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Another look at the evidence for rational partisan cycles

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Abstract. In presenting evidence in favor of rational partisan cycles, where electoral victories by leftist parties are expected to create temporary expansions and electoral victories by rightist parties are expected to create temporary recessions, Alesina, Cohen, and Roubini (1999) rely upon autoregressive time series intervention regressions. These regressions, however, are not consistent with their model. In this paper, a model is derived which is consistent with the intervention approach in its reduced-form. The differences between the models are highlighted and new empirical estimates are presented on a panel of seven OECD nations, which generally does not support the rational partisan cycle implications.

1. Introduction

A variety of models have been developed which propose a connection between politics and macroeconomic outcomes such as output and unemployment, but empirical support for most politico–economic models is lacking. One of the most famous models is Nordhaus' (1975) treatment of the political business cycle where incumbents are expected to take advantage of myopic voters by manipulating policy to spur the economy just prior to an upcoming election. The rational expectations revolution in macroeconomic theory seemed to break the theoretical link between manipulative policy and macroeconomic outcomes, and empirical studies have generally rejected the model's implications (Keech, 1995).

On the other hand, Hibbs (1977) had presented evidence that macroeconomic outcomes differ systematically by party control, which would seem to be counter to a rational expectations world. Alesina (1987) has designed a model, commonly referred to as Rational Partisan Theory (RPT), incorporating rational expectations into a partisan policy framework, which is partially consistent with Hibbs' evidence. In effect, Alesina argues Hibbs' evidence is misleading in that macroeconomic divergence between the parties occurs only at the beginning of their terms and eventually converges, so the systematic differences are only temporary. Alesina's theoretical innovation was to introduce the notion of electoral uncertainty where agents are unable to predict with complete accuracy who will control policy following an election so even under rational expectations they will not know the future inflation rates. While his model reestablishes the theoretical link, empirical studies

employing single country regressions have generally not supported the model (Sheffrin, 1989; Carlsen, 1998; Heckelman, 2001a).

Most of the evidence in support of the model comes from Alesina himself. In a very influential study, Alesina and Roubini (1992) present evidence utilizing autoregressive intervention models for growth and unemployment.[1] The intervention is a trinary variable taking the values of -1 for new leftwing governments, $+1$ for new rightwing governments, each for a predetermined number of quarters, and zero otherwise. Unlike the studies mentioned above, Alesina and Roubini utilize a panel approach covering a large number of OECD nations in a single pooled regression. Their study has been updated in the recent book by Alesina, Roubini, and Cohen (1999) following the same methodology and extending the sample period. First, they test the US separately and after finding a statistically significant coefficient for the intervention variable, later utilize the pooled OECD regression specification, again finding a significant result.

It is not clear, however, if the autoregressive intervention approach is truly consistent with the model implications of Alesina (1987) and the specific model formulated in Alesina, Roubini, and Cohen (1999) for short-term expansions following leftist victories and short-term recessions following rightist victories. In the next section I develop an RPT-type model, which generates the autoregressive intervention regression in its reduced form. The differences between this model and Alesina, Roubini and Cohen's model and testing procedure are highlighted in Section 3. The new model is then tested in Section 4 on a panel of OECD nations allowing for asymmetric partisan effects within and across countries, and utilizing two types of controls for unemployment hysteresis. Regression results are not consistent with the RPT implications. A summary appears in the final section.

2. A Model of Partisan Policies and Rational Expectations

There are several versions of the RPT model, each differing in various parameters but all predicated on the notion of partisan policy uncertainty when contracts are signed prior to elections.[2] The model presented here is designed to directly result in the autoregressive intervention regression used by Alesina, Roubini, and Cohen (1999), in its reduced form. The focus will be exclusive to unemployment, although Alesina, Roubini, and Cohen (1999) present similar representations for output growth[3] and inflation.[4]

2.1. *Economic structure*

Two major parties, L and R, compete for policy control. Both parties recognize the harm of inflation and unemployment but differ only in their relative aversions to these components of the "misery index". Specifically, party leaders

wish to minimize their respective loss functions, which take the form of

$$\tilde{\Im}^L = \sum_{t=0}^{\infty} \delta^t \left[(\pi_t)^2 + \tilde{z}^L u_t \right] \tag{1a}$$

$$\tilde{\Im}^R = \sum_{t=0}^{\infty} \delta^t \left[(\pi_t)^2 + \tilde{z}^R u_t \right] \tag{1b}$$

where π_t is the inflation rate and u_t is the unemployment rate in period t. The discount rate, $0 < \delta < 1$, is the same for each party and implies they are relatively more concerned with current, rather than future, inflation and unemployment. The parameters $\tilde{z}^L$ and $\tilde{z}^R$ represent differences in the parties' beliefs of the relative harm from inflation and unemployment, such that $\tilde{z}^L > \tilde{z}^R > 0$.

On the supply side, unemployment is governed by the relationship

$$u_t = \bar{u} - g(\pi_t - \dot{w}_t) + \epsilon_t \tag{2}$$

where $\bar{u}$ is the natural rate of unemployment, $\dot{w}_t$ is the growth in nominal wages, $g > 0$, and ϵ_t are serially correlated exogenous shocks represented by

$$\Psi(B)\epsilon_t = \eta_t \tag{3}$$

where $\Psi(B) = 1 - \sum_{i=1}^{r} b_i B^i$, B is the backshift operator such that $B^i x_t = x_{t-i}$, and η_t is an innovation process distributed i.i.d. with zero mean. Thus, unemployment will deviate from its natural rate when real wages fluctuate or from the presence of uncontrollable current and past shocks.

The RPT model is predicated on a Taylor (1980) style wage setting format. Wage setters (perhaps monopolistic labor unions) set nominal wages for the following period (which Alesina and coauthors assume is equal to 1–2 years) to achieve stability in the real wage. Contracts cannot be adjusted during their existence, nor are they indexed, and new nominal wages can only be set when the current contracts expire. It then follows that wages will be set according to the inflation expected to prevail during the span of the new contracts; thus

$$\dot{w}_t = \pi_t^e. \tag{4}$$

Agents in the model are forward-looking and rational in their expectations, as derived below. Finally, actual inflation is determined directly by the growth in money, $\dot{m}_t$, as

$$\pi_t = \alpha \dot{m}_t. \tag{5}$$

where $\alpha > 0$.

2.2. *Solving for the reduced-form equations*

The above equations fully determine the structure of the economy and the model can now be solved. Substituting Equations (2), (4), and (5) into the loss functions (1a) and (1b) yields

$$\tilde{\mathfrak{I}}^L = \sum_{t=0}^{\infty} \delta^t \left[(\alpha \dot{m}_t)^2 - \tilde{z}^L \left(\bar{u} + \alpha g \left(\dot{m}_t - \dot{m}_t^e \right) + \epsilon_t \right) \right] \tag{6a}$$

$$\tilde{\mathfrak{I}}^R = \sum_{t=0}^{\infty} \delta^t \left[(\alpha \dot{m}_t)^2 - \tilde{z}^R \left(\bar{u} + \alpha g \left(\dot{m}_t - \dot{m}_t^e \right) + \epsilon_t \right) \right] \tag{6b}$$

The parties choose their optimal money growth targets in each period to minimize the loss functions. Since expectations on money growth were formed in the previous period, they are taken as given. First-order conditions reveal

$$\dot{m}_t^L = \tilde{z}^L g / 2\alpha \equiv \dot{m}_*^L \tag{7a}$$

$$\dot{m}_t^R = \tilde{z}^R g / 2\alpha \equiv \dot{m}_*^R \tag{7b}$$

therefore optimal money growth is stable during the tenure of each party but $\dot{m}_*^L > \dot{m}_*^R$ since $\tilde{z}^L > \tilde{z}^R$. Define L_t to be a binary variable with value of 1 when party L is in control of policy, and value of zero when party R is in control, and R_t is defined vice versa. Then money growth in any period can be characterized by the relationship

$$\dot{m}_t = \dot{m}_*^L L_t + \dot{m}_*^R R_t. \tag{8}$$

In setting the wage contracts, then, rational agents are concerned with which party will be in control of monetary policy, and thereby able to determine the prevailing inflation rate. If elections are announced far enough in advance, or fixed by constitutional design, so that wage-setters will know when they set contracts if an election will take place in the next period,[5] then rational expectations on monetary policy take the following form.

$$\dot{m}_t^e = \begin{cases} \dot{m}_*^L L_{t-1} + \dot{m}_*^R R_{t-1}, & \text{no election announced in } t-1 \text{ for period } t \\ \dot{m}_*^L \varrho^L + \dot{m}_*^R \varrho^R, & \text{election announced in } t-1 \text{ for period } t \end{cases} \tag{9}$$

where ϱ^L and ϱ^R represent the probability that party L and party R will emerge victorious in the upcoming election ($\varrho^L + \varrho^R = 1$).

Substitution of Equations (4), (5), (7a), (7b), (8) and (9) into (2) and combining the results generates the unemployment pattern

$$u_t = \begin{cases} \bar{u} + \Psi^{-1}(B)\eta_t, & \text{no election in period } t \\ \bar{u} - \varrho^R g^2(\tilde{z}^L - \tilde{z}^R)/2\alpha + \Psi^{-1}(B)\eta_t, & L \text{ wins election in period } t \\ \bar{u} + \varrho^L g^2(\tilde{z}^L - \tilde{z}^R)/2\alpha + \Psi^{-1}(B)\eta_t, & R \text{ wins election in period } t \end{cases} \tag{10}$$

which reveals that in the absence of exogenous shocks, unemployment will be expected to temporarily fall when party L wins an election, and temporarily rise when party R wins an election. This is the standard RPT proposition that short-term expansions are triggered by leftwing victories, short-term recessions are triggered by rightwing victories, and convergence will be achieved later in the party's tenure when there is no uncertainty over policy control (Alesina, 1987).

Expanding and rearranging the terms in (10) yields

$$u_t = \begin{cases} \beta_0 + \sum_{i=1}^{r} \beta_i u_{t-i} + \eta_t, & \text{no election} \\ \beta_0 + \sum_{i=1}^{r} \beta_i u_{t-i} - \lambda^L + \eta_t, & L \text{ wins election} \\ \beta_0 + \sum_{i=1}^{r} \beta_i u_{t-i} + \lambda^R + \eta_t, & R \text{ wins election} \end{cases} \tag{11}$$

where $\beta_0 = \bar{u}(1 - \sum b_i)$, $\beta_i = b_i$, $\lambda^L = \varrho^L g^2(\tilde{z}^L - \tilde{z}^R)(1 - \sum b_i)/2\alpha$, $\lambda^R = \varrho^R g^2(\tilde{z}^L - \tilde{z}^R)(1 - \sum b_i)/2\alpha$. Note $\beta_0, \beta_i, \lambda^L, \lambda^R > 0$. Now define the intervention variables (recalling from above that Alesina and coauthors assume each period lasts multiple quarters) as

$$E_t^L = \begin{cases} -1, & \text{first } n \text{ quarters after} \\ & L \text{ wins election} \\ 0, & \text{else} \end{cases} \quad \text{and} \quad E_t^R = \begin{cases} +1, & \text{first } n \text{ quarters after} \\ & R \text{ wins election} \\ 0, & \text{else} \end{cases}$$

so (11) can be simplified to the single equation

$$u_t = \beta_0 + \beta_1 u_{t-1} + \beta_2 u_{t-2} + \cdots + \beta_r u_{t-r} + \lambda^L E_t^L + \lambda^R E_t^R + \eta_t. \tag{12}$$

Under the additional assumption that election outcomes are purely random events, $\varrho^L = \varrho^R = {}^1/_2$. In this case, $\lambda^L = \lambda^R$ so the restricted version of (12) becomes

$$u_t = \beta_0 + \beta_1 u_{t-1} + \beta_2 u_{t-2} + \cdots + \beta_r u_{t-r} + \lambda E_t^{LR} + \eta_t \tag{13}$$

where $\lambda = \lambda^L = \lambda^R$ and

$$E_t^{LR} = E_t^L + E_t^R = \begin{cases} -1, & \text{first } n \text{ quarters after} \\ & \quad L \text{ wins election} \\ +1, & \text{first } n \text{ quarters after} \\ & \quad R \text{ wins election} \\ 0, & \text{else.} \end{cases}$$

The representation in (13) is equivalent to the regressions utilized by Alesina, Roubini, and Cohen (1999) in their tests of the US data. Therefore, the AR intervention representations used in their regressions are consistent with a reduced-form equation from an RPT model, but not for the particular model they claim to be testing. That model, which does not allow for persistence or exogenous shocks, results in one-time jumps away from the natural rate during the election period and then an immediate return to the natural rate in the next period. The autoregressive intervention specification utilized by Alesina and others in their empirical formulations and formally derived in (13) assumes instead partisan deviations to unemployment following an election *increase* for each of the first n quarters, before slowly adjusting back toward the natural rate. The natural rate, though, may never actually be achieved prior to the next election depending on the degree of persistence. Further differences between these representations are highlighted in the next section where their importance to the regression analysis is considered.

3. Analysis of the Reduced-Form Equations

The decision to test RPT using an autoregressive intervention model of the form of (13) "based on the assumption that output growth and unemployment are generated by a covariance-stationary stochastic process that can be expressed in autoregressive form" (Alesina and Roubini, 1992, pp. 668–669) is not as benign as it might seem. It rests upon very particular assumptions that are stronger than their model implies.

3.1. *Election probabilities*

In particular, one critical assumption is that the election winner probability is not only non-stochastic, which has been criticized by others (Chappel and Keech, 1988; Hibbs, 1992), but specifically the winning party must be a toss-up to generate the needed symmetry for the intervention variable coding.[6] Thus using the constant but not necessarily equal probabilities assumed throughout the RPT literature will make (13) an inconsistent representation. The coefficient estimates for λ will be biased unless the probabilities truly are

equal, which is necessary to generate the symmetric intervention effect. If the winning probabilities are fixed but not equal, then (12) is the correct form.

3.2. *Transitions vs. continuous party control*

When turning to the pooled OECD data, Alesina, Roubini, and Cohen (1999) make two subtle changes to the time-series representations, consistent with the pooled RPT tests utilized in Alesina and Roubini (1992), which did not consider the US data separately. First, they code the pooled intervention variable such that non-zero values only occur for transitions in party control, not for each election. This intervention representation is not a valid test of RPT unless there is no uncertainty when the incumbent party is reelected, which would require $\varrho^L = L_{t-1}$ and $\varrho^R = R_{t-1}$ in order to always predict an incumbency reelection. Thus, the election probabilities are no longer non-stochastic, which is inconsistent with the model. Furthermore, as suggested by Hibbs (1992) and formally developed in Heckelman (1999), this type of variable representation is indistinguishable from a model where agents form their expectations on inflation and policy adaptively and do not consider the possibility of policy change due to an upcoming election. Since the main innovation of RPT is the incorporation of rational expectations and electoral uncertainty, Hibbs (1992) argues that such a formulation on agent expectations deprives RPT of any substantive improvement over the earlier partisan models.

3.3. *Unemployment hysteresis issues*

A second change made by Alesina, Cohen, and Roubini to the pooled sample, again following from Alesina and Roubini (1992), is to transform the unemployment series as deviations from the average OECD unemployment rate. This is done purely for estimation purposes, due to concerns over hysteresis in European unemployment (this transformation is not done for their growth regressions). However, the intervention variable as constructed does not properly address the expected time-series pattern of this new variable. While the original RPT model predicts that uncertainty over partisan policies affects unemployment only for a short time after an election, it would also predict that the transformed unemployment series would deviate from the natural rate in predictable ways even late in the parties' terms due to the presence of elections in the other OECD nations. Left party victories in other nations will temporarily reduce the average OECD unemployment rate, thereby increasing the deviation of domestic unemployment from the average OECD unemployment rate even if no election takes place domestically. Conversely, right party victories in other nations will reduce domestic unemployment relative to the OECD average. Therefore, such a transformation to the unemployment series would require an additional intervention variable

coded similarly to E_t^{LR}, whose coefficient would be predicted to be negative in order to capture electoral effects from these other nations.

Specifically, if there are k countries under consideration,

$$\begin{aligned} u_{jt} - \frac{1}{k-1}\sum_{-j} u_{jt} = \beta_0 &+ \beta_1\left(u_{jt-1} - \frac{1}{k-1}\sum_{-j} u_{jt}\right) \\ &+ \beta_2\left(u_{jt-2} - \frac{1}{k-1}\sum_{-j} u_{jt}\right) \\ &+ \cdots + \beta_r\left(u_{jt-r} - \frac{1}{k-1}\sum_{-j} u_{jt}\right) \\ &+ \lambda E_{jt}^{LR} + \gamma \sum_{-j} E_{jt}^{LR} + \eta_{jt} \end{aligned} \tag{14}$$

for $j = 1, \ldots, k$ and $\gamma < 0$. A similar intervention model could be designed to reflect the case of unequal election probabilities reflected in Equation (12) by summing instead over the remaining set of E_t^L and E_t^R interventions:

$$\begin{aligned} u_{jt} - \frac{1}{k-1}\sum_{j} u_{jt} = \ \beta_0 &+ \beta_1\left(u_{jt-1} - \frac{1}{k-1}\sum_{j} u_{jt}\right) \\ &+ \beta_2\left(u_{jt-2} - \frac{1}{k-1}\sum_{j} u_{jt}\right) + \cdots \\ &+ \beta_r\left(u_{jt-r} - \frac{1}{k-1}\sum_{j} u_{jt}\right) + \lambda^L E_{jt}^L + \lambda^R E_{jt}^R \\ &+ \gamma^L \sum_{-j} E_{jt}^L + \gamma^R \sum_{-j} E_{jt}^R + \eta_{jt} \end{aligned} \tag{15}$$

with $\gamma^L, \gamma^R < 0$.

The problem of hysteresis is that shocks (random or otherwise) will have permanent rather than transitory effects. This has two conceptual difficulties. First, Alesina interprets his model as generating deviations from trend only for a short time after an election, and converging for both parties later in their terms. This however is simply a construct of how Alesina models his Phillips Curve representation. If unemployment is highly persistent the Phillips Curve should properly represent this. Hysteresis suggests only that Alesina's specific model is not supported by the data, not that the underlying framework of electoral uncertainty fails. Using a more dynamic structure to the Phillips Curve, as in (3), but keeping the basic RPT premise of electoral uncertainty, yields a different implication from Alesina's RPT model, which may be more

consistent with the data. Alesina, Roubini, and Cohen (1999) lean toward this new interpretation when they admit that their transformed unemployment variable retains high persistence but argue it may be from "persistent temporal propagation of the original partisan shock" (p. 155) rather than continued partisan shocks throughout the electoral term.

While the model can easily accommodate hysteresis from a theoretical perspective, there still leaves the problem that ordinary least squares (OLS) analysis on (13) would be invalid. Again, Alesina and Roubini chose to alter the unemployment series but, as explained, this complicates the RPT interventions. Furthermore, it is not clear from their estimated coefficients they have eliminated the problem. Since their estimated lagged coefficients sum to .98, then for "practical purposes it makes little difference whether we encounter such a high level of persistence or pure hysteresis, which given the autoregressive part of the estimation equation most likely cannot be ruled out statistically" (Gartner, 1994, p. 432). Moreover, the US unemployment regressions in Alesina, Roubini, and Cohen (1999) yield coefficient estimates on the lagged unemployment variables which sum to .96, suggesting the US series may suffer from the same problem as the international data.

In essence, hysteresis implies there is a unit-root problem to the unemployment series. OLS analysis is only valid when unemployment is a stationary (or trend-reverting) series. Through Monte Carlo simulations, McCallum (1993) finds that an AR(1) correction to a non-stationary series yields almost identical results to OLS estimates on the differenced stationary series. He concludes underdifferenced series do not create "serious estimation or testing mistakes in regression models with exogenous regressors, provided that the investigator takes intelligent account of serial correlation present in the regression residuals" (McCallum, 1993, p. 30). I therefore consider an AR(1) correction to (12) and (13) in addition to OLS on the transformed series in (14) and (15).

4. Empirical Estimation of the Model

4.1. *Data*

Tests of the reduced-form equations will consider both the original unemployment series with an AR(1) error correction, and the deviations of domestic unemployment from the OECD average supplemented with the additional OECD RPT interventions. Alesina and Roubini (1992) calculate the average OECD unemployment rate as the average of the seven largest OECD nations, US, Japan, Germany, France, UK, Italy, and Canada, excluding for each nation its own unemployment rate, as presented in Equations (14) and (15). Alesina and Roubini (1992) use quarterly data on the seasonally adjusted unemployment series from OECD Main Economic Indicators from 1960 to 1987, which is extended to 1993 in Alesina, Roubini, and Cohen (1999). The same sample period is considered here. Monthly unemployment data from 1960:1 to

1993:12 are taken from the OECD Main Economic Indicators mini database, which accompanies Rats 4.1. Each series is averaged to quarterly rates, except for Italy which was already available as quarterly data.[7] The intervention variable retains its non-zero values for the first six quarters starting with an election. Election dates and winning parties are taken from the appendix to Chapter 6 of their book. All computations, which follow, were compiled using Rats 4.1 software. The Schwarz Bayesian Information Criteria is used to determine the optimal number of lags, which is minimized for both series using a 5 lag structure.

4.2. *Empirical estimates*

Panel data tests for the models are presented in Table 1. Recall the model predicts coefficients on the domestic interventions to have positive signs, and coefficients on the OECD interventions to have negative signs, as more left victories than right victories in the other nations should reduce the average OECD unemployment rate and therefore, ceteris paribus, have the opposite effect on the transformed series.

First note the symmetric intervention variable, E_t^{LR}, is not a significant regressor for either unemployment series, although for the transformed series both the domestic intervention and the OECD intervention are of the predicted sign.[8] If the election effect is asymmetric across the parties, as expected if $\varrho^L \neq \varrho^R$, then the symmetric intervention variable coefficient estimate will be inconsistent. The asymmetric effect results are only slightly more promising. For the domestic unemployment series, they remain insignificant, and the rightist victories intervention yields the wrong sign. The same holds true for the transformed series, except the domestic left intervention would be considered statistically significant at the 10% level.

This result would only support the model if rightist victories are never surprises and leftists are never expected to win ($\varrho^L \approx 0$), which does not seem likely (or fully rational). Furthermore, the OECD intervention is not significant for the left, although it is of the predicted sign. Finally, despite the borderline significance of the left domestic intervention variable, a Wald test does not reject the symmetric effect representation at reasonable levels of confidence, and as indicated before, that representation does not generate statistically significant intervention effects.

4.3. *Country-specific partisan effects*

In order for the panel regressions to be adequate representations of the model, it must be valid to pool the data in such a manner. There is good reason to think this is not the case. The primary advantage to pooling the data is to compare against a greater number of elections and thereby increase degrees of freedom,

Table 1. Partisan effect of election outcomes on unemployment (absolute t-ratios)

	Domestic unemployment		Domestic unemployment minus remaining OECD average	
Constant	0.176	0.177	0.002	−0.002
	(2.81)	(2.92)	(0.24)	(0.10)
u_{t-1}	0.716	0.731	1.328	1.328
	(20.9)	(21.4)	(38.9)	(39.0)
u_{t-2}	0.238	0.239	−0.188	−0.187
	(5.76)	(5.73)	(3.32)	(3.30)
u_{t-3}	0.110	0.104	−0.034	−0.037
	(2.56)	(2.40)	(0.59)	(0.63)
u_{t-4}	−0.290	−0.294	−0.321	−0.320
	(6.79)	(6.85)	(5.52)	(5.51)
u_{t-5}	0.206	0.202	0.208	0.210
	(5.78)	(5.67)	(5.98)	(6.04)
E_t^{LR}	−0.006		0.016	
	(0.23)		(1.06)	
E_t^L		0.028		0.045
		(0.74)		(1.76)
E_t^R		−0.031		−0.009
		(0.91)		(0.37)
OECD E_t^{LR}			−0.002	
			(0.32)	
OECD E_t^L				−0.010
				(0.83)
OECD E_t^R				0.003
				(0.32)
AR(1)	0.70	0.68		
	(10.3)	(9.1)		
Symmetric partisan effect (p-value)		(.27)[a]		(.15)[a] (.42)[b]
Mean dep. var	5.81	5.81	0.019	0.019
Regression standard error	0.26	0.26	0.28	0.28
Sum sqd. residuals	56.03	55.95	63.34	63.13

[a] $E_t^L = E_t^R$.
[b] OECD E_t^L = OECD E_t^R.

but if partisan effects differ across nations, pooling will generate biased results. Recall that the size of the intervention coefficients depends on the degree of partisan difference in monetary policy ($\tilde{z}^L - \tilde{z}^R$). Partisan differences in general are thought to be greater within the European nations, compared to US and Canada. In reality, the ability to generate partisan monetary policies

depends critically on the degree of influence the governing parties have on the central banks. In the model, it was assumed the parties had direct control. A completely independent central bank will sever the electoral uncertainty effect since central bankers do not change after elections. Thus, an RPT effect should be more likely to occur in Japan, with a relatively dependent central bank, than in Germany, which had a fiercely independent central bank. This implies RPT effects may be present in some nations, but not in others. The pooled representation would hinder the ability to detect partisan election effects if they are not uniform.[9]

To preserve degrees of freedom, only partisan effects are allowed to vary across nations, whereas the underlying structure of the Phillips Curve generating the autoregressive portion on unemployment is held fixed, as are the remaining OECD interventions. Results for the country-specific partisan effects are presented in Table 2. For domestic unemployment, only the US generates a statistically significant coefficient on the intervention variable, again at the 10% level. This corroborates the US specific regression result in Alesina, Roubini, and Cohen (1999), although they found a much stronger effect. Canada, France, and FRG also yield positive intervention effects, but minuscule t-statistics. For the transformed series, again the US generates a statistically significant coefficient, this time at a much higher confidence level, and France comes close.

Turning to the asymmetric intervention representation in the second column, it appears the electoral unemployment effects in the US were driven almost exclusively from left party victories which led to an immediate drop in unemployment of more than a quarter percentage point and (assuming the absence of any exogenous shocks) continued larger decreases in each of the first six quarters up to a maximal of 1.44 percentage point deviation, and then due to the strong persistence inherent in unemployment, only slowly declines thereafter and remains 1.21 percentage points below trend when the next election occurs in quarter 16, whereas right victories create statistically insignificant increases in unemployment of less than 3/100 s of a percentage point reaching a maximum of .15 percentage points above trend in the sixth quarter. As shown in Table 3, a Wald test confirms the significance of these partisan differences (in absolute value) at the 5% level. No other nation, however, supports the RPT implication of positive coefficients for both intervention variables. Surprisingly, the only other nation with significantly different partisan election effects appear in Canada, although even here the effect is marginal. Furthermore, each election in Canada leads to small reductions in the unemployment rate, contrary to the RPT model, with right party victories having slightly greater effects.

The transformed unemployment series generates similar results, except the partisan differences in the US are smaller, and no longer significantly different from each other. Canadian partisan differences are significant at a higher level

Table 2. Country specific partisan effects (absolute t-ratios)

	Domestic unemployment			Domestic unemployment minus remaining OECD average		
Constant	0.157	0.139	0.112	0.003	−0.001	0.008
	(2.84)	(2.92)	(3.01)	(0.25)	(0.03)	(0.72)
u_{t-1}	0.762	0.833	0.939	1.317	1.317	1.318
	(22.20)	(24.09)	(27.30)	(38.49)	(38.33)	(38.57)
u_{t-2}	0.237	0.227	0.192	−0.183	−0.184	−0.184
	(5.60)	(5.14)	(4.16)	(3.24)	(3.25)	(3.26)
u_{t-3}	0.101	0.074	0.034	−0.029	−0.031	−0.031
	(2.28)	(1.62)	(0.72)	(0.50)	(0.54)	(0.53)
u_{t-4}	−0.311	−0.336	−0.363	−0.321	−0.323	−3.23
	(7.08)	(7.38)	(7.62)	(5.53)	(5.57)	(5.57)
u_{t-5}	0.194	0.189	0.189	0.207	0.216	0.212
	(5.43)	(5.27)	(5.31)	(5.95)	(6.16)	(6.10)
Canada						
E_t^{LR}	0.008			0.005		
	(0.13)			(0.12)		
E_t^{L}		0.074	0.073		0.068	0.060
		(1.05)	(1.12)		(1.41)	(1.26)
E_t^{R}		−0.111	−0.118		−0.087	−0.082
		(1.24)	(1.44)		(1.49)	(1.41)
France						
E_t^{LR}	0.041		0.043	0.084		0.083
	(0.46)		(0.57)	(1.63)		(1.62)
E_t^{L}		−0.040			0.066	
		(0.32)			(0.81)	
E_t^{R}		.0117			0.095	
		(1.00)			(1.37)	
FRG						
E_t^{LR}	0.009		0.020	0.040		0.037
	(0.131)		(0.35)	(0.99)		(0.92)
E_t^{L}		−0.006			0.042	
		(0.05)			(0.52)	
E_t^{R}		0.022			0.031	
		(0.30)			(0.64)	
Italy						
E_t^{LR}	−0.028		0.004	−0.034		−0.026
	(0.49)		(0.08)	(0.90)		(0.70)
E_t^{L}		−0.017			−0.015	
		(0.28)			(0.38)	
E_t^{R}		0.015			−0.088	
		(0.09)			(0.76)	

(*Continued on next page*)

Table 2. (*Continued*)

	Domestic unemployment			Domestic unemployment minus remaining OECD average		
Japan						
E_t^{LR}	−0.078		−0.085	−0.042		−0.040
	(1.32)		(1.61)	(1.06)		(1.03)
E_t^{L}		−0.048			−0.028	
		(0.20)			(0.14)	
E_t^{R}		−0.088			−0.045	
		(1.48)			(1.08)	
UK						
E_t^{LR}	−0.044		−0.036	−0.003		−0.007
	(0.64)		(0.60)	(0.09)		(0.16)
E_t^{L}		−0.034			0.008	
		(0.30)			(0.12)	
E_t^{R}		−0.042			−0.020	
		(0.53)			(0.38)	
USA						
E_t^{LR}	0.116			0.096		0.096
	(1.80)			(2.47)		(2.47)
E_t^{L}		0.274	0.263		0.160	
		(2.76)	(2.91)		(2.57)	
E_t^{R}		0.029	0.040		0.048	
		(0.36)	(0.55)		(0.92)	
OECD E_t^{LR}				−0.004		−0.004
				(0.55)		(0.53)
OECD E_t^{L}					−0.012	
					(0.99)	
OECD E_t^{R}					0.0004	
					(0.04)	
AR(1)	0.65	0.57	0.46			
	(7.4)	(4.66)	(2.78)			
Mean dep. var	5.81	5.81	5.81	0.019	0.019	0.019
Regression S.E.	0.26	0.26	0.26	0.28	0.28	0.28
SSR	55.66	55.17	55.22	62.53	62.02	62.23

of confidence, and France and FRG generate intervention coefficients of the predicted positive sign for both parties. However, they are not significantly different from zero, or each other. The OECD interventions do not support the model either.

Finally the last column under each unemployment series mixes the interventions, keeping only the asymmetric representation where symmetry had been rejected in Table 3, that is for Canada and US for domestic

Table 3. Wald tests for symmetric partisan effects

	Domestic unemployment		Domestic unemployment minus remaining OECD average	
	F-value	Significance level	F-value	Significance level
Canada	2.82	.09	4.58	.03
France	0.82	.37	0.070	.79
FRG	0.036	.85	0.014	.91
Italy	0.028	.87	0.34	.56
Japan	0.026	.87	0.0074	.93
UK	0.0031	.96	0.10	.75
US	3.68	.05	1.82	.18
Remaining OECD			0.57	.45

unemployment, and Canada for the transformed series.[10] This change does not affect the signs or significance compared to the relevant prior regression specification except in two cases, both for domestic unemployment. First, the Italy intervention coefficient estimate now has the predicted positive sign, but with a t-statistic of only 0.08 is hardly worth noting. Second, the Japan intervention comes much closer to achieving a 10% significance level, but is of the opposite sign as predicted by RPT.

To sum, only the US supports the RPT model, and this is only partial support. Leftwing victories lead to significant unemployment decreases, but the increases in unemployment following rightwing victories are much smaller and not significant. Thus the "surprise" inflation effects from elections are much stronger when the left wins, suggesting agents must place a very strong weight on rightwing victories, perhaps even as strong as 100%. Such a weighting toward one party would be a questionable way to support the RPT model given actual US election outcomes. The RPT model is not supported in the other nations.

5. Summary

An RPT model was constructed to coincide directly with the reduced-form autoregressive intervention representation for unemployment utilized in the empirical sections of Alesina and Roubini (1992) and Alesina, Roubini, and Cohen (1999). The model reveals that temporary electoral uncertainty is expected to lead to longer lasting unemployment deviations than usually described by Alesina, due to the persistence of the temporary shocks. The model is tested on a pooled sample of the seven largest OECD nations.

To control for hysteresis complications in the empirical section, unemployment is tested using an AR(1) error correction, and also as deviations from the average OECD unemployment rate, which requires adding additional intervention regressors for the other OECD nations. Neither version supports the model implications, even when allowing for asymmetric partisan effects.

The country-specific partisan effects reveal the US is the only nation which generates a statistically significant intervention coefficient, but the asymmetric representation demonstrates the effect is only from leftwing victories significantly leading to lower unemployment, and the increases in unemployment following rightwing victories are much smaller and not statistically significant. Thus, even in the US the RPT model is only supported if electoral uncertainty exists only for Democratic victories meaning agents fully expect Republicans to win each election. It is difficult to reconcile this assumption within a fully rational model, given the relatively competitive balance between the two parties.

Notes

1. See also the evidence in Alesina (1989) and Alesina and Sachs (1988).
2. For the most recent survey of the RPT literature, see Drazen (2000).
3. The output growth equations are not without controversy. Beginning in Alesina (1987), he has chosen to model the Phillips Curve relationship in terms of growth, rather than output, primarily to better explain the US experience for his model predictions. His comparisons against the earlier partisan models of Hibbs (1977, 1987) do not distinguish between the RPT predicted short-term deviations to growth due to rational expectations and Hibbs' prediction of long-term deviations to the level of output without rational expectations. A strong critique is given by Gartner (1994) and Drazen (2000), and is not developed further here. Other RPT studies have considered output either in terms of growth or levels without seeming to acknowledge the difference.
4. Partisan differences in inflation, determined endogenously, are expected to last for the duration of party control but not beyond. The intervention variable used by Alesina and coauthors in the autoregressive inflation regressions takes on the values of ± 1 for the entire tenure of party control. Note however, that an autoregressive framework assumes persistence in the variable of interest, in this case partisan policies/inflation. Given the functional form of this inflation intervention variable, policy persistence would then last beyond current party control and is therefore not consistent with the RPT framework which assumes each party selects its own time-consistent target policy which changes when party control changes. If there is persistence in policy itself, this should be accounted for by each party and rational agents in the model. It will be shown below that an RPT-type model, which generates a simple autoregressive intervention unemployment series, is derived from a stable inflationary relationship without any persistence. Thus, although modeling unemployment as an autoregressive series for the purpose of empirical testing may be consistent with a particular RPT model, modeling inflation in the same way is not.
5. The model changes substantially if election timing may be unexpected. See Ellis and Thoma (1991) and Heckelman (2001b).

6. Carlsen (1998) and Heckelman (2001a) use poll data for US and UK, respectively, to estimate winning probabilities.
7. The German series begins in 1962:1, and the French series begins in 1978:1. The sample here does not exactly match those used by Alesina and Roubini (1992) or Alesina, Roubini, and Cohen (1999), as their French series began earlier, and their German series later. Also, they did not include Japan in the former study but do in the latter, beginning in 1965. Finally, they also include additional OECD nations in the panel regressions not found in the mini database, but these are not part of their computed OECD average.
8. Note also that the autoregressive coefficients very nearly sum to one.
9. Wald tests reject equivalence of the effects across countries in the transformed series regression but do not reject equivalence at conventional levels for the untransformed domestic unemployment regressions. In the regressions which follow, differences are detected primarily for US and Canada.
10. Asymmetric intervention differences remain significant for Canada and US at 5%.

References

Alesina, A. (1987). Macroeconomic policy in a two-party system as a repeated game. *Quarterly Journal of Economics, 102*, 651–678.

Alesina, A. (1989). Politics and business cycles in industrial democracies. *Economic Policy, 8*, 55–98.

Alesina, A., & Roubini, N. (1992). Political cycles in OECD democracies. *Review of Economic Studies, 59*, 663–688.

Alesina, A., Roubini, N., & Cohen, G. (1999). *Political cycles and the macroeconomy*. Cambridge, MA: MIT Press.

Alesina, A., & Sachs, J. (1988). Political parties and the business cycle in the United States, 1948–1984. *Journal of Money, Credit and Banking, 20*, 63–82.

Carlsen, F. (1988). Rational partisan theory: Empirical evidence for the United States. *Southern Economic Journal, 65*, 64–82.

Drazen, A. (2000). *Political economy in macroeconomics*. Princeton: Princeton University Press.

Ellis, C., & Thoma, M. (1991). Partisan effects in economies with variable electoral terms. *Journal of Money, Credit, and Banking, 23*, 728–741.

Gartner, M. (1994). The quest for political cycles in OECD economies. *European Journal of Political Economy, 10*, 427–440.

Heckelman, J. (1999). Adaptive partisan theory. *Journal of Public Finance and Public Choice, 17*, 11–18.

Heckelman, J. (2001a). The econometrics of rational partisan theory. *Applied Economics, 33*, 417–426.

Heckelman, J. (2001b). Partisan business cycles under variable election dates. *Journal of Macroeconomics, 23*, 261–275.

Hibbs, D. (1977). Political parties and macroeconomic policy. *American Political Science Review, 71*, 1467–1487.

Hibbs, D. (1987). *The American political economy*. Cambridge, MA: Harvard University Press.

Hibbs, D. (1992). Partisan theory after fifteen years. *European Journal of Political Economy, 8*, 361–373.

Keech, W. (1995). *Economic politics: The costs of democracy*. Cambridge: Cambridge University Press.

McCallum, B. (1993). Unit roots in macroeconomic time series: Some critical issues. Federal Reserve Bank of Richmond. *Economic Quarterly, 79*, 13–43.

Nordhaus, W. (1975). The political business cycle. *Review of Economic Studies, 42*, 169–190.

Sheffrin, S. (1989). Evaluating rational partisan business cycle theory. *Economics and Politics, 1*, 239–259.

Taylor, J. (1980). Aggregate demand and staggered contracts. *Journal of Political Economy, 87*, 1–23.