Public Choice **113:** 179–189, 2002.

Electoral uncertainty and the macroeconomy: the evidence from Canada

JAC C. HECKELMAN
Wake Forest University, P.O. Box 7505, Winston Salem, NC 27109-7505, U.S.A.

Accepted 26 March 2001

Abstract. The partisan advantage and incumbency advantage versions of the rational partisan business cycle model are tested. Both models assume agents form weighted averages of partisan inflation rates during an election period, and differ only in how the weights are formed which alters the form of business cycles. The partisan advantage assumes fixed weights designated for both major parties in each election, whereas the incumbency advantage model assumes fixed weights for whichever is the incumbent and opposition party in each election. The symmetric representation assumes each election is a toss-up. Strongest support is found for a temporary symmetric effect on the level of output, but none of the models are supported for temporary electoral changes in growth or unemployment rates.

1. Introduction

According to Alesina's (1987) Rational Partisan Theory model, elections trigger short-run macroeconomic changes as economic agents unable to forecast the election winner will be unsure of which partisan policy will be enacted in the future. To minimize the variance on their forecast error, rational agents choose a weighted average of the two potential inflation rates, where the weight is set by the probability of each party to win the election. In this highly stylized model, the probability is assumed fixed over time for each party. Whichever party does emerge victorious then institutes its preferred inflation rate, which will differ from the predicted weighted average. Alesina assumes the economy can be described by a natural growth rate expectations-augmented Phillips Curve. Thus whenever the leftists win, inflation is higher than expected and the resulting "inflation surprise" generates a temporary economic boom. When agents update their contracts to the new higher inflation rates, the boom is halted. Likewise, a rightwing victory leads to inflation lower than expected and a temporary recession ensues until contracts are updated in the next period.

Alternatively, Alogoskoufis, Lockwood, and Philippopoulos (1992) believe the likelihood for any party to win an election is stochastic, and based on the well-documented incumbency advantage, will be biased toward reelec-

tion. Assuming, then, the probability of *reelection* is non-stochastic, electoral effects will differ depending not only on the party to win, but also if this party was reelected or not. Temporary booms will still follow each leftist victory, but the "inflation surprise" will be larger if the leftists replace a rightist government then if they are reelected. Likewise, the amplitude of economic recessions will be larger for new rightist governments compared to reelected rightists.

Alogoskoufis et al. refer to their model as the incumbency advantage model, and Alesina's earlier representation as the partisan advantage model, implicitly assuming the unspecified fixed probabilities for each party to win an election in Alesina's model are not equal. The primary theoretical difference between these models is limited to how agents form their inflationary expectations under uncertainty.

In this study, the two models are tested on Canadian GDP, growth, and unemployment data from 1965–1996 using a specified autoregressive intervention approach. Neither model generates much support, however a more parsimonious symmetric model which assumes the absence of either an incumbency or partisan advantage reveals a strong temporary electoral effect on the level of GDP, but not for growth or unemployment.

The rest of the paper is structured as follows. The empirical methodology is developed in the next section. In Section 3, the data are described and construction of the electoral variables are detailed. Empirical estimates for the various models, along with consideration of the endogeneity problem inherent in the empirical representation are presented in Section 4. The paper is briefly summarized in the final section.

2. The intervention approach

Since McCallum (1978), the traditional method to test for electoral business cycles has been to rely on reduced-form autoregressive intervention models. The electoral intervention variable seeks to determine if, when controlling for normal historical cyclical patterns, the macroeconomy differs in predictable ways during an election period. Alesina and Roubini (1992) utilize McCallum's basic approach in their tests for political business cycles and extend the methodology for the Rational Partisan Theory model by creating a trinary variable taking the values of +1 for rightwing electoral victories, −1 for leftwing victories, and zero otherwise. The election variable retains its non-negative values for up to eight quarters following an election.

The autoregressive intervention approach creates some conceptual difficulties testing Alesina's (1987) model. Since the intervention variable retains the same value for several quarters, the autoregressive coefficients force the

economic deviations from trend to increase in each quarter it has a non-negative value, since its quarterly electoral impact is added to the remainder of past electoral effects. As detailed by Gartner (1994), such a pattern is not consistent with Alesina's model. Instead, it seems the intervention variable should take on smaller absolute values in each subsequent quarter after an election, so that the electoral effect will decline over time until returning to trend, which is consistent with a gradual updating of contracts of variable length, so that there is more uncertainty early after in election which then declines over time.

The single intervention variable approach also assumes the partisan effects are symmetric across the two parties. This is consistent with the model only if an equal weight is assumed for each party to win an election. If this probability is not actually *50–50*, then whichever party has the higher probability of victory will yield a smaller "surprise" and thus a smaller effect on the economy will be generated. A single symmetric variable will lead to misspecification bias.

Similarly, an equal probability of reelection or loss (no incumbency advantage) in the Alogoskoufis model will also generate a symmetric effect, and in fact, be equivalent to Alesina's model since in either case each election will be a toss-up. Otherwise, the presence of a fixed incumbency advantage predicts symmetric effects across the parties but larger impacts for transition governments compared to continuing governments, after each election.

It should also be noted that Alesina and Roubini (1992) only treat transition governments as surprise outcomes, which as detailed elsewhere (Sheffrin, 1989, Hibbs, 1992) is not consistent with Alesina's original model. In fact, this representation is closer to the Alogoskoufis et al. model if the predicted probability of reelection is close to unity.[1]

Alesina's (1987) original model was based on a Phillips Curve for growth, whereas Alogoskoufis et al. consider a model for unemployment. Gartner (1994) and Drazen (2000) criticize Alesina for his choice, arguing that output level is a more natural choice for the Phillips Curve representation, in which case the temporary effects will be to the level of output, whereas the temporary growth effects Alesina derives actually generate permanent changes in the level of output. Various rational partisan models have been developed in the literature for all three cases. Therefore, all will be considered in the empirical section below.

3. Data construction

The various models will be tested on Canadian elections for 1965–1996. The Canadian economy may be subject to other external shocks. To con-

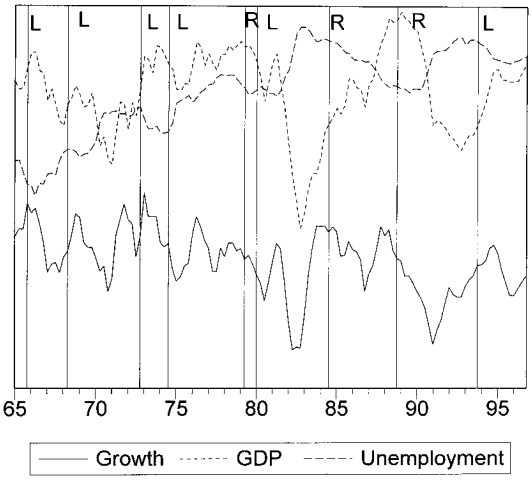

Figure 1. Election timing and winning party

trol for such events, the regressions will include the average unemployment and growth rates in the other G7 nations. Quarterly real GDP and monthly unemployment rates are taken from the OECD Main Economic Indicators database.[2] Both series are seasonally adjusted and the unemployment rates are aggregated to quarterly averages. All computations are compiled using RATS 4.1 software. Real GDP and unemployment are converted to their log values. Real GDP growth (denoted hereafter simply as growth) is calculated as the change in the log of real GDP compared to the same quarter in the previous year.

The data are plotted in Figure 1. To facilitate comparison, GDP is detrended against a constant, time and time squared as done by Toma (1999). Unemployment is detrended against an AR (1) residual to control for potential hysteresis and unit root problems (McCallum, 1993). Interior vertical lines in the graph denote election quarters and L denotes a parliamentary majority going to the Liberals and R denotes the emerging majority party as the Progressive Conservatives. Of the nine elections during this time span, the Liberals have won six times, and each party has lost reelection twice, suggesting rational agents may place a greater probability of victory on the Liberal party. The incumbency advantage therefore also appears stronger for the Liberal party.

The dominant two-party system has been challenged at the provincial level, first by the New Democratic Party in Ontario and Manitoba and later by the separatist Quebec Bloc, but remained virtually unchallenged at the federal level until the 1993 election when the ruling Conservatives only mustered

two seats in the House of Commons. (The Liberals held an absolute majority of seats.) Only following the March 1979 election did one of the two major parties fail to achieve an absolute majority of seats in the House of Commons. The Conservatives' plurality of House seats was not enough to ensure smooth government operation and ultimately led to the dissolution of the House in December 1979 and a new election in February 1980 where the Liberals retook the House as the majority winner. Thus during the sample time period, except for a brief four quarter period, Canadian government policy strongly followed the two-party model outlined in the rational partisan models.

To test the models, the electoral intervention variables are constructed as follows. For the partisan advantage model, LEFTWIN has values of 8, 7, 6, ..., 0, 0, 0, ... in each quarter beginning with a left victory in any election (reelection or not), whereas LEFTLOSS has values of –8, –7, –6, ..., 0, 0, 0, ... in each quarter beginning with a right victory in any election (reelection or not). The values decline in absolute value in each subsequent quarter to denote the reduction in uncertainty as contracts are updated over time until all contracts properly reflect the current administration's preferred partisan inflation rate.[3] In the incumbency advantage model, INCUMWIN has values of +(–)8, +(–)7, ..., 0, 0, ... when the left (right) is reelected, and INCUMLOSS has values of +(–)8, +(–)7, ..., 0, 0, ... when the right (left) loses a potential reelection. If incumbency losses are more unexpected than incumbency wins, the estimated marginal impact of INCUMLOSS should be greater than for INCUMWIN. No prediction on the relative marginal impacts for LEFTWIN and LEFTLOSS are directly predicted by Alesina's model since either party may a priori have the partisan advantage, although elections in Canada seem to favor the Liberals, in which case if this is expected, then the estimated coefficient for LEFTWIN should be smaller than for LEFTLOSS.

Finally, the SYMMETRY variable assumes the absence of either a partisan or incumbency advantage, in which case the marginal impacts for each variable should be identical. This variable is thus computed, equivalently, as LEFTWIN + LEFTLOSS or INCUMWIN + INCUMLOSS, and have values of +8, +7, +6, ... 0, 0, 0, ... for left wins and –8, –7, –6, ... for right wins. All coefficients for the electoral variables are predicted to be positive for GDP and growth, and negative for unemployment.

The electoral variables, as constructed, imply fixed surprises across either party or incumbency victory, consistent with the structural equations in Alesina (1987) and Alogoskoufis et al. (1992), and the reduced form tests employed by them.[4] Hibbs (1992) and Chappel and Keech (1988) criticize this approach by arguing the size of the surprise should differ in each election, which is how the rational partisan models are often interpreted and tested, especially for the United States using poll data to estimate the degree of

Table 1. Schwarz Bayesian Information Criteria values for different lag lengths

Lag	Log real GDP[a]	Real GDP growth	Log unemployment[b]
1	–9.238	–8.553	**–6.164**
2	**–9.338**	–8.668	–6.132
3	–9.312	–8.651	–6.092
4	–9.314	–8.631	–6.072
5	–9.295	**–8.807**	–6.038
6	–9.277	–8.777	–6.016
7	–9.235	–8.733	–6.001
8	–9.201	–8.734	–5.965

Note. Minimum values in bold. [a]Detrended against constant, time and time-squared. [b]Estimated by Cochrane-Orcutt AR(1) method.

surprise where the evidence typically does not support the model implications (Chappel and Keech, 1988; Carlsen, 1998). Here, the choice of electoral variable construction is selected to maintain consistency with the original fixed probability parameters as originally developed by Alesina and Alogoskoufis et al. to directly test their models against each other.

4. Empirical estimates

As standard throughout the literature, the number of lags for each cyclical variable is determined by the Schwarz Bayesian Information Criteria, which seeks to minimizing an adjusted regression standard error formula by comparing the improvement in fit against a penalty from additional regressors. Values are presented up to a lag length of 8 in Table 1. The values are minimized for GDP for two lags, growth for five lags, and unemployment for one lag.

Notice from Figure 1 that elections are not spaced evenly over time. The literature is not well developed to explain election timing, but it is generally assumed incumbents may consider the state of the economy (Lachler, 1982; Ito and Park, 1988; Heckelman and Berument, 1998) since this is likely to have an effect on determining the election winner, even among a partisan electorate (Balke, 1991). The electoral intervention variable, which denotes election timing and outcome by construction, would then be endogenous to the cyclical variables under consideration (Heckelman, 2001). The regressions will therefore be estimated by instrumental variable routines. Excluded instruments expected to be correlated with election outcomes and timing include Gallup poll data on the support for the Liberal and Conservative parties

Table 2. First stage regressions

	LEFTWIN	LEFTLOSS	INCUMWIN	INCUMLOSS	SYMMETRY
LIBPOLL	0.082	0.010	0.038	0.053	0.091
	(7.36)	(1.12)	(2.98)	(4.84)	(5.55)
PCPPOLL	0.003	–0.063	0.010	–0.070	–0.059
	(0.25)	(5.59)	(0.63)	(4.99)	(2.83)
COUNTER	–0.211	0.095	–0.125	–0.009	–0.116
	(5.67)	(3.20)	(2.88)	(0.24)	(2.10)
$\overline{R}^2$	0.47	0.27	0.14	0.18	0.21
Tx R^2	2.06	3.55	20.10	24.38	27.56
$1/\rho^2$	62.14	36.01	6.37	5.25	4.64

Note. Absolute t-ratios appear in parenthesis. $\overline{R}^2$ is correction of partial R^2 for degrees of freedom of the form $1/[(T-1)/(T-m)]*(1-R^2)$, where m is the number of instruments, as suggested by Shea (1997). $1/\rho^2 = 1/\{[(T-1)/(T-2)]R^2-2/(T-2)\}$ is instrument relevance measure from Nelson and Startz (1990).

(Chappell, 1990), and a counter variable for the number of quarters since the previous election (Balke, 1990).[5] Instrument relevance tests are presented in Table 2 for each electoral variable.

In the first-stage regressions, the counter is statistically significant in each case except for INCUMLOSS, and typically negative which indicates elections tend to be called later, rather than earlier in an electoral term. As might be expected, poll data supporting the Liberals are positively correlated with LEFTWIN and SYMMETRY and poll data supporting the Conservatives are negative correlated with LEFTLOSS and SYMMETRY. They are both strongly correlated with INCUMLOSS (the one case where COUNTER is not) and LIBPOLL is also significantly correlated with INCUMWIN. The instrument relevance measures suggested by Shea (1997) and Nelson and Startz (1990) all suggest the selected instruments are reasonable.

Instrumental variable regressions for the autoregressive interventions are presented in Table 3, but to conserve space and focus attention on the potential electoral effects, only the electoral variables are included. In terms of the level of real output, all the electoral variables generate the predicted positive coefficients. For the partisan incumbency model only LEFTWIN is statistically significant, which implies agents must place close to 100% probability on right party victories. This is inconsistent with Alesina's model and does not make much sense in the context of Canadian elections. The incumbency advantage model also only generates mixed support.

Table 3. Estimated partisan effects

Electoral variable	Dependent variable		
	Log real GDP[a]	Real GDP growth	Log unemployment[b]
LEFTWIN	0.73	–0.12	0.097
	(2.53)	(1.33)	(0.33)
LEFTLOSS	0.25	–0.0083	0.39
	(0.76)	(0.050)	(0.89)
INCUMWIN	1.14	–0.29	0.43
	(1.58)	(0.84)	(0.82)
INCUMLOSS	0.53	–0.038	–0.045
	(1.65)	(0.37)	(0.12)
SYMMETRY	0.63	–0.10	0.17
	(2.22)	(1.37)	(0.67)

Note. Instruments include poll data on Liberal party and Progressive Conservative party popularity, and number of quarters since previous election. Absolute t-ratios appear in parenthesis. Autoregressive components and the average growth and unemployment rates for the other G7 nations not presented. [a]Detrended against constant, time and time-squared. [b]Detrended against AR(1) error component.

The INCUMLOSS variable coefficient is barely significant at the 10% level whereas the significance level for INCUMWIN does not make even this weak cutoff, supporting somewhat the notion that incumbent losses generate larger surprises than incumbency victories, but only if incumbent losses are fully predicted, similar to the Alesina and Roubini (1992) approach noted above. However, the relative coefficient magnitudes are in reverse order of the model predictions suggesting the lack of an incumbency loss effect is simply due to its being estimated with greater imprecision rather than having a truly smaller effect.

If the probability estimates for each party to emerge victorious in any given election are identical (no partisan or incumbency advantage), then the two variable representations for the partisan and incumbency advantage models introduce a nuisance parameter and estimates will be inefficient. The SYMMETRY variable will then be a more parsimonious representation. Replacing the other electoral variables with SYMMETRY generates a positive and strongly significant coefficient, thus lending support to fixed and symmetrical electoral surprises. This implies agents perceive each Canadian election to be a toss-up.

Each of the models perform poorly, however, when the Phillips Curve is derived in terms of growth or unemployment, which is how the rational par-

tisan models are typically tested. None of the electoral variable coefficients are of the predicted sign (positive for growth and negative for unemployment) except for INCUMLOSS under unemployment, but with a minuscule t-statistic of 0.12 this is hardly meaningful.

5. Conclusions

Two alternative rational partisan models are tested. In each, uncertainty over future policy following an upcoming election prevents economic agents from correctly anticipating inflation rates when setting contracts. Agents are expected to form a weighted average of the two potential partisan inflation rates. In the partisan advantage model, the parties are assigned fixed probabilities to emerge victorious in each election, and the party which has the smaller probability will generate a larger "inflation surprise" and consequently affect economic cycles to a greater extent when they win than when the other party wins. In the incumbency advantage model, whichever party currently has the majority in parliament has a greater fixed probability of maintaining its majority than losing it. Incumbency reelections will then generate smaller "inflation surprises" than incumbent party losses.

The models are tested within an autoregressive intervention framework on Canadian data, controlling for potential external shocks, and endogeneity of the electoral variable by an instrumental variable routine. Neither model is strongly supported by the data. This does not necessarily imply the absence of any electoral effects, as it was found that Liberal party victories typically do lead to temporarily higher GDP, but no consistent impact was found to follow from Conservative party victories, which would seem to be more unexpected and thus be predicted by the partisan model to have stronger economic effects. Alternatively, the evidence is also suggestive, at a much lower level of confidence, of partisan changes to output levels following incumbent party losses. The strongest evidence was found in favor of electoral effects when agents are modeled to treat every election as a coin-flip, yielding symmetrical effects across party and incumbency wins and losses. Finally, no systematic impact from elections was found on growth or unemployment.

Notes

1. More recently, Alesina, Roubini, and Cohen (1998) use a similar autoregressive intervention technique to analyze U.S. data allowing for a surprise effect to occur in each election, but in the pooled OECD sample they revert to the earlier Alesina and Roubini (1992) method of assuming reelection is always fully expected.

2. The GDP data series for France and Italy begin in 1970. The unemployment series for France begins in 1978 and the unemployment series for Germany ends in 1994.
3. Contracts are assumed to last up to two years (Alesina, 1987; Alesina and Roubini, 1992).
4. Alesina's testing can be found in Alesina (1988).
5. A quadratic counter variable was also considered but was not as strongly correlated with the electoral variables as the simple linear measure.

References

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

Alesina, A. (1988). Macroeconomics and politics. *NBER macroeconomics annual, 13–52.* Cambridge: MIT Press.

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

Alesina, A., Roubini, N. and Cohen, G. (1998). *Political cycles and the macroeconomy.* Cambridge: MIT Press.

Alogoskoufis, G.; Lockwood, B. and Philippopoulos, A. (1992). Wage inflation, electoral uncertainty and the exchange rate: Theory and UK evidence. *Economic Journal ??*: 1370–1394.

Balke, N. (1990). The rational timing of parliamentary elections. *Public Choice* 65: 201–216.

Balke, N. (1991). Partisanship theory, macroeconomic outcomes, and endogenous elections. *Southern Economic Journal* 57: 920–935.

Carlsen, F. (1998). Rational partisan theory: Empirical evidence for the United States. *Southern Economic Journal* 65: 64–82.

Chappel, H. (1990). Economic performance, voting, and political support: A unified approach. *Review of Economics and Statistics* 72: 313–320.

Chappel, H. and Keech, W. (1988). The unemployment consequences of partisan monetary policies. *Southern Economic Journal* 55: 107–122.

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

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

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

Heckelman, J. and Berument, H. (1998). Political business cycles and endogenous elections. *Southern Economic Journal* 64: 987–1000.

Hibbs, D. (1993). Partisan theory after fifteen years. *European Journal of Political Economy* 8: 361–373.

Ito, T., and Park, J. (1988). Political business cycles in the parliamentary system. *Economics Letters* 27: 233–238.

Lachler, U. (1982). On political business cycles with endogenous election dates. *Journal of Public Economics* 17: 111–117.

McCallum, B. (1978). The political business cycle: An empirical test. *Southern Economic Journal* 44: 504–515.

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

Nelson, C. and Startz, R. (1990). The distribution of the instrumental variable estimator and its t-ratio when the instrument is a poor one. *Journal of Business* 63: S125–140.

Shea, J. (1997). Instrument relevance in multivariate linear models: A simple measure. *Review of Economics and Statistics* 79: 348–352.

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

Toma, M. (1999). A positive model of reserve requirements and interest on reserves: A clearinghouse interpretation of the federal reserve system. *Southern Economic Journal* 66: 101–116.