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Timing Is All: Elections and the Duration of United States Business Cycles

THEORIES OF POLITICAL BUSINESS CYCLES predict that the quadrennial election cycle in the United States should affect the timing of the peaks and troughs of United States business cycles. Various political business cycles theories have different implications concerning this relationship. The opportunistic political business cycle model (Nordhaus 1975, Lindbeck 1976, Tufte 1978) suggests that a business cycle trough (that is, the beginning of an expansion phase of the business cycle) is likely in the period before an election as an incumbent attempts to increase the chance of reelection. This model also suggests that a business cycle peak (that is, the beginning of the contraction phase of a business cycle) follows soon after an election as the preelection stimulus is reversed. Alternatively, partisan political business cycle theories suggest that the likelihood of a peak or a trough following a presidential election depends upon which party was victorious. Rational partisan theory (Alesina 1987) suggests that a business cycle peak marking the end of an expansion is more likely in the wake of a Republican presidential victory than at other times and less likely after a Democratic presidential victory than at other times. Conversely, a business cycle trough is less likely after a Republican has won a presidential election than at other times and more likely after a Democrat has won than at other times.[1]

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1. In the rational partisan model (Alesina 1987) postelection business cycles arise because of the existence of nominal contracts. The duration of these cycles, however, is limited by forward-looking wage

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The predictions of these political business cycle theories correspond to the popular view that in politics timing is all. Previous empirical research on these theories, however, only addresses the timing issue indirectly by focusing on the amplitude of macroeconomic variables before and after elections or across the tenure of different parties (for example, Alesina and Roubini 1992). In this paper we provide a more direct test of the temporal links between political and economic events. We use duration analysis to test whether the likelihood of the occurrence of a business cycle turning point in the United States (that is, either the end of a contraction or the end of an expansion) is significantly affected by the occurrence and the outcome of an election.

Duration analysis is particularly well suited for analyzing the temporal links between elections and business cycle turning points. Duration analysis allows for directly testing the determinants of the likelihood of the end of a business cycle phase in any period conditional upon the phase lasting up until that period.[2] The determinants of the timing of peaks and troughs that we focus on in this paper are the occurrence and the outcome of presidential elections. Duration analysis enables an estimate of the effect of elections on the likelihood of the end of a business cycle phase holding constant other factors. In particular, duration analysis controls for *duration dependence* that arises when there is a changing probability of the end of a business cycle as the cycle itself progresses.[3]

The empirical results presented in this paper do not support the prediction from opportunistic political business cycle theory that a contraction is more likely to end in the period before an election than in other periods regardless of the political party of the president. We do find, however, a significant increase in the likelihood of the end of a contraction ceterus paribus in the two-year period before an election when there is a Democratic president. There is also evidence that expansions are more likely to end soon after an election than in other periods. This is consistent with predictions of opportunistic political business cycle theory.

This result for postelection business cycle effects is further examined in the context of rational partisan theory by disaggregating postelection periods according to which party won the election. Consistent with rational political business cycle theory we find a significant increase in the likelihood of the end of an expansion and a significant decrease in the likelihood of the end of a contraction following the election of a Republican president. We find less significant evidence, however, of predictions from rational partisan theory consistent with the behavior of the economy in the period following the election of a Democratic president.

In the next section of the paper we discuss the manner in which we use duration analysis to test for the effect of the U.S. quadrennial election cycle on the turning

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and price setting. In contrast, the partisan theory of Hibbs (1977, 1987), which assumes a stable Phillips curve, predicts systematic differences in macroeconomic aggregates across the entire tenure of Republican and Democratic administrations.

2. For an overview of duration analysis, see Kiefer (1988) or Lancaster (1990).

3. Diebold and Rudebusch (1990) and Sichel (1991) find evidence of duration dependence in pre-World War II expansions and Sichel (1991) also finds evidence of duration dependence in post-World War II contractions.

points of its business cycle over the period 1855 to the present as well as for different subsamples. Results follow in the second section of the paper. Concluding comments are offered in section 3.

1. ELECTIONS AND THE DURATION OF BUSINESS CYCLES

Theories of political business cycles differ in their assumptions across several dimensions.[4] One dimension concerns the nature of the economy itself. For example, the early literature, such as that by Nordhaus (1975), Lindbeck (1976) and Hibbs (1977), assumes that the economy is characterized by a stable inflation-output tradeoff, inflation is directly controlled by policymakers, and expectations of inflation are adaptive. More recent work reflects the rational expectations critique of these assumptions. The basic assumptions of Persson and Tabellini (1990), Rogoff and Sibert (1988), Rogoff (1990) and Alesina (1987), for example, are that people are forward-looking and make decisions based upon all information available to them at the time. The link between attempted political manipulation and phases of the business cycle is more tenuous under these assumptions than under the assumption of a stable Phillips curve. In particular, there is little scope for a preelection stimulation of the aggregate economy (though there is a scope for political budget cycles) since the dates of quadrennial elections are known in advance. Postelection effects of elections are more short-lived when people are rational and forward-looking than when there is a stable Phillips curve.

The motivation of policymakers represents another important dimension along which models of political business cycles can be categorized. Opportunistic political business cycle models, such as Nordhaus (1975), assume that the goal of all policymakers is to be reelected and policy is used toward this end. Incorporating forward-looking behavior into this model, as in the rational opportunistic political business cycle model of Persson and Tabellini (1990), mitigates the extent to which the economy can be moved by policy and makes the voters' goal to elect the most "competent" candidate regardless of ideology.

The goal pursued by policymakers in partisan political business cycle models is not reelection but instead realizing ends commensurate with their ideology. In the work of Hibbs (1977, 1987), in which politicians can exploit a stable output-inflation tradeoff, this leads to differences across the tenure of left-wing and right-wing governments. The rational partisan theory of Alesina (1987) retains the assumption of policymakers pursuing ideological motives but tempers their ability to realize their goals by modeling an economy characterized by rational wage-setters who are temporarily bound by nominal contracts. In this model, wages are set equal to expected inflation. In the period before an election, the expected inflation rate is a weighted average of the likelihood of the election of the party more sensitive to the costs of inflation (in this case, the Republicans) and the party less sensitive to infla-

4. For a more detailed comparison of different politico-economic theories see Alesina and Roubini (1992).

tion's costs (the Democrats). The outcome of the election determines the actual inflation rate and therefore whether real wages are unexpectedly high (due to the victory of the Republicans) and there is a contraction or whether real wages are unexpectedly low (due to the victory of the Democrats) and there is an expansion. The length of the deviation of output from its natural rate in this model is the length of the wage contract, not, as in Hibbs' model, the entire tenure of the administration.

These theories present different testable implications concerning the temporal relationship between elections and business cycle turning points.[5] Opportunistic political business cycle theory predicts a higher likelihood of a business cycle trough (that is, the end of a contraction) with the coming of an election. This theory also predicts that the onset of a contraction (that is, a business cycle peak) to offset the preelection stimulative policy is more likely following an election than at other times. These predictions stand regardless of the party in power. Alternatively, the party in power is central to the predictions of the timing of business cycle turning points drawn from the insights of the rational partisan theory. Rational partisan theory predicts that the likelihood of a business cycle peak marking the end of an expansion is higher after the election of a Republican president than at other times and is lower after the election of a Democratic president than at other times. This theory also predicts that the likelihood of a business cycle trough marking the end of an expansion is lower after the election of a Republican president than at other times and higher after the election of a Democratic president than at other times.

The timing of business cycle turning points relative to the quadrennial United States presidential election cycle implied by these theories lends itself to an empirical investigation using duration analysis. The data used in duration analysis consist of *spells*. In our data, a spell represents the number of months in either a contraction or an expansion. The focus of duration analysis is the *hazard function*. The hazard function at time t, $h(t, x(t))$, is an estimate of the probability of the completion of a spell during the time $(t, t + dt)$, given that the spell has lasted up until time t. We estimate the hazard function for the probability of a peak (trough) in the business cycle during the next month given that the economy has been in an expansion (contraction) up until the beginning of that month.[6] The hazard function exhibits *duration dependence* if its value at any moment is a function of the time already spent in a spell. The hazard function may shift due to exogenous factors, represented by the vector $\mathbf{x(t)}$, which are called *covariates*. In a continuous time framework the hazard function is defined as

5. These theories obviously have implications beyond the timing of turning points in the business cycle. For example, the partisan theory predicts differences across the tenure of governments with different ideologies. This implies an inflationary bias of left wing governments either by design or because of the interplay of people's expectations and the perceived goals of the government. Therefore, the empirical results presented in this paper complement those that test the amplitude of various macroeconomic time series in response to political factors.

6. The regular quadrennial nature of U.S. election cycles insures that there is not a simultaneity problem whereby the spells determine the covariates. This problem may arise when studying a country with a parliamentary system in which elections can be called at the discretion of the ruling party. Heckman and Singer (1984) discuss the problems that arise when time-varying covariates are not exogenous.

$$h(t,x(t)) = \lim_{dt \to 0} \frac{Pr(t \leq T < t + dt \mid T \geq t, \mathbf{x(t)})}{dt}. \quad (1)$$

The hazard function can be interpreted as the probability of a turning point in the short interval *dt* after *t*, conditional on the current phase of the business cycle having lasted until time *t*.

There are a number of potential candidates for the functional form used to implement this analysis. The focus of attention in this study is the effect of the election covariates on the hazard rather than the estimation of the duration dependence of expansions or contractions. Therefore we estimate the *Cox proportional hazard model*. This model factors the hazard into an arbitrary and unspecified *baseline hazard*, $h_0(t)$, and a function that depends upon a vector of explanatory variables, $\mathbf{x(t)}$, and the associated vector of coefficients, $\boldsymbol{\beta}$, as follows;

$$h(t, x(t), \beta, h_0) = h_0(t) \cdot \exp(x(t)\beta) \quad (2)$$

This specification meets the requirement of non-negativity of the hazard without imposing any restrictions on the coefficients $\boldsymbol{\beta}$. The exponent of the coefficient on preelection or postelection covariates can be interpreted as the shift of the hazard during the relevant period as compared to the other times.[7]

The focus of this study is a set of covariates representing specified periods before or after elections. These preelection and postelection periods are identified by dummy variables that enter as *time-varying covariates*, that is, covariates that can change over the course of a spell.[8] Each of these covariates represents one of three different time frames and correspondingly is set equal to 1 in the nine-month, twelve-month or twenty-four-month period either before or after an election.[9] The use of different time frames for the covariates allows for investigation of the length of the period of the political effect on the hazard. The coefficients across different specifications of time frames are directly comparable since the hazard is the estimate of the likelihood of the completion of a business cycle phase in the next month conditional on its lasting up until that month.

Some specifications include a constant covariate that denotes those business cy-

7. The arbitrary baseline hazard of the Cox proportional hazard model can have any shape and it is not estimated. The proportional hazard specification is well suited for investigating the effect of covariates on the relative risk of ending a spell but it does not lend itself to an investigation of duration dependence.

8. It is important to use time-varying covariates rather than to simply identify those business cycles in which there was an election with a dummy variable that serves as a constant covariate because the longer the business cycle the more likely that there would be an election during it. Therefore, the use of elections as constant covariates would give rise to spurious results.

9. An earlier version of the paper also included a six-month covariate but none of the coefficients on this covariate was significant. In an alternative specification the postelection covariates began in the month following the new president's inauguration if he represented a different party from his predecessor and began in the month after the election otherwise. This alternative specification is more consistent with the notion that once in power, the government was able to affect the economy, while the specification based only on election dates and not the dates of inaugurations is more consistent with the notion that the effect of the election on the economy was due to the "news" revealed by the outcome of the election. In any case, the results using either specification were very similar.

cles during which the United States was at war.[10] The expected sign of this coefficient is positive for contractions and negative for expansions. The coefficients on the preelection and postelection covariates represent the shift in the hazard during the specified period before an election or after an election, respectively, holding constant the effect of duration dependence and (if the war covariate is included) controlling for whether there was a war during the business cycle.

Preelection and postelection covariates used in tests of the hypotheses of opportunistic political business cycle theory do not distinguish between political parties. Opportunistic political business cycle theory predicts positive coefficients on the preelection covariates in hazard estimates for contractions. This implies that contractions that have lasted until the period before an election are more likely to end at that time than at other times ceterus paribus. This theory's prediction of a postelection downturn is consistent with positive coefficients on postelection covariates in hazard estimates for expansions.

The set of postelection covariates used to test the implications of rational partisan political business cycle theory includes separate covariates for the period after the election of a Republican president and for the period after the election of a Democratic president. Rational partisan theory predicts that the postelection effect depends upon the party in power. Consistent with this theory, estimates of hazard functions for expansions would include positive coefficients on the covariates representing the period following the election of a Republican president and negative coefficients on the covariates representing the period following the election of a Democratic president. Rational partisan theory also predicts that estimates of hazard functions for contractions include negative coefficients on the covariates representing the period following the election of a Republican president and positive coefficients on the covariates that represent the period following the election of a Democratic president.

It is reasonable to expect that the effects of elections on business cycle turning points differ across subperiods of the almost century and a half over which we have data. Accordingly we estimate hazard functions for the full set of thirty-one contractions and thirty-one expansions in the United States since 1855 as well as for subsamples of the fifteen contractions and sixteen expansions in the period after World War I and the nine contractions and nine expansions in the period after World War II.

The relatively small number of business cycles, especially in the subsamples, makes inference based upon standard asymptotics suspect. Therefore we use bootstrap techniques. The point estimates presented in Tables 4 through 8 represent the mean value of the respective estimates for five hundred resamples from the original data. We resample "clusters" of observations from the original data set choosing the set of observations corresponding to an entire business cycle as one "draw." Each resample therefore has the same number of business cycles as the original sample.

The calculation of the significance of these bootstrap estimates is based upon the

10. Alternatively we also estimated the hazards using war as a time-varying covariate and found the results on the preelection and postelection dummies were almost identical.

underlying assumption of bootstrapping that the relative frequency distribution of statistics calculated from the resamples serves as an estimate of the sampling distribution of the true value of these statistics. In the tables that follow we present two types of tests for the significance of the coefficients. Bootstrap standard errors are presented which allow calculation of significance using the *normal approximation method.* In this case, the significance of coefficients is calculated in a manner analogous to the standard approach. We also present *p*-values corresponding to two-tailed significance tests using the *bias-corrected method.* The bias-corrected method adjusts the bootstrapped sampling distribution in such a way that it is centered on the point estimate of the statistic calculated from the original data.[11]

2. EMPIRICAL RESULTS

The key data in our empirical analysis of the link between political and economic events are the dates of turning points of the business cycle. These turning points are peaks and troughs of U.S. business cycles identified by economists at the National Bureau of Economic Research.[12] The sample begins with the trough in January 1855 and ends with the trough in March 1991. There are thirty-one complete business cycles over this period and therefore thirty-one expansions (periods from troughs to peaks) and thirty-one contractions (periods from peaks to troughs). The duration of each of these contractions and expansions is presented in Table 1.[13] Table 1 also identifies those phases of the business cycle during which the United States was at war.[14] The final two columns in Table 1 report for each contraction and expansion which party held the White House and whether an election was held during that phase of the business cycle. It can be seen from Table 1 that twenty-six of the thirty-four elections held over the entire sample occurred during expansions. This is broadly consistent with the prediction of opportunistic political business cycle theory that incumbents attempt to generate expansions in the period leading up to elections in order to increase the likelihood of being returned to office.

Table 2 provides further information on business cycle phases and the party affiliation of the president for the full sample period as well as for a subsample beginning after World War I and for a subsample beginning after World War II. The marginal probabilities in the three panels presented in Table 2 show that Republican presidents held office during 61 percent of the full sample, 54 percent of the post-

11. An early reference on bootstrapping is Efron (1982). In a useful survey, Mooney and Duval (1993) discuss issues related to the number of resamples and the size of the original sample (pp. 21–22), bias-corrected *p*-values (pp. 37–40) as well as other topics related to bootstrapping.

12. Recently Romer (1992) has produced an alternative set of business cycle turning points beginning with the peak in February 1887. An earlier version of this paper (published as NBER working paper no. 4383, June 1993) included an analysis on Romer's dating as well as the NBER's dating.

13. We count a peak or a trough as the final month of the expansion or contraction, respectively.

14. During the sample period covered in this paper the United States was at war from April 1861 to April 1865 (the Civil War), April 1898 to July 1899 (the Spanish American War), April 1917 to November 1918 (World War I), December 1941 to August 1945 (World War II), June 1950 to June 1953 (the Korean War) and August 1964 (when the Gulf of Tonkin resolution was passed by Congress) to January 1973 (the Vietnam War).

TABLE 1

DATES OF BUSINESS CYCLE TURNING POINTS

Date of		Duration (in months)		Party in Power during the		Was an Election Held during the	
Trough	Peak	Cont.	Exp.	Cont.	Exp.	Cont.	Exp.
December 1854	June 1857	—	30	—	D	—	Yes
December 1858	October 1860	18	22	D	D	No	No
June 1861	April 1865	8*	46*	D/R	R	Yes	Yes
December 1867	June 1869	32	18	R	R	No	Yes
December 1870	October 1873	18	34	R	R	No	Yes
March 1879	March 1882	65	36	R	R	Yes	Yes
May 1885	March 1887	38	22	R/D	D	Yes	No
April 1888	July 1890	13	27	D	D/R	No	Yes
May 1891	January 1893	10	20	R	R/D	No	Yes
June 1894	December 1895	17	18	D	D	No	No
June 1897	June 1899	18	24*	D/R	R	Yes	No
December 1900	September 1902	18	21	R	R	Yes	No
August 1904	May 1907	23	33	R	R	No	Yes
June 1908	January 1910	13	19	R	R	No	Yes
January 1912	January 1913	24	12	R	R/D	No	Yes
December 1914	August 1918	23	44*	D	D	No	Yes
March 1919	January 1920	7*	10	D	D	No	No
July 1921	May 1923	18	22	D/R	R	Yes	No
July 1924	October 1926	14	27	R	R	No	Yes
November 1927	August 1929	13	21	R	R	No	Yes
March 1933	May 1937	43	50	R/D	D	Yes	Yes
June 1938	February 1945	13	80*	D	D	No	Yes (2 elections)
October 1945	November 1948	8*	37	D	D	No	Yes
October 1949	July 1953	11	45*	D	D/R	No	Yes
May 1954	August 1957	10	39	R	R	No	Yes
April 1958	April 1960	8	24	R	R	No	No
February 1961	December 1969	10	106*	R/D	D/R	Yes	Yes (2 elections)
November 1970	November 1973	11*	36*	R	R	No	Yes
March 1975	January 1980	16	58	R	R/D	No	Yes
July 1980	July 1981	6	12	D	D/R	No	Yes
November 1982	July 1990	16	92	R	R	No	Yes (2 elections)
March 1991		8	—	R	—	No	—

NOTES: Along a row, Contraction refers to period from peak in previous row to trough in that row. Expansion refers to period from trough in that row to peak in that row.

* War occurred during this phase of the business cycle.

World War I period and 60 percent of the post-World War II period. The marginal probabilities on business cycle phases show that contractions marked one-third of the full sample period, 24 percent of the post-World War I period and 17 percent of the post-World War II period.

Table 2 also presents joint probabilities and conditional probabilities. For the full sample, the likelihood that the economy was in a contraction given that the president was a Republican is 39 percent while the likelihood that the economy was in a contraction with a Democratic president is 23 percent. These conditional probabilities fall over the later two subsamples for both parties since the likelihood of being in a contraction declines. The difference in the conditional probabilities between the two parties, however, becomes more pronounced in the later periods. The likelihood of being in a contraction in the post-World War I and the post-World War II periods is more than twice as high when a Republican was in the White House as compared to when there was a Democratic president. Table 2 also shows that Re-

TABLE 2

BUSINESS CYCLE PHASE AND PRESIDENTIAL PARTY: JOINT, MARGINAL AND CONDITIONAL PROBABILITIES

Full Sample	Proportion of Time in Contraction	Expansion	Sum of Rows
Republican	0.24	0.37	0.61
Proportion of Time with President Who Is			
Democrat	0.09	0.30	0.39
Sum of columns	0.33	0.67	1.00

Prob(Contraction | Republican) = 0.39
Prob(Contraction | Democrat) = 0.23
Prob(Republican | Contraction) = 0.73
Prob(Republican | Expansion) = 0.55

Post-World War I	Proportion of Time in Contraction	Expansion	Sum of Rows
Republican	0.17	0.37	0.54
Proportion of Time with President Who is			
Democrat	0.07	0.39	0.46
Sum of columns	0.24	0.76	1.00

Prob(Contraction | Republican) = 0.31
Prob(Contraction | Democrat) = 0.15
Prob(Republican | Contraction) = 0.71
Prob(Republican | Expansion) = 0.48

Post-World War II	Proportion of Time in Contraction	Expansion	Sum of Rows
Republican	0.13	0.47	0.60
Proportion of Time with President Who Is			
Democrat	0.04	0.36	0.40
Sum of columns	0.17	0.83	1.00

Prob(Contraction | Republican) = 0.22
Prob(Contraction | Democrat) = 0.10
Prob(Republican | Contraction) = 0.76
Prob(Republican | Expansion) = 0.57

publican presidents are more likely to be in office during contractions than during expansions. Over the full sample, there is a 73 percent probability that the president was a Republican if the economy was in a contraction and a 55 percent likelihood that the president was a Republican if the economy was in an expansion. These conditional probabilities are similar for the post-World War I and post-World War II periods.

The statistics in Tables 1 and 2 characterize the relationship between business cycle phases and the party affiliation of the president but do not directly address the issue of the timing of turning points relative to elections. Opportunistic political business cycle theory predicts that expansions tend to end soon after a presidential election and contractions tend to end before presidential elections. Rational partisan theory predicts that peaks occur sooner after the election of a Republican than after the election of a Democrat and that troughs occur later in Republican administrations than in Democratic administrations. If there were no link between elections and business cycle turning points we would expect to find a uniform distribution of business cycle turning points across the election cycle and, on average, a twenty-four-month period between both peaks and trough and elections.

TABLE 3

STATISTICS ON THE TIMING OF PEAKS AND TROUGHS RELATIVE TO ELECTIONS

	Months since Elections							
	Peaks				Troughs			
	Av'g (s.d.)	Min.	Max.	Obs.	Av'g (s.d.)	Min.	Max.	Obs.
Full Sample	18.0 (13.2)	0	47	31	23.4 (13.5)	1	45	31
Post-World War I	17.1 (13.6)	0	41	15	21.7 (12.8)	3	44	16
Post-World War II	16.4 (14.0)	0	41	9	21.9 (11.7)	3	44	9
Republican Administrations								
	Months since Elections							
	Peaks				Troughs			
	Av'g (s.d.)	Min.	Max.	Obs.	Av'g (s.d.)	Min.	Max.	Obs.
Full Sample	17.2 (10.0)	5	41	19	25.7 (13.3)	1	45	19
Post-World War I	17.2 (11.1)	8	41	10	25.2 (10.6)	8	44	9
Post-World War II	15.7 (11.8)	8	41	7	23.2 (4.8)	17	28	6
Democrat Administrations								
	Months since Elections							
	Peaks				Troughs			
	Av'g (s.d.)	Min.	Max.	Obs.	Av'g (s.d.)	Min.	Max.	Obs.
Full Sample	19.1 (17.6)	0	47	12	19.7 (13.6)	3	44	12
Post-World War I	17.0 (19.3)	0	38	5	17.1 (14.7)	3	44	7
Post-World War II	19.0 (26.9)	0	38	2	19.3 (21.7)	3	44	3

Table 3 provides an initial view of the timing of peaks and troughs relative to presidential elections. For the full sample and following Republican presidential election victories the time between troughs (that is, the beginning of an expansion) and subsequent elections averages close to twenty-four months. Peaks (that is, the end of an expansion) follow, on average, less than twenty months after elections with post-World War II peaks averaging 16.4 months following elections. Peaks occur sooner following Republican election victories than following Democratic victories in the full sample and in the post-World War II era and troughs consistently occur, on average, sooner following Democratic victories than following Republican victories. This is broadly consistent with the predictions of rational partisan theory. The standard deviations for all these statistics, however, are quite large relative to the averages.

While these summary statistics are suggestive, more powerful tests of political business cycle theories are provided by duration analysis. Unlike the unconditional estimates in Table 3, duration analysis enables us to consider the effects of elections on business cycles holding constant the effects of other factors such as wars and the time on the business cycle itself. The bootstrap estimates of the Cox proportional hazard models for contractions with the various preelection periods serving as time-varying covariates are presented in Table 4.[15] Although all the coefficients on the preelection time period dummy variables are of the expected positive sign, the only

15. There are insufficient observations for estimating a hazard for contractions in the post-World War II period.

TABLE 4

ESTIMATES OF HAZARD FUNCTIONS FOR CONTRACTIONS

I. Full Sample: 1855–1991

Equation	Variable	Dummy Variables: Months before an Election		
		Nine Months	Twelve Months	Twenty-four Months
A.	Election	0.10 (0.55) [0.03]	0.28 (0.43) [0.88]	0.27 (0.45) [0.52]
B.	Election	0.27 (0.57) [0.09]	0.51 (0.47) [>0.99]	0.41 (0.47) [0.38]
	War	2.16 (0.69)* [<0.01]	2.31 (0.76)* [0.01]	2.24 (0.75)* [<0.01]

II. Post-World War I

Equation	Variable	Dummy Variables: Months before an Election		
		Nine Months	Twelve Months	Twenty-four Months
A.	Election	0.30 (0.63) [0.07]	0.54 (0.72) [0.35]	0.70 (0.57) [0.18]
B.	Election	0.57 (0.72) [0.22]	0.84 (0.78) [0.61]	0.79 (0.59) [0.14]
	War	1.51 (0.81)** [0.15]	1.54 (0.83)** [0.09]	1.43 (0.87)** [0.11]

NOTES: Numbers in parentheses are bootstrap standard errors. Numbers in square brackets are bias-corrected p-values for two-tailed test.

* Significant at 95 percent level of confidence by normal approximation method.
** Significant at 90 percent level of confidence by normal approximation method.

instance of a coefficient that differs from zero at the 5 percent level of significance is the nine-month covariate in the full sample where the bias-corrected p-value is 0.03. The bias-corrected p-value on this coefficient rises to 0.09, however, when war is included as a constant covariate.[16] Thus the predictions of opportunistic political business cycle theory that there is a greater likelihood of a contraction ending in the period before an election than in other periods (conditional upon its having lasted until that period) is not strongly supported by these results.

Opportunistic political business cycle theory does not suggest that there should be a difference across political parties in attempts to engineer an expansion in the period before an election. It may be, however, that the likelihood of a contraction ending in the period before an election depends upon the administration holding power at the time. This possibility is investigated in Table 5. In that table the covariates representing the period before an election distinguish between those times when a Republican holds the presidency and those times when a Democrat sits in the White House. As above, positive and significant values of the estimated coefficients would demonstrate a greater likelihood of the end of a contraction in the period leading up

16. The constant covariate for war is significant at the 5 percent level and of the expected positive sign in each specification for the full sample by either the bias-corrected method or the normal approximation method. It is significant at the 10 percent level in the post-World War I case in each specification by the normal approximation method, and in the specification with the twelve-month covariate by the bias-corrected method. This can be interpreted as meaning that contractions during which the United States was at war are significantly shorter than those during which the United States was not at war, holding constant the effect of elections.

TABLE 5

ESTIMATES OF HAZARD FUNCTIONS FOR CONTRACTIONS BY PARTY

I. Full Sample: 1855–1991

Equation	Variable	Dummy Variables: Months before an Election, by Party Nine Months	Twelve Months	Twenty-four Months
A.	Republican	−0.30 (0.63) [0.67]	0.14 (0.53)** [0.65]	−0.01 (0.51) [0.93]
	Democrat	1.00 (0.75) [0.22]	0.63 (0.68) [0.28]	1.09 (0.65)** [0.10]
B.	Republican	−0.21 (0.61) [0.96]	0.33 (0.57) [0.99]	0.13 (0.50) [>0.99]
	Democrat	1.33 (0.71)** [0.52]	1.14 (0.76) [0.71]	1.25 (0.59)* [0.14]
	War	2.32 (0.75)* [<0.01]	2.38 (0.75)* [<0.01]	2.26 (0.75)* [<0.01]

II. Post-World War I

Equation	Variable	Dummy Variables: Months before an Election, by Party Nine Months	Twelve Months	Twenty-four Months
A.	Republican	0.05 (0.48) [>0.99]	0.41 (0.67) [0.67]	0.52 (0.61) [0.70]
	Democrat	0.98 (0.56)** [0.03]	1.08 (0.65)** [0.11]	1.60 (0.67)* [<0.01]
B.	Republican	0.24 (0.55) [0.99]	0.75 (0.81) [0.97]	0.52 (0.56) [0.66]
	Democrat	1.55 (0.72)* [0.38]	1.67 (0.76)* [0.54]	1.66 (0.61)* [<0.01]
	War	1.69 (0.82)* [0.08]	1.84 (0.90)* [0.19]	1.48 (0.89)** [0.25]

NOTES: Numbers in parentheses are bootstrap standard errors. Numbers in square brackets are bias-corrected p-values for two-tailed test.

* Significant at 95 percent level of confidence by normal approximation method.
** Significant at 90 percent level of confidence by normal approximation method.

to an election than at other times. As seen in Table 5, there is no evidence that a contraction is significantly more likely to end in the period before an election than at other times when a Republican is president. Interestingly, however, the bias-corrected p-values of the coefficients on the dummy variables representing the twenty-four-month period before an election when there is a Democratic president are less than 0.01 for both the full sample and the post-World War I periods. These estimates suggest that, for the full sample, an ongoing contraction was 3.49 (that is, exp(1.25)) times more likely to end in any given month during the two-year period before an election when there was a Democratic president than at other times. This likelihood of the end of the contraction in the next month by virtue of a proximate election and a Democratic president rises to 5.26 (that is, exp(1.66)) when the sample is constrained to the post-World War I era.

Table 6 presents the estimates for expansions with the postelection periods serving as time-varying covariates. Opportunistic political business cycle theory predicts a higher likelihood of an expansion ending in the period immediately after an election than in other periods conditional on its having lasted until that period. This would be reflected in positive coefficients on the postelection covariates. The results presented in this table provide support for this prediction. The point estimates for

TABLE 6

ESTIMATES OF HAZARD FUNCTIONS FOR EXPANSIONS

I. Full Sample: 1855–1991

Equation	Variable	Dummy Variables: Months since an Election Nine Months	Twelve Months	Twenty-four Months
A.	Election	0.82 (0.46)** [0.10]	0.92 (0.47)* [0.06]	0.84 (0.46)** [0.24]
B.	Election	0.77 (0.45)** [0.07]	0.90 (0.50)** [0.07]	0.73 (0.42)** [0.08]
	War	−1.08 (0.54)* [0.07]	−1.12 (0.55)* [0.10]	−0.98 (0.54)** [0.10]

II. Post-World War I

Equation	Variable	Dummy Variables: Months since an Election Nine Months	Twelve Months	Twenty-four Months
A.	Election	1.23 (0.74)** [0.14]	1.51 (0.75)* [0.07]	0.92 (0.70) [0.42]
B.	Election	1.17 (0.77) [0.13]	1.56 (0.76)* [0.08]	0.85 (0.71) [0.33]
	War	−0.94 (0.70) [0.20]	−0.97 (0.71) [0.28]	−1.01 (0.74) [0.24]

III. Post-World War II

Equation	Variable	Dummy Variables: Months since an Election Nine Months	Twelve Months	Twenty-four Months
A.	Election	1.30 (0.80)** [0.04]	1.75 (0.74)* [<0.01]	0.59 (0.80) [0.41]
B.	Election	1.36 (0.93) [0.10]	1.80 (0.84)* [0.02]	0.52 (0.85) [0.43]
	War	−0.50 (1.04) [0.50]	−0.66 (0.91) [0.36]	−0.44 (0.97) [0.58]

NOTES: Numbers in parentheses are bootstrap standard errors. Numbers in square brackets are bias-corrected p-values for two-tailed test.

* Significant at 95 percent level of confidence by normal approximation method.
** Significant at 90 percent level of confidence by normal approximation method.

coefficients corresponding to the covariates for a particular time frame as well as their significance increase as the sample is restricted from the full sample to the post-World War I subsample to the post-World War II subsample. Within any one sample period the coefficient on the twelve-month covariate is larger than the coefficient on either the nine-month or the twenty-four-month covariate. Using the bias-corrected p-values to gauge significance, we find that none of the coefficients on the twelve-month covariates across samples has a p-value greater than 0.08 and in the post-World War II sample the p-value is 0.02 or less in the two specifications. The bias-corrected p-value of the coefficient on the twenty-four-month covariate is less than 0.10 only in the full sample for the specification including war. The bias-corrected p-value of the coefficient on the nine-month covariate is 0.04 in the post-World War II sample in the specification not including war but otherwise is not less than 0.05.

The magnitudes of the differences in the hazard between the year after an election and other periods are striking. For example, the likelihood of the end of an expan-

sion, given its survival up until that time, is 2.46 (that is, exp(0.90)) as high in the twelve months after an election than at other times for the entire sample, controlling for whether the economy was at war and controlling for duration dependence. The larger point estimates for the post-World War I and post-World War II estimates are even more striking; the likelihood of an expansion ending within twelve months of an election is 4.76 (that is, exp(1.56)) times as high as in other periods in the post-World War I period and 6.05 (that is, exp(1.80)) times as high as in other periods in the post-World War II period. This suggests that this effect has become more pronounced over time.

A change in the likelihood of a business cycle turning point in the period following an election may also be consistent with rational partisan political business cycle theory although a test of this theory requires a more disaggregated specification that distinguishes between the parties in power. As discussed above, we use a specification that has separate time-varying covariates for the months since the election of a Republican and the months since the election of a Democrat. Rational partisan theory suggests that the likelihood of the end of an expansion is higher after the election of a Republican and lower after the election of a Democrat than at other times. In hazard estimates of expansions this implies that the coefficients on the covariates representing the period after a Republican presidential election victory are positive while those on the period following a Democratic victory are negative. Rational partisan theory also predicts the likelihood of the end of a contraction is lower after the election of a Republican president and higher after the election of a Democrat that at other times. In hazard estimates of contractions this implies that the coefficients on the covariates representing the period in the wake of a Republican presidential victory are negative and the coefficients on the covariates representing the period after a Democratic presidential victory are positive.

Results presented in Tables 7 and 8 support the hypotheses of the rational partisan theory as regards the effects of Republican presidential election victories in the post-World War I and post-World War II periods.[17] In the estimates of the hazards for expansions presented in Table 7, the coefficients on the covariate representing the twelve-month period after the election of a Republican in the post-World War I period are positive and significant at the 7 and 9 percent levels in specifications with and without war as a covariate, respectively. All of the coefficients on the Republican covariate in the post-World War II period have p-values below 0.01. Another prediction from rational partisan theory, that an expansion is less likely to end in the period following the victory of a Democratic president, finds less support in the data. Although none of the Democratic coefficients in Table 7 are negative, none have a bias-corrected p-value less or equal to 0.05 nor are any significant at the 10 percent level using the normal approximation.

The coefficients on the Republican covariates are larger than the corresponding

17. There is only one instance of a business cycle peak in the two years following the election of a Democratic president in the post-World War II period, making the estimate of the coefficient on the Democratic covariate for this subperiod impossible.

TABLE 7

ESTIMATES OF HAZARD FUNCTIONS FOR EXPANSIONS BY PARTY

I. Full Sample: 1855–1991

Equation	Variable	Dummy Variables: Months since an Election, by Party Nine Months	Twelve Months	Twenty-four Months
A.	Republican	0.71 (0.62) [0.44]	0.92 (0.52)** [0.19]	1.03 (0.46)* [0.21]
	Democrat	0.90 (0.74) [0.13]	0.81 (0.65) [0.07]	0.44 (0.59) [0.30]
B.	Republican	0.60 (0.61) [0.28]	0.80 (0.60) [0.17]	0.83 (0.51)** [0.10]
	Democrat	0.93 (0.69) [0.13]	0.96 (0.75) [0.17]	0.51 (0.66) [0.37]
	War	−1.18 (0.62)** [0.15]	−1.14 (0.59)* [0.13]	−0.97 (0.59)** [0.12]

II. Post-World War I

Equation	Variable	Dummy Variables: Months before an Election, by Party Nine Months	Twelve Months	Twenty-four Months
A.	Republican	1.70 (0.88)* [0.18]	1.94 (0.90)* [0.07]	1.59 (0.78)* [0.17]
	Democrat	0.78 (0.79) [0.25]	0.75 (0.80) [0.14]	−0.06 (0.80) [0.93]
B.	Republican	1.54 (0.94)** [0.23]	1.89 (0.96)* [0.09]	1.48 (0.91) [0.18]
	Democrat	0.73 (0.89) [0.22]	0.83 (0.94) [0.30]	0.07 (0.81) [>0.99]
	War	−1.07 (0.76) [0.28]	−1.08 (0.75) [0.24]	−0.81 (0.83) [0.20]

III. Post-World War II

Equation	Variable	Dummy Variables: Months before an Election, by Party Nine Months	Twelve Months	Twenty-four Months
A.	Republican	1.33 (0.79)** [<0.01]	1.75 (0.75)* [<0.01]	1.44 (0.86)** [<0.01]
B.	Republican	1.32 (0.86) [<0.01]	1.89 (0.81)* [<0.01]	1.46 (0.93) [<0.01]
	War	−0.47 (0.99) [0.58]	−0.62 (0.94) [0.60]	−0.22 (0.94) [0.27]

NOTES: Numbers in parentheses are bootstrap standard errors. Numbers in square brackets are bias-corrected p-values for two-tailed test.

* Significant at 95 percent level of confidence by normal approximation method.
** Significant at 90 percent level of confidence by normal approximation method.

coefficients on the postelection covariates that do not differentiate between the party of the president in all the post-World War I and post-World War II estimates but for one case in which they are equal. As with the results in Table 6, the coefficients on the periods following the election of a Republican president are largest for the twelve-month covariate. The estimates suggest that an expansion is 6.62 times more likely to end within a year of a Republican presidential victory than at other times in the post-World War I and post-World War II periods, controlling for wars and for duration dependence. There is only one instance of a peak within two years of a Democratic presidential victory in the post-World War II era implying that the result for the post-World War II period in Table 6 is solely due to periods following a Republican presidential victory.

TABLE 8

ESTIMATES OF HAZARD FUNCTIONS FOR CONTRACTIONS BY PARTY

I. Full Sample: 1855–1991

Equation	Variable	Dummy Variables: Months since an Election, by Party Nine Months	Twelve Months	Twenty-four Months
A.	Republican	0.54 (0.61) [0.99]	0.50 (058) [0.97]	−0.13 (0.51) [0.15]
	Democrat	1.05 (0.70) [0.01]	1.08 (0.69) [0.09]	0.26 (0.64) [0.79]
B.	Republican	0.26 (0.56) [0.72]	0.26 (0.54) [0.63]	−0.38 (0.54) [0.33]
	Democrat	1.30 (0.84) [0.06]	1.07 (0.77) [0.10]	0.14 (0.67) [0.65]
	War	2.23 (0.82)* [<0.01]	2.17 (0.81)* [<0.01]	2.37 (0.77)* [0.01]

II. Post-World War I

Equation	Variable	Dummy Variables: Months since an Election, by Party Nine Months	Twelve Months	Twenty-four Months
A.	Republican	−0.27 (0.41) [0.02]	−0.27 (0.41) [0.05]	−0.53 (0.60) [0.17]
	Democrat	0.46 (0.80) [0.45]	0.93 (0.68) [0.20]	0.45 (0.71) [0.67]
B.	Republican	−0.27 (0.41) [0.05]	−0.24 (0.38) [0.02]	−0.78 (0.73) [0.44]
	Democrat	0.67 (0.81) [0.69]	0.82 (0.80) [0.24]	0.25 (0.77) [0.44]
	War	1.32 (0.83) [0.05]	1.35 (0.75)** [0.04]	1.67 (0.81)* [0.23]

NOTES: Numbers in parentheses are bootstrap standard errors. Numbers in square brackets are bias-corrected p-values for two-tailed test.

* Significant at 95 percent level of confidence by normal approximation method.
** Significant at 90 percent level of confidence by normal approximation method.

Results presented in Table 8 for the estimates for hazard functions for contractions also demonstrate some effects consistent with rational partisan theory.[18] The coefficients on the covariates for the period following the election of a Republican president in the post-World War I period are all of the expected negative sign and those for the nine-month and twelve-month covariates have bias-corrected p-values equal to 0.05 or less. These covariates suggest that a business cycle trough is about 78 percent as likely to occur in the year following a Republican presidential victory as at other times controlling for wars and for duration dependence. The coefficients on the covariates for the period following the election of a Democratic president are all of the expected positive sign and those for the nine-month and twelve-month covariates have bias-corrected p-values equal to 0.10 or less in the full sample estimates. The point estimate for the twelve-month Democratic covariate for the full sample when war is included suggests that a business cycle trough marking the end of a contraction is 2.92 times as likely to occur in the year following the election of

18. All of the coefficients on the war covariate that identifies those business cycles during which there was a war have bias-corrected p-values of 0.05 or less but for the specification using twenty-four-month postelection covariates in the post-World War I period.

a Democratic president as at other times. None of the coefficients on the twenty-four-month election covariates are significant for hazards for contractions.[19]

3. CONCLUSIONS

This paper tests political business cycle theories by using duration analysis. This approach provides a more direct test of the timing of business cycle turning points relative to elections than previous research which considers the amplitude of macroeconomic variables before and after presidential elections. There is some evidence supporting the prediction from opportunistic political business theory of an increased likelihood of the end of a contraction in the two-year period before an election but only when there is a Democratic president. Other results presented here are consistent with the postelection downturn predicted by opportunistic political business cycle theory. Further examination of the postelection results show a difference by the party of the victorious presidential candidate. There is a significantly higher likelihood of the end of an expansion occurring in any given month in periods following Republican presidential victories. This is consistent with rational partisan theory. Also consistent with rational partisan theory is the finding that contractions are less likely to end following a Republican presidential election victory than at other times and more likely to end in the wake of a Democratic presidential victory than at other times.

The results presented in this paper do not provide a complete test of the hypotheses of political business cycle theories. Other predictions that involve the amplitude of variables across periods, such as differences in inflation across the tenure of political parties, cannot be addressed using duration analysis. Duration analysis is well suited, however, for examining the timing of economic events relative to political events. An understanding of this relationship is central to our understanding of the empirical relevance of political business cycle theories.

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19. The timing of business cycle turning points relative to elections presented here is consistent with research on the effect of elections on the amplitude of macroeconomic variables. Alesina (1988) finds that the effect of elections on macroeconomic variables in the United States appears no sooner than two quarters after a presidential election. He reports that the largest effect is found five to six quarters after an election. Ten quarters after an election Alesina finds no statistically significant effect of the election on the amplitude of macroeconomic variables.

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