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Partisan Effects in Economies with Variable Electoral Terms

INTEREST IN PARTISAN POLITICAL-ECONOMIC MODELS has recently experienced a revival, with most of the recent work concentrating on explaining the political business cycle in the United States.[1] However, the United States is a special case, its political system being among a minority with fixed electoral terms. In most nations the timing of the next potential change in government is uncertain. This paper incorporates a variable electoral term into a partisan model.

In variable electoral term economies partisan surprises are associated with both a change in government and with the timing of the change. We concentrate on the latter. This effect is interesting as it provides an explanation of movements in expected inflation, output, and employment in all periods, not just those immediately after an election.

We present two versions of the partisan model. In the first a government involuntarily risks losing power. Both the probability of an election and the probability of a change in government are exogenous. This represents a vote of no confidence, coalition breakdown, or coup d'état. In the second the government follows an optimal stopping rule and calls an election when it wishes. In both, the economy deviates from the natural rate of output when the probability of a change in government is nonzero. The direction of output deviations depends on the government's

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[1]See Hibbs (1977), Alesina (1987), Havrilesky (1987), Alesina and Sachs (1988a, 1988b), and Haynes and Stone (1990).

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preferences. A party that places relatively more weight on output experiences output above the natural rate. A party that places less weight on output experiences the opposite.

1. A SIMPLE PARTISAN MODEL WITH VARIABLE ELECTORAL TERMS

All democratic systems have a maximum term between elections, but most have no minimum term. Notable exceptions are the United States, Norway, and Sweden. Governments may be involuntarily removed by a vote of no confidence as in the United Kingdom, by coalition dissolution as in Italy or Belgium, or even by coup d'état as experienced in Greece. In this section we modify the models of Barro and Gordon (1983) and Alesina (1987) to incorporate these features.

A conservative (c) and liberal party (ℓ) each have preferences over real output, inflation, and distributional goals, as represented by the cost functions[2]

$$\sum_{t=0}^{\infty} q^t C_t^i = \sum q^t[(1/2)(\pi_t)^2 + b^i(\bar{y} - y_t) + D_t^i] \qquad i = c, \ell \ , \tag{1}$$

where π_t is inflation in period t, y_t is the level of output in period t, y is the natural rate of output, $q \epsilon [0,1]$ is a discount factor, b^i is the weight placed on output, and D_t^i is a constant representing the cost a party incurs because it is unable to pursue distributional policies. The b^is capture the parties' preferences over the redistributional implications of achieving output levels in excess of the natural rate. The D_t^is are intended to capture party preferences over redistributions at given levels of output. We assume that D_t^i is positive when i is not in power and zero otherwise.

The economy is represented by the surprise Phillips curve[3]

$$y_t = \bar{y} + \gamma(\pi_t - {}_{t-1}\pi_t^e) \ , \tag{2}$$

where ${}_{t-1}\pi_t^e$ is the rational expectation of inflation conditional on period $t - 1$ information, and $\gamma > 0$ is a parameter.

The two parties' time-consistent policies involve choosing π_t to minimize (1) subject to (2) taking ${}_{t-1}\pi_t^e$ as given, so

$$\pi_t = b^i\gamma \qquad \forall t, \ i = c,\ell \ . \tag{3}$$

Expected inflation is given by

$$ {}_{t-1}\pi_t^e = (1 - P_t^* + P_t^* P^i)b^i\gamma + P_t^* P^j b^j \gamma \qquad i = c,\ell \qquad j = c,\ell \qquad i \neq j \ , \tag{4}$$

[2]The "distributional parameter" is the only difference between this specification of preferences and those of Barro and Gordon (1983) and Alesina (1987).

[3]See Alesina (1987) for the microfoundations.

where P_t^* is the probability of an election (or attempted coup) in period t, and P^i is

not change hands we use (3) an (4) in (2) to obtain

$$y_t^i - \bar{y} = \gamma^2 P_t^* P^j (b^i - b^j) \qquad i = c,\ell \qquad j = c,\ell \qquad i \neq j\,. \tag{5}$$

Deviations of real output from the natural rate are due to expectational errors in inflation. In all periods with a nonzero election probability, the party placing greater (lesser) weight on output experiences output above (below) the natural rate. These results arise either if the incumbent wins, or if no election is held. We concentrate on the implications of an election *not* being held when it has a positive probability.

If $b^\ell > b^c$ then differentiating (5) appropriately yields Table 1. The models' properties are as follows. In periods with a nonzero election probability, but when one is not called, then: (i) A conservative (liberal) government experiences output below (above) the natural rate. (ii) The more responsive is output to expectational errors (the larger is γ) the larger are the output deviations. (iii) The greater the difference between the parties' preferences (the larger is $b^\ell - b^c$) the greater the absolute deviations in output from the natural rate. (iv) For both parties, the greater the probability of being reelected given that an election is called, the smaller the deviation of output from the natural rate. (v) For both parties, the greater the probability of an election being called, the greater the deviation of output from the natural rate.

The existence of these politically driven deviations of output from the natural rate in nonelection periods is a key prediction of this model and that which follows. These output deviations will be absent in fixed electoral term economies, which should therefore experience lower output variance.

2. THE MODEL WITH THE GOVERNMENT CHOOSING THE ELECTION DATE

In the preceding model both the probability of an election being held in any period and the probabilities associated with the potential election outcomes were exogenous. Here we endogenize these probabilities. We model the expected cost minimization problem of a government free to call an election at any time before some future mandatory election date. Other work by Nordhaus (1975), Chappell and Peel (1979), and Lachler (1982) has examined models with variable electoral terms, adaptive expectations, and manipulable voting, while Terrones (1989) has examined a rational model where calling an early election gives a positive signal about

TABLE 1

COMPARATIVE STATICS RESULTS

	$d\gamma$	dP^c	db^c	db^ℓ	dP^*
$d(y_t^c - \bar{y})$	−	−	+	−	−
$d(y_t^\ell - \bar{y})$	+	+	−	+	+

government efficiency and leads to increased electoral support. Our work differs from these approaches: here expectations are rational and election probabilities nonmanipulable. In this analysis the government is opportunistic; an election is called if a stochastic noneconomic event raises its probability of success above some critical value.[4] We analyze the time path of this critical value and the associated time paths of election probabilities, expected inflation, and the level of real output.

The basic structure of the model is as in the preceding section. Government preferences are given by the cost functions, equation (1). The economy is described by a surprise Phillips curve, equation (2), which without loss of generality is assumed to have unitary slope (that is, $\gamma = 1$). The parties' time-consistent policies are therefore as given in (3). The problem faced by the government is to choose the period in which the next election is to be held, subject to the constraint that this must be on or before the next mandatory election date T. For simplicity we model the case where the winner of the next election remains in power permanently thereafter. This has only quantitative implications.

In every period the government's relative popularity is stochastically determined by noneconomic events characterized by the i.i.d. random variable ϵ which is assumed to be uniformly distributed on $[0, 1/B]$. The probability of party i winning an election in any period is assumed to depend linearly on ϵ, viz. $P^i = B\epsilon$ so $P^i \epsilon [0,1]$. ϵ is observed before the government decides to call an election. The question is "what value of P^i just induces an expected cost minimizing government to call an election?" We analyze the behavior of two types of government, a conservative government that cares about distributional issues and inflation, and a liberal government that cares about real output as well as these issues.

A. *The Behavior of the Political/Economic System under a Conservative Government*

A conservative government cares only about inflation and distributional issues; its preferences are described by (1) with $b^c = 0$ (hereafter $b^\ell \equiv b$). In each period before T it may call an election if this minimizes expected present discounted cost. The expected cost of calling an election is

$$P_t(0) + (1 - P_t)[(b^2/2(1 - q)) + D^c/(1 - q)] \ , \tag{6}$$

where P_t is the probability of winning, 0 is the present discounted value of the cost function if the election is won, and $b^2/2(1 - q) + D^c/(1 - q)$ is the present discounted value of the cost function if it is lost. A conservative government clearly always prefers electoral victory to defeat. If no election is called the government's payoff is defined to be

$$qV_{t+1} \ . \tag{7}$$

[4]Ito and Park (1988) present evidence that the Japanese Liberal Democratic Party behaves opportunistically when calling elections.

It follows from (6) and (7) that an election is called in period t if the probability of victory exceeds some critical value denoted X_t defined by

$$P_t > 1 - 2[q(1 - q)/(b^2 + 2D^c)]V_{t+1} \equiv X_t \, . \tag{8}$$

The probability of an election being called in period t is then $1 - X_t$. The conditional probability of winning given an election is called is simply

$$(1 + X_t)/2 \, . \tag{9}$$

Using (6)–(9) the cost of entering t without having held an election is

$$V_t = X_t(qV_{t+1}) + (1 - X_t)\left\{ \left[\frac{1 + X_t}{2}\right](0) + \left(\frac{1 - X_t}{2}\right)\left[\frac{b^2 + 2D^c}{2(1 - q)}\right]\right\} \, . \tag{10}$$

Using (8) and simplifying allows (10) to be expressed in terms of the Xs

$$X_t = \left(\frac{2 - q}{2}\right) + (q/2)X_{t+1}^2 \, . \tag{11}$$

X_t is increasing and convex in X_{t+1}, and for all q converges to unity as the number of periods to the next mandatory election date rises. Furthermore, the speed of convergence decreases monotonically in the discount rate (for higher q, X_t is lower for every t). This implies that the probability of an election decreases monotonically in the number of periods to the next mandatory election date. Furthermore, this probability is lower in every period the higher is the discount rate. From (4) expected inflation is given by

$$_{t-1}\pi_t^e = b(1 - X_t)^2/2 \, . \tag{12}$$

X_t is decreasing over time; this and (12) imply that expected inflation is increasing over time, and rises faster the higher the discount rate. Since actual inflation is zero, expectational errors must rise monotonically over time. In each period that the conservative party remains in office output falls further below the natural rate. Furthermore, the expectational errors are larger in every period the larger is the discount rate, so that higher discount rates produce larger output gaps. Figure 1 illustrates time paths for expectational errors and output with different discount rates.

These results may be understood by thinking recursively about the government's problem. If it calls no election before period T, it expects to win with probability 1/2. In $T - 1$ it must decide what probability of victory is sufficient to risk an early election. Not calling an election in $T - 1$ ensures zero cost for that period, but implies an election at T with an expected victory probability of only 1/2. If the probability of victory in $T - 1$ is less than 1/2, then clearly no election is called.

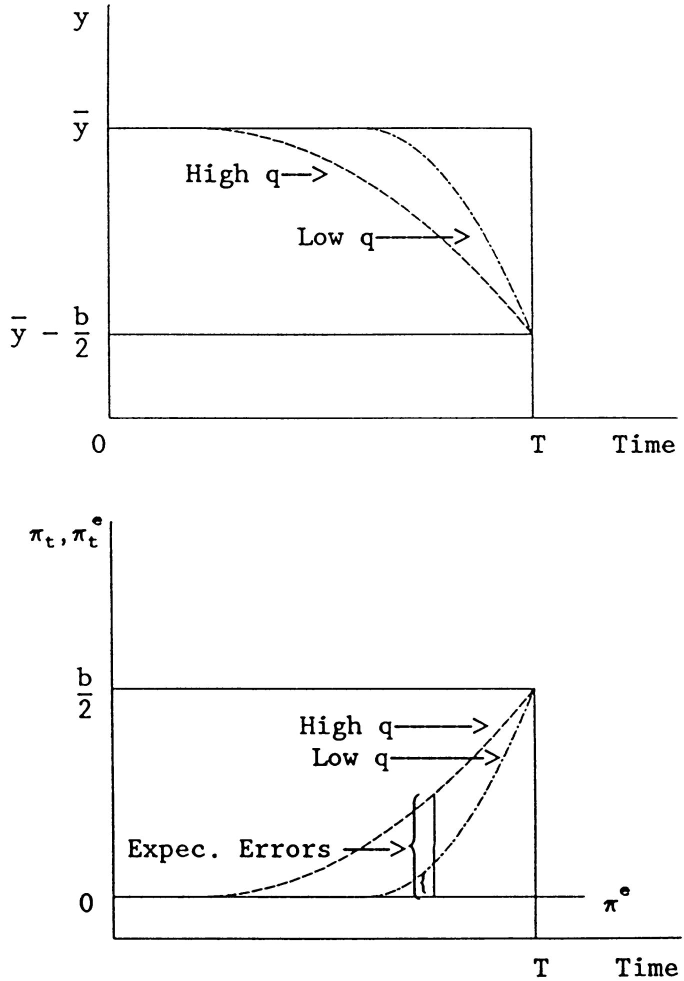

FIG. 1. Time Paths of Output Growth and Expectional Errors: Hard-nosed Case

Applying this argument to each successive prior period implies that the further in the future is T, the larger the probability of success must be for an election to be called. Furthermore, the probability of electoral success needed to induce an election in every period varies inversely with q. This implies that in every period the probability of an election and expected inflation increase with q, which in turn implies larger deviations of output below the natural rate. Intuitively, the larger is q the more the government cares about the future problem associated with having only a 50 percent expected chance of winning an election held in period T. Hence less incentive in the form of current popularity is required to induce an early election.

B. The Behavior of the Political/Economic System under a Liberal Government

Here the government cares about output, inflation, and distributional policies. It chooses the election date to minimize expected cost. However, this need not imply it wants to win the election. To lose and incur the costs associated with the inflation rate of the other party may be preferable to the costs associated with its own time-consistent policies. Zero post-election inflation is optimal for both parties, but time consistent only for party c. We shall characterize when winning or losing is preferred, and economic behavior in both cases. We focus attention on the "want to win" case, both because it is more reasonable, and because it is unclear why a party that wants to lose does not guarantee doing so by simply not contesting the election.[5]

The setup of the model is as before except that a little care must be taken in defining expected inflation to allow for both the case where the government desires defeat and the case where it desires victory. We have

$$_{t-1}\pi_t^e = \bar{P}_t b(1 + X_t)/2 + b(1 - \bar{P}_t) , \tag{13}$$

where $\bar{P}_t$ is the probability an election is called at t. The conditional probability of party ℓ winning is as in (10). From (3), (6), and (13) we get the expected costs associated with calling an election and winning or losing.

$$\bar{P}_t b^2 \left[\frac{X_t - 1}{2} \right] + b^2/2(1 - q) \qquad \text{if } \ell \text{ wins} , \tag{14}$$

and

$$b^2 - \bar{P}_t b^2 \left[\frac{1 - X_t}{2} \right] + \frac{D^\ell}{1 - q} \qquad \text{if } \ell \text{ loses} . \tag{15}$$

Winning is preferred if $b^2(2q - 1) - 2D^\ell < 0$. If the party places significant weight on short-term output (b^ℓ is large and q is small), or if it emphasizes distributional policies (D^ℓ is large), then it prefers winning. Finally the expected cost of not calling an election is

$$(b^2/2)[1 + \bar{P}(X_t - 1)] + qV_{t+1} . \tag{16}$$

It follows from (14)–(16) that party ℓ will call an election if

$$b^2(2q - 1) - 2D^\ell \lesseqgtr \quad \text{and} \quad \bar{P}_t \gtrless \frac{(1 - q)(2qV_{t+1} - b^2)}{b^2(2q - 1) - 2D^\ell} \equiv X_t . \tag{17}$$

[5]For our specification victory was preferred in over 50 percent of the parameter space. Intuition suggests that in a repeated election model the parameter space over which defeat is preferred would be even smaller. Also, in a repeated election model it may be easier to justify the want-to-lose case. Defeat may be preferred today but not necessarily in the future.

If victory (defeat) is preferred, the probability of an election is given by $1 - X_t$ (X_t). Whatever outcome is preferred the election is called only when its probability is sufficiently high. We now derive time paths for the key variables by computing the expected cost of entering any arbitrary period given that no prior election has been called. This expected cost follows a first-order nonlinear difference equation from which we deduce the key variables' intertemporal behavior. There are two cases:

B.(i) The Liberal Party Prefers to be Elected, $b^2(2q - 1) - 2D^\ell < 0$

Using (9) and (14)–(17), the expected cost of entering period t without having called a prior election is written

$$V_t = X_t(qV_{t+1} + b^2/2) + [(1 - X_t^2)(b^2/2) + (1 - X_t)^2 D^\ell]/2(1 - q)\ . \qquad (18)$$

Now substituting for the Vs from (17) and simplifying we get

$$X_{t-1} = A + BX_t + CX_t^2\ , \qquad (19)$$

where $A \equiv [(q - 2)D^\ell - b^2(1 - 3q/2)]/E$, $B \equiv q[2b^2(1 - q)]/E$, $C \equiv q[b^2(2q - 1) - D^\ell - b^2/2]/E$, and $E \equiv [b^2(2q - 1) - 2D^\ell]$. Closed-form solutions for nonlinear difference equations are generally unavailable. To establish the model's dynamic properties we make use of numerical simulations. These are reported in section B. (iii).

B.(ii) The Liberal Party Prefers Not to be Elected, $b^2(2q - 1) - 2D^\ell > 0$

This is the case where the time-consistent policy of the liberal party is sufficiently different from its optimal policy that it prefers to be out of government. This is because the costs it experiences when the other party plays its time-consistent policy are lower than those when it sets policy itself. Essentially the conservative time-consistent policy is closer to the liberals' optimal policy than the liberals' own time-consistent policy. Mechanically this case is similar to the previous one. Using (9) and (14)–(17) in a manner similar to the preceding case we obtain

$$X_{t-1} = D + FX_t + GX_t^2\ , \qquad (20)$$

where

$$D \equiv (q - 1)[2D^\ell + b^2(1 - q)]/E,$$

$$F \equiv [3q(b^2/2 - D^\ell)]/E,$$

$$G \equiv q[b^2(q - 3/2) + D^\ell]/E, \text{ and}$$

$$E \equiv [b^2(2q - 1) - 2D^\ell].$$

The coefficients' signs are sensitive to the values of q, b, and D^{ℓ}. Again, we need to utilize numerical methods to establish the model's dynamic properties.

B.(iii) The Time Paths of Output, Expected Inflation, and the Probability of an Early Election

In the two preceding sections we have derived expressions for the time paths of the critical probability under a liberal government both for when that government desires electoral victory and for when it desires defeat. We now use these expressions to obtain time paths for output and expected inflation. The critical probabilities time paths for the "want to win" and "want to lose" cases are given by (19) and (20). In the "want to win" case, for $X_t \epsilon [0,1]$, (13) implies that expected inflation is an increasing concave function of the critical value, and tends to b as the probability tends to unity. From (2) (3), and (13) we obtain

$$y_t - \bar{y} = b - b[(1/2) + X_t - (X_t^2/2)] = b(1 - X_t^2)/2 . \tag{21}$$

The deviation of output from the natural rate is a decreasing convex function that tends to zero as the probability approaches unity. The time paths of expected inflation and output follow from the critical probabilities. For the "want to lose" case we obtain

$$y_t - \bar{y} = b(1 - X_t)X_t/2 . \tag{22}$$

Here the output deviation is concave in the critical probability for $X_t \epsilon [0,1]$. We have established that the critical probability follows a nonlinear time path. It then follows from this and (22) that the level of output must also follow a nonlinear time path. To establish the model's dynamic properties we must therefore adopt numerical techniques.

3. SIMULATION RESULTS

As alluded to in the preceding sections, several of the characteristics of this model cannot be established analytically. Here we present the results of numerical simulations used to establish its properties. The full details of all the numerics may be found in Ellis and Thoma (1989).

A. The Relative Size of the "Want-to-Win" and "Want-to-Lose" Regions

We have argued that a liberal government will not always prefer electoral victory to defeat. Here we divide the parameter space into "want-to-win" and "want-to-lose" regions (hereafter W and L). The relative magnitudes of these regions is clearly important both for understanding government behavior and for determining the types of preferences that are likely to characterize competing political parties.

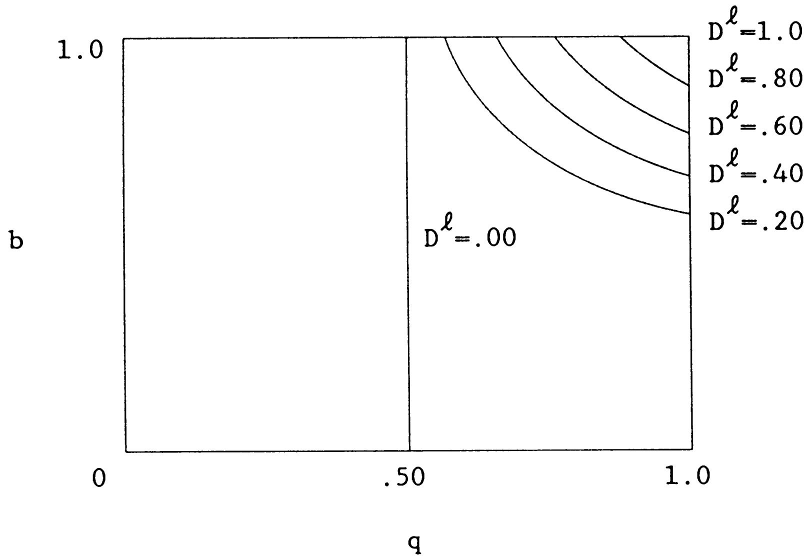

FIG. 2. Indifference Curves in $b - q$ Space. The W region is to the left and the L region is to the right of each indifference curve.

Fixing one parameter, we divide the parameter space by the indifference curves $b^2(2q - 1) - 2D^{\ell} = 0$. In Figure 2 these curves are plotted in (b,q) space for various values of D^{ℓ}. The size of region W increases as D^{ℓ} rises, q falls, or b falls. Increases in D^{ℓ} shift the indifference curve northeast. Victory is preferred over a greater area the more important are distributional costs. Raising b describes a northward movement across the diagram. The higher resultant time-consistent inflation rate gives larger short-term cost-reducing partisan effects, but also higher long-term costs from inflation. At low q, victory is preferred. At high q, increases in b raise long-term costs relative to short-term costs, eventually causing a move from the W to L region. Increasing q describes an eastward movement on the diagram. As the party cares more about the long-term inflationary consequences of its policies, it switches to preferring defeat and the zero inflation rate policy of the opposition.

B. Dynamics of the Want-to-Win Case

Across all numerical simulations the time paths for the critical probability for calling an election follow a consistent pattern. In period T, the critical probability is by definition 0; moving backward through time this probability monotonically approaches unity. This implies that when party ℓ prefers victory, it is more willing to call an election as t approaches T. This gives rise to decreasing expected inflation. If no election occurs, realized inflation is b, so that as T approaches, the deviation of output from the natural rate is positive and increasing.

The exact time paths generated in this case vary with the parameter values, these comparative dynamic properties analyzed with the use of Figure 3. In Figure 3a

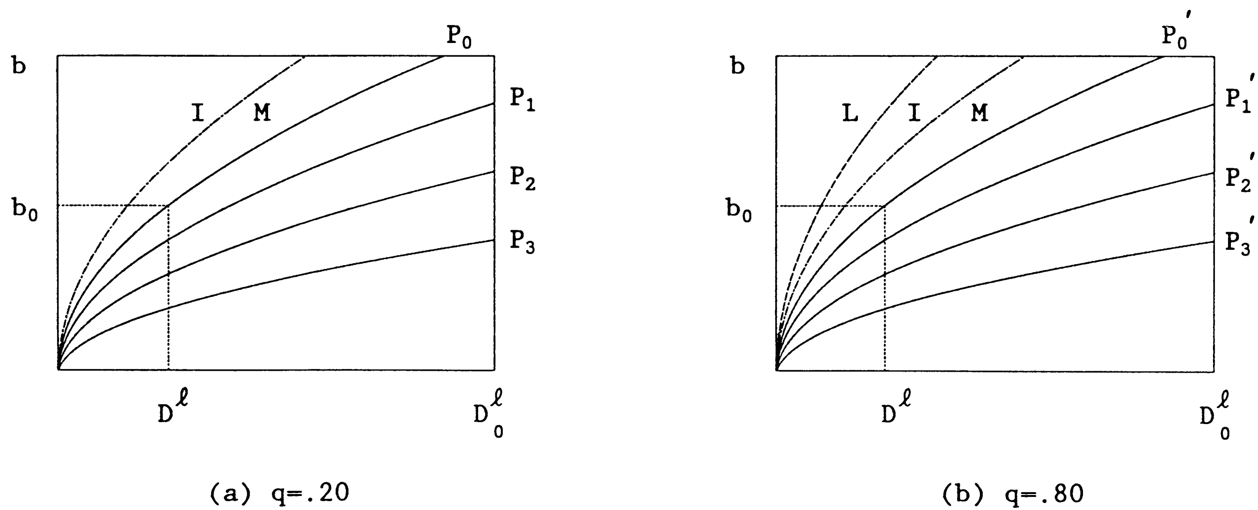

FIG. 3. Isocritical Probability Sequences in $b - D^{\ell}$ Space

there are two regions, I and M, and in 3b there are three regions, I, M, and L. Region L contains want-to-lose cases, region I cases where the critical probability converges to 1 immediately (that is, in one time period), and region M cases where convergence to 1 is monotonic. The lines $P_0 - P_3$ in region M represent isocritical probability sequences; these parameter values generate identical time paths for *not* calling an election, $\{X_t\}$. Along P_0 the set of identical time paths $\{X_t\}$ are higher for every $t \neq T$ than for those along P_1 (similarly, P_1 and P_2 etc.). Additionally, the identical time paths associated with P_0 in Figure 3a are higher at every $t \neq T$ than those associated with P_0' in Figure 3b.

To establish the models' comparative dynamic properties we illustrate how changes in the models' parameters shift those isocritical probability sequences. Then, from these shifts we compute the implications for the time paths of output and expected inflation.

In Figure 3 the effects of an increase in q on the isocritical probability sequences are shown. There are two things to note. First, the I region in Figure 3a is divided into an I region and an L region in Figure 3b. Thus, as q increases above .5, the L region begins expanding into the I region. The reason for the larger L region as q increases is explained above. Second, the size of the region M does not change as q increases. However, within the M region the isocritical probability sequences rotate counter-clockwise as q increases. Thus, for example, the sequence generated by b_0 and D_0^ℓ in Figure 3a on the isocritical line P_0 is above the sequence generated by b_0 and D_0 in 3b on the isocritical line P_0'. Intuitively, as q increases the probability of not calling an election decreases for all $t \neq T$. A higher q implies that the party cares more about long-term costs. At T the probability of victory is only 50 percent. When q is higher, a lower probability of victory is required for an election to be called in each preceding period. Equations (12) and (21) imply that for higher q a liberal party experiences (a) lower expected inflation and larger deviations in output from the natural rate in every period, (b) an earlier start to the premandatory election boom, and (c) a slower decline in expected inflation and lower output acceleration.

Next consider changes in b. These are illustrated by a northward movement in Figure 3a or 3b (other than along the vertical axis). As b rises, higher-valued isocritical probability sequence lines are cut. The probability of *no* election rises, achieving one in region I. For higher b an early election is less likely. The party cares a great deal about output; furthermore, in region W the discount rate is relatively low. Short-term output changes are weighted highly. Requiring a high probability of victory to call an election reduces expected costs both because it makes the short-term output gains from not calling an election more likely, and because it reduces the expected cost of the partisan effect associated with defeat. If b increases then (12) and (21) imply the pre-election boom experienced by the liberal party is characterized by (a) higher expected inflation and smaller deviations in output from the natural rate in every period, (b) a later start to the expansion, and (c) a more rapid decline in expected inflation and greater acceleration in output.

Finally let D^ℓ increase, as represented by an eastward movement across Figure 3a or 3b. The more weight placed on distributional goals the lower is the probability of victory required for an early election. In period T the victory probability is only 50 percent. The larger D^{ℓ} is, the greater the expected cost of entering T without having held an election, and the lower is the electoral victory probability required for the party to call an election in $T - 1$. Again a recursive argument explains the sequence. For higher values of D^{ℓ}, equations (12), (21), and the time path of the election probabilities imply (a) lower expected inflation and larger deviations in output above the natural rate in every period, (b) an earlier start to the expansion, and (c) a slower decline in the expected inflation rate and a smaller acceleration in output.[6]

4. CONCLUSIONS

In this paper we have developed two partisan models of political-economic interaction to analyze economies with variable electoral terms. In these economies partisan effects are present in all periods in which there are positive probabilities of change in government and therefore economic policy. Both models indicate that variability in the electoral term adds to an economy's output variance. The second model, in which the government follows an optimal stopping rule to choose the next election date, predicts that conservative administrations should experience deepening recessions late in their terms while liberals should experience increasing booms. It should be emphasized that these effects arise not as a consequence of a clever government manipulating a myopic forgetful electorate, but rather as the consequence of rational forward-looking behavior in the presence of uncertainty. This conflicts with traditional views of the political cycle in which pre-election economic booms are manufactured by a government of either party to gain electoral support from an irrational electorate.

The analysis presented above leads to the intuitive conclusion that institutional reforms that reduce the expected variance of political institutions will also reduce the expected variance of the real economy.

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[6]The theoretical model makes two key predictions. First, within a country, output and inflation should be higher and unemployment lower when the liberal party is in power. Second, across countries, the variance of output should be higher in those countries with variable electoral terms. Ellis and Thoma (1989) present some suggestive evidence in support of these predictions. These results are available on request.

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[Footnotes]

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