \underset{(2.18)}{1.49} - \underset{(-1.83)}{1.14}\, R + \underset{(6.52)}{0.39}\, t \,, \tag{23}$$

$$R^2 = 0.74, \qquad \text{D-W} = 1.96 \,.$$

TABLE 4

POST–SECOND WORLD WAR RECESSIONS

Through	Beginning of Contraction	Previous Election (Party Elected)
October 1949	November 1948	November 1948 (D)
May 1954	June 1953	November 1952 (R)
April 1958	July 1957	November 1956 (R)
February 1961	April 1960	November 1956 (R)
November 1970	October 1969	November 1968 (R)
March 1975	December 1973*	November 1972 (R)
July 1980	January 1980*	November 1976 (D)
November 1982	May 1981	November 1980 (R)

SOURCE: National Bureau of Economic Research
*Oil Shocks

The dummy variable for Republican administrations, R, assumes the value of 1 during Republican administrations and zero otherwise. The coefficient of this variable is negative, as predicted by the theory, and statistically significant at the 5 percent level using a one-sided test. As expected, there is a highly significant trend.

The second empirical implication for money growth is that one should observe a larger deviation from trend in the second half of a Democratic administration than in the first. In a Republican administration, instead, the opposite should hold if $h > 0$. The following regression tests these implications:

$$m_t = \underset{(1.19)}{0.95} + \underset{(1.28)}{1.18}\, D2 - \underset{(-0.82)}{0.71}\, R1 - \underset{(-0.40)}{0.36}\, R2 + \underset{(6.34)}{0.38}\, t \,, \tag{24}$$

$$R^2 = 0.77, \qquad \text{D–W} = 1.81 \,.$$

$D2$ is a dummy assuming the value of 1 in the second halves of Democratic administrations and zero otherwise. As predicted by the theory, there is more money creation in the second part of a Democratic administration than in the first: the coefficient of $D2$ is, in fact, positive and large, although statistically not strongly significant. For the Republican administrations the results are quite ambiguous: the relative magnitude of the two coefficients is opposite from what the theory predicts, but the two coefficients are not strongly significant.

It is quite interesting to verify that, as pointed out by Beck (1984), there are two observations which do not fit the partisan theory of monetary policy: these are the second half of the Nixon administration and the Kennedy administration. The Nixon administration does not fit the "partisan theory" because of the monetary expansion of 1971–72: the political business cycle theory is perhaps a better explanation of this observation. The Kennedy administration does not fit the partisan theory of monetary policy because of a policy mix with expansionary fiscal policy and tight monetary policy. The following two regressions are consistent with these observations:

$$m_t = \underset{(3.61)}{2.13} - \underset{(-3.30)}{1.82}\, R + \underset{(3.00)}{2.03}\, KN + \underset{(7.70)}{0.37}\, t \,, \tag{25}$$

$$R^2 = 0.84, \qquad \text{D–W} = 2.56 \,.$$

$$m_t = \underset{(2.38)}{1.58} + \underset{(1.66)}{1.19}\, D2 - \underset{(-1.71)}{1.20}\, R1 - \underset{(-1.64)}{1.23}\, R2 + \underset{(3.04)}{2.04}\, KN + 0.37\, t \,, \tag{26}$$

$$R^2 = 0.81, \qquad \text{D–W} = 2.47 \,.$$

In (25) and (26) KN is a dummy assuming the value of -1 in the two periods of the Kennedy administration and 1 in the second period of the Nixon administration. In (25) the dummy KN is added to the regression (23): the coefficient on KN is positive and strongly significant. In (26) the dummy KN is added to the regression (24). Note that the coefficients on $R1$ and $R2$ become more significant and virtually identical. It is interesting to note, for future reference, that the model predicts that for $h=0$ these two coefficients should be equal.

We have also examined the unexpected money variable, DMR, constructed by Barro (1978). This variable is obtained from the residual of a regression of the rate of money growth, $M1$, on several lagged variables assumed to be in the relevant information set of the economic agents.[11] Biannual averages of this variable (DMR) are reported in Table 5 (this variable is not available after 1976). Barro's unexpected money variable is not consistent with our definition of "unexpected money" since we do not rely upon lagged values to compute expected money. This difference may explain why Barro does not find monetary "surprises" only in the first half of the terms of office, but also in the second halves, as shown in Table 5. Nevertheless, it is interesting to examine this variable as an indicator of "money supply shocks." Ten observations have the expected sign, negative for Republican and positive for Democratic administrations. Only four observations do not fit. As noted before the Kennedy and Nixon administrations, in particular, the second half of the latter one, are those that do not quite fit the partisan pattern. According to the following simple regression we can mildly reject the hypothesis of no difference in the "money surprises" under the two types of administration:

$$DMR_t = \underset{(1.11)}{0.43} - \underset{(-1.42)}{0.73}\, R \ , \qquad (27)$$

$$R^2 = 0.14, \qquad \text{D-W} = 1.21 \ .$$

TABLE 5

BARRO'S UNEXPECTED MONEY, BIANNUAL AVERAGES (RATE OF GROWTH IN PERCENT)

Truman	0.30
	1.35
Eisenhower I	−1.00
	−0.20
Eisenhower II	−0.85
	−1.25
Kennedy	−0.85
	0.15
Johnson	0.35
	1.30
Nixon	0.45
	1.65
Nixon/Ford	0.25
	−1.45

SOURCE: Barro (1978), Table 1, p. 552.

[11]These variables are lagged money growth, lagged unemployment, and a measure of federal expenditure (Barro 1978, equation (1), p. 551). This method of computing expected money has been criticized; see, for example, the comments on Barro and Rush in Fischer (1980) and Mishkin (1982).

The coefficient on the dummy for Republican administrations (R) is only "mildly" significant (ten percent level, one-sided test) because of the Nixon administration, which, as noted earlier, is the outlier in this regression. In fact, by leaving out the second half of this administration one greatly improves the regression, in particular, the significance of the coefficient of R:

$$DMR_t = \underset{(1.36)}{0.43} - \underset{(-2.33)}{1.01}R \,, \tag{28}$$

$$R^2 = 0.33, \qquad \text{D–W} = 1.40 \,.$$

4. ESTIMATION OF THE MODEL

The empirical evidence in the preceding section suggests that the model is broadly in accordance with the data. In fact, the cross-equation restrictions imposed by the theory cannot be rejected. The system of equations (13) to (20) has been estimated using nonlinear least squares. The only modification from equations (13) to (20) is given by the introduction of a dummy variable in the output growth equation accounting for the two oil shocks as in (22). The results are reported in Table 6. The log-likelihood test does not reject the restrictions imposed by the theory at the 5 percent confidence level.

TABLE 6

ESTIMATION OF THE MODEL

Parameters	Estimates	t-Statistics
$\bar{y}$	4.26	10.01
γ	4.97	0.98
P	0.81	5.13
g	0.90	6.08
h	−1.60	−0.22
k	0.17	0.59
β	−0.001	−0.32
v	−1.29	−1.91
$\bar{m}$	0.58	0.68
σ	0.39	7.56

Log of likelihood function: −52.44

The estimated values of h and g do not reject the partisan hypothesis. In fact, the parameter $h = \tilde{d}\gamma^2/(c+d)$ is insignificantly different from zero while $g = \tilde{b}\gamma^2/(a+b)$ is positive and strongly significant. The relative magnitude of g and h is then consistent with the hypothesis that Democratic administrations have attributed relatively more weight to the output target than Republican administrations, which, instead, have been concerned mainly (or only, strictly speaking) with the money growth target. The estimated value of P, the probability of electing a Democratic administration, is high (0.81), implying that Republican administrations have always been elected with a certain amount of "surprise." The value of this parameter is due to the fact that the deviations from trend of output growth at the beginning of Republican administrations have been on average larger (in absolute value) than the same deviations at the beginning of Democratic administrations. This observation was already apparent from the result of the regressions (21) and (22) and from Tables 2 and 3. In our stylized model this asymmetry can only be captured by a high P, implying, ceteris paribus, more surprise when a Republican president is elected, and, therefore, stronger effects on output of monetary policy. However, in a more general model, the same phenomenon could be explained by an asymmetric effect of negative versus positive monetary shocks due, for example, to different degrees of price flexibility upward or downward. Needless to say, the probability P is, in general, different in every election. The relationship between poll predictions about electoral outcomes and effects of policies "surprises" needs further investigation in the context of this model.[12] The value of $\bar{y}$ (4.26) is plausible and statistically significant (see Table 2); β is insignificantly different from zero, implying very little evidence of a negative trend in the natural rate of growth. The parameters a, $\bar{m}$ and σ have the expected sign and order of magnitude; in particular, there is a positive and significant trend in money growth (σ is significant and positive). The oil shocks have affected negatively output growth: this result is captured by the parameter v (referred to the variable OIL).

The remaining two parameters γ and $\bar{k}$ are less plausible. The former is too high and the latter perhaps too low and both are only weakly significant. These unsatisfactory estimates for γ and $\bar{k}$ indicate, presumably, weak identification of these two parameters. Note, in fact, that in the output growth equation given by (13)–(16) $\bar{k}$ always enters multiplied by γ. The parameter γ also enters multiplied by β, but the latter is insignificantly different from zero. Thus, the identification of γ and $\bar{k}$ is left exclusively to the money growth equation. Due to the lack of many degrees of freedom, this identification is probably weak.

In order to test this conjecture we have estimated the model holding $\bar{k}$ fixed at several different values. If one holds $\bar{k}$ fixed, the estimates of γ becomes much more significant. Furthermore, as expected, if $\bar{k}$ is raised, γ falls while the other parameters remain plausible as in Table 6 and the log-likelihood function remains virtually unchanged for a relevant range of values of $\bar{k}$.[13] In Table 7 we report the results obtained by fixing $\bar{k} = 0.75$. The value of γ falls to 3.17 and becomes statistically significant. This estimates for the effect of unanticipated money on output growth (γ) is not inconsistent with the findings of Barro (1978).[14] These value of γ and $\bar{k}$ imply a "bliss point" of output growth (ϕ) of

[12]The high value of P is probably model-specific. For example, a richer structure of lags in the supply equation would affect (and presumably would lower) its value.

[13]We have also performed the same experiment holding γ fixed and estimating $\bar{k}$. We obtained analogous results: $\bar{k}$ becomes significant and increases when γ is reduced. The data clearly reject values of γ lower than about 2.5. These results are available from the authors.

[14]Barro (1978) presents the following regression:

$$\lg y_t = \underset{(0.04)}{2.95} + \underset{(0.21)}{1.04}\, DMR_t + \underset{(0.22)}{1.21}\, DMR_{t-1} + \underset{(0.21)}{0.44}\, DMR_{t-2} + \underset{(0.16)}{0.26}\, DMR_{t-3}$$

TABLE 7

ESTIMATION OF THE MODEL: $\bar{k}$ = 0.75

Parameters	Estimates	t-Statistics
$\bar{y}$	4.20	9.16
γ	3.17	2.02
P	0.72	5.84
g	0.65	3.63
h	−0.28	−0.24
β	0.001	−0.09
v	−1.09	−1.58
$\bar{m}$	0.43	0.40
σ	0.39	7.52

Log-likelihood function: −52.87

about 7 percent which appears quite reasonable.[15] The parameters v, σ, $\bar{m}$, and β are virtually unchanged and confirm the implications of Table 6. The only significant difference is that both P and g are lower. However, g is clearly still positive, thus, greater than h as implied by the "partisan theory," and P remains high (clearly greater than ½).

5. SUMMARY

This paper provides empirical support to the "partisan view" of monetary policy. First of all, we could reject the hypothesis that macroeconomic outcomes have been the same under Democratic and Republican administrations in the post–Second World War period in the United States. Deviation of output growth from trend occurred mostly in the first halves of the terms, while the rate of growth of money has been systematically different for the entire term, as predicted by the theory. Two conclusions have been inferred from these results. In the first place, Democratic administrations seemed relatively more concerned with an output target than with a money growth/inflation target. Second, the real effects of new policies are stronger at the beginning of new administrations. If a more expansionary administration is elected, it can take advantage of a short-term Phillips curve. However, once the economy has fully adjusted to the

$$+ \underset{(0.09)}{0.55}\, MIL_t + \underset{(0.0004)}{0.0354}\, t\ .$$

Standard errors are in parentheses. y = log of GNP at 1972 prices; DMR = unexpected $M1$. MIL is the ratio of military personnel to the male population aged 15 to 44. Barro's results cannot be directly compared with those of this paper, because of the different specification of the output equation, but the two estimates have the same order of magnitude. However, these results by Barro have been criticized by Mishkin (1982) and (1983).

[15]Several alternative values of $\bar{k}$ have been tested. For $\bar{k}$ = 0.25 we obtained (t-statistic in parentheses) γ = 4.2 (1.70); P = 0.79 (6.2); g = 0.86 (12.3). For $\bar{k}$ = 0.5 we obtained γ = 3.40 (2.00); P = 0.74 (5.98); g = 0.75 (5.98). For $\bar{k}$ = 1 we obtained γ = 3.10 (1.92); P = 0.72 (5.72); g = 0.58 (2.57). For $\bar{k}$ = 1.3 we obtained γ = 3.08 (1.91); P = 0.71 (5.62); g = 0.51 (1.85). All the other parameters and the log-likelihood function show virtually no changes for this range of values of $\bar{k}$. Complete results are available from the authors.

new regime, the same expansionary policy has little if any effect on real variables, i.e., the Phillips curve is more (or completely) vertical. Conversely, there are short-term output losses when an administration more concerned with inflation is elected because inflationary expectations have been raised by the administration more concerned with output growth. These results suggest that a "partisan theory" of economic policy contributes to the explanation of macroeconomic outcomes in the United States.

LITERATURE CITED

Abrams, Richard, Richard Froyen, and Roger Waud. "Monetary Policy Reaction Functions, Consistent Expectations and the Burns Era." *Journal of Money, Credit, and Banking* 12 (February 1980), 30–42.

Alesina, Alberto. "Credibility and Policy Convergence in a Two-Party System with Rational Voters." Unpublished, November 1986.

———. "Macroeconomic Policy in a Two-Party System as a Repeated Game." *Quarterly Journal of Economics* 102 (1987), 651–78.

Allen, Stuart. "The Federal Reserve and the Electoral Cycle." *Journal of Money, Credit, and Banking* 18 (February 1986), 88–94.

Barro, Robert. "Unanticipated Money, Output and the Price Level in the United States." *Journal of Political Economy* 86 (August 1978), 549–80.

Barro, Robert, and David Gordon. "Rules, Discretion and Reputation in a Model of Monetary Policy." *Journal of Monetary Economics* 12 (July 1983), 101–22.(a)

———. "A Positive Theory of Monetary Policy in a Natural Rate Model." *Journal of Political Economy* (August 1983), 589–610.(b)

Beck, Nathaniel. "Parties, Administrations and American Macroeconomic Outcomes." *American Political Science Review* 26 (March 1982), 83–94.

———. "Domestic Political Sources of American Monetary Policy: 1955–82." *Journal of Politics* 46 (August 1984), 786–817.

Business Conditions Digest, various issues (for *M*1). U.S. Department of Commerce, Bureau of Economic Analysis.

Chapell, Henry, and William Keech. "Party Differences in Macroeconomic Policies and Outcomes." *American Economic Review* 76 (May 1986), 71–74.

Citibank Database.

Downs, Anthony. *An Economic Theory of Democracy.* New York: Harper and Row, 1957.

Economic Report of the President 1985.

Fischer, Stanley. "Long-Term Contracts, Rational Expectations and the Optimal Money Supply Rule." *Journal of Political Economy* 85 (February 1977), 191–206.

——— (ed.). *Rational Expectations and Economic Policy.* Chicago: University of Chicago Press, 1980.

Frey, Bruno, and Friedrich Schneider. "A Empirical Study of Politico-Economic Interaction in the United States." *Review of Economics and Statistics* 60 (May 1978), 174–83.

Friedlaender, Ann. "Macro Policy Goals in the Postwar Period: A Study in Revealed Preference." *Quarterly Journal of Economics* 87 (February 1973), 25–43.

Golden, David, and James Poterba. "The Price of Popularity: The Political Business

Cycle Reexamined." *American Journal of Political Science* 24 (November 1980), 696–714.

Havrilesky, Thomas. "A Partisanship Theory of Fiscal and Monetary Regimes." *Journal of Money, Credit, and Banking* 19 (August 1987), 308–325.

———. "Monetary Policy Signaling from the Administration to the Federal Reserve." *Journal of Money, Credit, and Banking* 20 (February 1988).

Havrilesky, Thomas, Robert Sapp, and Robert Schweitzer. "Tests of the Federal Reserve's Reaction to the State of the Economy." *Social Science Quarterly* 55 (March 1975), 835–52.

Haynes, Stephen, and Joe Stone. "Does the Political Business Cycle Dominate United States Unemployment and Inflation?" mimeo, forthcoming in *Political Business Cycles*, edited by Thomas Willett, Pacific Institute (1988).

Hibbs, Douglas. "Political Parties and Macroeconomic Policy." *American Political Science Review* 71 (December 1977), 1467–87.

———. *The American Political Economy: Electoral Policy and Macroeconomics in Contemporary America.* Cambridge: Harvard University Press, forthcoming, 1988.

Kiewieit, Roderick. *Micropolitics and Macroeconomics.* Chicago: Chicago University Press, 1985.

Kydland, Finn, and Edward Prescott. "Rules Rather than Discretion: The Inconsistency of Optimal Plans." *Journal of Political Economy* 85 (June 1977) 473–90.

Laney, Leroy, and Thomas Willett. "Presidential Politics, Budget Deficits and Monetary Policy in the United States; 1960–1976." *Public Choice* 40 (January 1983), 53–69.

MacRae, Duncan. "A Political Model of the Business Cycle." *Journal of Political Economy* 85 (April 1977), 239–64.

McCallum, Bennett. "The Political Business Cycle: An Empirical Test." *Southern Journal of Economics* 44 (January 1978) 504–15.

Minford, Patrick, and David Peel. "The Political Theory of the Business Cycle." *European Economic Review* 17 (February 1982), 253–70.

Mishkin, Frederic. "Does Anticipated Monetary Policy Matter? An Econometric Investigation." *Journal of Political Economy* 90 (February 1982), 22–51.

———. "A Rational Expectations Approach in Macroeconometrics." Chicago: University of Chicago Press, 1983.

National Bureau of Economic Research, Timing of Recessions in the U.S.

Nordhaus, William. "The Political Business Cycle." *Review of Economic Studies* 42 (April 1975), 169–90.

Okun, Arthur. "General Economic Conditions and National Elections." Comments on Stigler's Paper. *American Economic Review* 63 (May 1973), 172–77.

Richards, Daniel. "Unanticipated Money and the Political Business Cycle." *Journal of Money, Credit, and Banking* 18 (November 1986), 446–57.

Rogoff, Kenneth, and Anne Sibert. "Equilibrium Political Business Cycles." National Bureau of Economic Research, Working Paper No. 1838, February 1986.

Samuelson, Paul. "Some Dilemmas in Economic Policy." *Challenge* (March/April 1977), 45–52.

Soh, Byung Hee. "Political Business Cycles in Industrialized Democratic Countries." *Kyklos* 39 (January 1986), 31–46.

Stein, Herbert. *Presidential Economics.* New York: Simon and Schuster, 1985.

Stigler, George. "General Economic Conditions and National Elections." *American Economic Review* 63 (May 1973) 160–67.

Tabellini, Guido, and Vincenzo La Via. "Money Deficit and Public Debt: An Empirical Investigation." Unpublished, September 1986.

Taylor, John. "Aggregate Dynamics and Staggered Contracts." *Journal of Political Economy* 87 (February 1980), 1–23.

Tufte, Edward. *Political Control of the Economy.* Princeton, N.J.: Princeton University Press, 1978.

Weintraub, Robert. "Congressional Supervision of Monetary Policy." *Journal of Monetary Economics* 4 (April 1978), 341–62.