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Abstract

There is an extensive literature on the relative virtues of different electoral systems in producing more responsive and effective governments, but far less attention has been paid to role of dynamic factors. This article examines how government minority/majority status and popularity shape the trade-off between government responsiveness and effectiveness. We argue that minority governments face legislative constraints that incentivize them to be responsive to the public, but that this comes at the expense of legislative effectiveness. This trade-off between responsiveness and effectiveness is, however, conditioned by the government's standing in the polls. The more popular a minority government is in the polls, the less responsive and the more effective it becomes. These propositions are tested using original time-series data on public policy preferences, government popularity, legislative output and public expenditures in Canada from 1958 to 2009. Our findings demonstrate that minority governments are more responsive to the median voter but less legislatively effective than majority governments, and that these effects are moderated by the popularity of the government.

Key words: minority governments, representation, polls, responsiveness, effectiveness, Canada

Introduction

The relative merits of consensus and majoritarian democracies have been debated extensively (see e.g. Lijphart 1999; Powell 2000; Rogowski and Kayser 2002). A key element of this debate is the argument that consensus democracies with institutions of proportional representation tend to create greater incentives for responsiveness than majoritarian systems with plurality electoral systems (e.g. Powell 2000), while at the same time reducing the government's legislative effectiveness (e.g. Lowell 1896). Conversely, majoritarian systems are considered more effective but provide fewer incentives for responsiveness. This suggests a trade-off between responsiveness and effectiveness. Others disagree that such a trade-off exists, either arguing that majoritarian systems provide greater incentives for responsiveness (Pearson and Tabellini 2004, Norris 1997) or that proportional systems do not necessarily hinder effectiveness (Lijphart 1999; Powell 2000). Hence, disagreement persists in the literature as to how institutions conditions government responsiveness and effectiveness. Moreover, most studies have focused on differences *between* different electoral systems and neglected variation in responsiveness and effectiveness *within* systems.

This article contributes to this debate on the trade-off between responsiveness and legislative effectiveness by examining the role of *dynamic* institutions, notably the government's minority/majority status and popularity. Hence, in contrast to most of the existing literature, we examine the effect of contextual factors that change regularly on government responsiveness and effectiveness. We argue that a government's incentives and abilities to respond to citizens' preferences and enact legislation in parliamentary systems are crucially determined by whether it currently holds a majority in the legislature as well as its prospects of controlling a legislative majority after the next election. Minority governments are expected to be more responsive to the median voter than majority governments, as they need to appeal to the median voter and the median legislator, in order pass legislation in parliament. At the same time, though, minority governments will be less effective at passing legislation. However, this trade-off between effectiveness and responsiveness is conditioned by the government's standing in the polls. The more popular a minority government is in the polls, the less responsive and the more effective it becomes, until it behaves

much like a majority government. In fact, that point occurs once a minority government's standings in the polls suggests it could form a majority if an election were held.

These propositions are tested using unique time-series data from Canada in the period from 1958 to 2009. Canada makes an excellent case to test our propositions for three reasons. First, minority governments are common in Canada at the federal level. Almost half of the sessions of the Canadian Federal Parliament over the last half-century have had minority governments. Second, the lack of coalition governments in Canada simplifies the analysis by allowing for a clear distinction between majorities with full control and minorities that are dependent on the house at large, with no intermediate category that relies on more complex coalitional logic. Third, Canada is considered to have one of the most majoritarian electoral systems (Lijphart 1999). It thus provides a test of the trade-off between responsiveness and legislative effectiveness under extreme circumstances.

Our analysis of government responsiveness and effectiveness in the post-war period in Canada makes a number of contributions to the literature. First, we are focusing on the conditioning influence of dynamic factors rather than static one. We can appropriately study their influence on responsiveness and effectiveness over time within a single country and thereby avoid making erroneous inferences due to confounding factors in a static cross-national study. Second, we utilize a new measure of the preferences of the governing party's electoral base, so that we can estimate the responsiveness of the government to the median voter relative to their party base. Third, we go further than past studies on responsiveness in modeling the equilibrium between public opinion and government policy, allowing us to estimate both long-term and short-term responsiveness.

This article proceeds as follows. First, we discuss the literature on responsiveness and effectiveness, with a specific focus on the conditions that lead to variations in both. Thereafter, we present a simple theoretical model of why government minority/majority status and popularity shape responsiveness and legislative effectiveness and derive our hypotheses. We then examine whether the levels of social policy implemented by governments over time reflect the changing salience of social policy in the electorate (*policy responsiveness*) and the government's ability to pass into legislation the bills it tables in Parliament (*legislative effectiveness*), and how this is moderated by government status and

standing in the polls. We find support for our propositions concerning the effect of government status and standing in the polls. The concluding section discusses the implications of our results.

Government responsiveness and effectiveness

In an ideal world, we would design institutions that ensure that governments are both responsive to the preferences of citizens and effective in implementing their policy programme. Scholars have long debated whether consensus democracies, characterized by proportional representation (PR) and power-sharing executives, are preferable to majoritarian democracies characterized by plurality electoral rule and concentration of executive power (Lijphart 1999; Powell 2000). Much of the debate has focused on how relatively static institutions, notably electoral rules (Lijphart 1999; Powell 2000; Rogowski and Kayser 2002), shape government effectiveness and responsiveness. It is commonly argued that there is a trade-off between the government effectiveness that characterizes single-party majority governments produced by plurality elections, and representation of voters' views and preferences seen in systems with proportional representation (Lijphart 1999: 258). However, the extant literature presents rather mixed evidence about the effect of electoral institutions.

Looking first at government effectiveness, it is conventional wisdom that the majoritarian model with its emphasis on majority rule and concentration of power produces more effective government. For proponents of the majoritarian model, a key virtue of this system is that it tends to produce "strong" single-party governments, with a majority of parliamentary seats, which are able to implement their manifesto policies without the need to engage in post-election negotiations with coalition partners. Election results are decisive for government formation. Cabinet government can pass whatever legislation they feel is necessary during their term of office, so long as they can carry their own parliamentarians with them. Legislative effectiveness is enhanced by the exaggerative bias in the electoral system which rewards the winner with a bonus of seats. A "manufactured majority" is created by translating a relatively small lead in votes into a larger lead of seats in parliament (see Norris 1997).

Some have argued that the effectiveness of governments in majoritarian systems comes at the expense of responsive government, and proportional systems and coalitions governments provide higher ideological congruence between the public and governments (Lijphart 1984, 1999; Powell 2000). In other words, there is a trade-off between the two virtues of government. Others argue that plurality systems and majoritarian governments promote the link between the preferences of voters and the positions and policies of governments (see Austen-Smith and Banks 1988; Cox 1997; Persson and Tabellini 2004). Generally, there has been conflicting arguments and evidence about whether majoritarian or proportional systems results in the most responsive governments.

On the one hand, majoritarian systems, such as first-past-the-post, have been argued to be highly responsiveness to voter preferences, since in a competitive two-party system a small swing in the popular vote is sufficient to bring the opposition into office. In such a system, where a relatively modest change in electoral preferences produces disproportionate changes in power, governments should be highly responsive to voter preferences (Norris 1997; Austen-Smith and Banks, 1988; Cox 1997, Persson and Tabellini, 2004). Because shifts in public preferences have bigger consequences on election day in plurality systems, governments are likely to pay closer attention to changes in public opinion. There should also be greater incentive for constituency service in single-member districts than in large multi-member constituencies. Furthermore, scholars examining the effect of institutions on the degree of responsiveness in between elections have argued that majoritarian systems with strong governments enhance clarity of responsibility. This makes it easier for voters to identify politicians that shirk and this should encourage governments to be more responsive to public preferences (Anderson 2000; Powell and Whitten 1993). If clarity of responsibility conditions the extent to which voters can sanction governments, then such institutions should also be an important moderator of responsiveness, since governments that are held more to account should be more motivated to adjust policies in line with public preferences. As Soroka and Wlezien (2010: 48) note ‘during the periods between elections, there are good reasons to think that governments in majoritarian systems actually are more responsive’.

On the other hand, proponents of proportional systems have argued that such systems are more conducive to representative and responsive government (Lijphart 1999; Powell 2000). Evidence

suggests that proportional systems produce governments with positions closer to the median voter (see e.g. Powell 2000). According to Powell (2000, 2004) a balanced nationally-oriented party system where parties win roughly consistent vote shares from one contest to the next provides information helpful in bargaining and hence aids responsiveness. Also, while plurality systems may produce responsive governments when there is a delicate balance between the two parties in a two-party system, in reality such systems often produce one-party governments with a large parliamentary majority which makes them less vulnerable to public pressure during its term in office, and consequently less responsive to public mood swings and preferences than a government in a proportional system. Moreover, large parties can survive significant reversals of voter approval in the plurality system, as long as no majority forms to remove them (which is often highly unlikely in so-called 'safe' constituencies). Hence, the electoral removal sanction becomes less credible as the size (and majority) of the governing party increases in a majoritarian democracy and governments will tend not to be preoccupied with opinion change before it reaches a level where the opposition is in a position to threaten the government. In this regard, PR has an advantage in terms of sanctions because there are more candidates in each constituency with a reasonable chance of gaining representation (Lijphart 1999:162).

We know from the few comparative studies of government responsiveness that government responsiveness between elections is weaker in the majoritarian Canada and the UK compared to the US. Soroka and Wlezien argue that this is because the parliamentary legislatures of Canada and the UK have a lower capacity to check the power of the executive than Congress has on the President in the US. Responsiveness is lower in the parliamentary systems because prime ministers and cabinet members exhibit more discretion in different policy areas (Soroka and Wlezien 2010: 58). The logic is that executives that face fewer legislative constraints are less responsive. This runs counter to the classic expectation that the greater legislative capacity in the US to check the executive and therefore the lower clarity of responsibility will reduce responsiveness relative to Canada and the UK. Similarly, Hobolt and Klemmensen (2008) find that responsiveness between elections is weaker in the UK, where clarity of responsibility is high, compared with Denmark and the US, where clarity of responsibility is far lower due to the predominance of minority governments (Denmark) and divided government (US). Hobolt and Klemmensen argue that the harder the competitive struggle for votes

and policies, the more likely executives are to pander to public preferences and the less opportunity governments have to pursue their own interests. These findings suggest that governments facing greater pressures inside the legislature (legislative constraints) may in fact be *more* responsive to the median voter.

These debates suggest that it is not sufficient simply to look at the contrast between two general models of democracy (consensus and majoritarian) or two clusters of electoral systems (proportional and plurality) to understand when and why governments are more effective and responsive. Importantly, there may be changing factors *within* such systems that incentivize and enable governments to be either more responsive or more effective. In this article, we focus on the effect of dynamic institutions rather than static ones. In particular we argue that the degree to which governments face legislative constraints (and this varies both within and between systems) influence how responsive they are to public preferences. Governments with greater legislative constraints, notably minority government, are more responsive to changes in public preferences when formulating policies than governments that face lesser constraints, because they will seek to formulate policies that appeal to the median voter in order to secure public approval and therefore the legislative support that is necessary to pass a policy programme. This is in line with work on the US president by Canes-Wrone. She has argued that since the president always needs the support of Congress to pass legislation, and often faces a Congress dominated by the opposition party, public appeals are an essential element of presidential power (Canes-Wrone 2006), and the outcome is that under such legislative constraints the policy outcomes are closer to the preferences of the electorates than when the executive faces no legislative constraints. Just like US presidents, many executives in parliamentary systems also face institutional constraints, notably minority governments that do not control a majority of seats in the legislature (Hobolt and Karp 2010). These institutional constraints make it necessary for different parties to cooperate in order to pass legislation, and this is more likely to occur when the government can demonstrate to the other parties involved that it carries public opinion. In each of these cases, institutional constraints place pressure on governments to pursue popular policies in order to pass legislation.

We further argue that a government's standing in public opinion polls shape its incentives to respond to the median voter, since politicians who feel safe from electoral punishment because of their popularity in the polls will be less incentivized to respond to the median voter and instead feel free to pursue partisan interests. As Stimson, Mackuen and Erikson (1995: 544) state: 'Politicians create an appropriate margin of safety: those who highly value policy formulation or who feel safe at home choose policy over security; those who face competitive challenge in the next election lean towards ''expediency'' over security'. Similarly Canes-Wrone (2006) has argued that a 'highly popular president will not pander' (119) – 'the only presidents who do so are the marginally popular ones' since '...the increase in approval the incumbent receives from promoting a popular policy makes him likely to win reelection' (121, see also Canes-Wrone and Shotts, 2004). Incumbents are thus expected to modify their policy behavior more when they fear for their survival than when they feel safe. This 'margin of safety' or electoral uncertainly can be operationalized by measuring government popularity in the polls (Hobolt and Klemmensen 2008; Hakhverdian 2010). Moreover, the two conditioning factors – minority status and government popularity – are interdependent. When experiencing legislative constraints, the government requires popularity to pass legislation. Therefore, unpopular minority governments will be especially interested in gaining popularity by pursuing popular policies. In contrast, popular majority governments can more safely ignore the median voter and pursue more narrowly partisan policies. This argument is presented more formally in the next section.

A Simple Model of the Conditionality of Government Responsiveness and Effectiveness

The focus of our theoretical argument is the extent to which governments in parliamentary systems – facing different legislative constraints (due to minority/majority status) and ratings in the polls – will respond to the changing preferences of the median voter when developing their policy programs and passing legislation.

For the sake of simplicity, we illustrate our argument focusing on just two parties: the governing party (GP); and the opposition party (OP) on a single dimension. The assumption of our model is that for ideological, strategic or policy-seeking reasons, the governing party would like to pass legislation and enact policy that is in line with its core voters – its party base (see Cox, 1984; Persson and Tabellini,

2004) – but that its primary objective is to return to office (Downs 1957). Party supporters offer scarce resources, such as active campaign participation and party donations, that the governing party leadership may be dependent upon (see e.g. Kitschelt 1988; Miller and Schofield 2003; Panebianco 1989). Moreover, the preferences of the partisan base are likely to reflect the policy objectives of parties more accurately than the average voter. Hence, unlike most studies of responsiveness, we consider the potential trade-off that governments face between appealing to the median voter and following the preferences of their partisan base.[1] The governing party has the choice of proposing policy that falls along a particular policy spectrum. On this particular policy spectrum, the preference of the median voter (MV) falls between the preferences of the governing and opposition parties. For our purposes, we will consider the spectrum to represent more or less policy on a particular issue.

MORE <----------GP----------MV----------OP----------> LESS

The opposition party has the choice of supporting or opposing the policy proposed by the government. Both parties take into account whether the government is a majority or minority (MIN) as well as the governing party's current standing in the polls(P).

We are interested in estimating 1) the responsiveness of the government to the median voter relative to its base, and 2) the effectiveness of the government at passing legislation, given the popularity of the governing party in the polls(P) and the governments majority/minority status(MIN).

We begin by considering a majority government. If the governing party is doing well in the polls, well above the threshold to form a majority government in an election, we can expect the governing party to propose policy that falls in line with (is very close to) the preference of its base (GP). For our specific purposes, the threshold in Canada is generally considered to be 40 per cent[2] We also expect

[1] Recent empirical research has focused on the extent to which some types of parties are responsive to party supporters rather than median voters. Adams et al. (2006) and Ezrow et al. (2010) show that niche parties (i.e. parties belonging to the Communist, Nationalist and Green party families) are highly sensitive to shifts in the position of their mean supporter, while they do not respond systematically to the median voter in the general electorate.

[2] Since the World Wars, the lowest percentage of the popular vote that led to a majority government was received by the Liberal party under Jean Chrétien in 1997. The Liberals formed a majority government with only 38.46 percent of the vote. An almost identical results (in terms of the popular vote) -- 38.42 percent -- earned the Liberal party under Pierre Trudeau in 1972 a minority government. In fact, the Liberal party under Lester B. Pearson only received minority governments in 1963 and 1965 with popular votes in the 40 to 42 percent range. The current Stephen Harper majority was earned with 39.62 percent of the popular vote.

such a government to be highly effective at passing its legislation. The opposition party may be motivated to oppose the policy change but will not be in a position to block it, so it will be implemented.

As we consider the situation with decreasing levels of popularity in the polls for the majority governing party, we would expect the policy proposed by the governing party to shift somewhat towards that of the median voter(MV). This shift would be motivated by the governing party's desire to appeal to the median voter and to improve its standing in the polls. This in turn is motivated by the anticipation of a future election. Depending on how close the policy is to the wishes of the median voter, the opposition party may be more or less motivated to oppose the policy change but again, they will not be in a position to block the policy. The government will continue to be highly effective at passing its legislation, although its legislation may be more in line with the wishes of the median voter than it would be under a more popular majority government.

Next we consider a minority government. If it is doing very well in the polls, the governing party can propose policy close to that of its party base. It can do this because it knows that the opposition party will hesitate to oppose the policy and force an election which it would likely lose (possibly resulting in the governing party gaining a majority). For this reason, the legislative effectiveness of such a minority government will likely be about as high as that of a majority government. However, implemented policy may be somewhat closer to the median voter than a majority government in the same situation as the governing party will need to propose and implement policy that appeals to the median voter in order to retain its position in the polls (which is much more important than it is under a majority government).

Under a minority government that is doing less well in the polls, the governing party will have to shift this policy even further in the direction of the median voter, both in order to improve its standing in the polls and to be able to put the opposition party in a position that it will be unlikely to oppose the policy. As this minority government will not want to risk forcing an election, they are likely only to propose legislation that the opposition will not oppose. There is also the more short-term concern namely that the government needs an actual legislative majority to *support* the legislation for it to get passed. Hence, policies closer to the median voter under minority governments may also be the

function of governments reaching out to a broader based coalition in parliament. Given the need for support from the opposition party to pass legislation, the legislative effectiveness of such a minority government will be lower than that of a majority government or a more popular minority government.

This theoretical model is summarized in Figure 1. This figure suggests that the level of policy is a function of both the preferences of the governing party base and the median voter. The extent to which the governing party responds to the median voter, rather than its party base, is a function of whether the governing party controls a majority in parliament. Minority governments will be more responsive. As for legislative effectiveness, this too will be a function of majority status. Minority governments will be less effective. Hence, the trade-off. Further, the sensitivity of the governing party's responsiveness and effectiveness to being a minority government will be a function of the polls. As the governing party's popularity increases, a minority government's responsiveness decreases while its effectiveness increases. At the point that the polls suggests the governing party could form a majority if an election were held (40 per centin Canada), the minority government should be about as responsive and effective as a majority government – although it may still retain a degree of responsiveness above that of majority government. The responsiveness of a majority government to the median voter relative to the party base may also, to a lesser degree, be a function of the governing party's popularity in the polls.

-- Figure 1 --

The theoretical model also includes whether it is an election year and the party in government as predictors of government policy response and it includes the party in government as a predictor of legislative effectiveness

Based on this theoretical model, we can formulate the following hypotheses. For reasons explained below, we reformulate the hypotheses with respect to the mean, rather than the median voter.

H1: Compared to majority governments, minority governments produce policies that are more responsive to the preferences of the mean voter, relative to those of their partisan base.

H2: Compared to majority governments, minority governments are less legislatively effective.

H3: The effect of being a minority government on responsiveness to the mean voter and legislative effectiveness (relative to a majority government) will decline as the governing party's popularity in the polls increases.

The implication of H3 is that once a minority government reaches sufficiently high levels of support in the polls to suggest it could form a majority government, it exhibits about the same levels of responsiveness and legislative effectiveness as a majority government.

The Data

This article tests two hypotheses regarding the impact of minority government on democratic responsiveness (H1, H3), and two hypotheses regarding the impact of minority government on legislative effectiveness (H2, H3).

The dependent variable when estimating government responsiveness is policy output. This is measured by program expenditures of the federal government during the same period. Expenditures are measured in billions of 2002 Canadian dollars.[3] We rely on government expenditures as an indicator of the resources the government is willing to allocate to a particular policy and we focus on voter preferences and consolidated government expenditures on social welfare programs.[4] We choose social welfare expenditures because it is a core component of government spending and past work has determined that Canadian government responsiveness in this area is generally high (Soroka and the Wlezien 2004, 2010). Also, our period of study covers the bulk of the period in which the social welfare state in Canada was developed and partially retrenched – although in terms of expenditures, the retrenchment has really just been a reduction in the speed of expansion. Yearly expenditures on social welfare programs during each parliamentary session are plotted in Figure 2.

– Figure 2 –

[3] Expenditure data comes from four Statistics Canada sources: Terminated CANSIM Matrix 2780 (data range: 1965-1996), CANSIM I Series D44950 (data range: 1933-1969), CANSIM table 3850001 (data range: 1989-2009), and the publication "Historical Statistics of Canada" by Richard M. Bird (1999) (data range: 1965-1975). After converting all dollar amounts into 2002 Canadian dollars, these sources were spliced together. There is a great deal of overlap between them and so the average proportional difference between each series was calculated and used to adjust each to the scale of the most recent series.

[4] By consolidated, we mean across the federal, provincial, territorial, and local governments.

Governments can be responsive both in terms of adjusting their issue positions (i.e. higher or lower taxes) and by changing their issue priorities (i.e. the social services is a higher priority than military spending) in line with public preferences. We focus on the latter type of responsiveness, i.e. we examine whether government spending on social welfare reflects the issue priorities of the mean voter relative to the preferences of the governing party's electoral base (see Hobolt and Klemmensen 2008). As an indicator of public preferences for spending on social welfare programs, we use a measure of relative priority of this issue over others, analyzing responses to what is known as the most important problem/issue question. These are (usually) open-ended questions asking respondents a question such as: "What do you think is the most important issue/problem facing Canada today?" Some variant of this question has been included consistently in polls and the election studies throughout the period of our analysis. Importantly, it provides a measure of issue salience relative to all other issues, as each respondent can only provide one answer. We proceed by combining survey data from the Canadian election studies and 85 commercial polls to estimate the policy preferences of the Liberal and (Progressive) Conservative party bases,[5] and those of the mean voter. This is done for the 1965 to 2009 period. The unit of analysis is the parliamentary session, which are approximately, but not entirely, yearly.

A potential source of measurement error comes from the likely possibility that some part of the over time change in issue priority reflects a change in salience rather than actual priority (Wlezien 2005). However, to the extent that there are differences between the base of the governing party and the mean voter, these differences reflect differences in priorities. Social welfare as a priority clearly relates to a set of policies. Therefore, the extent to which the mean voter identifies social welfare as the most important problem more often than the base of the governing party in large part reflects the differing policy priorities of the mean voter. Further, the identification of social welfare as an important issue typically means a preference for more spending. Reductions in spending are given a different code. It is possible a respondent may prefer a reduction in spending and not be clear about it in his/her response. This is a potential source of measurement error.

[5] These being the only parties that have formed government in Canada over the time period we study.

Our empirical strategy requires measures of social welfare as a policy priority for the mean voter and each governing party base. There are a number of potential ways to define a party base, in order to examine their issue priorities, but we cannot simply use the opinions of those that indicate they would vote for the party in each survey. The reason this is problematic is that as a party becomes more/less popular over time, more/less individuals will indicate they will vote for it. This will result in a change in the opinions of this group, not necessarily because any individual changed their opinion, but simply because the composition of the group has changed. To a lesser extent, the same problem applies to simply using voters' stated identification with a party in each poll.

For these reasons we define a party base socio-demographically. Specifically, we mean those Canadians who are most likely to vote for that party as measured by their socio-demographic characteristics. The mean voter is similarly defined by a socio-demographic profile. This approach allows us to hold the composition of the base, or mean voter, consistent over the electoral cycle, while measuring how each group's issue priorities change. This process is detailed below.

For each electoral cycle we measure the demographic characteristics of the party base – for each party that has governed – from the Canadian Election Study conducted during the election that preceded the electoral cycle. We then use these demographic profiles to estimate the opinions of the base for each party, using the commercial polls conducted throughout the electoral cycle. In other words, we hold the composition of each party's base constant and then estimate the changing opinions of these groups over time. At the beginning of a new electoral cycle, the demographics for each party are reassessed, based on the vote intentions of the respondents in the new election study. For example a poll conducted in the period between the 2000 and 2004 elections would use the demographics of a core constituent in the 2000 election. This allows for the real possibility that the composition of the base for each party might change from one electoral cycle to the next.

Our full procedure is provided in Appendix A.[6] The result is that we have an estimate of the proportion of each party's base that are predicted to indicate each issue as the most important at

[6] In brief, demographic variables are commonly recoded across all data sets (polls and elections studies) within the electoral cycle. Then, for each poll a penalized logit model is fit for each issue with these demographic variables. Each demographic profile can then be entered as the covariate values in each model to produce the predicted probability that a member of any particular demographic group lists the issue as their top priority.

various points in time (99 different months) over the 44 year period. In other words, for each party and each issue we have a time series of relative issue priorities for a full range of issues.[7]

As we did not have polls for every month in this time period, we have a monthly time series with missing values. The estimates and their standard errors were input into a Bayesian Kalman filter (Green, Gerber, and De Boef. 1999; Jackman 2009, Chapter 9) to produce a smoothed time series that both reduced the uncertainty in the estimates and interpolated values for the months without estimates.[8] The monthly interpolated values are then averaged over each Parliamentary session: 32 in total. This gives us the average proportion of each governing party's base that identified each issue as the most important issue during each Parliamentary session, from 1965 to 2009. For the study, we use the proportion that identified social welfare programs.

Using this same procedure, we also create a demographic profile of the average voter and estimate their relative issue priorities, and impute a full monthly time series in the same manner. This data is used to represent the mean voter. We choose to estimate the priorities of the average (mean) voter, rather than the median voter, as the response categories for some of the demographic variables have a limited number of categories. The result is that the demographic profile of the median voter changes in surges, while the demographic profile of the mean voter does not. Figure 3 plots the imputed portion of the governing party base (GP), and the difference between this and the proportion for the mean of all voters $(\mathrm{MV}-\mathrm{GP})$ that indicated social welfare as the most important issue over time. As we see from the plot, there certainly is a fair amount of common movement but there are also important differences that change over time

– Figure 3 –

[7] Our use of demographic variables to estimate the issue priorities of the governing party base requires that the models used have a reasonably good fit – i.e., demographics are a good predictor of responses to the MIP question. Penalized logits are problematic to evaluate with standard goodness of fit measures but to evaluate the prediction accuracy of each penalized logit, one can estimate ROC curves. The web appendix to Pickup and Whelan (2014) contains a table of summary statistics for the ROC curves from the penalized logits used to predict Welfare being identified as the most important by the governing party base using demographics. Overall, the penalized logits perform well. The standard statistic used to assess ROC curves is the area under the curve, ranging from 0.5 (equivalent to chance alone) to 1 (perfect prediction). The mean over all surveys was 0.842, which is a moderately strong ROC value.

[8] Interpolation estimates values of the time series for months that we do not have a poll using the poll information from months preceding and following the months without polls. We also have a temporal overlap between Gallup and Environics polls, which we used to estimate and control for systematic (constant) differences in polls from the two firms.

The dependent variable when testing hypotheses regarding legislative effectiveness is the ability of the government to pass legislation that it deems important. This is measured as the proportion of bills the government moved past second-reading in the House of Commons that received Royal Assent, in each session.[9] Our data cover the period extending from the beginning of the 24th Parliament to the end of the 40th. This includes 42 sessions of Parliament and spans the temporal period 1958 to 2008. The temporal unit of analysis is again the parliamentary session. We plot the legislative effectiveness in Figure 4.

– Figure 4 –

There are possibly two outliers. One of which (the 31st Parliament) was a result of a quickly defeated minority government. The inclusion of a minority variable in our empirical model (below) may account for this outlier. The other outlier (third session of the 37th Parliament) reflects the last session of a long-standing Prime Minister (Jean Chretien) and a high degree of infighting within the governing Liberal party over whether or not Chretien should resign. These outliers might cause issues with homoscedasticity, for which we will test. The plot of legislative effectiveness suggests there may be a systematic decline in legislative success in the later parliamentary sessions. This would be a non-linear trend that could be modelled with a quadratic function of time. It is possible that this is just an end effect – that is, there appears to be a trend at the end but if we were able to continue observing this series further in time we would see that it is just a temporary downward shift (Tufte 2001). Appendix B contains a test of this possible trend and determines that there is no evidence of it. Therefore, we do not include it in the empirical model (below).

We also require measures of our conditioning variables - government popularity (P), minority status (MIN) – and our control variables: elections year (E), unemployment rate (U) and party in government (PG). Turning first to our conditioning variables, the popularity of the governing party in the polls is

[9] Bills that do not pass second-reading are not considered. Bills were selected in this way because governing parties will sometimes introduce bills which they do not intend to pursue. There are a number of reasons why a governing party may do this. However, if the government pursues a bill past second reading in the House of Commons, one can be relatively certain that they are serious about passing it into law.

based on all vote intention polls published by major polling firms during each session of Parliament.[10] A typical vote intention question is: 'If a federal election were held tomorrow, which party would you vote for?' The measure of popularity is the average share of vote intention the governing party received in all polls published over each session. As for whether a government is a minority or a majority, a minority government is simply defined as any government in which the governing party has less than 50 per cent plus one of the seats in the House of Commons. The minority variable is coded 1 for minority governments and 0 for majority governments.

As for our control variables, the governing party variable is coded: Liberals (1) or (Progressive) Conservatives (0). We also include an election year variable by creating an indicator variable that is coded 1 if a session ends with an election and 0 otherwise. When testing responsiveness, the unemployment rate controls for the real demand for welfare programs which determines, in part, values of the dependent variable, spending, but will also be expected to correlate with the priority placed on spending by voters.[11]

The Empirical Models

If we translate the theoretical model for responsiveness in Figure 1 into an empirical model, the result is a number of interactions:

$$policy \sim f\big(\ln(P), MIN, E, U, T, PG, GP, (MV - GP), \ln(P) \times (MV - GP), \ln(P) \times MIN, MIN \times (MV - GP), \ln(P) \times MIN \times (MV - GP)\big)$$

In addition to the controls, this includes the interactions indicated in the theoretical model and all of the necessary constituent "main" effects. The GP term represents the estimated policy preferences of

[10] These polls were collected by the Polling Observatory. The polling firms include Angus Reid, Canadian Facts, Compas, Comquest Research, Decima, Ekos, Environics, Gallup, CROP, Insight Canada, Ipsos Reid, Leger, Nanos/SES, Pollara, Sorecom, Zogby, and Strategic Council.

[11] The unemployment data are from the Statistics Canada Labour Force Survey, which has been conducted since 1945. The data are comprised of two time series. For years prior to 1976 Statistics Canada publishes annual labour force data as part of its series on historical statistics of Canada (http://www.statcan.gc.ca/pub/11-516-x/sectiond/4057750-eng.htm#2). These data are based on the average of 12 monthly Labour Force Survey's for each year. In 1976 the Labour Force Survey was redesigned to be a more extensive and rigorous survey (http://www23.statcan.gc.ca/imdb-bmdi/document/3701_D7_T9_V1-eng.pdf). From this point onwards monthly data are available in Statistics Canada's CANSIM tables (http://www5.statcan.gc.ca/cansim/a26?id=2820087).

the governing party base and the $(\mathrm{MV}-\mathrm{GP})$ term is the difference between these preferences and those of the mean voter. Through the two-way interaction terms, we can capture the expectation that this relative responsiveness is affected by the governing party's standing in the polls: $\ln(\mathrm{P}) \times (\mathrm{MV}-\mathrm{GP})$, and whether the governing party has a minority or majority: $\mathrm{MIN} \times (\mathrm{MV}-\mathrm{GP})$. Through a three-way interaction term, we capture the expectation that the effect of polls on this relative responsiveness of a minority governing party will depend on its standing in the polls: $\ln(\mathrm{P}) \times \mathrm{MIN} \times (\mathrm{MV}-\mathrm{GP})$. We discuss how to interpret the estimated coefficients for these terms below.

To allow for both short- and long-term effects, and to allow for the possibility that the data are cointegrated (which we test below), we choose to use an error correction model, with a trend in the first differences and a quadratic trend in the cointegrating equation:

$$policy_t = \kappa_{0,0} + \rho_1 Coint_{t-1} + \sum_{k=1}^{K} \kappa_{0,k}\, \Delta X_{t,k} + \kappa_{0,k+1} T + \varepsilon_t$$

$$Coint_t = policy_t - \kappa_{1,0} + \sum_{k=1}^{K} \kappa_{1,k}\, X_{t,k} - \kappa_{1,k+1} T^2$$

Given that many of the interaction terms will exhibit collinearity and we have only 32 data points, we ran the model first without the interaction terms and then with the interactions. Therefore we test our hypotheses by breaking the model down into two separate empirical models.

1) $policy_t = \kappa_{0,0} + \rho_1 Coint_{t-1} + \kappa_{0,1}\, \Delta \ln(P)_t + \kappa_{0,2}\, \Delta MIN_t + \kappa_{0,3}\, \Delta E_t + \kappa_{0,4}\, \Delta GP_t + \kappa_{0,5}\, \Delta (MV-GP)_t + \kappa_{0,6}\, \Delta U_t + \kappa_{0,7}\, \Delta PG_t + \kappa_{0,8} T + \varepsilon_t$

   $Coint_t = policy_t - \kappa_{1,0} - \kappa_{1,1} \ln(P)_t - \kappa_{1,2} MIN_t - \kappa_{1,3} E_t - \kappa_{1,4} GP_t - \kappa_{1,5} (MV-GP)_t - \kappa_{1,6} U_t - \kappa_{1,7} PG_t - \kappa_{1,8} T^2$

2) $policy_t = \kappa'_{0,0} + \rho'_1 Coint'_{t-1} + \kappa'_{0,1}\, \Delta \ln(P)_t + \kappa'_{0,2}\, \Delta MIN_t + \kappa'_{0,3}\, \Delta E_t + \kappa'_{0,4}\, \Delta GP_t + \kappa'_{0,5}\, \Delta (MV-GP)_t + \kappa'_{0,6}\, \Delta U_t + \kappa'_{0,7}\, \Delta PG_t + \kappa'_{0,8}\, \Delta \big(\ln(P) \times (MV-GP)\big)_t + \kappa'_{0,9}\, \Delta \big(MIN \times (MV-GP)\big)_t + \kappa'_{0,10}\, \Delta (\ln(P) \times MIN)_t + \kappa'_{0,11}\, \Delta \big(\ln(P) \times MIN \times (MV-GP)\big)_t + \kappa'_{0,12} T + \varepsilon'_t$

$$Coint'_t = policy_t - \kappa'_{1,0} - \kappa'_{1,1}\ln(P)_t - \kappa'_{1,2}MIN_t - \kappa'_{1,3}E_t - \kappa_{1,4}GP_t - \kappa'_{1,5}(MV - GP)_t$$
$$- \kappa'_{1,6}U_t - \kappa'_{1,7}PG_t - \kappa'_{1,8}\big(\ln(P) \times (MV - GP)\big)_t$$
$$- \kappa'_{1,9}\big(MIN \times (MV - GP)\big)_t - \kappa'_{1,10}(\ln(P) \times MIN)_t$$
$$- \kappa'_{1,11}\big(\ln(P) \times MIN \times (MV - GP)\big)_t - \kappa'_{1,12}T^2$$

In each model, the first equation is the error correction equation and second equation is the cointegrating equation. The cointegrating equation models the long-run relationship between preferences and expenditures. The coefficients on the first differenced variables in the error correction equation represent the short-run effects of preferences on expenditures. The short-run effects are just the *change* in expenditures as a response to a *change* in preferences. The long-run effects need to be explained further.

In an error correction model with cointegrated data, the cointegrating equation represents the cointegrating relationship between the variables. How is this interpreted? Expenditures are not stationary, so there is no equilibrium to which they will return in the absence of external shocks. This is true even after controlling for the trending in expenditures. However, because expenditures are cointegrated with preferences, another type of equilibrium does exist. This equilibrium is the weighted difference between expenditures and preferences. Even though expenditures may not return to any specific equilibrium level, they do tend to return to an equilibrium relative to preferences (the simplest example of such an equilibrium would be if expenditures returned to a constant proportion of preferences). When expenditures are out of equilibrium in that they are too high relative to preferences, they will tend to decrease until they reached their relative equilibrium. Equivalently, if expenditures are out of equilibrium in that they are too low relative to preferences, they will tend to increase until they reached their relative equilibrium. An error correction model estimates the equilibrium relationship through the coefficients in the cointegrating equation and estimates the rate at which expenditures return to their relative equilibrium by the coefficient on the (lag of the) cointegrating term in the error correction equation ($Coint_{t-1}$). The necessary assumption to interpret these effects as causal is weak exogeneity (Enders 2004). Substantively this assumption is

that when expenditures and preferences are out of equilibrium, it is expenditures that change to re-achieve equilibrium and not preferences.

The first model tests the responsiveness of government policy to the preferences of the mean voter relative to the governing party base. The coefficient on $(\mathrm{MV}-\mathrm{GP})$ in the cointegrating equation represents the long-run responsiveness of the governing party to the mean voter relative to its party base, holding the preferences of the party base constant. In other words, this is the responsiveness of the governing party to the mean voter to the exclusion of the governing party base's preferences. The coefficient on GP represents the responsiveness of the governing party to its base holding $(\mathrm{MV}-\mathrm{GP})$ constant. It is the response of the government to changes in the preferences of the governing party when those preferences move in tandem with the mean voter. The difference in the coefficients on GP and $(\mathrm{MV}-\mathrm{GP})$ represent the responsiveness of the government to the governing party base holding mean voter preferences constant. To see this, consider the following. If GP increases by 1 unit while MV remains constant, the change in $(\mathrm{MV}-\mathrm{GP})$ is -1. Therefore, the effect is the coefficient on GP minus the coefficient on $(\mathrm{MV}-\mathrm{GP})$. Note that for the preferences of the governing party base to increase while the preferences of the mean voter remain constant, requires the preferences of those not part of the governing party base to decrease. This will be important when interpreting our results.

If the government responds to the mean voter, irrespective of governing party preferences, we would expect a positive and statistically significant coefficient on $(\mathrm{MV}-\mathrm{GP})$. If the government is responsive to its base, irrespective of mean voter preferences, we would expect the difference in the coefficients, for GP and $(\mathrm{MV}-\mathrm{GP})$ to be positive and statistically significant. Each of these expectations may also apply to the coefficients on the first differenced variables in the error correction equation. These represent the short-run effects: the immediate change in expenditures due to a change in preferences.

The second model includes the two-way and three-way interactions discussed above. The interaction between $(\mathrm{MV}-\mathrm{GP})$ the preferences of the mean voter (relative to those of the governing party base) on the one hand and the popularity of the governing party in the polls on the other captures the extent to which the relative responsiveness of a majority government differs depending on the standing of the governing party in the polls. If unpopular majority governments are generally more

responsive to the mean voter (relative to their party base) we would expect this interaction term to be statistically significant and negative. We use the natural log of the popularity of the governing party in the polls, $\ln(P)$, to capture some of the expected nonlinearity of these effects.

The interaction between the preferences of the mean voter (relative to those of the governing party base) on the one hand and the status of the government as a minority government on the other allows the responsiveness of the government to the mean voter (relative to its party base) to differ depending on whether the government has a majority or minority. If minority governments are generally more responsive to the mean voter, relative to their party base, we would expect this interaction term to be statistically significant and positive.

Finally, to test the sensitivity of mean voter responsiveness to polls for minority governments, we include the three-way interaction between the preferences of the mean voter (relative to those of the governing party base), the status of the government as a minority government, and the government popularity in the polls. If minority governments become less responsive as they gain popularity, we would expect this coefficient to be statistically significant and negative.

These are general expectations regarding the signs and significance of the coefficients. Due to the complexity of the model, we will have to plot the estimated responsiveness of the both majority and minority governments to the mean voter and the party base at different levels of popularity. Before we turn to the results of our estimated responsiveness model, we outline the empirical model for legislative effectiveness.

We include in our empirical model for legislative effectiveness: the minority government indicator variable, popularity in the polls, and an interaction between the two. We also include the square of poll popularity and its interaction with the minority indicator variable. This is done to account for nonlinearities in these effects.[12] Finally, we include a control for the party in government.

$$Leg_t = \beta_0 + \beta_1 GP_t + \beta_2 MIN_t + \beta_3 P_t + \beta_4 P_t^2 + \beta_5 P_t XMIN_t + \beta_6 P_t^2 XMIN_t + \varepsilon_t$$

Having outlined our empirical models, we examine the results of estimating each.

[12] This produced a marginally better fit than using the log of poll popularity: R^2 of 0.5106 vs 0.5075.

Results

We are testing the hypotheses that minority governments produce policies that are more responsive to the preferences of the mean voter, relative to those of their partisan base but are less legislatively effective than majority governments (H1, H2). We are also testing the hypothesis that these effects of being a minority government will decline as the governing party's popularity in the polls increases (H3). An implication of H3 is that once a minority government reaches sufficiently high levels of support in the polls to suggest it could form a majority government (40 percent in the Canadian case), it will exhibit about the same levels of responsiveness and legislative effectiveness as a majority government.

Responsiveness Results

Before we estimate an error correction model, we begin by testing whether government spending is cointegrated with the other variables in our model. The error correction model can be used for stationary or cointegrated data but the estimation technique used and interpretation will differ. We use the Johansen trace statistics to test for cointegration between government expenditures, the policy preferences of the governing party base, the differences in the policy preferences of the governing party base and the mean voter, government popularity and unemployment rates. The trace statistic indicates we can reject the null hypothesis of no cointegrating equations.[13] The trace statistic also indicates we cannot reject the null hypothesis of no more than one cointegrating equation.[14] This indicates that the data are cointegrated with just one cointegrating equation, as assumed in our empirical model specification.

The results for the two social welfare spending error correction models (each with one cointegrating equation) are presented in Tables 1 and 2. Table 1 contains the results for the cointegrating equations and Table 2 contains the results for the error correction equations. A third order moving average term is included in the cointegrating equations to remove serial correlation, necessitating a maximum

[13] Allowing for a quadratic trend, the trace statistic is 85.36 and the 5% critical value is 77.74.
[14] Allowing for a quadratic trend, the trace statistic is 54.26 and the 5% critical value is 54.64.

likelihood estimation for this equation.[15] With the inclusion of the third order moving average term, we cannot reject the null hypothesis that the residuals are a white noise process using the Portmanteau Q test for either of the two models.[16] The estimates for the error correction model are produced using OLS and the Granger two-step procedure (Wooldridge 2006).

– Tables 1 and 2 –

In the results for Model 1, we see that the coefficient on the difference in the preferences of the mean voter and the party base in the cointegrating equation is positive and statistically significant, at the 0.05 significance level. This is the long-run response of the mean voter, holding the governing party's base constant. If the percentage of all voters indicating social welfare is the most important problem increases by one point, while the percentage for the party base remains constant, spending will be 4.1 billion dollars greater than it would be otherwise. To put this in perspective, the observed range of $(\mathrm{MV} - \mathrm{GP})$ is -1.15% to 2.26%. The responsiveness of the government to the party base, holding mean voter preferences constant is the difference between the coefficient on GP and $(\mathrm{MV} - \mathrm{GP})$. A Wald test indicates that the difference is not statistically significant at the 0.05 significance level. The test statistic, which is chi-squared distributed with one degrees of freedom, is 3.51. The corresponding *P*-value is 0.0611.

These results are within the cointegrating equation. They indicate that there is an equilibrium relationship between government expenditures and mean voter preferences. For a full test of the long-term responsiveness of government expenditures to mean voter preferences, we must look at the results in table 2. The coefficient on the cointegration term in the error correction model indicates the rate at which government expenditures respond to mean voter preferences and government expenditures being out of equilibrium. For model one, the value is statistically significant and is -0.48. This gives the following interpretation. If mean voter preferences and government expenditures move out of equilibrium because mean voter preferences increased by one percentage point, the cointegration term will be -4.08 (this is the negative of the coefficient on relative mean voter

[15] Including a moving average term is not the ideal way of ensuring the correct standard errors in the cointegrating equation. Ideally we would use a lead-lag estimator (Wooldridge 2006). However, with so many covariates in the model and so few data points, a lead-lag estimator is impractical.

[16] Model 1: Q-statistic is 18.13 and is chi-squared(14) distributed, with a corresponding *P*-value of 0.201. Model 2: Q-statistic is 12.79 and is chi-squared(14) distributed, with a corresponding *P*-value of 0.543

preferences in the cointegrating equation). The result is that in the next time point, expenditures will increase by 48 percent of this amount (48 percent of 4.08 billion dollars), putting mean voter preferences and government expenditures closer to equilibrium. If nothing else occurs, expenditures will increase by 48 percent of the remaining difference in the next period and so on until equilibrium is achieved.

To test our hypotheses, we need to move on to model 2. Looking just at the coefficients in the cointegrating equation (Table 1), we see that the coefficient on the interaction between minority government status and relative mean voter preferences is positive and statistically significant. This suggests that minority governments are more responsive to the mean voter than majority governments (H1). We also see that the three-way interaction between minority governments status, relative mean voter preferences and popularity is negative and statistically significant. This indicates that the greater responsiveness of minority governments to the mean voter decreases as the government becomes more popular (H3). To get a full sense of government responsiveness to both the mean voter and the party base, we need to predict responsiveness at different levels of popularity, for both majority and minority governments.

Figure 5 plots the estimated long-run responsiveness of minority and majority governments to the mean voter, holding the preferences of the party base constant, at different levels of responsiveness. These are plotted over the observable range of popularity for minority and majority governments. We see that minority governments are certainly responsive to the mean voter and that this responsiveness declines as the government becomes more popular. The estimated level of popularity at which a minority government becomes equally responsive as a majority government is 39.20 percent (95% confidence interval: 37.40, 41.01). This is notable because 40 percent is commonly considered in Canada to be the percent of the vote a federal party needs to achieve in order to form a majority government. This suggests that a minority government becomes equally responsive as a majority government when the poll suggests it could win a majority in an election. As for the responsiveness of a majority government (Figure 5), there is a small range around 40 percent in the polls that a majority government has a minor, positive level of responsiveness that is statistically

significant at the 0.05 significance level. Otherwise, the responsiveness does not really change with popularity.

– Figure 5 –

Moving on to the responsiveness of a majority and minority governments to the governing party base, holding mean voter preferences constant, we look at Figure 6. Here we see the responsiveness of minority governments to the party base is negative at low levels of popularity in the polls. This is when we need to remember that an increase in the expenditure preferences of the governing party's base, holding the mean voter preferences constant, means that those outside the party base must have a decrease in expenditure preferences. This explains why at low levels of popularity, a minority government will respond to a relative increase in the preferences of its party's base with a decrease in expenditures. The government is responding to the decrease in the expenditure pressures of those outside its base. As a minority government becomes more popular, in particular when it passes 40 percent in the polls, its responsiveness is positive. This means that it responds to an increase in the relative expenditure preferences of its party base with an increase in expenditures even though those outside its base will have expressed a preference for decreased expenditures. This is notable because it is not just a response to its base but a response to its base in spite of the preferences of the mean voter.

– Figure 6–

Turning to majority governments, we see again that responsiveness is resistant to poll popularity. Responsiveness is statistically significant in the 40 to 50 percent range but very small and negative.

To confirm that government expenditures respond to being out of equilibrium with mean voter and/or governing party preferences, we need to look at the model two results in Table 2. The rate of cointegration coefficient is -0.72 and is statistically significant, at the 0.05 significance level. This means that government expenditures will increase in a given session to cover 72 percent of the gap in the equilibrium between expenditures and preferences.

The Table 2 results (model two) also give us the short-run effects of preferences on expenditures. These are estimates of the immediate change in expenditures due to a change in public preferences.

As with the coefficients in the cointegrating equation, we see that the effect of being a minority government on the relative responsiveness to the mean voter is positive and statistically significant. It is also the case that this effect is mitigated by the popularity of the government as indicated by the statistically significant and negative coefficient for the three-way interaction between popularity, minority government and relative mean voter preferences. Figure 7 plots the effect of a minority government's short-run responsiveness to the mean voter (holding the preferences of the party base constant) and to the party base (holding mean voter preferences constant) at different levels of popularity in the polls. We don't present the plots for majority governments as the short-run effects are not statistically significant at any level of observed popularity.

– Figures 7 –

The first plot in Figure 7 shows that the short-run responsiveness of a minority government to the mean voter decreases with popularity. The short-run responsiveness is only really statistically significant at the lower levels of popularity (25 to 30 percent). The effect of being a minority government, relative to a majority government, drops to zero at about 38.44 percent (95% CI: 35.57, 41.11). This is, again, around the 40 percent threshold perceived to be necessary for forming a majority government. The second plot in Figure 7 shows that the short-run responsiveness of a minority government to its party base again increases with popularity. This result is statistically significant at the extremes of popularity.

The evidence from the analysis clearly suggests that minority governments are more responsive to the mean voter than majority governments (hypothesis 1). This is true both in terms of the long-run equilibrium between expenditures and preferences and the short-run change in expenditures in response to changes in preferences. The results also support the theoretical expectation that the responsiveness of a minority government to the mean voter relative to their party base declines as it gains popularity in the polls (hypothesis 3). It also appears to be the case that the difference in responsiveness between minority and majority governments disappears once a minority government has approximately 40 percent of the intended vote reported in the polls.

The results are generally all consistent with our theoretical model. One thing we might have expected but did not find is responsiveness by majority governments to their party base, particularly when

popular in the polls. And, the responsiveness of the majority government to the mean voter is only really statistically significant around 40 percent in the polls when we would have also expected an effect at lower levels of popularity. It is always difficult to interpret a null result, as it is possible that we simply do not have the power to detect this responsiveness.

Effectiveness Results

We use OLS regression to estimate our model of legislative success testing the effects of minority versus majority government, government popularity and their interaction and a control for the party in government. The results are presented in Table 3.

– Table 3 –

We test the residuals for serial correlation, using the Q-test for white noise. We cannot reject the null hypothesis that the residuals are white noise, and are therefore free from serial correlation, at the 0.05 significance level.[17] We also test for heteroskedasticity using the Breusch-Pagan test for heteroskedasticity.[18] We cannot reject the null hypothesis of homoskedasticity.

The estimated coefficient for government popularity is the effect of popularity on the legislative effectiveness of majority governments. It is not statistically significant at a 0.05 significance level. This suggests that the legislative effectiveness of majority governments is not affected by its standing in the polls. The effect of government popularity on the effectiveness of minority governments is the sum of the coefficients on government popularity and the government popularity X minority interaction. The sum of these coefficients is 0.017 and a Wald test of the hypothesis that the sum of these coefficients is zero gives us a test statistic of: F(1, 35) = 10.57. The corresponding *P*-value is 0.0025. We can reject the null hypothesis that the sum of the coefficients is zero. It would appear that the legislative effectiveness of a minority government is improved as its popularity in the polls increases.

[17] The Q-statistic is 14.63. It is chi-squared(18) distributed with a corresponding *P*-value of 0.69.
[18] The test statistic is 3.40. It is chi-squared(4) distributed with a corresponding *P*-value is 0.49.

Figure 8 plots the effect of being a minority government on legislative effectiveness at different levels of popularity in the polls. It is clear from this plot that the effect of being a minority government declines as the governing parties popularity increases. The estimated point at which a minority government is just as effective as majority government is 39.05 percent.

– Figure 8 –

These results are again consistent with our hypotheses. Compared to majority governments, minority governments are less legislatively effective (hypothesis 2). This effect does decline with the increasing popularity of the minority government (hypothesis 3), to the point that a minority government is just as effective as a majority government. This point is approximately 40 percent of vote intention in the polls.

Conclusions

A large number of studies have examined how electoral systems influence government responsiveness and effectiveness. Yet, there is still no consensus as to whether one of these qualities comes at the expense of the other. In this article, we have focused instead on the dynamic factors that influence variation in government responsiveness and legislative effectiveness *within* systems, focusing specifically on government status and standing in the polls. We have analyzed this using unique time-series data from Canada, as this is a case of a majoritarian democracy with frequent changes between minority and majority governments. Our findings demonstrate that under a minority government, there is indeed a trade-off between responsiveness and effectiveness, and this trade-off is conditioned on the popularity of the government. A minority government becomes as responsive and legislatively effective as a majority government when it is polling at about 40 per cent of vote intention. The advantage of analyzing a single case is we avoid making erroneous inferences due to confounding factors – a problem to which a static cross-national study is subject. The drawback, of course, is that it is unclear whether the findings can be generalized beyond Canada.

While there is still work to be done to test these propositions in other countries, it is worth reiterating the significance of our results. Even within a strongly majoritarian system of government, we can see the trade-off between responsiveness and effectiveness. At least, we can see it within minority governments. The fact that a minority government's greater responsiveness and lower effectiveness is mitigated by its popularity in the polls has an interesting implication. Under a minority government, it places the degree of trade-off in the hands of the electorate. If a minority government is perceived as being unresponsive and pushing through legislation unwanted by the mean voter, its popularity is likely to drop, restricting the government's ability to pass legislation and increasing its incentives to become responsive. This suggests that institutions that produce minority governments on a (semi) regular basis may actually facilitate responsiveness and representation. These findings also highlight the importance of not focusing purely on relatively static institutional factors, such as electoral systems and federalism, when evaluating the quality of government, but also focusing on more dynamic factors that play a key role in how executives govern.

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Table 1. Social Welfare Responsiveness Cointegrating Equation

SW_billions	Election Year (E)	2.784 (1.999)	0.718 (2.438)
	Gov Party: Liberals (PG)	-7.284 (3.861)	-5.907 (4.291)
	Unemployment (U)	7.009 (0.683)**	4.675 (0.961)**
	Trend (T)	0.129 (0.004)**	0.151 (0.008)**
	Minority Government (MIN)	-5.843 (2.728)**	-536.556 (172.221)**
	Log of Government Popularity ln(P)	20.011 (6.632)**	0.478 (22.009)
	Governing Party Base (GP) MIP	1.578 (1.281)	-1.943 (1.774)
	Mean Voter (MV) – Governing Party Base (GP) MIP	4.081 (1.810)**	-32.343 (47.064)
	Intercept	-83.087 (23.768)**	5.816 (75.926)
	MIN X (MV – GP)		687.182 (179.679)**
	ln(P) X MIN		146.795 (47.138)**
	ln(P) X (MV – GP)		9.994 (12.875)
	ln(P) X MIN X (MV – GP)		-187.302 (49.214)**
ARMA	MA(3)	-0.497 (0.118)**	-1.000 (0.000)**
N		32	32

** $p<0.05$

Table 2. Social Welfare Responsiveness Error Correction Model

	ΔSW_billions	ΔSW_billions
Cointegrating Equation$_{t\text{-}1}$	-0.482 (0.163)**	-0.734 (0.261)**
ΔElection Year (E)	1.184 (1.005)	1.388 (1.223)
ΔGov Party – Liberals (PG)	-4.968 (2.654)	-6.606 (3.693)
ΔUnemployment (U)	0.991 (0.911)	0.379 (1.047)
ΔMinority Government (MIN)	-2.065 (1.801)	-228.282 (120.946)
Log of Government Popularity ln(P)	6.101 (3.672)	10.236 (10.986)
ΔGoverning Party Base (GP) MIP	1.098 (1.514)	-0.105 (1.668)
ΔMean Voter (MV) – Governing Party Base (GP) MIP	-0.785 (2.395)	3.250 (24.878)
ΔMIN X (MV – GP)		284.464 (132.614)**
Δln(P) X MIN		62.444 (33.429)
Δln(P) X (MV – GP)		-0.665 (6.662)
Δln(P) X MIN X (MV – GP)		-78.011 (36.557)**
Trend (T)	0.064 (0.097)	0.129 (0.118)
Intercept	3.752 (1.926)	3.150 (2.178)
R^2	0.52	0.54
N	31	31

** $p<0.05$

Table 3. Canadian Legislative Effectiveness Model

	Legislative Effectiveness
Governing Party (PG)	-0.044
	(0.036)
Government popularity (P)	-0.001
	(0.010)
Government popularity^2 (P^2)	0.000
	(0.000)
Minority Government (MIN)	-5.220
	(1.215)**
P X MIN	0.240
	(0.060)**
P^2 X MIN	-0.003
	(0.001)**
Constant	0.949
	(0.192)**
R^2	0.51
T	40

** $p<0.05$

Figure 1. Theoretical Model of Government Responsiveness and Effectiveness

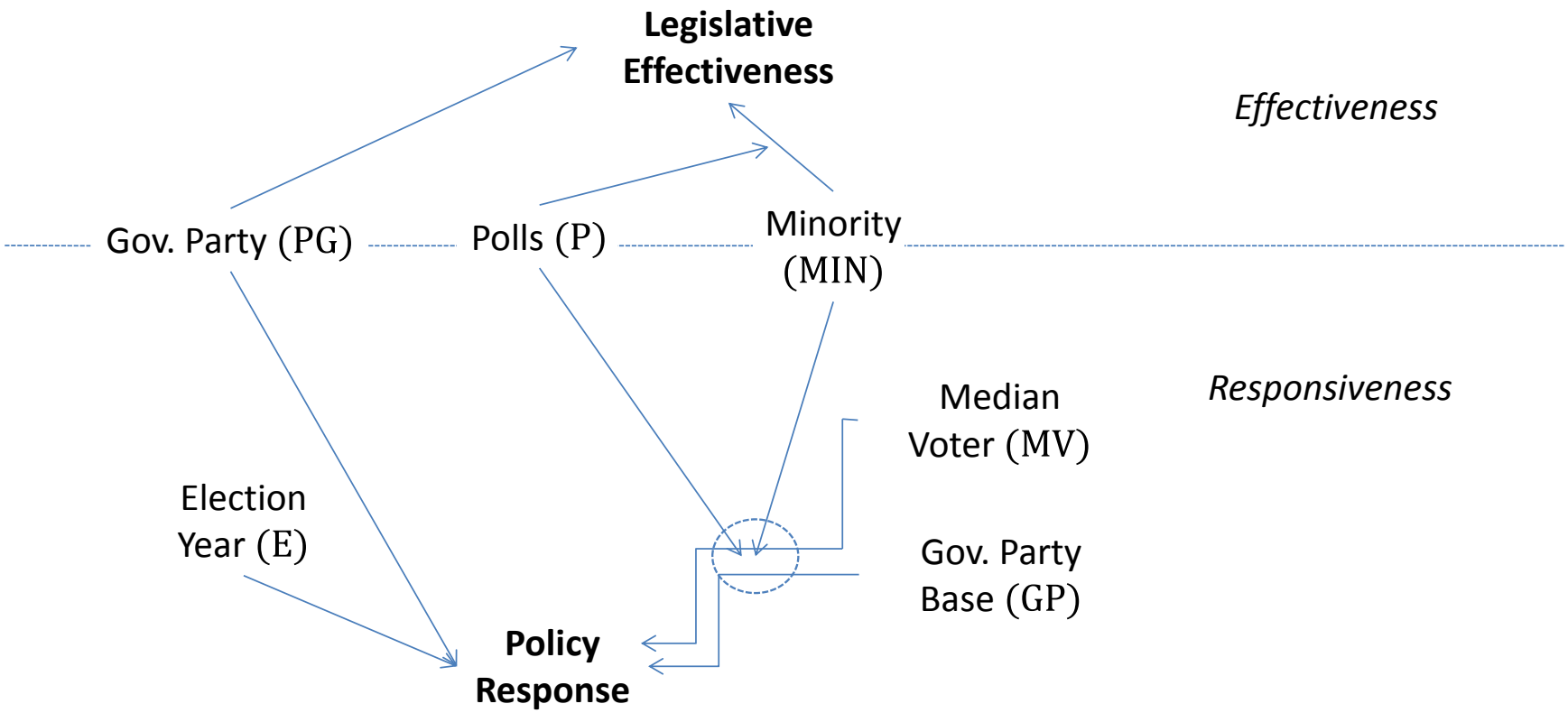


Figure 2. Government Expenditures on Social Welfare by Parliament and Session, 1965-2009

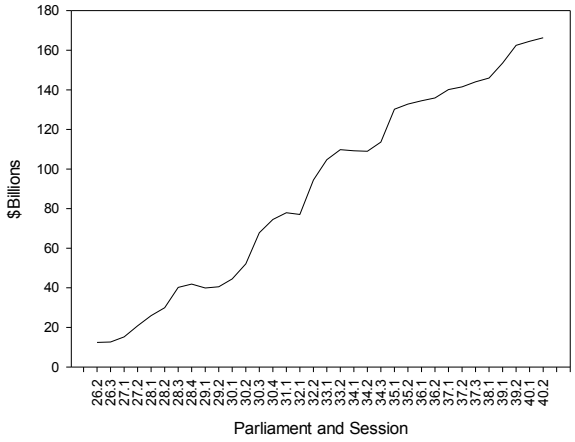


Figure 3. Social Welfare MIP by Parliament and Session, 1965-2009

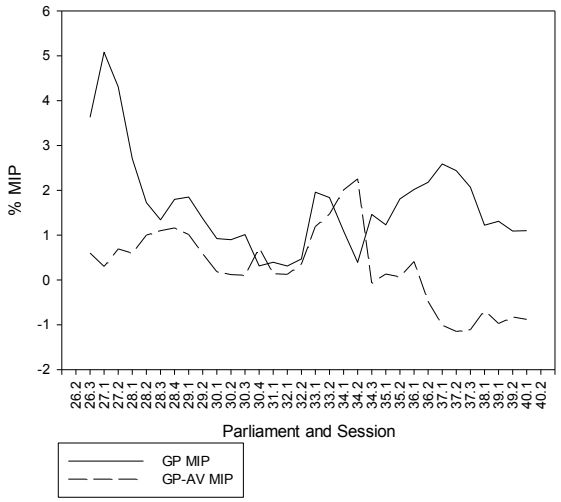


Figure 4. Legislative Effectiveness of the Canadian Federal Government, 1958-2008

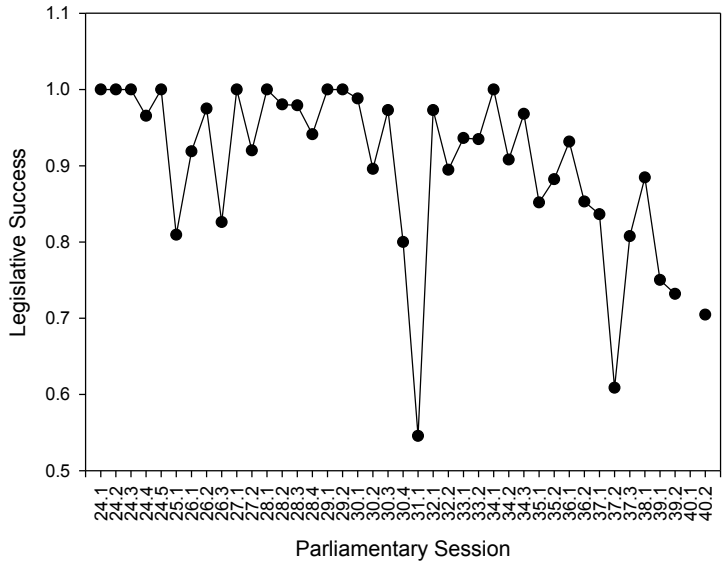
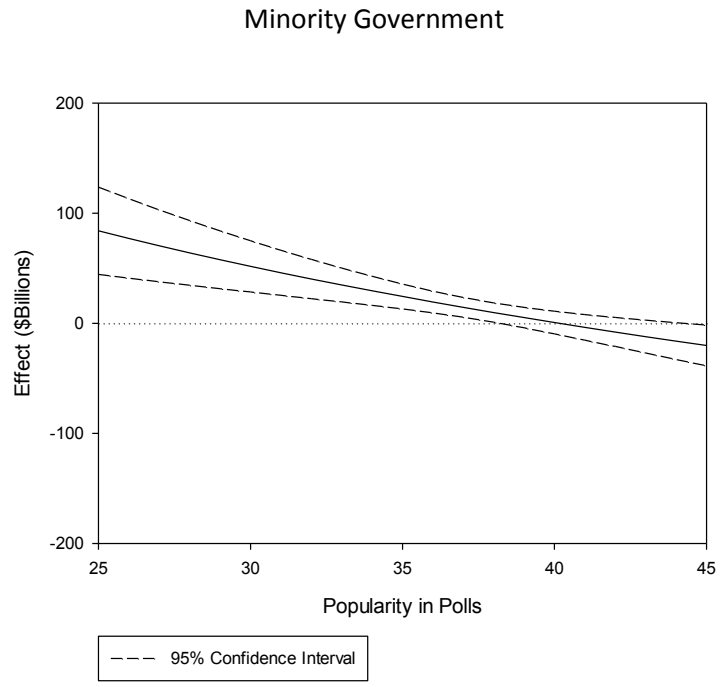


Figure 5. Long-run Responsiveness to Mean Voter (holding Party Base Constant)



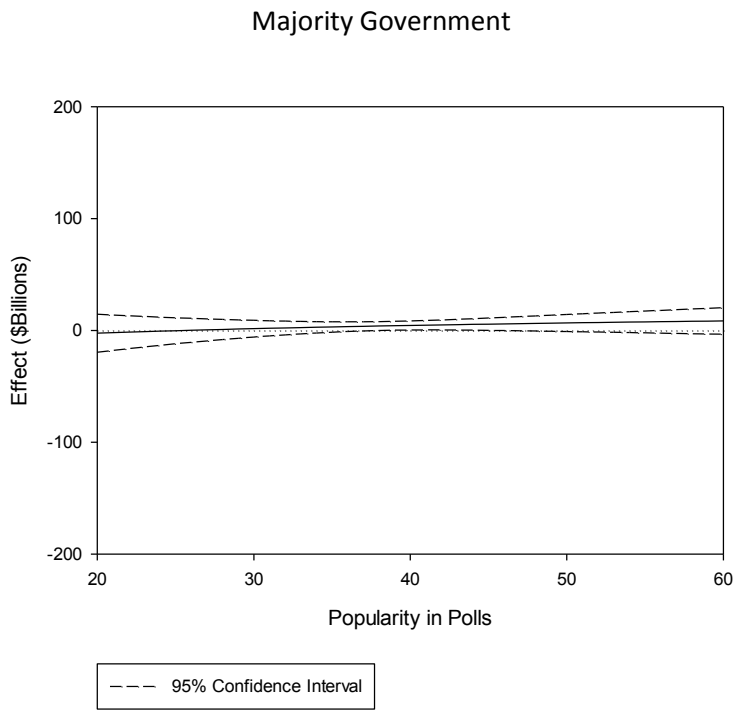
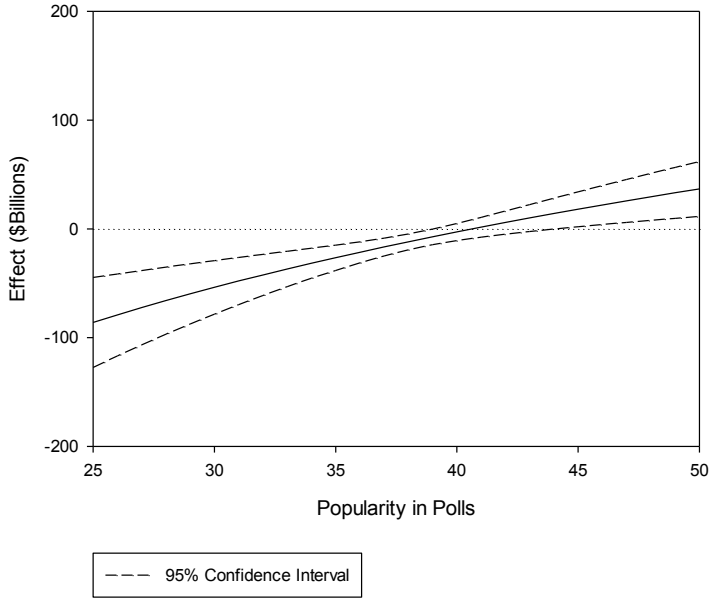


Figure 6. Long-run Responsiveness to Party Base (holding Mean Voter Constant)

Minority Government



Majority Government

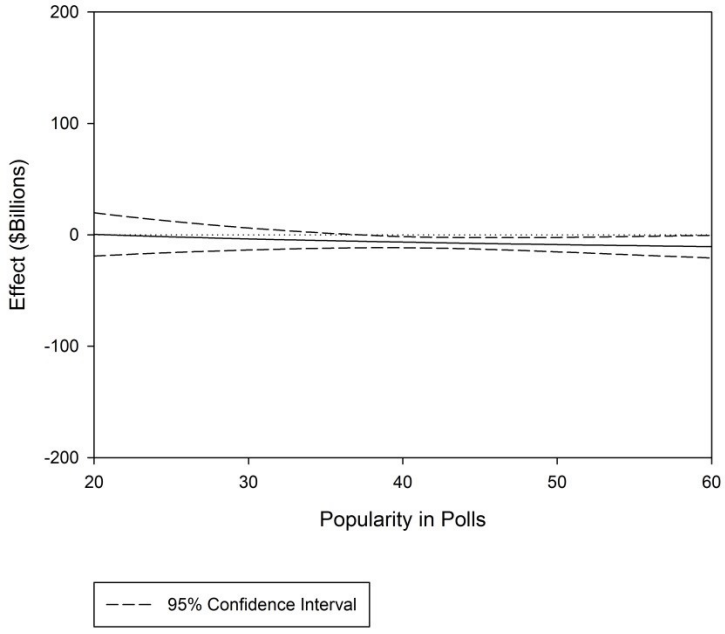
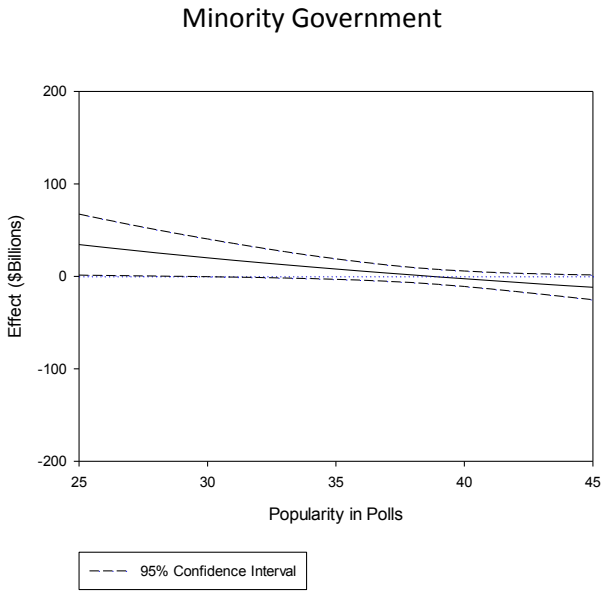


Figure 7.
Short-run Responsiveness to Mean Voter (holding Party Base Constant)



Short-run Responsiveness to Party Base (holding Mean Voter Constant)

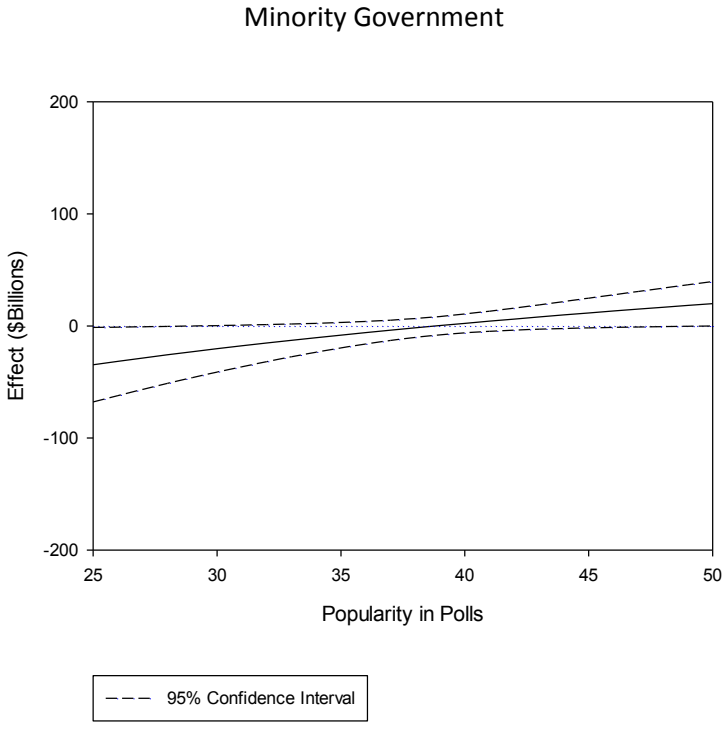


Figure 8. Effect of Minority Government on Effectiveness