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ELECTION CYCLES, PARTY IDEOLOGY AND INCUMBENT POPULARITY: THEORY AND EVIDENCE FOR OECD ECONOMIES

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Election cycles, party ideology and incumbent popularity: theory and evidence for OECD economies

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Abstract

The paper presents a rational political business cycle model where voters are imperfectly informed about both incumbent competence and incumbent preferences. The model predicts that election cycles on real variables are observed mainly when the incumbent is right-wing and unpopular. The model is put to test on a data set comprising 56 elections in eight OECD countries. Opinion poll series have been collected for each election campaign to compute estimates of the government's re-election chances. The results are broadly consistent with the theoretical model: there is evidence of abnormal pre-election decreases in unemployment and increases in output when right parties hold office and re-election prospects are poor but otherwise not.

JEL classification: E3.
Keywords: Election cycles; Asymmetric information; Government popularity.

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1. Introduction

The political business cycle (PBC) model pioneered by Nordhaus (1975) features the idea that governments create high growth and falling unemployment before elections in order to be re-elected. After the election, contractive policies are implemented to bring down inflationary pressure and clear the deck for future expansions.

Despite ample evidence that the economy affects the electoral fortunes of the ruling party or parties (Nannestad and Paldam, 1994; Mueller, 2003), the PBC model has not fared well in empirical tests. Most studies fail to find evidence of systematic election cycles in which growth surges and unemployment falls in the year or two before elections.[1]

The policy ineffectiveness argument of Lucas (1973) and Sargent and Wallace (1975) provides one possible explanation for the lack of empirical support for the PBC model. Persson and Tabellini (1990) and Lohmann (1998) have developed rational political business cycle (RPBC) models where only unanticipated inflation has real effects and voters are imperfectly informed about the true supply function (the policymaker's 'competence'). Their models imply that, in equilibrium, some or all types of incumbent conduct expansive policies before elections in order to be perceived as competent. But since agents understand these incentives, pre-election policies have on average no impact on real variables.

As emphasized by Drazen (2000) in his survey of the PBC

[1]Surveys of empirical tests of Nordhaus cycles include Alesina et al. (1997), Drazen (2000) and Franzese (2002).

literature, the notion that movements in economic activity are driven by inflation surprises is controversial. During the last years, several empirical investigations have found evidence of a long-run trade-off between inflation and unemployment.[2] Theoretical models consistent with a non-vertical long-run Phillips curve have recently been developed by Cukierman and Lippi (1999), Akerlof et al. (2000), Holden (2004) and Karanassou et al. (2005).

The model presented here goes some way towards explaining why regular election cycles on unemployment and growth are not observed without imposing policy ineffectiveness as a model assumption. The model predicts regular pre-election expansions only when right parties hold office, and then mainly when the incumbent's re-election chances are poor.

Whereas RPBC models assume that voters have incomplete information about government *competence* but complete information about government *preferences*, a large literature surveyed by Walsh (2003) has examined the implications of uncertainty about the policymaker's preferences for monetary policy. Several papers, including Alesina and Cukierman (1990) and Cukierman and Tommasi (1998), study electoral competition when voters are imperfectly informed about party preferences. However, none of these contributions have studied opportunistic macroeconomic policies of the Nordhaus type.

This paper develops a RPBC model where voters are imperfectly

[2]See, eg., King and Watson (1994), Brainard and Perry (2000) and Fair (2000) for the US, Koustas (1998) for Canada, and Dolado et al. (2000), Lundborg and Sacklén (2001), Karanassou et al. (2003) and Koustas and Serletis (2003) for various EU countries.

informed about ***both*** government competence and government preferences.[3] Incomplete information about preferences may for instance be due to changes in the leadership of the ruling party or variation in the relative influence of the groups which form the government's constituency. In order not to rule out election cycles of the Nordhaus type a priori, I allow both unanticipated and anticipated policy changes to have real effects.

The reason why my model generates distinct predictions for right and left incumbents is that the incumbent benefits at the polls from being perceived as moderate, i.e. with preferences close to those of the median voter. In equilibrium, some left incumbents - with centrist preferences - conduct ***contractive*** policies prior to elections to signal their true preferences. Other left incumbents - with a favourable supply function - conduct ***expansive*** policies to signal their true competence. In contrast, both right incumbents with centrist preferences and right incumbents with a favourable supply function generate pre-election ***expansions***. Right incumbents therefore on average conduct more expansive pre-election policies than left incumbents, and the difference is larger the less popular is the incumbent prior to the election.

The model is put to test on a data set which comprises 56 elections in eight OECD countries. To compute estimates of the government's re-election chances prior to an election, monthly

[3] A companion paper (Carlsen 2006) considers the case with asymmetric information about preferences but symmetric information about competence.

or quarterly opinion poll series have been collected for each election campaign.

The empirical evidence conforms well to the theoretical model. When right parties hold office, there is evidence of abnormal decreases in unemployment and abnormal increases in output during the last quarters prior to an election if the incumbent election win probability is low. The estimated effects are strongest in countries without an independent central bank. There is no evidence of election cycles on unemployment and output when left parties hold office. The main conclusions survive several robustness tests.

Three decades ago, Frey and Schneider (1978a,b) argued that governments have both ideological and opportunistic goals, and that the latter becomes more important the less favourable are the government's re-election prospects. Election cycles will therefore be observed mainly when incumbent popularity is low. Their contribution did not catch on particularly well in the PBC literature, partly because the argument was not based on a formal model with rational agents, and partly because other scholars, including Alt and Chrystal (1981,1983) and Ahmad (1983), questioned the robustness of their empirical results. The model presented here provides microfoundations for the link between opportunistic policies and incumbent popularity suggested by Frey and Schneider, but only for right-wing governments.

The paper is organized as follows. The next section presents the basic model, and section 3 characterizes the equilibrium

outcome. Section 4 presents the data set, section 5 presents the empirical results, and section 6 concludes.

2. The basic model

We consider a two-period economy. In each period t, t = 1,2, the policymaker sets inflation, π_t.[4]

Whereas most RPBC models use a standard Lucas-style supply function, we employ a supply function where real activity depends both on surprise inflation and expected inflation. The employment rate (or output growth), x_t, is given by

$$x_t = x_t^* + \gamma_1(\pi_t - \pi_t^e) + \gamma_2\pi_t^e + \varphi_t, \quad \gamma_1 \geq \gamma_2 > 0, \qquad (1)$$

where φ_t is the policymaker's competence, x_t^* is the natural growth rate at zero inflation and zero competence, and π_t^e is expected inflation. The supply function of most RPBC models is a special case of (1) where $\gamma_2 = 0$. Our supply function can be interpreted as a non-vertical Phillips curve where the short-run slope is $-\gamma_1$ and the long-run slope is $-\gamma_2$. An attractive feature of (1) is that systematic pre-election cycles in real variables are not assumed away a priori.[5] In the following, x_t^* is normalized to zero.

Two parties compete for office, 'right' and 'left'. At the end of period one, the incumbent party faces the opposition party

[4]To save space, we do not model the link between inflation and policy instrument(s).

[5]Ellis and Thoma (1993) employ a modified version of (1) to study how elections affect the policymaker's time inconsistency problem.

in an electoral contest, and the winner becomes policymaker in period two. The electorate consists of a representative (median) voter whose utility function is written as:

$$\sum_{t=1}^{2} \delta^{t-1}[U(x_t,\pi_t,\alpha^M) + \mu_t], \quad 1 \geq \delta > 0,$$
$$U(x_t,\pi_t,\alpha) = \alpha x_t - (\pi_t)^2/2, \tag{2}$$

where $U(x_t,\pi_t,\alpha)$ is one-period payoff associated with economic outcomes, denoted economic welfare, α characterizes an agent's preferences for employment versus inflation, and μ_t is a preference term which captures attributes of the policymaker not related to the economy. The opposition party's preference term is normalized to zero. The preference term of the incumbent party, μ, is assumed to be the same in both periods and given by

$$\mu = p + p'. \tag{3}$$

Incumbent popularity, p, is common knowledge and characterizes the incumbent's re-election chances prior to the game. p' is a random variable which represents electoral uncertainty faced by the incumbent when first period inflation is determined. The density and cumulative distribution functions of p' are denoted f(p') and F(p'), respectively.

RPBC models assume that the incumbent maximizes a weighted average of social welfare (here: economic welfare) and the expected intrinsic benefits of election victory. The weights are assumed to be independent of the election outcome. Recently, Schultz (1995), Lockwood et al. (1996) and

Economides et al. (2003) have argued that the latter assumption is unrealistic; the incumbent party is likely to care most about social welfare when in power. Consistent with their argument, the utility function of party i, i = R,L, is written as

$$\begin{cases} K + U(x_1,\pi_1,\alpha^i) + \delta U(x_2,\pi_2,\alpha^i) & \text{if the party wins} \\ \underline{U} & \text{if the party looses,} \end{cases} \tag{4}$$

where $\alpha^L > \alpha^M > \alpha^R$.[6] $K > 0$ is the intrinsic value of second period power. The intrinsic value of first period power is normalized to zero. In the following, $\underline{U}$ is also normalized to zero.

The competence of the incumbent party, φ, is assumed to be the same in both periods.[7] The competence of the opposition party is normalized to zero. Incumbent competence as well as incumbent preferences (α^i when party i is incumbent) cannot be observed by the voter. The voter cannot infer φ from the supply function before casting his/her vote as x_1 but not π_1 is observed prior to the election.[8] π_1 is observed at the beginning of period two and before π_2^e is formed. To simplify the exposition, the opposition party's competence (zero) as well as preferences (denoted α^{i-}) are assumed to be common

[6]There is evidence that supporters of left parties are relatively more concerned about unemployment whereas supporters of right parties are particularly averse to inflation (Hibbs 1987).

[7]Most RPBC models assume that competence follows a MA(1) process. In our model, my formulation and the standard formulation are equivalent.

[8]Persson and Tabellini (1999) discuss this assumption, which is standard in RPBC models.

knowledge; this assumption is trivial as the opposition party is passive before the election.

The incumbent is one of three types: 'normal' (type 0), 'competent' (type 1) and 'moderate' (type 2). The competence and preference parameters of the three types are:

	Right incumbent		Left incumbent	
Type 0:	$\varphi = 0$	$\alpha^R = \alpha^{R0}$	$\varphi = 0$	$\alpha^L = \alpha^{L0}$
Type 1:	$\varphi = \theta > 0$	$\alpha^R = \alpha^{R1} = \alpha^{R0}$	$\varphi = \theta > 0$	$\alpha^L = \alpha^{L1} = \alpha^{L0}$
Type 2:	$\varphi = 0$	$\alpha^R = \alpha^{R2} > \alpha^{R0}$	$\varphi = 0$	$\alpha^L = \alpha^{L2} < \alpha^{L0}$.

Compared to a normal incumbent, a competent incumbent has a favourable supply function whereas a moderate incumbent has preferences which are closer to those of the median voter.[9] The voter's prior beliefs about the incumbent's type are given by the probability distribution $\underline{\eta}_0$ (= $1-\underline{\eta}_1-\underline{\eta}_2$), $\underline{\eta}_1$ and $\underline{\eta}_2$. The posterior beliefs conditional on x_1 are given by the distribution η_0 (= $1-\eta_1-\eta_2$), η_1 and η_2.

3. Equilibrium outcome

It follows from (1), (2) and (4) that the election winner sets

$$\pi_2 = \begin{cases} \alpha^{ij}\gamma_1 = \pi^{*ij} & \text{if an incumbent of type } j \text{ wins} \\ \alpha^{i-}\gamma_1 = \pi^{*i-} & \text{if the opponent wins,} \end{cases} \qquad (5)$$

$i = R,L$; $j = 0,2$. The election winner's type is either known

[9] For tractability, we do not introduce an incumbent with a favourable supply function and moderate preferences.

before the election (if the opponent wins) or becomes known when π_1 is observed (if the incumbent wins).[10] Second period inflation expectations are therefore correct, implying that

$$x_2 = \begin{cases} \alpha^{i0}\gamma_1\gamma_2 & \text{if an incumbent of type 0 wins} \\ \alpha^{i0}\gamma_1\gamma_2 + \theta & \text{if an incumbent of type 1 wins} \\ \alpha^{i2}\gamma_1\gamma_2 & \text{if an incumbent of type 2 wins} \\ \alpha^{i-}\gamma_1\gamma_2 & \text{if the opponent wins.} \end{cases} \tag{6}$$

From (2), (5) and (6), we can derive the voter's expected second period economic welfare, $EU(x_2,\pi_2,\alpha^M)$.

$$EU(x_2,\pi_2,\alpha^M) = \begin{cases} \alpha^M\{[(1-\eta_2)\alpha^{i0} + \eta_2\alpha^{i2}]\gamma_1\gamma_2 + \eta_1\theta\} - [(1-\eta_2)(\alpha^{i0})^2 \\ + \eta_2(\alpha^{i2})^2](\gamma_1)^2/2 & \text{if the incumbent wins} \\ \alpha^M\alpha^{i-}\gamma_1\gamma_2 - (\alpha^{i-}\gamma_1)^2/2 & \text{if the opponent wins.} \end{cases} \tag{7}$$

The voter chooses the party which maximizes expected second period utility. From (2), (3) and (7), it follows that the incumbent will be re-elected if

$$p' > -p + \alpha^M\{[\alpha^{i-} - (1-\eta_2)\alpha^{i0} - \eta_2\alpha^{i2}]\gamma_1\gamma_2 - \eta_1\theta\} - [(\alpha^{i-})^2 - (1-\eta_2)(\alpha^{i0})^2 - \eta_2(\alpha^{i2})^2](\gamma_1)^2/2,$$

implying that the re-election probability, $P(p,\eta_1,\eta_2)$, is

[10] Strictly speaking, we must assume that the supply functions of type 0 and type 2 differ by an infinitesimal amount. The voter cannot otherwise distinguish between the two types by observing first period inflation.

$$P(p,\eta_1,\eta_2) = 1 - F\{-p + \alpha^M\{[\alpha^{i-} - (1-\eta_2)\alpha^{i0} - \eta_2\alpha^{i2}]\gamma_1\gamma_2 - \eta_1\theta\} - [(\alpha^{i-})^2 - (1-\eta_2)(\alpha^{i0})^2 - \eta_2(\alpha^{i2})^2](\gamma_1)^2/2\}. \quad (8)$$

We see from (8) that the incumbent's election win probability is increasing in popularity, p, as well as in η_1; the voter is more inclined to vote for a competent than a normal incumbent. An increase in η_2 raises the incumbent win probability if

$$(\alpha^{i0} - \alpha^{i2})\ [2\alpha^M\gamma_2 - (\alpha^{i0} + \alpha^{i2})\gamma_1] < 0. \quad (9)$$

This inequality is satisfied when party left is incumbent as $\gamma_1 \geq \gamma_2$ and $\alpha^{L0} > \alpha^{L2} > \alpha^M$. For a right incumbent, (9) is satisfied if $2\alpha^M\gamma_2 > (\alpha^{R0} + \alpha^{R2})\gamma_1$, which holds unless γ_2 is small compared to γ_1.[11] In the following, I will assume that (9) holds for both parties, implying that the voter prefers a moderate to a normal incumbent.

When the re-election chances of competent and moderate incumbents are better than those of normal incumbents and the incumbent's type cannot be observed prior to the election, normal incumbents have incentives to imitate competent and/or moderate incumbents whereas the latter have incentives to signal that they are not normal. Whether a normal incumbent prefers to imitate the other types depends on the expected benefits and costs of deviating from the optimal short-run

[11] If γ_2 is close to zero, the ideology of the policymaker is unimportant for employment, in which case the voter prefers a very conservative policymaker due to the low inflation inconsistency problem. There is, however, evidence that post-election employment and growth depend on the ideology of the election winner: employment and growth are generally higher after a left election victory (Alesina et al., 1997; Carlsen, 1998; Carlsen and Pedersen, 1999).

inflation rate, π^{*i0}. If K is small and/or imitation has only a modest effect on the win probability, a normal incumbent prefers $\pi_1 = \pi^{*i0}$ also when the other types choose their optimal short-run inflation rates. Then election cycles do not take place (unless competent and moderate incumbents imitate each other).

In the following, we consider the more interesting case where a normal incumbent prefers to mimick a competent incumbent choosing π^{*i0} (= π^{*i1}) and/or a moderate incumbent choosing π^{*i2}. Whether this signalling game has a unique sequential equilibrium depends on parameter values and restrictions placed on out-of-equilibrium beliefs. We assume that the intrinsic value of victory, K, is large compared to economic welfare, implying that the impact of a change in the incumbent election win probability on expected economic welfare is small relative to the impact on the expected intrinsic value of power. Ignoring the effect on expected economic welfare will simplify the analysis considerably.

Concerning out-of-equilibrium beliefs, the 'intuitive criterion' is often used to eliminate potential equilibria of signalling games. However, the intuitive criterion has little to say about out-of-equilibrium beliefs in our game. We therefore use the somewhat stronger 'D1 criterion' (Cho and Kreps, 1987). This criterion says that if a type j incumbent wishes to deviate from a potential equilibrium to $x_1 = x'$ whenever a type j- incumbent wishes to deviate to $x_1 = x'$, the voter will conclude that the incumbent is not type j- when x' is observed. In our game, the D1 criterion selects a unique

sequential equilibrium for most parameter values. Proposition 1 characterizes the equilibrium outcome.

Proposition 1. i) Right incumbent. If $K >> U(x_t,\pi_t,\alpha^R)$ and $\theta > \theta'$ or $\theta < \theta''$, where $\theta' = (\alpha^{R2}-\alpha^{R0})(\gamma_1)^2$ and $\theta'' = \theta'[\gamma_2/\gamma_1 - (\alpha^{R2}+\alpha^{R0})/2\alpha^M] < \theta'$, the D1 criterion selects a unique and fully separating equilibrium where

$$\pi_1 = \begin{cases} \pi^{*R0} & \text{if the incumbent is normal} \\ \pi^{R1} > \pi^{*R0} & \text{if the incumbent is competent} \\ \pi^{R2} > \pi^{*R2} & \text{if the incumbent is moderate.} \end{cases}$$

π^{R1} and π^{R2} are both decreasing in popularity, p.

ii) Left incumbent. If $K >> U(x_t,\pi_t,\alpha^L)$, the D1 criterion selects a unique and fully separating equilibrium where

$$\pi_1 = \begin{cases} \pi^{*L0} & \text{if the incumbent is normal} \\ \pi^{L1} > \pi^{*L0} & \text{if the incumbent is competent} \\ \pi^{L2} < \pi^{*L2} & \text{if the incumbent is moderate.} \end{cases}$$

π^{L1} (π^{L2}) is decreasing (increasing) in p.

Proof: See appendix A.

Except for the special case where party right is incumbent and $\theta' \geq \theta \geq \theta''$, the D1 criterion eliminates all but one sequential equilibrium, the fully separating equilibrium where competent and moderate incumbents set first period inflation sufficiently above or below their optimal short-run inflation

rates to prevent imitation from other incumbents.[12] The intuition behind the proposition is the following.

For a given level of employment, the costs of raising first period employment and inflation in terms of foregone economic welfare are ***smaller*** for competent incumbents than for normal incumbents as the former have a more favourable supply function. The costs of raising first period employment and inflation are also ***smaller*** for moderate right incumbents than for normal right incumbents since the former are relatively more concerned about employment than inflation, but ***larger*** for moderate left incumbents than for normal left incumbents as the former care relatively more about inflation. Therefore, in order to achieve separation, competent incumbents and moderate right incumbents set first period inflation ***above*** their respective optimal short-run inflation rates, whereas moderate left incumbents set first period inflation ***below*** the optimal short-run inflation rate.

In period two, all types of incumbent choose the optimal short-run inflation rate. Average inflation is therefore higher in period one than in period two when party right is incumbent. The relation between average first and second period inflation is ambiguous when party left is incumbent; average inflation is roughly equal in the two periods if $\pi^{L1}-\pi^{*L0} \cong \pi^{*L2}-\pi^{L2}$ and $\underline{\eta}_1 \cong \underline{\eta}_2$.

A decrease in incumbent popularity, p, makes incumbents more

[12]When party right is incumbent and $\theta' \geq \theta \geq \theta''$, several pooling equilibria are accepted by the D1 criterion. Some of these imply election cycles on real variables whereas others do not.

inclined to mimick types with a higher win probability. The reason is that the expected cost of deviating from the optimal short-run inflation rate is increasing in the win probability and therefore in popularity. Competent and moderate incumbents respond to a decrease in popularity by moving first period inflation further away from the respective optimal short-run inflation rates. Average first period inflation is therefore a decreasing function of popularity when party right is incumbent. The impact of popularity on average first period inflation is ambiguous when party left is incumbent.

It follows from the supply function (1) that average inflation determines average employment when expectations are rational. The model thus predicts that election cycles on real variables will be observed when party right is incumbent but not necessarily when party left is incumbent. Election cycles under right incumbents will be more pronounced the less popular is the incumbent party at the beginning of the election campaign.

4. Data description and computation of win probabilities

We now put the model to test. In multi-party countries, most elections leave open several coalition possibilities, and there is often no unambiguous link between the election result and government formation; a party may join the ruling coalition or continue in office after a bad election result, or leave government or remain in opposition after a good result. I therefore confine the empirical analysis to eight countries where national politics is or has been dominated by

two parties or party blocs clearly delineated by the left/right borderline: United States, Canada, United Kingdom, Germany, Australia, New Zealand, Sweden and Norway. In these countries, government has with few exceptions been formed by the largest party or, in the two-bloc systems, by one or more parties from the largest bloc.

Some of these countries have variable electoral terms. Endogenous timing suggests the possibility of reverse causality as a government may choose to call an election when economic forecasts are favourable. Another possible consequence of endogenous timing is that early elections are preceded by economic downturns since a recession may create or exacerbate conflicts within the ruling party or coalition that force the government to go to the polls before the maximum interval between elections has elapsed. To avoid problems of interpretation, elections called earlier than six months before the mandatory election date are excluded from the data set.[13]

The government's re-election chances prior to the election cannot be observed and must be estimated. For this purpose, monthly or quarterly opinion poll series have been collected. The sample comprises 56 elections for which polls are available during at least seven quarters before the election quarter. Right parties or party blocs were incumbent in 29 of these elections. Appendix B lists the elections included, the right and left parties/blocs and the sources of opinion polls.

[13]Keesing's record of world events gives information about the day of announcement.

Since government is usually formed by the party or party bloc receiving the highest number of votes, the probability of obtaining more than 50% of the two-party/two-bloc vote share is a good approximation to the probability that the incumbent party/bloc continues in office. To check that the empirical results are robust with respect to the choice of estimation procedure, two alternative quarterly probability series are computed. The first series, P^A_t, is based on the election option model developed by Cohen (1993).[14] The second series, P^B_t, is derived from vote prediction equations using an approach suggested by Chappell and Keech (1988).

The election option model converts vote intention polls to election win probabilities. Let T denote the election quarter and $POLL_t$ the two-party/two-bloc vote share obtained by the government in polls conducted during quarter t. If $POLL_t$ follows a random walk with zero mean and is an unbiased estimate of the election result, the probability that the government obtains a majority of the two-party/two-bloc votes can be approximated as

$$P^A_t = NO[(POLL_t - 0.5)/\sigma_t(T-t)^{1/2}], \qquad (10)$$

where NO(.) is the cumulative standard normal distribution and σ_t is the standard deviation of quarter-to-quarter changes in $POLL_t$. The assumptions underlying the election option model are supported by the data: for every country, the hypothesis that changes in $POLL_t$ are serially uncorrelated, normally

[14]For brevity, subscripts for country are omitted throughout the section.

distributed and have zero mean is accepted. Furthermore, the average difference between the last polls and the election result is small and statistically insignificant. P^A_t is computed from (10) using, for each election campaign, estimates of σ_t based on observations ending seven quarters prior to the election.[15]

The second probability series, P^B_t, is computed from a set of prediction equations explaining the government's election result as a function of polls and macroeconomic variables. To expand the number of observations available for prediction regressions, I also use elections called earlier than six months before the mandatory election date but more than seven quarters after the last election. The following regression is estimated across elections for each country and for each of the seven last quarters before an election, T-κ, κ = 1,7:

$$VOTE_T = \beta_{0\kappa} + \sum_{s=1}^{S} \{\beta_{1\kappa s} POLL_{T-\kappa-s} + \mathbf{MACRO}_{T-\kappa-s}\boldsymbol{\beta}_{2\kappa s}\}, \quad \kappa = 1,7,$$

where $VOTE_T$ is the two-party/two-bloc vote share obtained by the government party/bloc, $\mathbf{MACRO}_{T-\kappa-s}$ is a vector of macroeconomic variables dated κ+s quarters before the election quarter, and S is the maximum number of lags (set equal to three to reduce the set of potential regressors).[16,17]

[15]If the number of observations before the first election campaign or campaigns is small, estimates of σ_t for this election or these elections are computed from observations which include the first 2-3 elections.

[16]Election statistics are from Mackie and Rose (1991) and various issues of the *European Journal of Political Research* and *Electoral Studies*.

[17]For the US, the presidential approval rate is also included as regressor. In Canada, the UK and Australia, there is evidence that left governments consistently perform worse in elections than in polls. Therefore, a partisan

MACRO$_{T-\kappa-s}$ includes the level and yearly change in unemployment, the quarterly or yearly change in real GDP, whichever performs best, and the level and yearly change in inflation.

For each regression, I choose the specification which minimizes the standard error, subject to a set of parameter constraints stating that none of the macroeconomic variables may have implausible effects on the election result.[18] Based on the preferred specifications, quarterly estimates of the standard deviation of the forecasting error, $\sigma^f_{T-\kappa}$, are computed from each regression. The incumbent election win probability is computed as

$$P^B_{T-\kappa} = ST[(E_{T-\kappa}VOTE_T-0.5)/\sigma^f_{T-\kappa}],\ \kappa = 1,7,$$

where ST[.] is the cumulative student-t distribution and $E_{T-\kappa}VOTE_T$ is fitted vote share.

The panel data set correlation between P^A_t and P^B_t is 0.563. The high and positive correlation reflects that $POLL_t$ is a determinant of the election vote in most prediction equations. Plots reveal that both probability series are close to uniformly distributed but with largest density at the tails. The median observations are, respectively, 0.485 (P^A_t) and 0.449 (P^B_t).

5. Results

dummy is included in the vote equations of these countries.

[18]For instance, lags of inflation may not cumulatively raise the election vote of the government. It turns out that the constraints have limited effect on the choice of specification.

We now present panel data regressions for unemployment and output growth. Since unit root tests do not reject that unemployment is nonstationary, the dependent variables are, respectively, quarterly absolute change in seasonally adjusted unemployment (ΔUN_{it}) and quarterly rate of change of seasonally adjusted real GDP (GDP_{it}). Subscripts i and t refer to country and quarter. Appendix B provides details on the variables.

For each dependent variable, the following panel regressions on quarterly observations are estimated:

$$X_{it} = \beta_{0i} + \beta_1 X^{O}_{it} + \sum_{s=1}^{5} (\beta_{2s} X_{it-s} + \beta_{3s} X^{O}_{it-s}) + \beta_4 ELE\boldsymbol{N}_{it} HIGH^{j}_{it-r} + \beta_5 ELE\boldsymbol{N}_{it} LOW^{j}_{it-r} + \zeta_{it},$$

$j = A,B$, where X_{it} refers to the respective dependent variables (ΔUN_{it} and GDP_{it}), X^{O}_{it} is the corresponding OECD variable (GDP^{O}_{it} and ΔUN^{O}_{it}, see Appendix B), β_{0i} is a set of country specific fixed effects and ζ_{it} is a random disturbance. X^{O}_{it} and lags of X^{O}_{it} are included to control for effects of the world economy on the domestic economy. $ELE\boldsymbol{N}_{it}$ is an election dummy variable defined as:

$$ELE\boldsymbol{N}_{it} = \begin{cases} 1 & \text{in the election quarter and the preceding N-1 quarters} \\ 0 & \text{otherwise.} \end{cases}$$

$HIGH^{j}_{it}$ and LOW^{j}_{it} are dummy variables turned on if the government's election win probability exceeds or is below a threshold, $\bar{p}$:

$$1 \quad \text{if } P^{j}_{it} \geq \bar{p}$$

$HIGH^{j}_{it}$ =

0 otherwise

$LOW^{j}_{it} = 1 - HIGH^{j}_{it}$, j = A,B.

The election dummy is interacted with $HIGH^{j}_{it-r}$ and LOW^{j}_{it-r} to examine how the performance of the economy before the election depends on the government's re-election chances. The lag parameter, r, captures lags between movements in the government's re-election chances and economic activity. A dichotomous representation of the win probability is chosen as preliminary analyses suggest that the relation between pre-election movements in economic activity and the win probability is non-linear.

Separate regressions are estimated for right and left governments. The theoretical model predicts that the coefficients of the political variables ($ELE\boldsymbol{N}_{it}HIGH^{j}_{it-r}$ and $ELE\boldsymbol{N}_{it}LOW^{j}_{it-r}$) are small when left parties hold office. When right parties hold office, the coefficients should be negative for change in unemployment and positive for output growth. The model also predicts that election cycles under right incumbents are strongest if re-election chances are poor, i.e. that the coefficient of $ELE\boldsymbol{N}_{it}LOW^{j}_{it-r}$ is larger in absolute value than the coefficient of $ELE\boldsymbol{N}_{it}HIGH^{j}_{it-r}$.

For all reported regressions, I choose the lag structure and the set of country dummy variables that perform best in terms of Akaike's information criterion.

Table 1 presents least-squares estimates for N = 4, r = 4 and

$\bar{p}$ = 0.4. Reported t-statistics are White-corrected for heteroscedasticity; there is no evidence of autocorrelation in the residuals.

- Table 1 about here -

The results are broadly consistent with the theoretical model. There is no evidence of election cycles on unemployment and output when left parties hold office.

When right parties hold office, the coefficients of $ELE4_{it}HIGH^{j}_{it-4}$ and $ELE4_{it}LOW^{j}_{it-4}$ have the expected signs, negative for change in unemployment and positive for output growth. Also as expected, the estimated effects are strongest when the win probability is low: the coefficient of $ELE4_{it}LOW^{j}_{it-4}$ is statistically significant at the 1 percent or 5 percent confidence level in every regression, whereas the coefficient of $ELE4_{it}HIGH^{j}_{it-4}$ is smaller in absolute value and always insignificant. The results imply that the quarterly change in unemployment is about 0.1 percentage points below normal and average quarterly GDP growth about 0.5 percentage points above normal during the year before the election if the win probability is low and right parties hold office. The corresponding cumulative effects are approximately 0.7 percentage points lower unemployment and 2% higher output and the end of the election quarter.

Sensitivity analysis. The main results do not depend on the procedure used to compute the win probability: as is evident from table 1, P^{A}_{t} and P^{B}_{t} produce very similar estimates. To further examine the robustness of the results, I consider

several variations in empirical specification and data sample. To conserve space, only coefficients of political variables are presented, and additional regressions are not reported for left incumbents; the political variables are always insignificant when left parties hold office.

The first robustness check is to estimate the basic equations removing one election at a time. The coefficients and t-statistics of the political variables are hardly affected, implying that none of the main conclusions are driven by individual elections.

- Table 2 about here -

Table 2 presents results for alternative values of N, r and $\bar{p}$. Again, the results appear to be robust. For all combinations of N, r and $\bar{p}$, and for both probability series, the coefficient of $ELE\boldsymbol{N}_{it}LOW^{j}_{it-r}$ has the expected sign and is significant at the 5 percent confidence level (change in unemployment) or the 1 percent confidence level (output growth). The coefficient of $ELE\boldsymbol{N}_{it}HIGH^{j}_{it-r}$ is smaller in absolute value and always insignificant.

- Table 3 about here -

The third robustness check is to instrument the political variables. Since the political variables are generated regressors, standard errors may be biased unless the variables are instrumented (Pagan, 1984). Table 3 presents instrumental variables estimates using as instruments lags of $POLL_{it}$ and lags of orders of $POLL_{it}$ interacted with $ELE\boldsymbol{4}_{it}$. Comparison with

table 1 shows that neither coefficients nor t-statistics are much altered.

- Table 4 about here -

Selection bias is a potential issue as early elections have been omitted. Table 4 presents regression results for two subsamples: countries with fixed electoral terms (US, New Zealand, Sweden, Norway) and countries with variable electoral terms (UK, Canada, Germany, Australia).[19] In both subsamples, there is evidence of election cycles on unemployment and output when the win probability is low. The estimated effects are strongest in countries with fixed electoral terms, suggesting that the main results are not driven by selection bias.

As a final robustness test, I include more than two (up to ten) interaction terms between $ELEN_{it}$ and dummy variables for intervals of P^{j}_{it-r}. The results (not reported) confirm that pre-election movements in unemployment and output are observed mainly when the win probability is low (below 0.3-0.5).

Central bank independence. We conclude the section by comparing results for countries with different degrees of central bank independence (CBI). If election cycles on unemployment and output are generated by monetary policies rather than by fiscal policies, we would expect the results to be weak in countries with a relatively independent central

[19] For practical purposes, New Zealand can be considered to have fixed electoral terms as the cabinet's discretion to determine the election date is very limited.

bank. According to the CBI index developed by Cukierman (1992), the countries in my data set with the most independent central banks are the US, Canada, Germany and Australia.[20] Table 5 presents estimates for two subsamples: the high CPI sample consists of these four countries and New Zealand since 1990; the low CPI sample consists of the other countries and New Zealand before 1990.

- Table 5 about here -

Consistent with expectations, there is stronger evidence of pre-election movements in unemployment and output in low CPI countries than in high CPI countries. This suggests that election cycles on real variables are at least partly generated by monetary policies, and that the scope for opportunistic manipulation of the economy is reduced by the presence of an independent central bank.

6. Conclusion

Lack of empirical evidence of election cycles on real variables has been interpreted as supportive evidence of RPBC models where movements in economic activity are driven by inflation surprises. This paper has shown that the evidence on unemployment and output is consistent with a RPBC model where anticipated policy changes have real effects and voters are imperfectly informed about both government competence and government preferences.

[20] The elections in my data set precede the formation of the EMU.

The model presented here suggests two reasons why regular election cycles of the Nordhaus type are not observed. First, some left incumbents conduct contractive rather than expansive policies before elections in order to develop a reputation for being 'tough on inflation'. Second, election cycles involve costs. When re-election prospects are favourable, these costs are high relative to the electoral gains. The empirical evidence is consistent with these explanations. The evidence also suggests a third explanation: the scope for opportunistic manipulation of the economy is reduced by the presence of an independent central bank.

Appendix A

The incumbent election win probabilities in a fully separating equilibrium are, respectively, P(p,0,0) (type 0), P(p,1,0) (type 1) and P(p,0,1) (type 2). Throughout the proof, P(p,1,0)-P(p,0,0), P(p,0,1)-P(p,0,0), P(p,0,1)-P(p,1,0) and P(p,1,0)-P(p,0,1) are denoted, respectively, $\Delta P(p,1,0)$, $\Delta P(p,2,0)$, $\Delta P(p,2,1)$ and $\Delta P(p,1,2)$.

i) Right incumbent. Let $P(x_1)$ denote the win probability when the incumbent chooses x_1, $dP(x_1)$ the marginal win probability with respect to x_1, and $dU^j(x_1)$ and $ME^j(x_1)$ the marginal expected utility and the marginal first period economic welfare of type j with respect to x_1. It follows from (4) that $dU^j(x_1)$ can be written as

$$dU^j(x_1) = P(x_1)\, ME^j(x_1) + dP(x_1)\, [K + U(x_1,\pi_1,\alpha^{Rj}) + \delta U(j)],$$

where U(j) is second period economic welfare if the incumbent wins the election. Since, by assumption, economic welfare is small relative to K, $dU^j(x_1)$ can be approximated as

$$dU^j(x_1) = P(x_1)\, ME^j(x_1) + dP(x_1)\, K.$$

It follows that $dU^j(x_1) > dU^{j-}(x_1)$ iff $ME^j(x_1) > ME^{j-}(x_1)$. From (1), ME^j can be written as

$$ME^0 = \alpha^{R0} - \pi_1/\gamma_1$$

$$ME^1 = \alpha^{R0} - (\pi_1-\theta/\gamma_1)/\gamma_1$$

$$ME^2 = \alpha^{R2} - \pi_1/\gamma_1,$$

where π_1 is the inflation rate of type 0 and type 2 (the inflation rate of type 1 is $\pi_1-\theta/\gamma_1$). Hence, we have that $ME^1 > ME^0$ and $ME^2 > ME^0$. $ME^1 > ME^2$ if $\theta > (\alpha^{R2}-\alpha^{R0})(\gamma_1)^2 = \theta'$.

Consider next the relation between the win probabilities of

type 1 and type 2. (8) implies that $P(p,1,0) > P(p,0,1)$ if

$$\theta > (\alpha^{R2}-\alpha^{R0})\gamma_1[\gamma_2 - \gamma_1(\alpha^{R2}+\alpha^{R0})/2\alpha^{M}]$$
$$= \theta'[\gamma_2/\gamma_1 - (\alpha^{R2}+\alpha^{R0})/2\alpha^{M}] = \theta'' < \theta'.$$

There are three possible cases: $\theta > \theta'$, $\theta' \geq \theta \geq \theta''$, and $\theta < \theta''$. We consider these in turn.

a) $\theta > \theta'$. In this case the ranking of win probabilities is identical to the ranking of ME^j and therefore of dU^j as $P(p,1,0) > P(p,0,1) > P(p,0.0)$ and $ME^1 > ME^2 > ME^0$. Then the Spence-Mirrlees sorting condition is satisfied, and the D1 criterion selects a unique equilibrium, the generalized Riley equilibrium (see Cho and Kreps, 1987). In this equilibrium, type 0 chooses its optimal short-run inflation rate, π^{*R0}, type 2 chooses the inflation rate, π^{R2}, which makes type 0 indifferent between its employment rate, x^{*R0}, and the employment rate of type 2, x^{R2}. Type 1 chooses the inflation rate, π^{R1}, which makes type 2 indifferent between x^{R2} and the employment rate of type 1, x^{R1}.

Since $ME^2 > ME^0$, separation of type 0 and type 2 requires $\pi^{R2} > \pi^{*R0}$. By assumption, type 0 prefers π^{*R2} to π^{*R0} when type 2 sets $\pi_1 = \pi^{*R2}$. Therefore, we must have $\pi^{R2} > \pi^{*R2}$. A parallel argument shows that $\pi^{R1} > \pi^{*R0}$ $(= \pi^{*R1})$.

We now examine the relation between π^{Rj}, $j = 1,2$, and incumbent popularity, p. The allocations of type 2 and type 1 are given by the incentive compatibility conditions of type 0 and type 2, written as equalities.

Type 0: $$P(p,0,0)\ [K + U(x^{*R0},\pi^{*R0},\alpha^{R0}) + \delta U(0)] =$$
$$P(p,0,1)\ [K + U(x^{R2},\pi^{R2},\alpha^{R0}) + \delta U(0)] \qquad (A.1')$$

Type 2: $$P(p,0,1)\ [K + U(x^{R2},\pi^{R2},\alpha^{R2}) + \delta U(2)] =$$
$$P(p,1,0)\ [K + U(x^{R1},\pi^{R1}+\theta/\gamma_1,\alpha^{R2}) + \delta U(2)]. \qquad (A.2')$$

(A.1') states that type 0 is indifferent between choosing $\pi_1 = \pi^{*R0}$ and being perceived as type 0, or choosing $\pi_1 = \pi^{R2}$ and being perceived as type 2. (A.2') states that type 2 is indifferent between choosing $\pi_1 = \pi^{R2}$ and being perceived as type 2, or choosing $\pi_1 = \pi^{R1}+\theta/\gamma_1$ and being perceived as type 1. (Type 2 must set $\pi_1 = \pi^{R1}+\theta/\gamma_1 > \pi^{R1}$ in order to achieve $x_1 = x^{R1}$ because the supply function of type 2 is less favourable than that of type 1.

Inserting for economic welfare from (2) and omitting interaction terms between ΔP and U(j) yield (due to the assumption that economic welfare is small relative to the value of intrinsic power, they are dominated by interaction terms between ΔP and K):

$$\text{Type 0:} \quad \Delta P(p,2,0)\ K = P(p,0,1)\ [\alpha^{R0}(x^{*R0}-x^{R2}) - (\pi^{*R0})^2/2 + (\pi^{R2})^2/2] \qquad (A.1)$$

$$\text{Type 2:} \quad \Delta P(p,1,2)\ K = P(p,1,0)\ [\alpha^{R2}(x^{R2}-x^{R1}) - (\pi^{R2})^2/2 + (\pi^{R1}+\theta/\gamma_1)^2/2]. \qquad (A.2)$$

From the supply function we have

$$x^{*R0}-x^{R2} = \gamma_1(\pi^{*R0}-\pi^{R2})$$

$$x^{R2}-x^{R1} = \gamma_1(\pi^{R2}-\pi^{R1}) - \theta.$$

Inserting for $x^{*R0}-x^{R2}$ and $x^{R2}-x^{R1}$ in (A.1)-(A.2) gives

$$(\pi^{R2}-\pi^{*R0})^2/2 = [\Delta P(p,2,0)/P(p,0,1)]\ K \qquad (A.3)$$

$$(\pi^{R1})^2/2 - (\pi^{*R2}-\theta/\gamma_1)\pi^{R1} = [\Delta P(p,1,2)/P(p,1,0)]\ K + (\pi^{R2})^2/2 - \pi^{*R2}\pi^{R2} + \alpha^{R2}\theta - (\theta/\gamma_1)^2/4. \qquad (A.4)$$

As $\pi^{R2} > \pi^{*R2} > \pi^{*R0}$, (A.3) implies that π^{R2} is increasing in $\Delta P(p,2,0)/P(p,0,1)$. $\Delta P(p,2,0)/P(p,0,1)$ can be approximated as

$$Cf(-p+D)/[1-F(-p+D)],$$

where C and D are constants which depend on the model's parameters but not on p, and f(.)/[1-F(.)] is the ***hazard rate***. The hazard rate is monotonically increasing for a wide range of distribution functions, implying that $\Delta P(p,2,0)/P(p,0,1)$ and therefore π^{R2} are decreasing in p. It follows from a parallel argument that $\Delta P(p,1,2)/P(p,1,0)$ is also a decreasing function of p.

(A.4) implies that π^{R1} is increasing in $\Delta P(p,1,2)/P(p,1,0)$ as $\pi^{R1}+\theta/\gamma_1 > \pi^{*R2}$. (If $\pi^{R1}+\theta/\gamma_1 \leq \pi^{*R2} < \pi^{R2}$, then $y^{R1} < y^{R2}$, in which case separation between type 2 and type 1 is not possible when $ME^1 > ME^2$.) π^{R1} is also increasing in π^{R2} because $\pi^{R2} > \pi^{*R2}$. As both $\Delta P(p,1,2)/P(p,1,0)$ and π^{R2} are decreasing in p, it follows that π^{R1} is decreasing in p.

b) $\theta < \theta''$. As for case a), the ranking of win probabilities and the ranking of marginal economic welfare are identical, but now type 2 has the highest win probability and the lowest cost of signalling. The proof for this case is parallel to the proof presented above; the only difference is that the roles of type 1 and type 2 are interchanged.

c) $\theta' \geq \theta \geq \theta''$. In this case, type 1 has the highest win probability, but type 2 has the lowest cost of signalling. Then several sequential equilibria survive the D1 criterion.

ii) Left incumbent. The Spence-Mirrlees condition is not satisfied when party left is incumbent. The proof is therefore longer and more tedious than the proof for right incumbents.

Throughout the proof, x^j and π^j denote the first period employment and inflation rates of type j in a fully separating equilibrium. In order to mimick type 1, the other types must set $\pi_1 = \pi^1 + \theta/\gamma_1$. Type 1 must set $\pi_1 = \pi^0 - \theta/\gamma_1$ to mimick

type 0 and $\pi_1 = \pi^2 - \theta/\gamma_1$ to mimick type 2. x^P is the employment rate chosen by two or more types in an equilibrium where some or complete pooling occurs. π^P is the corresponding inflation rate ($\pi^P-\theta/\gamma_1$ when the incumbent is type 1, and $P(x^P)$ is the corresponding win probability. x', π', $\pi'-\theta/\gamma_1$ and $P(x')$ denote, respectively, the employment rate, the inflation rate of type 0 and type 2, the inflation rate of type 1, and the win probability of an alternative allocation, i.e. an allocation which a potential equilibrium allocation is compared to.

We first consider fully separating equilibria and show that the D1 criterion selects a unique equilibrium. We then show that equilibria with pooling are eliminated by the D1 criterion.

The incentive compatibility conditions of a fully separating equlibrium are

Type 0: $P(p,0,0)\ [K + U(x^0,\pi^0,\alpha^{L0}) + \delta U(0)] \geq$

$P(p,1,0)\ [K + U(x^1,\pi^1+\theta/\gamma_1,\alpha^{L0}) + \delta U(0)]$ (A.5')

$P(p,0,0)\ [K + U(x^0,\pi^0,\alpha^{L0}) + \delta U(0)] \geq$

$P(p,0,1)\ [K + U(x^2,\pi^2,\alpha^{L0}) + \delta U(0)]$ (A.6')

Type 1: $P(p,1,0)\ [K + U(x^1,\pi^1,\alpha^{L0}) + \delta U(1)] \geq$

$P(p,0,0)\ [K + U(x^0,\pi^0-\theta/\gamma_1,\alpha^{L0}) + \delta U(1)]$ (A.7')

$P(p,1,0)\ [K + U(x^1,\pi^1,\alpha^{L0}) + \delta U(1)] \geq$

$P(p,0,1)\ [K + U(x^2,\pi^2-\theta/\gamma_1,\alpha^{L0}) + \delta U(1)]$ (A.8')

Type 2: $P(p,0,1)\ [K + U(x^2,\pi^2,\alpha^{L2}) + \delta U(2)] \geq$

$P(p,0,0)\ [K + U(x^0,\pi^0,\alpha^{L2}) + \delta U(2)]$ (A.9')

$P(p,0,1)\ [K + U(x^2,\pi^2,\alpha^{L2}) + \delta U(2)] \geq$

$P(p,1,0)\ [K + U(x^1,\pi^1+\theta/\gamma_1,\alpha^{L2}) + \delta U(2)],$ (A.10')

(A.5') states that type 0 prefers x^0 to x^1, (A.6') states that type 0 prefers x^0 to x^2, etc. (A.5')-(A.10') are rewritten by inserting for economic welfare from (2) and omitting interaction terms between ΔP and economic welfare.

Type 0: $\Delta P(p,1,0)\ K \leq P(p,1,0)\ [\alpha^{L0}(x^0-x^1)$
$- (\pi^0)^2/2 + (\pi^1+\theta/\gamma_1)^2/2]$ (A.5)

$\Delta P(p,2,0)\ K \leq P(p,0,1)\ [\alpha^{L0}(x^0-x^2)$
$- (\pi^0)^2/2 + (\pi^2)^2/2]$ (A.6)

Type 1: $\Delta P(p,1,0)\ K \geq P(p,1,0)\ [\alpha^{L0}(x^0-x^1)$
$- (\pi^0-\theta/\gamma_1)^2/2 + (\pi^1)^2/2]$ (A.7)

$\Delta P(p,2,1)\ K \leq P(p,0,1)\ [\alpha^{L0}(x^1-x^2)$
$- (\pi^1)^2/2 + (\pi^2-\theta/\gamma_1)^2/2]$ (A.8)

Type 2: $\Delta P(p,2,0)\ K \geq P(p,0,1)\ [\alpha^{L2}(x^0-x^2)$
$- (\pi^0)^2/2 + (\pi^2)^2/2]$ (A.9)

$\Delta P(p,2,1)\ K \geq P(p,0,1)\ [\alpha^{L2}(x^1-x^2)$
$- (\pi^1+\theta/\gamma_1)^2/2 + (\pi^2)^2/2]$. (A.10)

The following argument shows that (A.8) is superfluous. (A.5) and (A.7) imply $\pi^1 \geq \pi^0-\theta/\gamma_1$ and therefore $x^1 \geq x^0$, whereas (A.6) and (A.9) imply $\pi^0 \geq \pi^2$ and $x^0 \geq x^2$. Type 1 prefers x^0 to x^2 if

$\Delta P(p,2,0)\ K \leq P(p,0,1)\ [\alpha^{L0}(x^0-x^2)$
$- (\pi^0-\theta/\gamma_1)^2/2 + (\pi^2-\theta/\gamma_1)^2/2]$. (A.11)

(A.11) is satisfied when (A.6) is satisfied and $\pi^0 \geq \pi^2$. Type 1 thus prefers x^0 to x^2 and, by (A.7), x^1 to x^0, implying that (A.8) is superfluous.

A similar argument shows that (A.10) is superfluous: type 2 prefers x^2 to x^0 and prefers x^0 to x^1 if $x^1 \geq x^0$ and type 0 prefers x^0 to x^1.

In a fully separating equilibrium, the type with the least favourable election prospects, type 0, sets first period inflation equal to the optimal short-run inflation rate. We therefore have $\pi^0 = \pi^{*L0}$. The corresponding employment rate is denoted x^{*L0}.

Inserting for $\pi^0 = \pi^{*L0}$ and $x^0 = x^{*L0}$ in (A.5) and (A.7) gives the set of possible allocations of type 1 in a fully separating equilibrium. Inserting for $\pi^0 = \pi^{*L0}$ and $x^0 = x^{*L0}$ in (A.6) and (A.9) gives the possible allocations of type 2.

Consider first type 2. Let π^{L2} and $\pi^{L2}{}'$ denote the inflation rates for which (A.6) and (A.9) hold with equalities. Since $\pi^{*L2} < \pi^{*L0}$ and, by assumption, type 0 prefers π^{*L2} to π^{*L0}, (A.6) and (A.9) imply that $\pi^2 \in [\pi^{L2}{}', \pi^{L2}]$, where $\pi^{L2}{}' < \pi^{L2} < \pi^{*L2}$.

The D1 criterion selects $\pi^2 = \pi^{L2}$ for the following reason. Let x^{L2} denote the employment rate corresponding to π^{L2}. It follows from the definition of π^{L2} that type 0 is indifferent between choosing $\pi_1 = \pi^{*L0}$ and being perceived as neutral, or choosing $\pi_1 = \pi^{L2}$ and being perceived as moderate. Hence, type 0 prefers an alternative inflation rate, $\pi' \leq \pi^{L2}$, to π^{L2} and therefore to π^{*L0} if

$$\text{Type 0:} \qquad [P(x')-P(p,0,1)]\, K \geq P(x')\, [\alpha^{L0}(x^{L2}-x') - (\pi^{L2})^2/2 + (\pi')^2/2]. \qquad \text{(A.12)}$$

Type 2 prefers π' to π^2 if

$$\text{Type 2:} \qquad [P(x')-P(p,0,1)]\, K \geq P(x')\, [\alpha^{L2}(x^2-x') - (\pi^2)^2/2 + (\pi')^2/2]. \qquad \text{(A.13)}$$

Since $\pi^2 \leq \pi^{L2} < \pi^{*L2}$, π^{L2} gives type 2 at least the same first period economic welfare as π^2: $\alpha^{L2}x^{L2} - (\pi^{L2})^2/2 \geq \alpha^2 x^2 - (\pi^2)^2/2$. (A.13) is therefore satisfied when

Type 2: $[P(x')-P(p,0,1)]\ K \geq P(x')\ [\alpha^{L2}(x^{L2}-x') - (\pi^{L2})^2/2 + (\pi')^2/2]$. (A.14)

Since $x' \leq x^{L2}$, (A.14) is satisfied when (A.12) is satisfied. Therefore, (A.13) is satisfied when (A.12) is satisfied, implying that type 2 will deviate to y' if type 0 deviates to x'. It then follows from the D1 criterion that the voter will not believe the incumbent is type 0 when $x' \leq x^{L2}$ is observed.

A similar argument shows that the voter will not believe the incumbent is type 1 when $x' \leq x^{L2}$ is observed. The voter will thus conclude that the incumbent is type 2. Since the win probability is the same, P(p,0,1), for all allocations which achieve separation (allocations where $x^2 \leq x^{L2}$), type 2 maximizes first period economic welfare by choosing $\pi^2 = \pi^{L2}$.

A parallel argument applies to π^1. Let $\pi^1 = \pi^{L1}$ and $x^1 = x^{L1}$ denote the inflation and employment rates for which (A.5) holds with equality when $\pi^0 = \pi^{*L0}$ and $x^0 = x^{*L0}$. If $x' \geq x^{L1}$ is observed, the voter will believe the incumbent is type 1 because type 1 always prefers x' when type 0 or type 2 prefer x'. Therefore, all allocations which achieve separation give the same win probability, P(p,1,0), implying that type 1 chooses $\pi^1 = \pi^{L1}$.

Before concluding that $(\pi^{L0*},\pi^{L1},\pi^{L2})$ is an equilibrium outcome, we must check whether any of the types have incentives to deviate. We consider only allocations for which $x^{L1} \geq x' \geq x^{L2}$ since, from the preceding argument, we know that none of the types will want to set $x_1 > x^{L1}$ or $x_1 < x^{L2}$. A type j incumbent prefers an alternative allocation if

Type 0: $[P(x')-P(p,0,0)]\ K \geq P(x')\ [\alpha^{L0}(x^{*L0}-x') - (\pi^{*L0})^2/2 + (\pi')^2/2]$ (A.15)

Type 1: $[P(x')-P(p,1,0)]\ K \geq P(x')\ [\alpha^{L0}(x^{L1}-x') - (\pi^{L1})^2/2 + (\pi'-\theta/\gamma_1)^2/2]$ (A.16)

Type 2: $[P(x')-P(p,0,1)]\ K \geq P(x')\ [\alpha^{L2}(x^{L2}-x') - (\pi^{L2})^2/2 + (\pi')^2/2]$. (A.17)

Since type 0 is indifferent between x^{*L0}, x^{L1} and x^{L2}, (A.15) can be written as

Type 0: $[P(x')-P(p,1,0)]\ K \geq P(x')\ [\alpha^{L0}(x^{L1}-x') - (\pi^{L1}+\theta/\gamma_1)^2/2 + (\pi')^2/2]$ (A.18)

or as

Type 0: $[P(x')-P(p,0,1)]\ K \geq P(x')\ [\alpha^{L0}(x^{L2}-x') - (\pi^{L2})^2/2 + (\pi')^2/2]$. (A.19)

Comparison of (A.16) and (A.18) shows that type 0 always prefers to deviate if type 1 prefers to deviate when $x' \leq x^{L1}$ (in which case $\pi' \leq \pi^{L1}+\theta/\gamma_1$). Similarly, comparison of (A.17) and (A.19) shows that type 0 always prefers to deviate if type 2 prefers to deviate and $x' \geq x^{L2}$. Hence, by the D1 criterion, the voter will believe the incumbent is type 0 if x', $x^{L2} \leq x' \leq x^1$, is observed, implying that none of the types will want to break the separating equilibrium.

Finally, we must prove that the D1 criterion eliminates equilibria with pooling. Consider first a potential equilibrium where both type 0 and type 2 set $x = x^P$ and $\pi_1 = \pi^P$. Type j, j = 0,2, prefers an alternative allocation if

Type 0: $[P(x')-P(x^P)]\ K \geq P(x)\ [\alpha^{L0}(x^P-x') - (\pi^P)^2/2 + (\pi')^2/2]$ (A.20)

Type 2: $[P(x')-P(x^P)]\ K \geq P(x^P)\ [\alpha^{L2}(x^P-x') - (\pi^P)^2/2 + (\pi')^2/2]$. (A.21)

Type 1 sets $x_1 = x^P$ and $\pi_1 = \pi^P - \theta/\gamma_1$, or, if possible, chooses an allocation which yields higher utility. In either case, a necessary condition for deviation is

$$\text{Type 1:} \qquad [P(x')-P(x^P)]\,K \geq P(x^P)\,[\alpha^{L0}(x^P-x') - (\pi^P-\theta/\gamma_1)^2/2 + (\pi'-\theta/\gamma_1)^2/2]. \qquad \text{(A.22)}$$

Comparison of (A.20)-(A.22) shows that both (A.20) and (A.22) imply (A.21) when $x' < x^P$ and $\pi' < \pi^P$. Therefore, if the voter observes $x' < x^P$, the voter will believe the incumbent is type 2, implying that $P(x') = P(p,0,1) > P(x^P)$. Thus, by setting x_1 slightly below x^P, type 2 (and type 0) can gain from deviation.

A parallel argument eliminates equilibria where type 0 and type 1 choose the same employment rate: since type 1 has stronger incentives to raise employment than the two other types, the voter will conclude that the incumbent is type 1 if $x' > x^P$ is observed. Therefore, both type 0 and type 1 prefer to deviate by setting x_1 slightly above x^P.

The last possibility is an equilibrium where type 1 and type 2 choose x^P and type 0 does not. It is straightforward to show that this case is not possible. The preceding analysis has established that type 0 and type 1 prefer different employment rates only if $x^P > x^0$, and that type 0 and type 2 prefer different employment rates only if $x^P < x^0$. Clearly both conditions cannot hold simultaneously.

π^{L1} and π^{L2} are given by (A.5) and (A.9), written as equalities, when $\pi^0 = \pi^{*L0}$. Inserting from the supply function and rearranging terms give

$$(\pi^{L1})^2/2 - (\pi^{*L0}-\theta/\gamma_1)\pi^{L1} = [\Delta P(p,1,0)/P(p,1,0)]\,K + E$$

$$(\pi^{L2})^2/2 - \pi^{*L0}\pi^{L2} = [\Delta P(p,2,0)/P(p,0,1)]\,K + G,$$

where E and G are constants which depend on the model's parameters but not on p. Since $\pi^{L1} > \pi^{L0*}-\theta/\gamma_1$, π^{L1} is increasing in $\Delta P(p,1,0)/P(p,1,0)$. π^{L2} is decreasing in $\Delta P(p,2,0)/P(p,0,1)$ as $\pi^{L2} < \pi^{L0*}$. From the proof for right incumbents, we know that $\Delta P(p,1,0)/P(p,1,0)$ and $\Delta P(p,2,0)/P(p,0,1)$ are decreasing functions of p. Therefore, π^{L1} is decreasing in p, whereas π^{L2} is increasing in p.

Appendix B

i) Elections. The analysis is based on the following elections (quarterly output series are not available for New Zealand):

US: 64:4,68:4,72:4,76:4,80:4,84:4,88:4,92:4,96:4
Canada: 62:2,79:2,93:4
UK: 64:4,92:2,97:2
Germany: 72:4,76:4,80:4,87:1,94:4,98:3
Australia: 66:4,69:4,72:4,80:4,87:3,90:1,93:1,96:1,98:4
New Zealand: 72:4,75:4,78:4,81:4,84:3,87:3,90:4,93:4
Sweden: 68:3,70:3,73:3,76:3,79:3,82:3,85:3,88:3,91:3,
94:3,98:3
Norway: 65:3,69:3,73:3,77:3,81:3,85:3,89:3

Elections before the early sixties are not included due to lack of data on OECD unemployment and output growth. Elections in New Zealand after 1993 are excluded due to the introduction of a new electoral system. Norwegian elections after 1989 are excluded because the two-bloc party system disintegrated in the early nineties. The German unification election in 1990 is excluded due to breaks in macroeconomic series.

ii) Polls. $POLL_t$ is computed in two steps. For each month during which polls were conducted, the average two-party/two-bloc vote share of the government party/bloc is computed. $POLL_t$ is then set equal to the government's average monthly vote share. If no polls were conducted during quarter t, $POLL_t$ is computed by interpolation.

For the US, $POLL_t$ is computed from Gallup and Harris presidential trial-heat polls. Prior to the conventions, party member preferences polls are used to select each party's front-runner, and the trial heats between the front-runners are taken to represent voter preferences.

The data sources are (data points computed by interpolation are listed in parentheses):

US: Gallup Organization/Harris (87:3-88:1)
Canada: Gallup Canada
UK: Gallup Organization
Germany: Allensbach
Australia: Roy Morgan (65:1-65:2,65:4,68:1)
New Zealand: NRB/Heylen (71:3,74:1)
Sweden: SIFO (66:4-67:1)
Norway: NSD (63:4,68:1-68:4,77:1-77:2)

iii) Parties/blocs.

US: Left: Democratic party. Right: Republican party
Canada: Left: Liberal party. Right: Progressive Conservative party.
UK: Left: Labour. Right: Conservative party.
Germany: Left: Social Democrats, Free Democrats (-82:4), Green party (83:1-). Right: Christian Democrats, Free Democrats (83:1-).
Australia: Left: Labour. Right: Liberal party, National/County party.
New Zealand: Left: Labour. Right: National party.
Sweden: Left: Social Democrats, Left Communist party/Left party, Green party (81:1-). Right: Conservative party, Liberal party, Centre party, Christian Democratic party (84:1-), New Democratic party (91:2-94:3).
Norway: Left: Labour, Socialist Left party. Right: Conservative party, Liberal party, Christian People's party, Centre party, Progress party (73:2-).

iv) Economic variables. Unemployment, UN_{it}, is: US, Canada, Australia: total unemployment scaled by civilian labour force. UK: registered unemployment scaled by total labour force.

Germany: registered unemployment scaled by civilian labour force. New Zealand: registered unemployment scaled by sum of employment and registered unemployment. Sweden: total unemployment scaled by total labour force. Norway: standardized unemployment rate. The unemployment rate of Sweden is seasonally adjusted by myself, the others by OECD. The OECD variable is weighted average unemployment in the six largest economies (not Germany due to the unification) using as weights each country's share of total nominal GDP. Following Alesina et al. (1997), the country in the left-hand side of the regression is excluded when computing OECD unemployment.

Output growth, GDP_{it}, is seasonally adjusted quarterly rate of change of real GDP. Computation of the OECD variable is analogous to unemployment.

Before 1993, German data refer to West Germany. All economic variables are from OECD Main Economic Indicators.

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References

Ahmad, K., 1983. An empirical study of politico-economic interaction in the United States. Review of Economics and Statistics 65, 170-177.

Akerlof, G., Dickens, W., Perry, G., 2000. Near-rational wage and price setting and the long-run Phillips curve. Brookings Papers on Economic Activity 1:2000, 1-60.

Alesina, A., Roubini, N., Cohen, G., 1997. Political Cycles and the Macroeconomy. MIT Press, Cambridge MA.

Alesina, A., Cukierman, A., 1990. The politics of ambiguity. Quarterly Journal of Economics 105, 829-50.

Alt, J., Chrystal, A., 1981. Politico-economic models of British fiscal policy, in: Hibbs, D., Fassbender, H. (Eds.), Contemporary Political Economy. North-Holland, Amsterdam, pp. 185-208.

Alt, J., Chrystal, A., 1983. Political Economics. Wheatsheaf, Brighton.

Brainard, W., Perry, G., 2000. Making policy in a changing world, in: Tobin, J., Perry, G. (Eds.) Economic Events, Ideas, and Policies: The 1960s and After. Brookings, Washington, pp. 43-82.

Carlsen, F., 1998. Rational partisan theory: empirical evidence for the United States. Southern Economic Journal 65, 64-82.

Carlsen, F., 2006. Political business cycles, preference uncertainty, and the clientele hypothesis. Working paper, Department of Economics, NTNU, Trondheim.

Carlsen, F., Pedersen, E., 1999. Rational partisan theory: evidence for seven OECD countries. Economics and Politics 11, 13-32.

Chappell, H., Keech, W., 1988. The unemployment consequences of partisan monetary policies. Southern Economic Journal 55, 107-122.

Cho, I., Kreps, D., 1987. Signaling games and stable equilibria. Quarterly Journal of Economics 102, 179-221.

Cohen, G., 1993. Pre- and Post-Electoral Macroeconomic Fluctuations. Dissertation, Department of Economics, Harvard University, Cambridge MA.

Cukierman, A., 1992. Central Bank Strategy, Credibility and Independence: Theory and Evidence. MIT Press, Cambridge MA.

Cukierman, A., Lippi, F., 1999. Central bank independence, centralization of wage bargaining, inflation and unemployment: theory and some evidence. European Economic Review 43, 1395-1434.

Cukierman, A., Tommasi, M., 1998. When does it take a Nixon to go to China? American Economic Review 88, 180-197.

Dolado, J., Lopéz-Salido, D., Vega, J., 2000. Unemployment and inflation persistence in Spain: are there Phillips curve trade-offs? Spanish Economic Review 2, 267-291.

Drazen, A., 2000. Political Economy in Macroeconomics. Princeton University Press, Princeton.

Economides, G., Philippopoulos, A., Price, S., 2003. How elections affect fiscal policy and growth: revisiting the mechanism. European Journal of Political Economy 19, 777-792.

Ellis, C., Thoma, M., 1993. Credibility and political business cycles. Journal of Macroeconomics 15, 69-89.

Fair, R., 2000. Testing the NAIRU model for the United States. Review of Economics and Statistics 82, 64-71.

Franzese, R., 2002. Electoral and partisan cycles in economic policies and outcomes. Annual Journal of Political Science 5, 369-421.

Frey, B., Schneider, F., 1978a, An empirical study of politico-economic interaction in the United States. Review of Economics and Statistics 60, 174-183.

Frey, B., Schneider, F., 1978b. A politico-economic model of the United Kingdom. Economic Journal 88, 243-253.

Grilli, V., Masciandaro, D., Tabellini, G., 1991. Institutions and policies. Economic Policy 13, 342-391.

Hibbs, D., 1987. The American Political Economy. Harvard University Press, Cambridge MA.

Holden, S., 2004. The costs of price stability: downward nominal wage rigidity in Europe. Economica 71, 183-208.

Karanassou, M., Sala, H., Snower, D., 2003. The European Phillips curve: does the NAIRU exist? Applied Economics Quarterly 49, 93-121.

Karanassou, M., Sala, H., Snower, D., 2005. A reappraisal of the inflation-unemployment tradeoff. European Journal of Political Economy 21, 1-32.

King, R., Watson, M., 1994. The post-war U.S. Phillips curve: a revisionist econometric history. Carnegie-Rochester Conference Series on Public Policy 41, 157-219.

Koustas, Z., 1998. Canadian evidence on long-run neutrality propositions. Journal of Macroeconomics 20, 397-411.

Koustas, Z., Serletis, A., 2003. Long-run Phillips-type trade-offs in European Union countries. Economic Modelling 20, 679-701.

Lockwood, B., Philippopoulos, A., Snell, A., 1996. Fiscal policy, public debt stabilisation and politics: theory and UK evidence. Economic Journal 106, 894-911.

Lohmann, S., 1998. Rationalizing the political business cycle: a workhorse model. Economics and Politics 10, 1-17.

Lucas, R., 1973. Some international evidence on output-inflation trade-offs. American Economic Review 63, 326-334.

Lundborg, P., Sacklén, H., 2001. Is there a long-run unemployment-inflation trade-off in Sweden? Working paper 173, FIEF, Stockholm.

Mackie, T., Rose, R., 1991. The International Almanac of Electoral History. Congressional Quarterly Inc., Washington D.C.

Mueller, D., 2003. Public Choice III. Cambridge University Press, Cambridge UK.

Nannestad, P., Paldam, M., 1994. The VP-function: a survey of the literature on vote and popularity functions after 25 years. Public Choice 79, 213-45.

Nordhaus, W., 1975. The political business cycle. Review of Economic Studies 42, 169-90.

Pagan, A., 1984. Econometric issues in the analysis of regressions with generated regressors. International Economic Review 25, 221-47.

Persson, T., Tabellini, G., 1990. Macroeconomic Policy, Credibility and Politics. Harwood Academic Publishers, Chur.

Persson, T., Tabellini, G., 1999. Political economics and macroeconomic policy, in: Taylor, J., Woodford, M. (Eds.), Handbook of Macroeconomics, Vol. 1., North-Holland, Amsterdam, pp. 1397-1481.

Sargent, T., Wallace, N., 1975. Rational expectations, the optimal monetary instrument, and the optimal money supply rule. Journal of Political Economy 83, 241-254.

Schultz, K., 1995. The politics of the political business cycle. British Journal of Political Science 25, 79-99.

Walsh, C., 2003. Monetary Theory and Policy (2nd ed.). MIT Press, Cambridge MA.

Table 1
Pooled regression estimates

Change in unemployment

	Right governments		Left governments	
	j=A	j=B	j=A	j=B
ΔUN_{it-1}	0.430	0.429	0.246	0.247
	(7.415)	(7.362)	(3.233)	(3.253)
ΔUN_{it-2}	0.183	0.185	0.175	0.176
	(2.810)	(2.826)	(3.502)	(3.508)
ΔUN_{it-3}	-0.065	-0.060	0.098	0.099
	(1.277)	(1.172)	(1.802)	(1.826)
ΔUN_{it-5}			-0.131	-0.128
			(2.535)	(2.469)
ΔUN^{O}_{it}	0.309	0.320	0.367	0.366
	(3.997)	(4.174)	(5.226)	(5.150)
$GERMANY_i$			0.071	0.068
			(2.368)	(2.249)
$NEW\ ZEALAND_i$			0.117	0.115
			(2.139)	(2.106)
$SWEDEN_i$	0.109	0.101		
	(1.678)	(1.556)		
$ELE4_{it}\ HIGH^{j}_{it-4}$	-0.029	-0.040	-0.023	-0.013
	(0.841)	(1.131)	(0.527)	(0.301)
$ELE4_{it}\ LOW^{j}_{it-4}$	-0.127	-0.110	0.012	-0.007
	(2.931)	(2.563)	(0.214)	(0.139)
Observations	449		469	
AR(1) [$\chi 2(1)$]	0.002	0.215	0.707	0.606
AR(2) [$\chi 2(2)$]	0.857	1.019	0.708	0.607
R^2_{adj}	0.377	0.375	0.253	0.252

Output growth

	Right governments		Left governments	
	j=A	j=B	j=A	j=B
GDP_{it-1}	-0.168	-0.166		
	(2.060)	(2.031)		
GDP^{O}_{it}	0.560	0.559	0.380	0.380
	(5.424)	(5.389)	(5.008)	(5.019)
GDP^{O}_{it-1}	0.174	0.191	0.146	0.148
	(1.758)	(1.882)	(1.881)	(1.908)
UK_i			-0.380	-0.380
			(2.273)	(2.272)
$GERMANY_i$			-0.237	-0.230
			(1.471)	(1.429)
$AUSTRALIA_i$	0.515	0.475	0.180	0.175
	(2.896)	(2.729)	(1.203)	(1.173)
$SWEDEN_i$	-0.423	-0.440		
	(2.051)	(2.113)		
$NORWAY_i$	0.275	0.260		
	(1.323)	(1.228)		
$ELE4_{it}$ $HIGH^{j}_{it-4}$	0.133	0.136	-0.103	-0.142
	(0.652)	(0.713)	(0.777)	(1.091)
$ELE4_{it}$ LOW^{j}_{it-4}	0.493	0.531	-0.296	-0.220
	(3.619)	(3.485)	(1.621)	(1.137)
Observations	390		432	
AR(1) [$\chi2(1)$]	0.126	0.115	0.000	0.002
AR(2) [$\chi2(2)$]	0.157	0.129	0.606	0.470
R^2_{adj}	0.147	0.148	0.094	0.093

Quarterly observations. t-statistics (absolute values, White-corrected for heteroscedasticity) in parentheses. Data points (early elections are omitted, see Appendix B): US (62:1-98:4), Canada (61:3-98:4), UK (63:1-98:4), Germany (71:3-89:4,94:3-98:4), Australia (65:3-98:4), New Zealand (71:1-94:4) (only unemployment), Sweden (67:1-98:4), Norway (64:1-91:4). Constant included in all regressions. A(1) and AR(2): Breusch-Godfrey LM tests of autocorrelation.

Table 2
Robustness tests. Right governments

Change in unemployment

	r = 3		r = 5[a]	
	j=A	j=B	j=A	j=B
$ELE4_{it}$ $HIGH^{j}_{it-r}$	-0.025	-0.004	-0.029	-0.014
	(0.746)	(0.103)	(0.714)	(0.343)
$ELE4_{it}$ LOW^{j}_{it-r}	-0.137	-0.146	-0.098	-0.112
	(3.068)	(3.563)	(2.166)	(2.530)

	$\bar{p}$ = 0.30		$\bar{p}$ = 0.50	
	j=A	j=B	j=A	j=B
$ELE4_{it}$ $HIGH^{j}_{it-4}$	-0.049	-0.046	0.002	-0.022
	(1.539)	(1.372)	(0.048)	(0.628)
$ELE4_{it}$ LOW^{j}_{it-4}	-0.120	-0.125	-0.131	-0.119
	(2.272)	(2.532)	(3.538)	(2.919)

	N = 3		N = 5[a]	
	j=A	j=B	j=A	j=B
$ELEN_{it}$ $HIGH^{j}_{it-4}$	-0.007	-0.031	-0.028	0.001
	(0.169)	(0.751)	(0.889)	(0.039)
$ELEN_{it}$ LOW^{j}_{it-4}	-0.124	-0.091	-0.108	-0.130
	(2.736)	(2.058)	(2.733)	(3.587)

Output growth

	r = 3		r = 5[a]	
	j=A	j=B	j=A	j=B
$ELE4_{it}\ HIGH^{j}_{it-r}$	0.114	0.116	0.213	0.248
	(0.557)	(0.611)	(0.968)	(1.171)
$ELE4_{it}\ LOW^{j}_{it-r}$	0.525	0.569	0.637	0.633
	(4.141)	(3.941)	(4.311)	(4.455)

	$\bar{p}$ = 0.30		$\bar{p}$ = 0.50	
	j=A	j=B	j=A	j=B
$ELE4_{it}\ HIGH^{j}_{it-4}$	0.140	0.095	0.030	0.178
	(0.753)	(0.535)	(0.118)	(0.902)
$ELE4_{it}\ LOW^{j}_{it-4}$	0.575	0.713	0.491	0.444
	(3.979)	(5.021)	(4.162)	(2.961)

	N = 3		N = 5[a]	
	j=A	j=B	j=A	j=B
$ELEN_{it}\ HIGH^{j}_{it-4}$	0.182	0.263	0.109	0.134
	(0.834)	(1.268)	(0.569)	(0.769)
$ELEN_{it}\ LOW^{j}_{it-4}$	0.674	0.614	0.463	0.475
	(4.690)	(3.758)	(3.717)	(3.369)

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[a]Since P^{j}_{it}, j = A,B, is computed for seven quarters before the election quarter, I set N = 3 when r = 5 and r = 3 when N = 5. Other notes: see table 1.

Table 3
Instrumental variables estimates. Right governments

	Change in Unemployment		Output growth	
	j=A	j=B	j=A	j=B
$ELE4_{it}$ $HIGH^{j}_{it-4}$	-0.021	-0.001	0.184	0.078
	(0.552)	(0.021)	(1.149)	(0.418)
$ELE4_{it}$ LOW^{j}_{it-4}	-0.137	-0.150	0.436	0.614
	(2.884)	(2.421)	(3.149)	(4.065)

Instruments: Level, square and cube of $ELE4_{it}$ $POLL_{it-4}$, $ELE4_{it}$ $POLL_{it-5}$ and $ELE4_{it}$ $POLL_{it-6}$. Other notes: see table 1.

Table 4
Results for countries with and without fixed electoral terms.
Right governments

Change in unemployment

	Countries with fixed electoral term		Countries without fixed electoral term	
	j=A	j=B	j=A	j=B
$ELE4_{it}\ HIGH^{j}_{it-4}$	-0.060	-0.058	-0.013	-0.037
	(1.227)	(0.936)	(0.268)	(0.870)
$ELE4_{it}\ LOW^{j}_{it-4}$	-0.140	-0.128	-0.104	-0.096
	(2.029)	(2.185)	(2.111)	(1.502)

Output growth

	Countries with fixed electoral term		Countries without fixed electoral term	
	j=A	j=B	j=A	j=B
$ELE4_{it}\ HIGH^{j}_{it-4}$	0.396	0.325	-0.124	-0.047
	(1.220)	(0.935)	(0.467)	(0.236)
$ELE4_{it}\ LOW^{j}_{it-4}$	0.728	0.760	0.345	0.414
	(3.232)	(3.600)	(2.041)	(1.807)

Countries with fixed electoral terms: US, New Zealand, Sweden, Norway. Countries without fixed electoral terms: UK, Canada, Germany, Australia. Other notes: see table 1.

Table 5. Results for high and low CBI countries.
Right governments

Change in unemployment

	High CBI countries		Low CBI countries	
	j=A	j=B	j=A	j=B
ELE4it HIGHjit-4	-0.046	-0.085	-0.016	0.060
	(1.078)	(1.985)	(0.206)	(0.860)
ELE4it LOWjit-4	-0.125	-0.059	-0.134	-0.186
	(1.951)	(0.884)	(2.395)	(3.299)

Output growth

	High CBI countries		Low CBI countries	
	j=A	j=B	j=A	j=B
$ELE4_{it}$ $HIGH^{j}_{it-4}$	0.302	0.306	-0.462	-0.305
	(1.700)	(1.793)	(0.800)	(0.721)
$ELE4_{it}$ LOW^{j}_{it-4}	0.391	0.378	0.581	0.691
	(1.948)	(1.643)	(2.976)	(3.517)

High CBI countries: US, Canada, Germany, Australia, New Zealand (90:1-94:4). Low CBI countries: UK, New Zealand (71:3-89:4), Sweden, Norway. Other notes: see table 1.