Effect of Economic Conditions on Government Popularity: The Canadian Provincial Case

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1. Introduction

Does the state of the economy influence voters' evaluation about the performance of their government? This question is at the centre of a continuously growing field of research concerning voting behaviour: the economic voting hypothesis. It has been estimated that more than 300 articles and books have been published on this subject (Lewis-Beck and Stegmaier, 2000). Although the United States has been the most studied country until now, economic voting in Canada has also received some attention. The bulk of the work, however, has concentrated on analyzing voting behaviour at a federal level. In fact, with the exception of Quebec, the provincial scene has been overlooked. Consequently, we do not know if Canadian voters hold their provincial government accountable for economic performance. Our objective in this paper is to fill this gap. We will test empirically if economic determinants influence the popularity of Canadian provincial governments.

2. Economic Voting Hypothesis

The economic voting hypothesis is based on the assumption that voters hold their government responsible for the current state of the economy. Consequently, they support the governing party if they are satisfied with the economy, but back opposition parties if economic conditions are deteriorating. Voters' support is usually measured with two sources of information: electoral outcomes and opinion polls. The economic voting hypothesis has been investigated with these two sources, each leading to

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the development of a specific model: the "vote function" for electoral outcomes and the "popularity function" for opinion polls. From a theoretical standpoint, there are no major differences between the two functions: both take into account the same economic determinants and make similar predictions. However, the effect of economic conditions is not necessarily of the same magnitude for both functions. Economic conditions are believed to exert lesser influence on electoral outcomes because politicians can bring non-economic issues to the attention of voters during electoral campaigns (Nannestad and Paldam, 1994).

Several macro-economic indicators have been used to empirically test the economic voting hypothesis. Over the years, two variables have emerged as major economic determinants of electoral and popularity outcomes: the rate of unemployment and inflation. The impact of economic growth, measured, for instance, by gross domestic product, has also been investigated, but findings vary significantly from one study to the next—an indication that, at best, its influence might hold for a specific country or a given period of time. Other macro-economic indicators have shown even greater instability, so generalizations about their real impact are difficult to establish (Lewis-Beck and Paldam, 2000; Lewis-Beck and Stegmaier, 2000; Nannestad and Paldam, 1994; Paldam, 1997). More recently, fiscal policy outcomes were added to the vote and popularity functions. The empirical evidence seems to suggest that taxes and unbalanced budgets influence voters' support toward incumbents (Kone and Winters, 1993; Lowry et al., 1998; Niemi et al., 1995).

The economic voting hypothesis has also been studied in Canada using the vote and popularity functions. Overall, findings seem to indicate that economic conditions influence voters' support toward federal political parties. However, the real pattern of economic voting is unclear, as inconsistencies are often found from one study to the next. For instance, the effect of the rate of unemployment on voters' support is confirmed by some (Cutler, 2002; Happy, 1992; Nadeau and Blais, 1993; Pétry and Harmatz, 1995), but refuted by others (Carmichael, 1990; Happy, 1986, 1989; Johnston, 1999; Monroe and Erickson, 1986). Findings on the effect of inflation are equally mixed. Several explanations have been presented in an attempt to reconcile these contradictory results. For instance, it has been demonstrated that substituting different indicators for the same macro-economic variable can lead to different conclusions (Happy, 1986, 1989, 1992; Nadeau and Blais, 1993). The impact of economic determinants was also found to fluctuate over time and between some provinces (Carmichael, 1990; Godbout and Bélanger, 2002; Guérin and Nadeau, 1998; Johnston, 1999). At the provincial level, in Quebec, a number of studies have investigated the relationship between the economy and political support. Once again, the empirical evidence seems to support the economic voting hypothesis, though some discrep-

Abstract. This study tested if the economic voting hypothesis can explain voters' support for provincial governments. Using pooled time-series data from six provinces, a popularity function was developed and tested. Findings indicate that economic conditions have an effect on provincial government popularity. Voters attribute different responsibilities, however, to different political parties. Left-wing incumbent parties are held to be accountable for unemployment, while centrist and right-wing ruling parties are accountable for public deficits. Results also show that provincial government popularity depreciates over time and is correlated to the federal government's own popularity.

Résumé. Cette étude a pour objectif de vérifier si l'hypothèse du vote économique peut expliquer la popularité des gouvernements provinciaux auprès des électeurs. Ainsi, une fonction de popularité est présentée, puis testée à l'aide de séries chronologiques provenant de six provinces canadiennes. Les résultats empiriques obtenus indiquent que la situation économique exerce une influence sur la popularité des gouvernements provinciaux. Toutefois, les électeurs attribuent différentes responsabilités à différents partis politiques. Ainsi, ils tiennent les partis de gauche responsables de la situation de l'emploi et les partis de centre et de droite responsables des déficits publics. De plus, les résultats démontrent que la popularité des gouvernements provinciaux se déprécie avec le temps et est corrélée à la popularité du gouvernement fédéral.

ancies can be found (Albert, 1980; Crête and Simard, 1984; Guérin and Nadeau, 1995).

Although, at first sight, the explanation presented by the economic voting hypothesis seems straightforward, it has, nonetheless, provoked several questions about the behaviour of voters over the years. For example, the assumption that voters are retrospective, that is, that they use the current or past state of the national economy to evaluate government performance, has been questioned. If the economic theory of rational expectation is correct, voters should be expected to behave in a prospective manner, that is, only taking into account future expected outcomes. The use of aggregate economic measures has also been called into question: Are voters egocentric individuals, more concerned about their personal financial well being, or sociotropic, responding to the state of the national economy (Kinder and Kiewiet, 1979)? Overall, empirical studies reported evidence of both retrospective and prospective behaviour, but found that voters are more sociotropic than egocentric (Fiorina, 1997; Lewis-Beck, 1988; Lewis-Beck and Stegmaier, 2000). Canada seems to be no exception (Alvarez et al., 2000; Archer and Johnson, 1988; Clarke and Kornberg, 1992; Godbout and Bélanger, 2002; Nadeau et al., 2000).

In addition, some have suggested that economic voting is also shaped by how voters perceive the incumbent's responsibility over the economy. Powell and Whitten (1993) proposed the "clarity of responsibility" hypothesis, which states that not all governing parties are held equally accountable for economic performance. For instance, coalition or minority governments can be thought of as having less control over the economy, since they must work with other political parties if they wish to remain in power. Concerns were also raised about the magnitude of voters' reaction to economic conditions. For example, Bloom and Price (1975) pro-

posed the "asymmetry" hypothesis, which alleges that voters punish governments more severely for deteriorating conditions than reward them for improving ones. Stevenson (2002) extended this assumption by suggesting that larger economic variations have more impact than smaller ones. Government ideology may also make a difference (Lowry et al., 1998; Powell and Whitten, 1993). It is commonly believed that left-wing parties pay more attention to the rate of unemployment and redistribution of income, while right-wing parties are more concerned about inflation and fiscal restraint.

So far only economic factors have been presented as potential determinants in the vote and popularity functions. However, it is widely acknowledged that political variables should also be taken into account, in conjunction with economic indicators (Nannestad and Paldam, 1994). Until now, one of the most consistent empirical findings concerns the "cost of ruling" explanation (Nannestad and Paldam, 2002). Support for the incumbent seems to decay over time, usually after a honeymoon period (Powell and Whitten, 1993). In Canada, Pétry and Harmatz (1995) found that the federal government loses, on average, one half of a point in popularity lead per quarter during its term in office, while Nadeau (1990) estimated that it gains at least six percentage points in the two quarters following a general election. The presence of another level of government might also have an impact. Several studies on American states have reported that the president's ideology influenced gubernatorial or legislative electoral outcomes. Voters seem to attribute more responsibilities to the president over regional economic performances than to state legislators (Niemi et al., 1995; Peltzman, 1987, 1992). Furthermore, the commitment of voters to a national party seems to generate a partisan predisposition at the state level (Chubb, 1988; Leyden and Borrelli, 1995; Lowry et al., 1998).

Overall, there is no lack of testable propositions that can be derived from the economic voting hypothesis and applied to the Canadian provincial case. We will take on the task of assessing to what extent they can explain the behaviour of voters on the provincial scene. Because economic voting has been found to have a greater influence on the popularity function than on the vote function, our analysis will focus on the popular support of the incumbent government as expressed by opinion polls.

3. Popularity Function

The general form of the popularity function may be written as:

$$POPLEAD_{it} = \alpha_0 + \sum_{j=1}^{k} \beta_j POL_{it,j} + \sum_{l=k+1}^{m} \beta_l ECO_{it,l} + \upsilon_{it} \qquad (1)$$

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where POPLEAD is the dependent variable, $\Sigma\ \beta_j\ POL_j$ and $\Sigma\ \beta_l\ ECO_l$ are two distinct sets of explanatory variables, the α and β values are the coefficients to be estimated and υ is the residuals term. The data used to estimate the popularity function in this study combined cross-section and time-series annual observations ($i = 1, 2, \ldots n$ units, or provinces, and $t = 1, 2, \ldots T$ periods). The pooled design is used to increase the number of observations, which in turn enhances the quality of statistical estimations. However, the use of a pooled structure can generate residuals that are not independently and identically distributed. Preliminary statistical tests have revealed the presence of heteroscedasticity, serial and contemporaneous correlation of residuals.[1] Consequently, the estimation procedure is ordinary least square (OLS) with unit fixed effects and correction for first-order autocorrelation of residuals (AR1).[2] In addition, standard errors were computed with the panel-corrected standard errors (PCSE) method proposed by Beck and Katz (1995).

3.1. Dependent Variable

POPLEAD is the popularity of the incumbent provincial government. It measures voting intentions of decided voters as a percentage, as reported by polling firms. Respondents were asked the following question: "If a provincial election was held today, which political party would you vote for?" Since the number of major political parties varies from one province to the next, absolute percentages of voting intentions do not seem to provide the most accurate measure: a party obtaining the support of 45 per cent of the electorate does not enjoy the same level of popularity in Ontario (where the Conservative party, the Liberal party and the New Democratic party (NDP) each usually receive more than 20 per cent of the votes in general elections), in Quebec (which traditionally has two major players: the Liberals and the Parti Québécois), or in Alberta (where the political scene has been somewhat dominated by the Conservative party). Therefore, we measured popularity of the incumbent as its popularity *lead* over the main opposition party (the second-highest-ranking party in voting intentions). The appendix provides further information on the conceptualization of this variable (as well as all other explanatory variables used in this study). Nonetheless, some additional comments are in order concerning the sources used to measure voting intentions on the provincial political landscape.

Only since the mid-1990s have polling firms shown a genuine interest for the estimation of voting intentions on the provincial scene on a regular basis (for instance, Léger Marketing in Quebec, Compas in Ontario and, more recently, Corporate Research Associates in the Atlantic provinces).[3] Consequently, the data drawn from provincial surveys covers a very narrow period of time—too short to be used in this study. On the

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other hand, several polls conducted on a national scale have asked specific questions about provincial voting intentions. Those national polls used a sample size large enough to make reliable statistical inferences about voting intentions at the national level, but their accuracy declines sharply when answers are disaggregated by province. For example, a national survey conducted among a sample of 1500 respondents is estimated to be accurate within 2.5 percentage points (19 times out of 20), but the margin of error increases to 4.6 points for a subsample of 450 (which is representative of the number of Quebec and Ontario residents polled in national surveys), 6.9 points for a subsample of 200 (typically used for Alberta and British Columbia) and 9.8 for a subsample of 100 (Manitoba and Saskatchewan). The problem of a small sample size can be overcome, however, because more than one polling firm conducted national surveys on a regular basis in Canada. Therefore, by aggregating answers provided to the same question during the same period of time by different sources, we can effect a meaningful increase in the overall sample size. We were able to collect data from four independent polling organizations to obtain good quality estimations for several provinces over the last two decades. The data were first computed on a quarterly basis, to ensure that enough data were available year-round, and then averaged on an annual basis.[4] Regrettably, sample sizes remained too small for the Maritime provinces (frequently less than 200 per year), so they had to be excluded from our analysis. The observations used in this study cover the following period: 1982–2001 for Quebec and Ontario, 1986–2001 for Manitoba and Saskatchewan, and 1984–2001 for Alberta and British Colombia.[5] In total, 108 annual observations are used.

3.2. Independent Variables

Following previous research, our provincial popularity function includes political and economic variables. The political variables pertain to the depreciation and honeymoon effects, and the presence of the federal government. The depreciation effect, which postulates that government popularity decays constantly over time, is represented by YEARS—a variable that measures the incumbent's number of years in office since the last general election. The honeymoon effect, which assumes that newly elected parties enjoy a burst of popularity at the beginning of their legislative mandate, is capture by CHANGE—a dummy variable that takes the value 1 if a new party has come into power.[6]

Several studies have revealed that electoral outcomes in American states are affected by partisan attitudes at the federal level. However, it is not certain that the presence of the federal government can have an effect on the provincial political scene. The Canadian political party system is

highly decentralized, and provincial and federal parties, identified by the same label, generally work independently from one another (Cross, 2004). In contrast, however, some studies have shown that provincial political features influence voters' support toward the federal government. For instance, the province of origin of party leaders was found to have a significant effect on the popularity of federal parties (Nadeau and Blais, 1993; Pétry and Harmatz, 1995). In addition, the empirical evidence has indicated that provincial Conservative party supporters were more likely to vote for the federal Progressive Conservative party than others (Clarke and Kornberg, 1992). A similar pattern was uncovered for Liberal and Conservative partisans in Quebec (Nevitte, 1984). Consequently, voters' attitudes toward federal and provincial parties might be linked to some degree. These considerations led us to incorporate an additional political variable in our model—the popularity lead of the federal government in each province (FED_POPLEAD)—as measured by opinion polls. It is therefore expected that voters' support toward the federal government is correlated to provincial support. However, the influence of the federal popularity lead might not point in the same direction for all provincial incumbents. For instance, it could be anticipated that an unpopular Conservative federal government might be beneficial to non-Conservative provincial governments, but harmful to Conservatives provincial incumbents. For this reason, an interaction effect is added to the model, based on IDEOL, a dummy variable that takes the value 1 when both provincial and federal parties share a similar ideological label (if both are Liberal or Conservatives) and 0 otherwise.

Economic variables relate to provincial economic performances. Two groups of economic indicators are used. First, three *macro-economic* indicators that have proved to be significant in previous studies are incorporated in the model: the rate of unemployment (UR), inflation (INFLATION) and personal income (INCOME), as a measure of economic growth. Although personal income does not appear to have a meaningful effect on economic voting in general, it was shown to be significant in Canada (Crête and Simard, 1984; Johnston, 1999). Following standard procedures, inflation and economic growth are measured as annual percentage variation and unemployment as absolute level of percentage rate (Powell and Whitten, 1993).[7] Secondly, two variables linked to *fiscal policy outcomes* are added to the provincial popularity function: the annual percentage variation of provincial income tax (TAX), which was reported to have an effect in Canada (Albert, 1980; Happy, 1992), and provincial surplus or deficit in percentage of total provincial public expenditures (budgetary balance or BB). Since our measures of economic indicators are based on current provincial events, it is implicitly assumed that voters are both retrospective and sociotropic.[8]

We estimated the provincial popularity function with the two following equations:

$$POPLEAD_{it} = \alpha_0 + \beta_1 YEARS_{it} + \beta_2 CHANGE_{it} + \beta_3 IDEOL_{it} + \beta_4 FED\_POPLEAD_{it} + \beta_5 IDEOL \times FED\_POPLEAD_{it} + \beta_6 UR_{it} + \beta_7 INFLATION_{it} + \beta_8 INCOME_{it} + \upsilon_{it} \quad (2)$$

$$POPLEAD_{it} = \alpha_0 + \beta_1 YEARS_{it} + \beta_2 CHANGE_{it} + \beta_3 IDEOL_{it} + \beta_4 FED\_POPLEAD_{it} + \beta_5 IDEOL \times FED\_POPLEAD_{it} + \beta_6 UR_{it} + \beta_7 INFLATION_{it} + \beta_8 INCOME_{it} + \beta_9 TAX_{it} + \beta_{10} BB_{it} + \upsilon_{it} \quad (3)$$

Equation (2) is the popularity function when the set of economic variables includes macro-economic indicators only. This equation will serve as our baseline model, so that comparisons can be established with previous studies and among competing explanations. Equation (3) adds fiscal policy outcomes. In both equations, the impact of the federal government popularity lead is introduced with an interaction effect that assumes a different intercept (IDEOL) and a different slope (IDEOL × FED_POPLEAD) between provincial incumbents sharing a similar ideological orientation with the federal government and the others. It is unclear why a provincial ruling party that shares a similar ideological label with the federal government should be more or less popular than other provincial governments per se. However, the potential effect of IDEOL alone on provincial government popularity deserves to be investigated more closely, so we will test if it has an influence on provincial government popularity lead.[9]

The theoretical expected values and/or signs are: for depreciation, $b_1 < 0$; for the honeymoon effect, $b_2 > 0$; for the presence of the federal government, b_3 is undetermined, $b_4 < 0$, and $b_4 + b_5 > 0$; for the macroeconomic indicators, b_6 and $b_7 < 0$ and $b_8 > 0$; and for fiscal policy outcomes, $b_9 < 0$ and $b_{10} > 0$, since a positive sign for BB represents a surplus and a negative sign a deficit (a surplus increase (*decrease*) or a deficit decrease (*increase*) will lead to a popularity lead increase (*decrease*)).

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4. Findings

The estimates for equations (2) and (3) are reported in Table 1. Starting with our baseline model (eq. (2), in Table 1, column 1), we see that the rate of unemployment is the only macro-economic indicator that exhibits an estimated coefficient with the correct sign and reaches statistical significance ($p < 0.10$). An increase of 1 per cent in the rate of unemployment reduces the popularity lead of the provincial incumbent by 1.80 percentage-points. The estimate for inflation has the wrong sign and is statistically insignificant, as its large standard error and p value indicate, thus suggesting that its effect is equal to zero. The division of powers set by the Canadian Constitution might explain this outcome. The federal government has exclusive power to legislate over monetary issues. Consequently, Canadian voters should not expect provincial governments to implement price control policies. Our findings support this view. The estimate for personal income displays the expected sign, but its value and standard error show that it has virtually no impact on provincial government popularity. This finding is perhaps an indication that Canadian voters attribute equal responsibility to federal and provincial governments for personal income fluctuations. Therefore they do not believe that provincial governments should be rewarded or blamed for changing conditions.[10]

TABLE 1
Economic Conditions and Government Popularity

	Macro-economic indicators Equation 2		Macro-economic indicators and fiscal policy outcomes Equation 3	
	(1)	(2)	(3)	(4)
Depreciation (YEARS) (b_1)	−1.91 (*1.07*)^c	−2.04 (*1.08*)^c	−1.67 (*1.07*)	−1.71 (*1.07*)
Honeymoon effect (CHANGE) (b_2)	9.61 (*3.67*)^a	8.83 (*3.65*)^b	11.15 (*3.62*)^a	10.90 (*3.59*)^a
Federal popularity lead:				
IDEOL (b_3)	−5.61 (*4.39*)	—	−4.63 (*4.39*)	—
FED_POPLEAD (b_4)	−0.18 (*0.10*)^c	−0.19 (*0.10*)^c	−0.15 (*0.09*)	−0.16 (*0.09*)^c
IDEOL × FED_POPLEAD (b_5)	0.62 (*0.18*)^a	0.64 (*0.18*)^a	0.60 (*0.16*)^a	0.62 (*0.16*)^a
Unemployment rate (UR) (b_6)	−1.80 (*1.01*)^c	−2.14 (*1.07*)^b	−0.65 (*0.86*)	−0.68 (*0.85*)
Inflation (INFLATION) (b_7)	0.16 (*0.84*)	0.04 (*0.85*)	0.19 (*0.79*)	0.11 (*0.78*)
Personal income (INCOME) (b_8)	0.07 (*0.29*)	−0.01 (*0.30*)	0.39 (*0.33*)	0.37 (*0.33*)
Income tax (TAX) (b_9)	—	—	−0.11 (*0.14*)	−0.11 (*0.14*)
Budgetary balance (BB) (b_{10})	—	—	0.47 (*0.17*)^a	0.55 (*0.15*)^a
Buse R^2	0.5007	0.4516	0.6403	0.6369
Standard error of the regression	13.53	13.54	13.46	13.45
N	108	108	108	108

Entries are unstandardized regression coefficients (standard errors in parentheses). All estimated equations include provincial dummy variables (results available from the author).^{a} $p < .01$;^{b} $p < .05$;^{c} $p < .10$ (two-tailed test).

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Turning to the influence of political factors, we found evidence of both a depreciation and a honeymoon effect. The estimates for YEARS and CHANGE exhibit the expected sign and are statistically significant. Newly elected parties see their popularity rising at the beginning of their term (leading the main opposition party by 9.6 percentage points during their first year in power), but lose support in subsequent years (their popularity lead declines by 1.9 percentage points per year). Our findings also reveal a relationship between federal and provincial governments' popularity lead. As predicted, the sign of the estimated coefficient is negative when both share a similar ideological orientation (-0.18) and positive otherwise ($-0.18 + 0.62 = 0.44$ with a standard error of 0.14 and $p < 0.01$). What is somewhat unexpected is the difference of magnitude between the two estimates: provincial governments identified by the same label as the federal government gain or lose much more (2.5 times more) than other provincial governing parties. This implies, for instance, that an unpopular (*popular*) federal Conservative government harms (*helps*) provincial Conservative governments much more than it helps (*harms*) non-Conservative provincial governments. Our results also show that the estimated coefficient for the dummy intercept IDEOL alone is negative but not statistically significant. Therefore we cannot conclude that sharing a similar ideology with the federal government influences provincial government popularity by itself. Because no theoretical argument seems to support the inclusion of the dummy intercept IDEOL in our model, and since the addition of an irrelevant independent variable might produce inefficient OLS estimators (although the estimators are unbiased), equation (2) was re-estimated with the assumption of a common intercept. Results are presented in Table 1, column 2. We can see that all new estimated coefficients and standard errors are very similar to those reported in Table 1, column 1, thus providing support for our previous conclusions.

Column 3 in Table 1 shows the estimated provincial popularity function when fiscal policy outcomes are added to the model. As far as political variables are concerned, the new estimates do not point to different conclusions. The estimated coefficients for the depreciation and the honeymoon effects, and for the popularity lead of the federal government, have values very similar to the ones previously reported, while the dummy intercept IDEOL remains statistically insignificant. Once again, removing the dummy intercept from the popularity function does not alter our findings (estimates shown in Table 1, column 4 are nearly identical to those reported in column 3).

Looking at macro-economic indicator estimates, a different picture emerges to some extent. Although the estimated coefficient for the rate of unemployment continues to exhibit a negative sign (-0.65 in column 3 and -0.68 in column 4), it is no longer statistically significant by con-

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ventional standards (standard errors are now higher than estimates). Inflation and personal income also do not reach statistical significance. Concerning fiscal policy outcomes, we found the estimate for income tax to have the proper sign but it is not significant, thus showing a lack of influence on provincial government popularity lead. This situation might be linked to the information available to voters: with the exception of one province (Quebec), provincial income taxes are collected by the federal government, thus possibly making it difficult for voters to distinguish exactly the responsibility of each level of government on this issue. Finally, budgetary balance is found to play an important role in the popularity function: its estimate (0.47) has the correct sign and is significant at the 0.01 level. Also, when budgetary balance is accounted for, the overall explanatory power of the model rises from about 0.50 to 0.64,[11] an increase that seems difficult to attribute solely to the presence of two additional variables. Consequently, voters seem to be concerned about unbalanced budgets and hold provincial governments accountable for changing conditions. However, the impact of the rate of unemployment has declined sharply, up to the point that it now seems irrelevant in explaining provincial government popularity.

Overall, our empirical analysis indicates that several economic factors do not have a significant impact on provincial government popularity. Although some theoretical arguments can be provided to justify this absence of a relationship for inflation, personal income and income tax, the empirical evidence is more puzzling for unemployment since, in other studies, it has generally been found to have an effect. Furthermore, it does not seem unreasonable to think that provincial governments have the means to intervene as far as job-related matters are concerned and that voters are aware of this situation. Therefore the issues deserve to be looked at more closely.

As stated above, several supplementary theses have been formulated over the years to improve the explanatory power of the popularity function. The clarity of responsibility hypothesis is one of them. As was pointed out: "minority ruling parties can always claim that their best efforts were blocked by other parties and that responsibility of policy failures must be shared by them" (Powell and Whitten, 1993). Consequently, voters might hold minority governments only marginally responsible for the state of the economy if they believe that incumbents are under pressure to make compromises with opposition parties. If voters act in accordance with this assumption, economic performance should therefore have a smaller effect on the popularity of minority governments when compared to majority governments. To test this hypothesis, an interaction effect is added to the popularity function based on MINORITY, a dummy variable that takes the value 1 if the provincial government does not hold a majority of seats in the provincial legislature. This distinction between

minority and majority governments is expected to yield different intercepts and slopes for the two groups. The following equations were used in the estimations:

For macro-economic indicators only:

$$\begin{aligned} POPLEAD_{it} = {} & \alpha_0 + \beta_1 YEARS_{it} + \beta_2 CHANGE_{it} \\ & + \beta_3 FED\_POPLEAD_{it} \\ & + \beta_4 IDEOL \times FED\_POPLEAD_{it} + \beta_5 MINORITY_{it} \\ & + \beta_6 UR_{it} + \beta_7 MINORITY \times UR_{it} \\ & + \beta_8 INFLATION_{it} + \beta_9 MINORITY \times INFLATION_{it} \\ & + \beta_{10} INCOME_{it} + \upsilon_{it} \end{aligned} \tag{4}$$

For macro-economic indicators and fiscal policy outcomes:

$$\begin{aligned} POPLEAD_{it} = {} & \alpha_0 + \beta_1 YEARS_{it} + \beta_2 CHANGE_{it} \\ & + \beta_3 FED\_POPLEAD_{it} \\ & + \beta_4 IDEOL \times FED\_POPLEAD_{it} + \beta_5 MINORITY_{it} \\ & + \beta_6 UR_{it} + \beta_7 MINORITY \times UR_{it} \\ & + \beta_8 INFLATION_{it} + \beta_9 MINORITY \times INFLATION_{it} \\ & + \beta_{10} INCOME_{it} + \beta_{11} TAX_{it} \\ & + \beta_{12} MINORITY \times TAX_{it} + \beta_{13} BB_{it} \\ & + \beta_{14} MINORITY \times BB_{it} + \upsilon_{it} \end{aligned} \tag{5}$$

The theoretical expected values and/or signs remain the same for depreciation, the honeymoon effect, the presence of the federal government, macro-economic indicators and fiscal policy outcomes. Minority governments are expected to have a smaller popularity lead, since they are usually elected with a small share of the vote. Therefore, the prediction is $b_5 < 0$. As for the variables linked to the clarity of responsibility hypothesis, the expected signs and values are: $b_7 > 0$ and $b_6 + b_7 \leq 0$ for unemployment, $b_9 > 0$ and $b_8 + b_9 \leq 0$ for inflation, $b_{12} > 0$ and $b_{11} + b_{12} \leq 0$ for income taxes, and $b_{14} < 0$ and $b_{13} + b_{14} \geq 0$ for budgetary balance. Personal income is expected to be equally beneficial to all governments (Powell and Whitten, 1993), so no interactive effects were added for this variable.[12]

Results for equations (4) and (5) are reported in Table 2. Columns 1 and 3 show estimates when a different intercept is used for minority and majority governments. However, our findings do not present a clear indication that minority governments are less popular than other ruling par-

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TABLE 2
The "Clarity of Responsibility" Hypothesis

	Macro-economic indicators Equation 4		Macro-economic indicators and fiscal policy outcomes Equation 5	
	(1)	(2)	(3)	(4)
Depreciation (YEARS) (b_1)	−3.15 (*1.04*)[a]	−2.56 (*1.08*)[b]	−2.97 (*1.00*)[a]	−2.95 (*0.99*)[a]
Honeymoon effect (CHANGE) (b_2)	7.84 (*3.61*)[b]	9.84 (*3.65*)[a]	9.97 (*3.43*)[a]	10.03 (*3.39*)[a]
Federal popularity lead:				
FED_POPLEAD (b_3)	−0.18 (*0.09*)[b]	−0.15 (*0.09*)	−0.12 (*0.09*)	−0.12 (*0.08*)
IDEOL × FED_POPLEAD (b_4)	0.64 (*0.17*)[a]	0.60 (*0.18*)[a]	0.58 (*0.15*)[a]	0.58 (*0.14*)[a]
Minority government				
(MINORITY) (b_5)	−101.35 (*31.86*)[a]	—	−10.58 (*46.76*)	—
Unemployment rate:				
UR (b_6)	−2.25 (*1.06*)[b]	−1.95 (*1.06*)[c]	−0.40 (*0.84*)	−0.41 (*0.84*)
MINORITY × UR (b_7)	−1.22 (*6.23*)	−11.00 (*4.60*)[b]	−8.93 (*6.48*)	−9.85 (*4.41*)[b]
Inflation				
INFLATION (b_8)	−0.06 (*0.81*)	−0.06 (*0.83*)	0.16 (*0.73*)	0.17 (*0.73*)
MINORITY × INFLATION (b_9)	26.58 (*7.47*)[a]	18.58 (*7.69*)[b]	15.66 (*8.32*)[c]	14.57 (*7.50*)[c]
Personal income (INCOME) (b_{10})	−0.04 (*0.25*)	−0.01 (*0.28*)	0.39 (*0.26*)	0.39 (*0.26*)
Income tax				
TAX (b_{11})	—	—	−0.24 (*0.13*)[c]	−0.24 (*0.13*)[c]
MINORITY × TAX (b_{12})	—	—	0.87 (*0.36*)[b]	0.90 (*0.32*)[a]
Budgetary balance				
BB (b_{13})	—	—	0.66 (*0.14*)[a]	0.66 (*0.14*)[a]
MINORITY × BB (b_{14})	—	—	−1.38 (*0.52*)[a]	−1.48 (*0.35*)[a]
Buse R^2	0.5182	0.4906	0.7140	0.7131
Standard error of the regression	12.93	13.24	12.41	12.34
N	108	108	108	108

ties during their entire term in office (everything else being equal). On the one hand, although statistically significant, the estimate presented in column 1 is difficult to justify. Its value suggests that the popularity lead of minority governments is inferior by about 100 percentage points (−101.35) to the popularity lead of other incumbents—an unrealistic situation by all means. On the other hand, when fiscal policy outcomes are added to the popularity function, the estimate for the dummy MINORITY does not reach statistical significance. Removing the dummy variable MINORITY from the model leads to estimates displayed in columns 2 and 4 of Table 2. Overall, the empirical evidence does not support the "clarity of responsibility" hypothesis for both equations: estimated coefficients for the rate of unemployment, inflation, income tax and budgetary balance all display signs or values contrary to expectation, while personal income remains statistically insignificant. In contrast, all estimates related to political variables show values similar to those reported in Table 1, thus suggesting that our previous findings are robust (a result that will prove to be consistent in all subsequent regression analyses presented below).

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The asymmetry hypothesis is another explanation that might offer greater insight into the problem. It postulates that voters' support for the incumbent is influenced by the political issues of the day or by party affiliation in times of prosperity, but by economic performance during economic recession (Bloom and Price, 1975). If this hypothesis holds, voters should punish governments for deteriorating conditions, but should not reward them for improving conditions, or at least not as much as they punish them. To test this explanation, the following dummy variables, indicating the presence of improving economic conditions, are added to the popularity function: DECREASE, coded 1 if the rate of unemployment has decreased since the previous year; LOW, coded 1 if the rate of inflation is under 4 per cent (the average rate of inflation for the entire period under investigation); POSITIVE, coded 1 if the annual variation of personal income is positive; NEGATIVE, coded 1 if the annual variation of income tax is negative; and SURPLUS if the budgetary balance is a surplus. The popularity functions to be estimated are now as follows:

For macro-economic indicators only:

$$\begin{aligned} POPLEAD_{it} = {} & \alpha_0 + \beta_1 YEARS_{it} + \beta_2 CHANGE_{it} \\ & + \beta_3 FED\_POPLEAD_{it} \\ & + \beta_4 IDEOL \times FED\_POPLEAD_{it} + \beta_5 UR_{it} \\ & + \beta_6 DECREASE + \beta_7 DECREASE \times UR_{it} \\ & + \beta_8 INFLATION_{it} + \beta_9 LOW \\ & + \beta_{10} LOW \times INFLATION_{it} \\ & + \beta_{11} INCOME_{it} + \beta_{12} POSITIVE \\ & + \beta_{13} POSITIVE \times INCOME_{it} + \upsilon_{it} \end{aligned} \tag{6}$$

For macro-economic indicators and fiscal policy outcomes:

$$\begin{aligned} POPLEAD_{it} = {} & \alpha_0 + \beta_1 YEARS_{it} + \beta_2 CHANGE_{it} \\ & + \beta_3 FED\_POPLEAD_{it} \\ & + \beta_4 IDEOL \times FED\_POPLEAD_{it} + \beta_5 UR_{it} \\ & + \beta_6 DECREASE + \beta_7 DECREASE \times UR_{it} \\ & + \beta_8 INFLATION_{it} + \beta_9 LOW \\ & + \beta_{10} LOW \times INFLATION_{it} + \beta_{11} INCOME_{it} \\ & + \beta_{12} POSITIVE + \beta_{13} POSITIVE \times INCOME_{it} \\ & + \beta_{14} TAX_{it} + \beta_{15} NEGATIVE \\ & + \beta_{16} NEGATIVE \times TAX_{it} + \beta_{17} BB_{it} \\ & + \beta_{18} SURPLUS + \beta_{19} SURPLUS \times BB_{it} + \upsilon_{it} \end{aligned} \tag{7}$$

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It is expected that improving conditions will have little or no effect on government popularity, contrary to deteriorating circumstances. Therefore, the theoretical predicted signs and values are: $b_7 > 0$ and $b_5 + b_7 \leq 0$ for unemployment; $b_{10} > 0$, and $b_8 + b_{10} \leq 0$ for inflation; $b_{13} < 0$, and $b_{11} + b_{13} \geq 0$ for personal income; $b_{16} > 0$ and $b_{14} + b_{16} \leq 0$ for income taxes; and $b_{19} < 0$ and $b_{17} + b_{19} \geq 0$ for budgetary balance. On the other hand, it is unclear why and how the interaction effect should lead to different intercepts when economic conditions are improving or deteriorating, so the predicted signs for b_6, b_9, b_{12}, b_{15} and b_{18} are undetermined. The theoretical expected signs and values for variables introduced previously remain the same.

Estimates for equations (6) and (7) are reported in Table 3, columns 1 and 3 respectively. Although one estimated dummy intercept variable reached statistical significance (LOW), we found no evidence that, jointly, all intercept dummies are significantly distinct.[13] Therefore both equations were re-estimated using a common intercept. Results are shown in Table 3, columns 2 and 4. With the exception of one variable, the asymmetry hypothesis is not supported by our dataset.[14] Estimates show no significant differences between improving and deteriorating economic conditions for the rate of unemployment, personal income and income tax (b_7, b_{13}, b_{16} are not statistically significant), while inflation is positively correlated with popularity lead, which is contrary to expectations. On the other hand, the asymmetry hypothesis seems to be validated for budgetary balance outcomes (eq. (7)). Deficits are found to be damaging for incumbents (the estimate is significantly positive in both columns 3 and 4), but surpluses have no meaningful impact ($0.48 - 0.45 = 0.03$ with a standard error of 0.33 in column 3, and $0.61 - 0.59 = 0.03$ with a standard error of 0.30 in column 4).[15] Consequently, voters seem to react differently in the presence of provincial budget deficits and surpluses.

Lastly, the partisanship hypothesis suggests that economic voting shows up differently for governing parties of different ideological orientation. For instance, voters may expect left-wing governments to deal with the unemployment situation and right-wing governments with inflation. The responsibility of centrist governing parties is less clear: whether voters hold them more responsible than other parties remains an open question. As for fiscal policy outcomes, taxes are expected to increase if a left-wing party is in power and decrease if it is a right-wing party (once again the assumption about centrist governments is unclear). The impact of public deficit is more contentious. It has long been claimed that left-wing parties are less fiscally responsible than right-wing parties because of their propensity to increase spending. However, most of the latest empirical findings do not support this view: left-wing and right-wing governments are equally fiscally disciplined (Franzese, 2002). In fact, some

TABLE 3
The Asymmetry Hypothesis

	Macro-economic indicators Equation 6		Macro-economic indicators and policy outcomes Equation 7	
	(1)	(2)	(3)	(4)
Depreciation (YEARS) (b_1)	−1.88 (*1.09*)[c]	−1.79 (*1.08*)[c]	−1.65 (*1.09*)	−1.44 (*1.07*)
Honeymoon effect (CHANGE) (b_2)	9.25 (*3.85*)[b]	9.07 (*3.83*)[b]	9.68 (*3.90*)[b]	10.22 (*3.79*)[a]
Federal popularity lead:				
FED_POPLEAD (b_3)	−0.20 (*0.10*)[b]	−0.18 (*0.10*)[c]	−0.20 (*0.10*)[b]	−0.17 (*0.10*)[c]
IDEOL × FED_POPLEAD (b_4)	0.58 (*0.18*)[a]	0.57 (*0.18*)[a]	0.58 (*0.17*)[a]	0.54 (*0.17*)[a]
Unemployment rate:				
UR (b_5)	−2.57 (*1.13*)[b]	−2.04 (*0.94*)[b]	−1.54 (*1.08*)	−1.07 (*0.91*)
DECREASE (b_6)	−7.34 (*8.43*)	—	−8.03 (*8.82*)	—
DECREASE × UR (b_7)	1.23 (*0.98*)	0.28 (*0.29*)	1.09 (*1.00*)	0.13 (*0.32*)
Inflation				
INFLATION (b_8)	2.09 (*1.31*)	0.28 (*0.83*)	2.36 (*1.33*)[c]	0.27 (*0.79*)
LOW (b_9)	14.90 (*8.18*)[c]	—	17.25 (*8.26*)[b]	—
LOW × INFLATION (b_{10})	−1.78 (*2.12*)	1.71 (*1.18*)	−2.74 (*2.18*)	1.24 (*1.20*)
Personal income				
INCOME (b_{11})	−1.38 (*1.02*)	−0.76 (*0.88*)	−1.13 (*1.10*)	−0.53 (*0.91*)
POSITIVE (b_{12})	3.24 (*3.11*)	—	3.03 (*3.25*)	—
POSITIVE × INCOME (b_{13})	1.49 (*1.28*)	0.99 (*1.24*)	1.45 (*1.32*)	1.03 (*1.25*)
Income tax				
TAX (b_{14})	—	—	0.24 (*0.28*)	−0.06 (*0.23*)
NEGATIVE (b_{15})	—	—	1.86 (*3.76*)	—
NEGATIVE × TAX (b_{16})	—	—	−0.65 (*0.54*)	−0.20 (*0.54*)
Budget balance				
BB (b_{17})	—	—	0.48 (*0.26*)[c]	0.61 (*0.23*)[a]
SURPLUS (b_{18})	—	—	2.64 (*3.67*)	—
SURPLUS × BB (b_{19})	—	—	−0.45 (*0.40*)	−0.59 (*0.41*)
Buse R^2	0.5318	0.5094	0.6435	0.6207
Standard error of the regression	13.48	13.51	13.60	13.55
N	108	108	108	108

findings indicated that deficits occur mostly when centrist parties are in power (Alesina and Perotti, 1995; Tellier, 2004).

To test if partisanship matters, provincial governing parties were grouped into three distinct categories: the Right, consisting of provincial Conservatives and Social Creditists, the Centre, for provincial Liberals, and the Left, for provincial NDP and the Parti Québécois. Incorporating two new dummy variables, RIGHT, coded 1 if the incumbent belongs to the Right, and CENTRE, taking the value 1 if Liberals are in power (the Left is the reference group), we now can estimate the following popularity functions:

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For macro-economic indicators only:

$$\begin{aligned} POPLEAD_{it} = {} & \alpha_0 + \beta_1 YEARS_{it} + \beta_2 CHANGE_{it} \\ & + \beta_3 FED\_POPLEAD_{it} \\ & + \beta_4 IDEOL \times FED\_POPLEAD_{it} + \beta_5 CENTRE_{it} \\ & + \beta_6 RIGHT_{it} + \beta_7 UR_{it} + \beta_8 CENTRE \times UR_{it} \\ & + \beta_9 RIGHT \times UR_{it} + \beta_{10} INFLATION_{it} \\ & + \beta_{11} CENTRE \times INFLATION_{it} \\ & + \beta_{12} RIGHT \times INFLATION_{it} \\ & + \beta_{13} INCOME_{it} + \upsilon_{it} \end{aligned} \tag{8}$$

For macro-economic indicators and fiscal policy outcomes:

$$\begin{aligned} POPLEAD_{it} = {} & \alpha_0 + \beta_1 YEARS_{it} + \beta_2 CHANGE_{it} \\ & + \beta_3 FED\_POPLEAD_{it} \\ & + \beta_4 IDEOL \times FED\_POPLEAD_{it} + \beta_5 CENTRE_{it} \\ & + \beta_6 RIGHT_{it} + \beta_7 UR_{it} + \beta_8 CENTRE \times UR_{it} \\ & + \beta_9 RIGHT \times UR_{it} + \beta_{10} INFLATION_{it} \\ & + \beta_{11} CENTRE \times INFLATION_{it} \\ & + \beta_{12} RIGHT \times INFLATION_{it} \\ & + \beta_{13} INCOME_{it} + \beta_{14} TAX_{it} + \beta_{15} CENTRE \times TAX_{it} \\ & + \beta_{16} RIGHT \times TAX_{it} + \beta_{17} BB_{it} \\ & + \beta_{18} CENTRE \times BB_{it} + \beta_{19} RIGHT \times BB_{it} \\ & + \beta_{20} SURPLUS \times BB_{it} + \upsilon_{it} \end{aligned} \tag{9}$$

If a partisan effect exists, we should see distinct partial slopes for macro-economic indicators and fiscal policy outcomes for the three groups. Furthermore, it is predicted that the rate of unemployment is determinant for left-wing incumbents but not for right-wing governing parties ($b_7 < 0$, $b_7 + b_9 = 0$, and b_8 undetermined), while inflation and income tax have the opposite effect (b_{10} and $b_{14} = 0$, $b_{10} + b_{12}$, and $b_{14} + b_{16} < 0$, and b_{11} and b_{15} are undetermined). On the other hand, predictions about public deficits for each group are more difficult to establish (but b_{17}, b_{18} and $b_{19} \neq 0$ if a partisan effect exists). Once again, personal income is expected to be equally beneficial to all governments, so no interaction effect is added for this variable.[16] Equations (8) and (9) also assume that ideology leads to different intercepts, although the theoretical expected

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signs are unclear (thus, the predicted signs for b_5 and b_6 are undetermined). Once again, the theoretical predicted signs and values for variables introduced previously remain the same.

Estimates for equations (8) and (9) are reported in Table 4, columns 1 and 3, respectively. For both equations, none of the dummy intercept variables reached statistical significance (CENTRE and RIGHT), indicating that ideology alone does not influence provincial government popularity lead.[17] Therefore, equations (8) and (9) were re-estimated using a common intercept. Estimates are displayed in Table 4, columns 2 and 4. Once again, we found no evidence that inflation, personal income and income tax have a significant effect on the dependent variable. None of the estimates associated with each of these three variables is close to reaching statistical significance by conventional standards. The rate of unemployment and public deficits, on the other hand, exhibit strong partisan effects. Estimates reported in columns 3 and 4 suggest that the rate of unemployment influences the popularity of left-wing governments, while public deficits have an effect on centrist and right-wing incumbents' popularity. Because some differences are visible between estimates displayed in the two columns, the popularity function was re-estimated using only unemployment and budgetary balance as explanatory economic variables.[18] The results are presented in the last column of Table 4. These results confirm previous findings: unemployment matters, but only for left-wing governments. An increase in the unemployment rate by 1 per cent decreases the popularity lead of left-wing governments by 2.59 percentage points. The effect of unemployment is of less magnitude and not statistically significant for centrist ($-2.59 + 3.59 = 1.00$, with a standard error of 2.17) and right-wing parties ($-2.59 + 1.47 = -1.12$, with a standard error of 0.92). As for the budgetary balance, public deficits influence the popularity of centrist ($0.15 + 2.35 = 2.50$, with a standard error of 1.41) and right-wing governments ($0.15 + 0.60 = 0.75$, with a standard error of 0.25), but not that of left-wing parties. In addition, surpluses are found to have no significant effect on popularity, confirming previous findings ($0.15 - 0.59 = 0.44$, with a standard error of 0.41).

Our results indicate that public deficits are more harmful for Liberals than for Conservatives and Social Creditists: an increase in the ratio deficit/total expenditure by one percentage point decreases the popularity lead of Liberals by 2.50 percentage points, compared to 0.75 for right-wing governments. Therefore, as far as public deficits are concerned, voters punish Liberals more severely than right-wing parties. How can this outcome be accounted for? The fact that public deficits were higher under a Liberal incumbency might provide an explanation. As Table 5 indicates, public deficits amounted to 7.6 per cent of total expenditures, on average, when Liberals were in power, compared to 5.8 per cent for

TABLE 4
The Partisanship Hypothesis

	Macro-economic indicators Equation 8		Macro-economic indicators and fiscal policy outcomes Equation 9		Unemployment Rate and budgetary balance
	(1)	(2)	(3)	(4)	(5)
Depreciation (YEARS) (b_1)	−2.04 (*1.08*)[c]	−2.05 (*1.05*)[c]	−2.09 (*1.07*)[c]	−2.14 (*1.05*)[b]	−1.76 (*0.98*)[c]
Honeymoon effect (CHANGE) (b_2)	8.34 (*3.58*)[b]	8.82 (*3.52*)[b]	9.50 (*3.76*)[b]	10.63 (*3.66*)[a]	11.79 (*3.46*)[a]
Federal popularity lead:					
FED_POPLEAD (b_3)	−0.21 (*0.09*)[b]	−0.23 (*0.09*)[b]	−0.21 (*0.10*)[b]	−0.19 (*0.09*)[c]	−0.15 (*0.09*)
IDEOL × FED_POPLEAD (b_4)	0.74 (*0.18*)[a]	0.77 (*0.18*)[a]	0.71 (*0.18*)[a]	0.70 (*0.17*)[a]	0.68 (*0.16*)[a]
Liberal incumbent (CENTRE) (b_5)	−11.94 (*21.81*)	—	6.54 (*22.01*)	—	—
Right-wing incumbent (RIGHT) (b_6)	−12.74 (*15.64*)	—	−19.48 (*16.03*)	—	—
Unemployment rate:					
UR (b_7)	−5.16 (*1.75*)[a]	−4.62 (*1.39*)[a]	−5.38 (*1.99*)[a]	−3.63 (*1.55*)[b]	−2.59 (*1.22*)[b]
CENTRE × UR (b_8)	0.30 (*2.10*)	1.33 (*0.68*)[c]	2.97 (*2.85*)	4.33 (*1.72*)[b]	3.59 (*1.55*)[b]
RIGHT × UR (b_9)	3.39 (*1.74*)[c]	2.29 (*0.82*)[a]	4.49 (*1.90*)[b]	2.23 (*0.88*)[b]	1.47 (*0.49*)[a]
Inflation					
INFLATION (b_{10})	0.27 (*1.19*)	0.66 (*1.18*)	0.40 (*1.19*)	0.64 (*1.17*)	—
CENTRE × INFLATION (b_{11})	−1.19 (*1.85*)	−0.85 (*1.81*)	−2.08 (*1.93*)	−1.99 (*1.88*)	—
RIGHT × INFLATION (b_{12})	−1.03 (*1.85*)	−2.06 (*1.78*)	−0.98 (*1.83*)	−1.70 (*1.76*)	—
Personal income (INCOME) (b_{13})	−0.17 (*0.31*)	−0.18 (*0.32*)	0.03 (*0.34*)	−0.04 (*0.34*)	—
Income tax					
TAX (b_{14})	—	—	0.04 (*0.34*)	0.06 (*0.34*)	—
CENTRE × TAX (b_{15})	—	—	−0.83 (*0.53*)	−0.68 (*0.52*)	—
RIGHT × TAX (b_{16})	—	—	−0.08 (*0.37*)	−0.12 (*0.37*)	—
Budget balance					
BB (b_{17})	—	—	−0.00 (*0.31*)	0.12 (*0.30*)	0.15 (*0.28*)
CENTRE × BB (b_{18})	—	—	2.00 (*1.54*)	2.77 (*1.48*)[c]	2.35 (*1.44*)[c]
RIGHT × BB (b_{19})	—	—	0.77 (*0.35*)[b]	0.63 (*0.34*)[c]	0.60 (*0.32*)[c]
SURPLUS × BB (b_{20})	—	—	−0.63 (*0.41*)	−0.63 (*0.42*)	−0.59 (*0.41*)
Buse R^2	0.5310	0.5661	0.6325	0.6599	0.6599
Standard error of the regression	13.34	13.15	13.28	13.06	12.75
N	108	108	108	108	108

TABLE 5
Average Annual Economic Performances by Governing Parties

Variables	NDP and Parti Québécois	Liberals	Conservatives and Social Creditists
Rate of unemployment (annual rate)	8.8	9.2	8.3
Inflation (annual variation in %)	2.5	3.8	3.3
Personal income (annual variation in %)	2.8	4.7	4.1
Income tax (annual variation in %)	1.1	1.6	3.9
Public deficit[a] (share of total public expenditures)	−5.8	−7.6	−5.8

[a]Budgetary balance excluding surpluses

left- and right-wing parties. However, data in Table 5 also suggest that the presence of a high percentage might not be sufficient to provide a satisfactory explanation. As stated previously, we found that income tax variations do not influence the popularity of any ruling parties. Still, income taxes increased much more when right-wing parties were in power, compared to other parties (on average, 3.9 per cent per year compared to 1.1 and 1.6 per cent for the left-wing and centrist parties, respectively). Why then do Conservative and Social Credit supporters, who are believed to be strongly opposed to tax increases, sanction such an outcome? It might be that dissatisfied right-wing voters are less likely to support other political parties. Being located on the right of the political spectrum, it might be more difficult for them to find another political party that meets their expectations. Being in the centre, Liberal supporters have more choice. Consequently, the positioning of the Liberal parties in the middle of the scale might well be the reason why public deficits have such an impact on their popularity.

5. Conclusions

The aim of this study was to examine if economic voting takes place on the Canadian provincial political scene. Our main conclusion is that it does. Voters use economic indicators to pass judgement on the competency of their provincial government. However, not all economic factors tested in this study were found to have an influence. Our results indicate that voters do not use inflation, personal income and income tax as indicators of competency. Our findings also show that voters react differently depending on which party is in power. They expect left-wing incumbents to handle unemployment issues, but do not look for this with centrist and right-wing parties. In the matter of responsibility for public deficits, voters hold the Liberals and right-wing governments account-

able, but not left-wing parties. In addition, voters do not reward incumbents for public surpluses nor do they find minority governments less accountable for economic performance.

If the goal is to explain government popularity, economic factors alone are not enough. Our analysis has shown that two major features of Canadian political institutions have an impact on the popularity of provincial governments. First, our findings confirm previous studies on the cost of ruling: the popularity of the governing party depreciates over time, after an initial surge created by an election. Second, federal institutions matter. Our results show that the popular support received by provincial governments is linked to the popularity of the federal government, even though national and provincial political parties are distinct entities.

Although our analysis provides some answers on the issue of economic voting in Canadian provinces, it also raises some questions. For example, are our results valid for each province? Are they constant over time? Also, the use of aggregate economic data needs to be investigated in more depth. Are voters truly retrospective and sociotropic when it comes to evaluating provincial governments? Are they also prospective and egocentric? These questions need to be addressed in future research if we wish to better understand the behaviour of voters on the provincial scene.

Appendix: Variables conceptualization and data sources

Dependent variable: POPLEAD = popularity of the incumbent *minus* popularity of the party ranked second in voting intentions. Data were collected on a quarterly basis and then averaged over a year using the percentage of respondents in each quarter as weight. In election years, the party that had ruled for most of the year was considered the governing party. *Sources*: Angus Reid, Pollara, Environics, and the Canadian Election Study (for the years 1984, 1997 and 2000).

Independent political variables: YEARS = number of years since the last election (0, 1, 2, 3 and 4); CHANGE = 1 if a change of party or premier in office occurred, and 0 otherwise (only premiers that will be elected in the next election are considered); IDEOL = 1 if both the federal and the provincial parties are Liberals or Conservatives, and 0 otherwise; MINORITY = 1 if the provincial government does not have a majority of seats in the Legislative Assembly, and 0 otherwise; CENTRE = 1 if the Liberal party is in power, and 0 otherwise; RIGHT = 1 if a Conservative or Social Credit party is in power, and 0 otherwise. *Sources*: Provincial Offices of the Chief Electoral Officer. FED_POPLEAD = popularity lead of the federal government (see POPLEAD for more details).

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Independent economic variables: UR = annual provincial rate of unemployment; INFLATION = annual variation of provincial Consumer Price Index (1992 = 100) in percentage; INCOME = annual variation of real personal disposable income per capita (1997 = 100) in percentage; TAX = annual variation of provincial real income tax per capita (1997 = 100), in percentage; BB = ratio of provincial surplus or deficit on total provincial public expenditure; $DECREASE_t = 1$ if $UR_t < UR_{t-1}$, and 0 otherwise; LOW = 1 if INFLATION < 4%, and 0 otherwise; POSITIVE = 1 if INCOME > 0, and 0 otherwise; NEGATIVE = 1 if TAX < 0 and 0 otherwise; SURPLUS = 1 if BB ≥ 0, and 0 otherwise. *Source*: Statistics Canada, *Provincial Economic Accounts*, cat. n° 13-213 (CANSIM II, Table 3840013 for the rate of unemployment and personal income, Table 3840006 for income tax, and Table 3840036 for population and price index), *The consumer price index*, cat. n° 62-001 (CANSIM II, Table 3260001) for inflation, and *Public sector statistics*, cat. n° 68-512 for years before 1989 and cat. n° 68-213-213 afterwards (CANSIM II, Table 3850002) for budgetary balance.

Notes

1 Lagrange and Breusch–Pagan–Lagrange multiplier tests were used to detect heteroscedasticity, an *F*-test was used for fixed effects, and a pooled Durbin–Watson *d*-test was used for autocorrelation (Sayrs, 1989; Greene, 2000).

2 One method that can be used to solve the problem of residual autocorrelation is to include a lagged dependent variable on the right side of the equation. However, this procedure is problematic in the present case because incumbents may not have been in power during the previous year.

3 Surprisingly, Gallup has been measuring federal voting intentions since the 1940s.

4 Only 15 of the 432 quarters covered in this study have missing observations.

5 The annual measure of the popularity lead is accurate within 2.2 percentage points or less for Quebec and Ontario; 2.9 percentage points for Alberta and British Colombia; and 4.7 percentage points for Manitoba and Saskatchewan.

6 The arrival of a new premier is also included in the variable CHANGE to represent a honeymoon effect in provinces where a political party has been in power for a long period of time. This is notably the case for Alberta, where Conservatives have ruled without interruption since 1971, but under the leadership of different premiers (P. Lougheed, D. Getty and R. Klein). Only premiers who have been subsequently elected are considered in our measure.

7 We also tested if other measures of inflation and personal income would provide better estimates (such as the level of CPI, the level and annual variation of the GDP implicit price index, total and per capita personal income, in nominal and in real terms), but none turned out to be statistically significant.

8 Studies have generally shown that retrospective voters are highly myopic, using economic events that have occurred only in close proximity to the current situation, generally within a quarter, to evaluate the incumbent's economic performance (Nannestad and Paldam, 1994; Lewis-Beck and Stegmaier, 2000). Since our analysis relies on annual data, it does not seem relevant to use lagged explanatory economic variables to represent voters' myopia. Nonetheless, we have tested the popularity function with

lagged economic variables ($t - 1$) and found that none turned out to be statistically significant.

9 We are grateful to an anonymous reviewer for pointing out this possibility.

10 The question of multicolinearity among the macro-economic indicators must also be addressed since high levels of correlation can generate biased estimates. Additional tests were performed, where each economic variable was regressed on all other explanatory variables. The resulting R^2 values never exceeded 0.45 (and were usually below 0.20), so multicolinearity problems can be ruled out.

11 The Buse R^2 is a goodness-of-fit measure similar to the conventional R^2, but it cannot be guaranteed to be a non-decreasing function of the number of explanatory variables (Whistler et al., 2004). The conventional R^2 cannot be computed when pooled observations are corrected for AR(1) errors.

12 However, we also tested the model with the inclusion of an interactive MINORITY variable for personal income but found no significant relationship.

13 The F-test for H_0: $b_6 = b_9 = b_{12}$ vs. H_1: $b_6 \neq b_9 \neq b_{12}$ is $F(3,76) = 0.97$ (Eq. (6)); and for H_0: $b_6 = b_9 = b_{12} = b_{15} = b_{18}$ vs. H_1: $b_6 \neq b_9 \neq b_{12} \neq b_{15} \neq b_{18}$ is $F(5,68) = 0.72$ (Eq. (7)).

14 We also tested if larger variations have more impact than smaller ones by using squared economic indicators (as suggested by Stevenson, 2000), but found no empirical evidence that they provide a better measure to test the clarity of responsibility hypothesis.

15 The estimate for SURPLUS × BB is not statistically significant ($p = 0.155$, which is above the 0.10 level in column 4 of Table 3), but its standard error remains inferior to its estimated coefficient and its large value might be explained by a small sample size.

16 However, we also tested the model with the inclusion of an interactive effect between personal income and party ideology but found no significant relationship.

17 The F-test for H_0: $b_5 = b_6$ vs. H_1: $b_5 \neq b_6$ is $F(2,70) = -0.13$ (Eq. (8)) and $F(2,56) = 0.01$ (Eq. (9)).

18 We also tested for the presence of a distinct ideology intercept in this last regression by adding the dummy variables CENTRE and RIGHT, but the estimates for both variables remained statistically insignificant while overall results were not affected.

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