



Increasing irrationality? The equilibrium relationship between electoral and legislative party system size, 1950–2005

Robin E. Best*

Political Science Department, Faculty of Social Sciences, Wassenaarseweg 52, Leiden University, 2300 RB Leiden, Netherlands

ARTICLE INFO

Article history:

Received 22 February 2008

Received in revised form 31 May 2009

Accepted 30 July 2009

Keywords:

Party system size

Electoral institutions

Strategic voting

Error-correction model

ABSTRACT

Institutional theories of party system size tell us that voters and parties should anticipate the mechanical effects of electoral systems and adjust their behaviour accordingly. If these expectations hold true, then the size of the party system at the electoral and legislative levels should maintain a long-run equilibrium relationship, as the number of parties receiving votes is adjusted in response to the number of parties in the legislature. I estimate a series of error-correction models to examine this expectation in 16 Western democracies from 1950 to 2005. Party system size at the electoral level does exhibit a general, equilibrium relationship with party system size in the legislature. However, this relationship has recently disappeared in single-member-district systems. This growing disparity between party system size at the electoral and legislative levels signals important changes in the nature of electoral representation.

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1. Introduction

Electoral institutions are often assigned a large role in shaping party system size, either on their own (Duverger, 1963 [1954]; Rae, 1971; Taagepera and Shugart, 1989) or in combination with social forces (Ordeshook and Shvetsova, 1994; Amorim Neto and Cox, 1997; Golder and Clark, 2006). The electoral system will determine the extent to which the party system reflects societal diversity by placing an upper bound on the number of viable competitors (Cox, 1997). Party system size, however, can be observed at two different and distinct levels: (1) at the electoral level, in terms of the number of parties receiving votes; and (2) at the legislative level, in terms of the number of parties receiving seats.

Theoretical accounts of electoral systems and party system size tell us that electoral systems affect the behaviour of rational political actors in ways that should produce a long-term equilibrium relationship between party system

size at the electoral and legislative levels. Although a large body of literature has documented evidence in support of both the mechanical and psychological effects of electoral systems (Duverger, 1963 [1954]; Shively, 1970; Spafford, 1972; Cain, 1978; Rae, 1971; Riker, 1982; Blais and Carty, 1991; Bowler and Lanoue, 1992; Liphart, 1994; Cox, 1997; Golder and Clark, 2006), the expected equilibrium relationship between electoral and legislative party system sizes remains unexplored. In this article I develop this theoretical relationship and elucidate the implications for party system size. Specifically, party system size at the electoral level should be tied to legislative party system size in the long run. Short run deviations in electoral party system size should be corrected over time, as the system returns to its long-run equilibrium relationship with legislative party system size. To examine this relationship empirically, I estimate a series of error-correction models that are perfectly suited to capture long-run equilibrium relationships (e.g. De Boef and Keele, 2008).

This project also provides a framework for evaluating how well legislative representation reflects (expressed) electoral preferences. In the absence of an equilibrium relationship, the current configuration of electoral

* Tel.: +31 (0)71 527 3670; fax: +31 (0)71 527 3815.

E-mail address: rbest@fsw.leidenuniv.nl

institutions will poorly represent the preferences of the electorate in the legislature. By many accounts, representation of voter preferences is enhanced when the distribution of parties supported by voters matches the distribution of parties in the legislature (e.g. Powell, 2000; McDonald and Budge, 2005). In the absence of an equilibrium relationship, the number and relative strength of legislative parties are disconnected from electoral outcomes. This would tell us that democratic representation under the current configuration of electoral laws is flawed at best and absent at worst. Indeed, such a lack of correspondence between party system size at the electoral and legislative levels would make a strong case for electoral reform.

Finally, this approach brings a fresh perspective to current changes in electoral politics by exploring the potential causes and consequences of electoral change in light of this institutional framework. The amassed evidence suggests that the predictability of electoral returns has declined in recent decades (e.g. Franklin et al., 1992; Dalton, 2004; Dalton and Wattenberg, 2002) and this, in turn, gives us reason to suspect that the behavioural constraints of electoral systems may have declined as well.

The findings of the analyses suggest that party system size at the electoral level is, as expected, in a long-run equilibrium relationship with legislative party system size in most democracies and for most of the post-WWII era. However, the analyses reveal a striking (and growing) disparity between electoral returns and legislative representation in the second half of the post-WWII era in single-member-district (SMD) electoral systems where the equilibrium relationship appears to have vanished. This suggests that voters and parties in SMD systems have been operating outside the bounds of institutional theories in recent decades, and that proportional electoral systems are better equipped to address and incorporate recent electoral changes. The final section is devoted to exploring possible explanations and implications of these findings for future studies of electoral systems, voting behaviour, and democratic representation in general.

2. Electoral institutions and party system size

2.1. *Electoral institutions as determinants of party system size*

The relationship between electoral institutions and party system size was brought to the forefront of political studies with the seminal work of Duverger (1963 [1954]), whose statement that SMD-plurality methods of elections tend to produce a two-party system attracted a wealth of attention. Although Duverger's 'Law' has been challenged as a deterministic statement and reformulated to account for third party persistence (e.g. Riker, 1976; Dobell, 1986; Chhibber and Kollman, 1998, 2004), support for the two mechanisms by which SMD systems encourage a two-party system – the mechanical and psychological effects – remains largely intact.

The mechanical effect of SMD systems encourages a two-party system due to its disproportional translation of vote shares into seat shares, which under-represents smaller parties in the legislature (Duverger, 1963 [1954]).

While research has shown SMD systems to be more disproportional than PR systems, very few (if any) electoral systems are perfectly proportional. District magnitude (Taagepera and Shugart, 1989; Gallagher, 1991; Cox, 1997), electoral allocation rules (Lijphart, 1986; Benoit, 2000), and electoral thresholds (Gallagher, 1992) can all contribute to disproportional vote-to-seat translations and, therefore, pose mechanical barriers to smaller parties seeking legislative representation. Taken in isolation, the mechanical translation of votes into seats affects party system size at the legislative level alone. The electoral system does not directly determine how many parties will receive vote shares or what these vote shares will be. Its only direct effect is on how these vote shares get translated into legislative representation. Of course, electoral systems are also known to affect party system size at the electoral level, but this requires additional assumptions about the behaviour of parties and voters.

The psychological effect expects voters to desert parties that stand little chance of winning representation. In an SMD system, two candidates that can viably compete in each district, so that voters should desert all but the largest two parties. This psychological effect can be found throughout the rational choice literature under the more actor-oriented terms of 'strategic', 'sophisticated', and 'tactical' voting (e.g. Downs, 1957; Riker, 1982; Cox and Shugart, 1996), and empirical examinations have amassed evidence in support of strategic behaviour (Shively, 1970; Spafford, 1972; Cain, 1978; Blais and Carty, 1991; Bowler and Lanoue, 1992; Merolla and Stephenson, 2006). Under SMD rules the incentives for strategic voting are clear, but since few electoral systems achieve perfect proportionality, voters in PR systems also have incentives to vote strategically (Cox and Shugart, 1996; Cox, 1997).

Political elites have similar incentives to behave strategically. Under SMD laws, parties and candidates have incentives to coalesce prior to elections in order to maximize their chances of being one of the two largest competitors (Duverger, 1963 [1954]). More generally, when representational prospects look bleak, political parties should either fail to emerge or should merge with larger parties (for a Belgian example, see Hooghe et al. (2005)). Blais and Carty (1991) examine this psychological effect on parties and find that fewer numbers of political parties contest elections under restrictive (i.e. SMD) electoral rules. Notably, if parties and potential candidates behave strategically in SMD systems, then voters will have no choice but to decide between the two parties that present candidates in their district. Thus, the size of the party system should be constrained first by the actions of parties, and then also by voters operating within the confines of electoral laws.

The associations between electoral systems and party system size have been well established, but what this body of literature lacks is a long-term view of the relationship between the mechanical and psychological effects. If voters and parties accurately anticipate and react to the mechanical effects of the electoral system, then they should adjust the number of parties receiving votes over time to bring it in line with the number of parties receiving seats.

2.2. The equilibrium relationship

It is only through the psychological effects on parties and voters that electoral systems constrain the size of the party system at the electoral level. Voters and parties anticipate mechanical effects, make calculations as to which parties are likely to receive representation, and structure their actions accordingly. It is in this sense that party system size at the electoral and legislative levels is endogenous, since the relationship between the mechanical and psychological effects have an endogenous relationship. Both are products of the electoral system, so that examinations of mechanical effects may also inadvertently capture psychological effects (Benoit, 2002). This endogenous relationship also underlies Taagepera and Shugart's (1989) "law of conservation of disproportionality (p. 123)", where they observe that electoral systems constrain the size of the party system to a number that maintains a given level of disproportionality.

It is this endogeneity that allows us to formulate expectations about party system size at the electoral level. The mechanical effects of electoral systems determine party system size at the legislative level by determining the level of (dis)proportionality, given the distribution of party vote shares. Importantly, the level of disproportionality will vary not only in response to the electoral system, but also in response to the distribution of votes. Under an electoral system that supports five viable parties, disproportionality will be higher if votes are distributed among nine parties than if votes are distributed among six parties. This is where the psychological effect steps in to limit the degree of disproportionality we observe. Voters and candidates will desert parties who fail to achieve legislative representation. In doing so, they should lower the number of parties to roughly match the number receiving representation. For instance, if an electoral system supports the representation of five parties in the legislature, but election results show voters supporting eight, then voters and candidates should coordinate their efforts to desert the parties least likely to win representation and support only five in the next election.

The strategic actions of voters, parties, and candidates should continually bring party system size at the electoral level in line with party system size at the legislative level, so that the two ebb and flow together over time. Stated differently, party system size at the electoral and legislative levels should be in an equilibrium relationship. When deviations from this equilibrium occur, as may happen in the presence of a swell in support for minor parties or a restructuring of voter alignments, these deviations should dissipate in subsequent elections as voters and parties respond to the mechanical effects of the electoral system.

In a perfectly strategic world with full information, deviations from equilibrium would be fully corrected in the next election and party system size at the electoral and legislative levels would be identical. However, we may expect party system size at the electoral level to always be slightly larger for two reasons. Firstly, although voters may know the likely mechanical effects of the electoral system, they are unlikely to be able to predict them perfectly. Therefore, we can expect party system size at the electoral

level to be higher than party system size at the legislative level at any point in time due to current deviations from proportionality in the vote-to-seat translation.

Secondly, we may expect party system size to always be slightly higher due to imperfect information (Myatt and Fischer, 2002; Clough, 2007; Myatt, 2007), a general acceptance by voters and parties of some level of disproportionality in election outcomes (Taagepera and Shugart, 1989) or other incentives to vote sincerely (e.g. Myatt and Fischer, 2002; Myatt, 2007).¹ Put differently, we may always expect some (presumably small) proportion of parties and voters to engage in sincere behaviour.² These things considered, once we have accounted for the current discrepancies in the vote-to-seat translation and the general willingness to support parties that do not receive legislative representation, we should still observe the expected equilibrium relationship in the form of a long run, one-to-one correspondence between party system size at the electoral and legislative levels.

This long-term relationship, however, is likely to be more fragile in SMD systems where the mechanical effect is very strong. Cox's $N + 1$ rule (and, of course, Duverger's Law) places an upper bound of two on the size of the party system in SMD systems.³ Sincere preferences in many districts are likely to dictate more than two political parties, so that strategic behaviour is essential for party system size to stay within this upper bound. Thus, the equilibrium relationship in SMD systems is highly vulnerable to coordination failures or increases in sincere behaviour, since these are likely to result in a strong disparity between the number of parties receiving votes and the number of parties receiving seats. Conversely, the incentives to behave strategically are strongest in SMD systems; therefore, it is precisely under these restrictive electoral laws that we should observe the equilibrium relationship predicted by institutional theories. Should voters and parties miscalculate the mechanical effects of the electoral system in any given election, they should readjust their behaviours accordingly, so that these deviations from the equilibrium dissipate quickly over future elections.⁴ If voters and parties have perfect information about the likely behaviour of others, then we would expect the return to equilibrium to

¹ Interestingly, work by Myatt and Fischer (2002) and Myatt (2007) suggests strategic voting by some voters may encourage sincere voting by others.

² Of course, a strict interpretation of the institutional approach to party system size would not allow or predict any amount of sincere behaviour (cf. Myatt and Fischer, 2002; Myatt 2007). My purpose here is simply to acknowledge the possibility (and empirical reality) that party system size at the electoral level is likely to be larger due to some degree of sincere behaviour.

³ Note, however, that this relationship takes place at the district-level. Thus, the fact that party system size has increased at the national level above two (as shown in Fig. 1) does not imply that the $N + 1$ bound has been exceeded at the district-level.

⁴ Importantly, the equilibrium relationship can (and is expected to) hold in SMD systems even if the size of the national party system is greater than two. Although the analysis presented here focuses on the national level, and consequently misses interesting district-level variation, the national equilibrium relationship should give us an idea of how well the electoral party system as a whole responds to changes in legislative representation.

occur immediately. If, however, there is ambiguity regarding which two parties/candidates are the most viable in the district, then it may take longer than one or two elections for the system to return to equilibrium.

Proportional systems, in contrast, can be much more accommodating to coordination failures and sincere behaviour, particularly where district magnitude is large and the electoral threshold is low. An accommodating electoral system can leave room for behaviour that is not subject to electoral constraints, meaning that PR systems can be quite adept at absorbing increases in party system size at the electoral level without a large amount of strategic behaviour. In many cases, increases in party system size at the electoral level may not produce deviations from equilibrium. This should make the equilibrium force easier to maintain in PR systems, since less strategic action is required.

2.3. Short-term instrumental rationality, information, and coordination

Any theory that incorporates the psychological effects of electoral systems assumes that the goal of both parties and voters is to receive representation in the legislature and that neither set of actors takes a long-term view. In short, we assume that voters and parties are short-term instrumentally rational with legislative representation as their goal.⁵

In order to observe the expected equilibrium relationship, we must also assume both voters and parties are informed about which political parties are most likely to receive representation. For instance, if we expect SMD systems to produce two parties at the district-level, then we must assume that voters and parties can agree on the same two parties. In other words, voters and parties must be able to coordinate in a manner that produces a party system at the electoral level that reflects the likely party system at the legislative level. This assumption may come under challenge when there is a lack of information about which parties are ultimately the most viable. These types of coordination problems are more likely to be present in fledgling democracies with unconsolidated party systems, rather than in advanced democracies where past election results serve as strong informational cues. However, a rapid fluctuation in the number or policies of parties contesting elections, massive political scandals, or any other change that weakens traditional voter alignments may produce similar effects in established democracies. Under these conditions, voters may choose to question the dominant role of the major parties, but fail to agree on which parties should replace them.

Judging by the changes that have taken place during the post-WWII era in the nature of Western electoral politics, it is not too far-fetched to imagine that voter coordination has

declined. Party systems and voter alignments appeared rather predictable in the 1950s and 1960s, when traditional social cleavages underpinned the workings of electoral politics (Lipset and Rokkan, 1967; Rose and Urwin, 1970). Recent scholarship, however, has amassed a preponderance of evidence to suggest that the old political order has deteriorated as traditional social cleavages (such as social class or religion) have declined (e.g. Franklin, 1985; Franklin et al., 1992; c.f. Evans, 1999), ecological and radical right parties have entered the electoral realm (e.g. Kitschelt, 1994; Norris, 2005), and voters have become more educated, independent, and less partisan (e.g. Dalton, 2002). In short, the nature of electoral politics in advanced democracies has changed. A major effect of these changes has been to produce increases in party system fragmentation in virtually all advanced democracies. Fig. 1 illustrates the increases in party system fragmentation by charting the average effective number of parties (ENP) at the electoral level, across the first and second halves of the post-WWII era for 16 advanced democracies.⁶ Only France has been immune from the increases in party system fragmentation that characterize the rest of the advanced democracies considered here.⁷

These changes give us good reason to question whether the long-term relationship between party system size at the electoral and legislative levels should apply equally across the post-WWII era. These patterns of electoral change may signal an electorate that is increasingly unable or unwilling to coordinate their electoral behaviour in a manner that maintains the expected relationship between party system size at the electoral and legislative levels. The available literature tells us that voter coordination is likely to decline when the number of parties contesting elections increases (Cox, 1997; Merolla and Stephenson, 2006). Merolla and Stephenson (2006), for example, find some support for decreasing levels of strategic behaviour with an increasing number of parties in Canada. Furthermore, research by Blais and Turgeon (2004) suggests that a significant proportion of voters have difficulty determining the most viable candidates in their district when the number of parties in SMD systems is greater than two. In the subsequent analyses I therefore pay special attention to the latter half of the post-WWII era.

Increased party system fragmentation tells us that voters are casting their ballots differently than they have in the past. It does not, however, tell us whether voters and parties are still acting rationally within the confines of electoral laws. The following analyses are therefore

⁶ The effective number of parties is a measure of party system size created by Laakso and Taagepera (1979) and is calculated as $1/\sum p_i^2$, where p is the proportion of votes (or seats) received by party i . This measure of party system size is useful in that it weights the contribution of each party by the party's vote (seat) share when calculating the size of the party system.

⁷ Fig. 1 presents an underestimation of party system fragmentation in Belgium by treating linguistically divided parties as single parties throughout both time periods. Thus, the changes presented for Belgium represent the changes in fragmentation that have occurred outside of the linguistic fragmentation. Somewhat similarly, the figures for the Netherlands treat the three Christian democratic parties as a single unit prior to their merger into the Christian Democratic Appeal in 1977.

⁵ Although short-term instrumental rationality is the primary assumption that forms the foundation of institutional explanations of party system size, Cox's (1997) model also requires assuming strict preference orderings, representation of all types of voters, and accurate information about likely vote shares (see pp. 76–78).

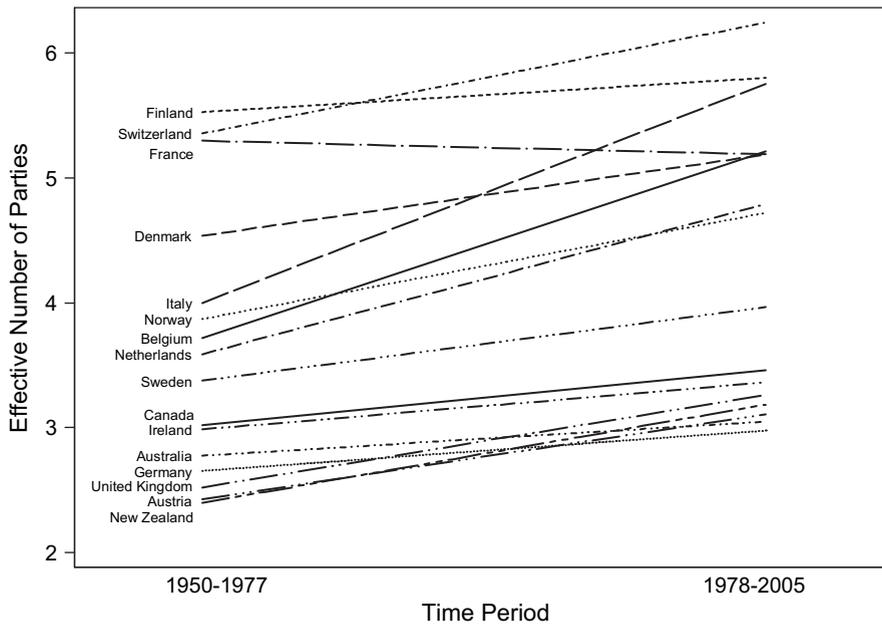


Fig. 1. The effective number of parties in votes in 16 advanced democracies, 1950–1977 and 1978–2005.

designed to shed light not only on whether the expected equilibrium relationship exists, but also whether there has been a marked difference in the effects of electoral institutions on voting behaviour over time. If this relationship has deteriorated over the post-WWII era, then we have evidence that the increases in fragmentation have been matched by corresponding declines in the predictability of voter and party behaviour. Such a finding should then direct our attention to the possible reasons for this decline.

3. An error-correction model of party system size

The expectations about the relationship between party system size at the electoral and legislative levels can be properly examined with an error-correction model. Error-correction models are useful anytime short- and long-term dynamics are of interest, and especially useful for estimating the speed at which two variables return to their equilibrium relationship once a deviation has occurred (see De Boef and Keele, 2008). The basic form of an error-correction model is as follows.

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \beta_0 \Delta X_t + \beta_1 X_{t-1} + \epsilon_t \quad (1)$$

In Eq. (1), α_1 estimates the speed at which X and Y return to their long-run equilibrium state after a deviation has occurred, while β_1/α_1 is the long-run multiplier that tells us the total long-run effect of a unit change in X on Y . This long-run effect is distributed over future time periods, with α_1 as the proportion of the effect that occurs per time period. Put simply, after a change in X , α_1 will tell us how quickly Y changes to restore the equilibrium relationship,

while the long run multiplier will tell us the total amount of change in Y . The estimate of β_0 will capture the immediate, short run effect of a change in X on Y .

The estimates of the long-run effects of X on Y make error-correction models perfectly suited for the task at hand. In terms of the posited relationship between the effective number of parties at the legislative and electoral levels ENP-Seats, the error-correction model can be specified as follows.

$$\begin{aligned} \Delta ENP-Votes_t = & \alpha_0 + \alpha_1(ENP-Votes_{t-1}) + \beta_0(\Delta ENP-Seats_t) \\ & + \beta_1(ENP-Seats_{t-1}) + \epsilon_t \end{aligned} \quad (2)$$

In Eq. (2), the effective number of parties calculated from party vote shares (ENP-Votes) is modelled as a function of short- and long-term effects of the effective number of parties calculated from party seat shares (ENP-Seats). The estimated coefficient for $\Delta ENP-Seats_t$ (β_0) will capture any short-term relationship between the ENP-Seats and ENP-Votes, the effects of which never linger longer than one election. Stated differently, β_0 will capture the mechanical effects of the electoral system, signalling how the ENP-Votes and ENP-Seats change together in the short-term. We can expect this coefficient to equal one under a perfectly proportional electoral system (or a system that behaves as such) and to be less than one in systems that favour larger parties. The coefficients on the lagged ENP-Votes (α_1) and lagged ENP-Seats (β_1) terms capture the crux of the argument by estimating the long-term effects of changes in the ENP-Seats on the ENP-Votes, the equilibrium relationship between the two, and the speed at which the ENP-Votes will adjust to any deviations from its equilibrium relationship with ENP-

Seats. In other words, these coefficients will tell us whether party system size at the electoral level is functioning as an equilibrium force on party system size at the electoral level.

If the ENP-Votes and ENP-Seats are properly modelled as having a long-term, equilibrium relationship, then α_1 should be negative and significant, signalling an error-correcting mechanism. More precisely, α_1 will tell us the speed at which the ENP-Votes adjust in response to a deviation from its equilibrium relationship with the ENP-Seats by estimating the proportion of the deviation (or, 'error') that is corrected per election, and the long-run multiplier (β_1/α_1) will tell us the total effect of a one-unit increase in the ENP-Seats.

De Boef and Keele (2008: p. 186) state (correctly) that political science theories rarely dictate precise expectations about the timing of dynamic relationships and the precise characteristics of equilibrium behaviour. The current study, however, presents an interesting exception to this claim. The institutionally driven accounts of party system size presented above have very explicit implications for the dynamic relationship between the ENP-Votes and the ENP-Seats.

In the context of an error-correction model, a statistically significant and negative coefficient on the error-correction mechanism (α_1) in combination with a significant and positive long-run multiplier would provide evidence in support of an equilibrium relationship between ENP-Votes and ENP-Seats. These findings would suggest that an increase (decrease) in the ENP-Seats is matched by an increase (decrease) in the ENP-Votes that is distributed over subsequent elections. A substantial number of estimated coefficients would, therefore, substantiate the general claim that the ENP-Seats should operate as an equilibrium force on the ENP-Votes by meeting these requirements. We can, however, formulate more precise expectations. If voters and parties respond perfectly to mechanical effects, then we would expect the error-correction mechanism to be almost immediate, signalling the ability of voters and parties in the current election to correct any miscalculations made in the past election. In short, if both voters and parties behave in a rational and strategic manner, then α_1 should approximate -1 , which would signal a return to equilibrium in the next election. However, the rate of error-correction will depend upon the amount of information available to parties and voters and, therefore, may slow in response to lower levels of information.

Additionally, voters and parties should coordinate to bring party system size at the electoral level in line with party system size at the legislative level, which suggests a one-to-one long-term relationship. In terms of an error-correction model, we would expect the long-run multiplier to approximate a value of 1, as the ENP-Votes should respond to a one-point change in the ENP-Seats with a similar one-point change. We would expect to observe these precise long-term relationships after accounting for any vote-to-seat discrepancies in the current election (captured in the model by β_0) and for the degree to which voters and parties willingly support parties that do not receive legislative representation, which is roughly captured by α_0 .

4. Analysis

I estimate a series of error-correction models using vote and seat data for 16 Western democracies over the post-WWII era (1950–2005).⁸ If institutional accounts of party system size are correct, then the ENP-Seats should act as an equilibrium force on the ENP-Votes in all countries and across all time periods. However, we have reason to suspect that this relationship may differ in an era of increased party system fragmentation. Thus, I also report estimates separated by time period (1950–1977 and 1978–2005) and by electoral system type (SMD vs. PR). The separation of the analysis into the two time periods accurately represents expected theoretical differences in the nature of electoral politics. The electoral politics of Western democracies are commonly regarded as stable, at least in terms of voter alignments, during the 1950s and 1960s. We begin to see the first signs that these traditional alignments are fraying in the mid to late 1970s before the changes become readily apparent with the entry of ecological and radical right parties and increasing fragmentation in the 1980s and 1990s.

The unit of observation is the country-election. Thus, the data are properly characterized as time-series cross-sectional (TSCS) data. Due to the potential for TSCS data such as these to have non-spherical errors, I have estimated all error-correction models using panel-corrected standard errors (Beck and Katz, 1995).⁹ All models were also estimated with country-specific fixed-effects (not reported) to account for country-specific heterogeneity.

I begin by examining the short- and long-term dynamics of party system size in all countries. Table 1 reports the results of three error-correction models: one for the entire post-WWII era, 1950–1977, and 1978–2005. Across countries and time, the implications of institutional theories of party system size receive a substantial amount of empirical support. Throughout the entire time period (post-1950) we see that the ENP-Seats does act as an equilibrium force on party system size. Moreover, the estimate of the long-run multiplier in the full model is statistically indistinguishable from one, suggesting changes in the ENP-Seats and

⁸ While the institutional expectations for party system size should apply to any democracy, Western democracies make a good selection for this analysis given their common length of tenure with democracy and exhibition of similar trends in party system size over time. Data on party vote and seat shares come from Mackie and Rose (1991) and various editions of the *European Journal of Political Research*. The 16 advanced democracies include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, New Zealand, Norway, Sweden, Switzerland, and Great Britain. The United States is not included due to the nature of the presidency and the Electoral College.

⁹ Time-series cross-sectional (TSCS) data are characterized by having repeated observations of the same units over time and asymptotic properties that are derived from the number of time-points. The repeated time-points in TSCS are what allow us to apply time-series methods, such as error-correction models, to data that is TSCS. Although large numbers of time-points are generally preferred to few, the number of time periods (i.e. elections) per country in the data used here range from a low of 12 (Italy) to a high of 21 (Denmark and Australia). These numbers are large enough so that "averages over the T time periods for each unit make sense (Beck, 2001: p. 274)". However, greater caution should be exercised in interpreting the results of the models for the first and second halves of the post-WWII era due to the lower number of time periods.

Table 1
Legislative representation as an equilibrium force on the effective number of parties^a.

Dependent Var. Δ ENP-votes	Post-1950	1950–1977	1978–2005
	Coefficient (se)	Coefficient (se)	Coefficient (se)
Δ ENP-seats	0.83** (0.05)	0.83** (0.06)	0.81** (0.07)
ENP-Votes _{<i>t</i>-1}	-0.48** (0.12)	-0.70** (0.19)	-0.62** (0.19)
ENP-Seats _{<i>t</i>-1}	0.49** (0.12)	0.69** (0.20)	0.55* (0.19)
Constant	0.26* (0.11)	0.33* (0.14)	0.81* (0.27)
N	263	135	128
R ²	0.75	0.83	0.75
Long-run multiplier of ENP-Seats _{<i>t</i>-1}	1.04** (0.02)	1.00** (0.03)	0.89** (0.04)

^a Table entries are OLS coefficients and panel-corrected standard errors. Standard errors and significance levels of the long-run multipliers were estimated using the Bewley transformation regression (see Bewley, 1979; De Boef and Keele, 2008). Country-specific fixed-effects not reported. ** $p \leq 0.001$, * $p \leq 0.05$, one-tailed tests.

ENP-Votes occur in a one-to-one relationship, after controlling for current deviations from proportionality.¹⁰ This finding falls directly in line with what institutional accounts of party system size would have expect.

If voters and parties had complete information about the likely electoral fortunes of each political party, then we would expect an immediate return to equilibrium after a deviation had occurred. What we observe, however, is a more modest rate of error-correction. The error-correction process operates at about 0.48% per election, so that it takes approximately four elections for almost all of the deviation from equilibrium to be corrected. The positive and significant value of the constant suggests that the change in the ENP-Votes is, on average, about 0.26 even after accounting for the long-term equilibrium relationship, which signals a modest willingness on the part of voters to support parties who do not receive representation.

The predicted relationship between the ENP-Seats and the ENP-Votes looks even better from 1950 to 1977, where the long-run multiplier is equal to one, the constant is insignificant, and the error-correction mechanism operates faster at a rate of 0.70 per election.¹¹ Moreover, this estimate of the error-correction process is statistically indistinguishable from one, signalling an immediate return to

equilibrium. In the 1978–2005 period, the error-correction process drops slightly to 0.62 per election (and is now distinguishable from one)¹² and the ENP-Votes appears to be slightly under-responsive to changes in the ENP-Seats, producing a long-term increase of 0.9 in the ENP-Votes for every one-point increase in the ENP-Seats. Furthermore, in the later time period voters appear more willing to support parties that do not receive representation. Although voters and parties do not respond immediately to deviations in the equilibrium relationship between the ENP-Seats and the ENP-Votes, the results generally support the expected relationships. We observe a long-term, equilibrium relationship between the ENP-Seats and the ENP-Votes that approximates a one-to-one relationship across all time periods. However, the psychological effects of electoral system translations appear to have stronger effects on party system size in the first time period compared to the second.

The mechanical and psychological effects of electoral systems tell us that these effects should be stronger and more apparent in SMD systems than in more proportional systems. However, we should also expect SMD systems to be especially vulnerable to coordination failures and sincere voting behaviour. In Table 2, I present the results of models that separate the data by both time period and electoral system type. A quick glance at the table reveals that the favourable results found in the previous models were driven primarily by PR systems, which perform according to expectations, while the performance of SMD systems is generally lower and varies across time periods.

In countries employing proportional representation systems, the short-term relationship between the ENP-Seats and the ENP-Votes is equal to one, while the long-term equilibrium relationship appears to be over-responsive at times. The estimates for the post-1950 period suggest that a one-point increase in the ENP-Seats is matched by a 1.15 increase in the ENP-Votes, with an error-correction speed of 0.75 of deviations corrected per election. This suggests a general tendency for the ENP-Votes to increase above and beyond the number of parties that receive representation in the legislature after an increase in the ENP-Seats. This over-responsiveness of the ENP-Votes is present in both time periods, but is statistically distinct from a one-to-one

¹⁰ Standard errors and significance levels for long-run multipliers were estimated using Bewley transformation regressions (see Bewley, 1979; De Boef and Keele, 2008).

¹¹ There are two possible ways to examine the period effects that are of interest here. One is to estimate a pooled model with interaction terms to capture any differences in the independent variables across time periods. Due to the difficulty in interpretation that occurs with multiple interactive terms that share a constitutive term, I have chosen instead to separate the analyses by time period. The division of time into periods of 1950–1977 and 1978–2005 corresponds to theoretical and empirical expectations about electoral change and also keeps the number of time periods as high as possible across periods. The results of a full interaction model do not differ statistically or substantively from those presented here, but provide estimates of whether or not the coefficients are significantly different across time periods or electoral system type. In the full interaction model, the difference in the long-run multiplier between the two time periods, as presented in Table 1, is significant at the 0.05 level. In Table 2, all of the estimated coefficients for SMD and PR systems over the post-1950 are significantly different at the 0.05 level. For SMD systems, the long-run multiplier is significantly different across the two time periods at the 0.05 level, while the short-term effect (β_0) of a change in the ENP-seats is statistically different across the two time periods at the 0.1 level for PR systems.

¹² Notably, the estimates of the error-correcting mechanism (ENP-votes_{*t*-1}) are not significantly different across these three models.

Table 2Legislative representation as an equilibrium force on the effective number of electoral parties by electoral system type^a.

Dependent Var.: Δ ENP-Votes	Post-1950		1950–1977		1978–2005	
	SMD Coefficient (se)	PR Coefficient (se)	SMD Coefficient (se)	PR Coefficient (se)	SMD Coefficient (se)	PR Coefficient (se)
Δ ENP-Seats	0.43** (0.14)	1.00** (0.03)	0.40** (0.12)	1.04** (0.03)	0.46* (0.26)	0.92** (0.05)
ENP-Votes _{t-1}	-0.42** (0.13)	-0.75** (0.11)	-0.65** (0.18)	-0.72** (0.16)	-0.51* (0.25)	-0.98** (0.19)
ENP-Seats _{t-1}	0.23 (0.20)	0.86** (0.13)	0.45* (0.17)	0.76** (0.17)	-0.02 (0.42)	1.03** (0.20)
Constant	0.73* (0.44)	-0.12 (0.11)	0.72* (0.44)	0.09 (0.13)	1.71* (0.87)	0.46 (0.37)
N	99	164	54	81	45	83
R ²	0.41	0.91	0.63	0.96	0.45	0.91
Long-run multiplier of ENP-Seats _{t-1}	0.54* (0.18)	1.15** (0.02)	0.69** (0.16)	1.06** (0.02)	-0.04 (0.43)	1.05** (0.06)

^a Table entries are OLS coefficients and panel-corrected standard errors. Standard errors and significance levels of the long-run multipliers were estimated using the Bewley transformation regression (see Bewley, 1979; De Boef and Keele, 2008). Country-specific fixed-effects not reported. * $p \leq 0.001$, ** $p \leq 0.05$, one-tailed tests.

relationship only in the first half of the post-1950 era. This result is encouraging, if unsurprising. In PR systems, it appears that party system size has room to increase and still fall within institutionally defined boundaries. Across all time periods, PR systems also exhibit a fast rate of error-correction. In the 1978–2005 period, the estimated rate of error-correction signals an immediate return to equilibrium in the following election. Furthermore, estimates of β_0 for all PR models are indistinguishable from one, suggesting that vote-to-seat deviations are virtually absent even in the short run. These findings are in line with expectations and demonstrate the ability of PR systems to adapt to a changing electorate and party system.

SMD systems present a different picture. When the entire post-1950 time period is considered, the ENP-Votes appears to be substantially under-responsive to changes in the ENP-Seats, increasing by only 0.54 for every one-point increase in the ENP-Seats. When the two time periods are considered separately, it appears that this finding is driven by the complete breakdown of the ENP-Seats as an equilibrium force in the 1978–2005 period. From 1950 to 1977, the ENP-Seats act as an equilibrium force on the ENP-Votes with a long-run multiplier that is slightly under-responsive, but statistically indistinguishable from one at the 0.05 confidence level. The rate of error-correction is also very fast, estimated at 65% of the deviation per election and with a standard error that makes it statistically indistinguishable from one. Overall, the expectations are met in the 1950–1978 period. However, all of these findings disappear in the 1978–2005 period, where a one-point change in the ENP-Seats has no long-run equilibrating effect on the ENP-Votes. Furthermore, voters in this time period appear to be increasingly willing to support candidates who do not receive legislative representation. The lack of any long-run relationship between the ENP-Votes and ENP-Seats is troubling from an institutional perspective, since it signals an electorate either unwilling or unable to consider the representational prospects of parties when casting their ballots. In the latter half of the post-WWII era, representational motivations appear to have declined.

With the notable exception of SMD systems in the later time period, the ENP-Seats does appear to act as an equilibrium force on the ENP-Votes and often in a manner that produces a precise one-to-one long-term relationship. But

how quickly is this long-term relationship realized? Fig. 2 charts the movement of the ENP-Votes in response to a one-point increase in the ENP-Seats over subsequent elections, first for all countries and then by electoral system type. When all countries are considered, a one-point increase in the ENP-Seats produces a roughly one-point increase in the ENP-Votes. Most of this effect is realized within the first couple of elections, but the entire increase is observed at a maximum of seven elections into the future. The speed of the error-correction mechanism is faster in the beginning of the post-1950 era, taking a total of four elections to correct all deviations from equilibrium, than in the second time period where about six future elections are required.

When the countries are separated by electoral system type, the fast-paced nature of PR systems in correcting deviations from equilibrium is readily apparent in the 1978–2005 time period, when the system returns to equilibrium after only two elections. In the 1950–1978 time period both electoral system types take longer (approximately five elections) to fully realize the long-term effect. Moreover, the tendency for the ENP-Votes to over-respond to changes in the ENP-Seats is visible in both time periods, as the ENP-Votes jumps above one within two elections after a one-point increase in the ENP-Seats.

The more striking results presented here are found in SMD systems. On the one hand, SMD systems may be easier to throw out of equilibrium, so to speak, since the mechanical effects of the electoral system are so strong. An increase in party system size that occurs at the electoral level is unlikely to be matched with corresponding increases at the legislative level, due to the disproportional translation of votes into seats. Furthermore, any outburst of sincere voting will register more in SMD systems than in PR systems, making it more difficult to maintain the equilibrium relationship. SMD systems are not as accommodating to changes in voter preferences and miscalculations, so that the equilibrium relationship is easier to disrupt with only small changes in electoral behaviour. The changes in voter alignments and party preferences that have occurred over the post-WWII era may have easily distorted this relationship. That being said, it is in SMD systems where we expect the psychological effects of electoral systems to exert the strongest force on the behaviour of parties and

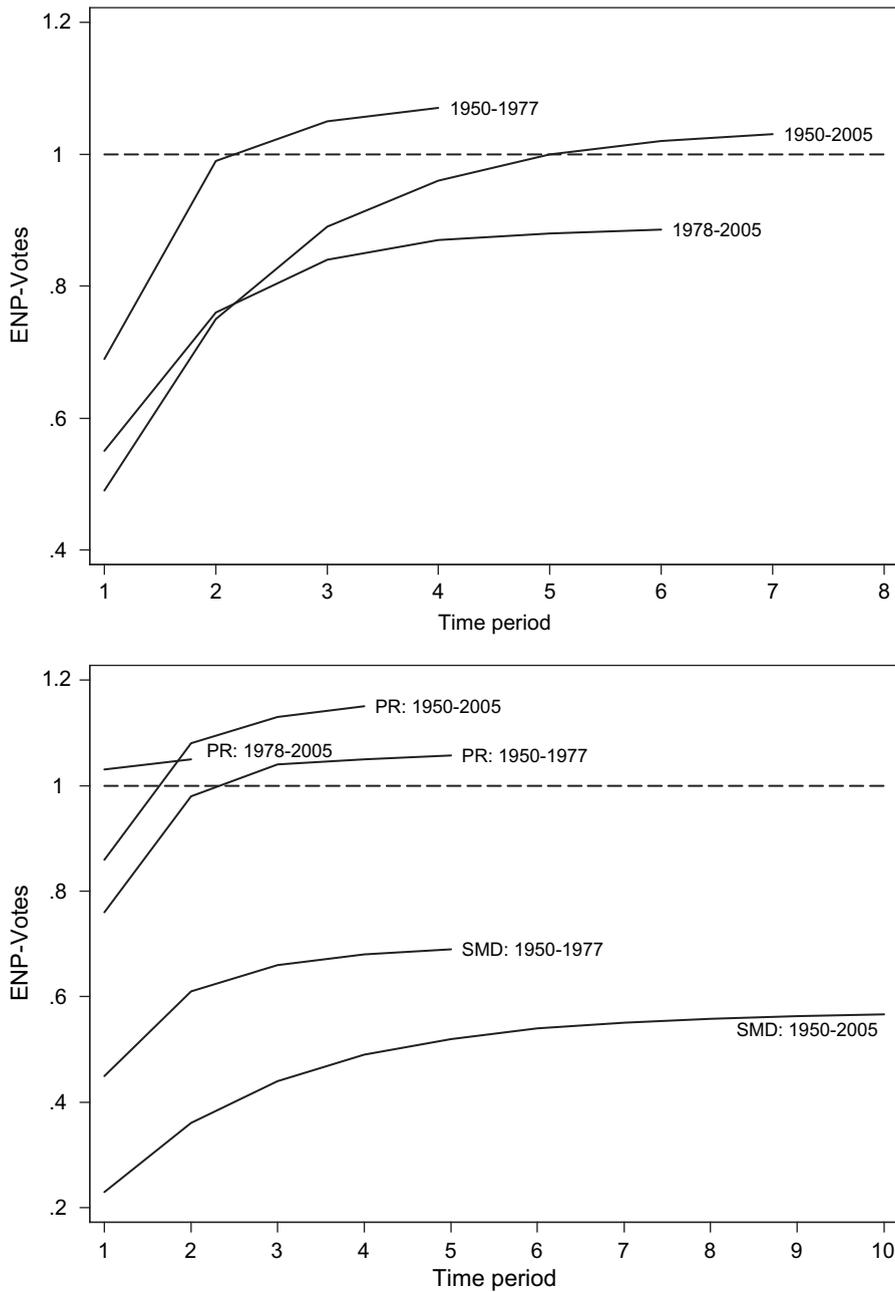


Fig. 2. Change in the ENP-votes in response to a one-point increase in the ENP-seats.

voters at the electoral level. The results presented for SMD systems in the 1978–2005 period stand in direct contrast to this proposition. Furthermore, if voters in SMD systems decided, for any reason, to throw their support toward parties that stand little chance of winning elections, our theories tell us this support for small parties should dissipate over time, as it becomes clear that small parties will not receive legislative returns in proportion to their vote shares. What we witness is exactly the opposite.

Fig. 3 provides an illustration of the changes in party system size that have occurred at both the electoral and

legislative levels for all countries. If the equilibrium relationship exists, then we should see the ENP-Votes roughly track the ENP-Seats over time. This is roughly what we observe in some nations employing PR electoral systems, such as Denmark, the Netherlands, Norway and Sweden. However, in all of the SMD systems we see some form of persistent increase of the ENP-Votes without similar increases in the ENP-Seats. Party system size at the electoral level appears to be drifting higher and higher, undeterred by the mechanical constraints of the electoral system. While the precise timing of these changes differs across countries,

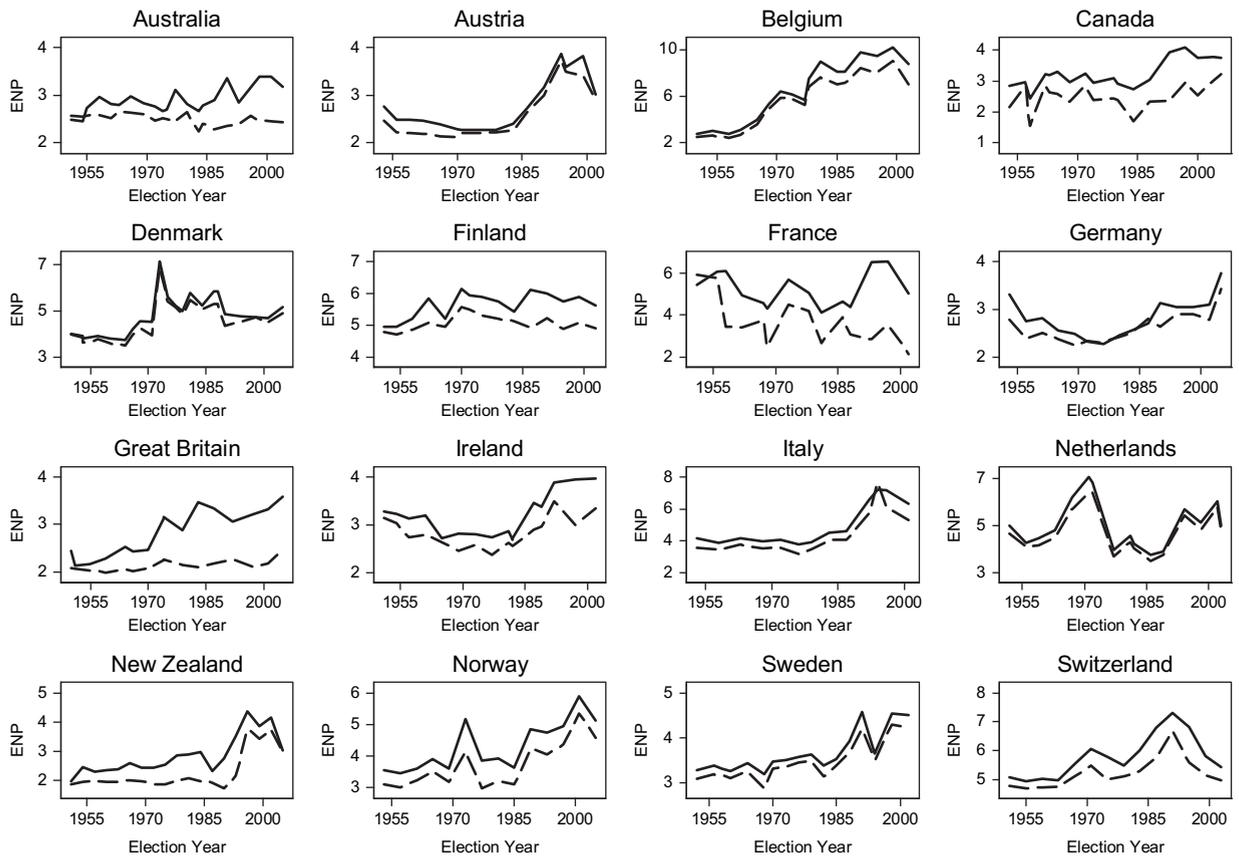


Fig. 3. The effective number of parties in votes and seats in 16 advanced democracies, 1950–2002. Solid line: ENP-votes; dashed line: ENP-seats.

we can see that this unexpected relationship occurs mainly in the latter half of the post-WWII era. For instance, in Australia and Canada, the ENP-Votes begins to move away from the ENP-Seats in the 1980s. In New Zealand, we see a modest drift of the ENP-Votes away from the ENP-Seats prior to the first elections under a mixed-member proportional system in 1996. Even in France, the sole country that does not exhibit significant increases in party system fragmentation, we see the ENP-Votes drift away from the ENP-Seats in the 1990s. By far, however, the most striking trends are seen in Great Britain, where party system size at the electoral level has been persistently increasing throughout the post-WWII era and is noticeably isolated from party system size at the legislative level.

5. Implications for electoral politics and research

If the mechanical and psychological effects of electoral systems operate according to the expectations of institutional theories, then we should observe an equilibrium relationship between party system size at the electoral level and legislative level. Party system size at the legislative level should direct party system size at the electoral level by providing information to voters and parties about which, or how many, parties are viable political contenders. The above analyses support the existence of this relationship in Western democracies over the post-WWII era. Generally speaking,

both parties and voters do appear to behave as if they care, in the short-term, about representational prospects. The findings presented here are best characterized as support for the equilibrium relationship institutional theories would have us expect. In that sense, this evaluation of democratic representation under different electoral institutions generally looks good.

However, there is some evidence that this relationship has been challenged by recent changes in electoral politics. In PR systems, the growth of party system size at the electoral level has been easily absorbed at the legislative level, preserving and even strengthening the long-term relationship. The situation looks worse, however, in SMD systems where the equilibrium force appears to have broken down. While we know PR systems are better equipped at translating electoral changes into the legislative arena, the fact that SMD systems illustrate similar changes without corresponding legislative adjustments is a puzzle. Why would party system size increase at the electoral level when faced with such a hostile vote-to-seat translation? At face value, this trend presents a challenge to accurate representation under SMD rules.

It is, of course, possible that the assumptions made by institutional theories about the behaviour of voters do not accurately characterize voters in recent decades. Fewer numbers of voters and parties appear to be short-term instrumentally rational, in the sense that their behaviour is

driven by the immediate prospects of legislative representation. Therefore, one possible explanation is that we have seen an increase in sincere behaviour on the part of both voters and parties and/or that parties and voters take a long-term view when making their decision. However, this possibility is rather unsatisfying on its own in that it does not give us any explanation as to why this type of behaviour has increased.

One explanation may be that protest voting has increased. Studies of tactical voting have revealed evidence of both strategic voting and protest voting in SMD systems (e.g. Riker, 1976; Bowler and Lanoue, 1992). Voters may increasingly choose to express their dissatisfaction with the major political parties by supporting to minor parties in the system. In order for protest voting to be a plausible explanation for the trends we have observed, dissatisfaction with the major parties in the system must have been rapidly growing over the post-WWII era. Judging from available indicators of voter trust and support toward government, this claim may not be unfounded (Dalton, 2004).

Alternatively, a lack of district-level competition could also result in this disparity. Voters have stronger incentives to behave sincerely in uncompetitive districts (e.g. Shively, 1970; Spafford, 1972; Cain, 1978; Bowler and Lanoue, 1992). Thus, it is possible that the number of uncompetitive districts has increased in SMD systems, promoting an increase in sincere voting.

The incentives to form and maintain political parties, however, may be more important than changes in voting behaviour, since voting behaviour is constrained by the available political parties. If parties behaved perfectly strategically, then voting options would be limited to those parties that are already defined as 'rational' or even 'strategic' choices. The only way in which voters may vote sincerely for a party that has little chance of securing representation is if this party has already behaved 'non-strategically' in deciding to contest the election. Importantly, voter coordination is also more difficult when more parties contest elections (Cox, 1997; Blais and Turgeon, 2004; Merolla and Stephenson, 2006), so that what looks like erratic behaviour on the part of voters may really be driven by the actions of parties (Tavits, 2008). Thus, the question is how and why we might expect higher numbers of parties to contest elections.

In recent decades a great number of advanced democracies have introduced laws that provide public funds for political parties. If these funds are provided on the basis of electoral performance, then they may serve as an alternative reward for contesting elections. Parties may therefore find a financial benefit in contesting elections even if they do not immediately receive representation in the legislature. The subject of party finance is certainly a potential explanation that is worthy of further exploration.

The denationalization of politics may also underlie this trend. Scholars have long been aware of exceptions to Duverger's Law. Canada and India, and in more recent years Great Britain, have served as exceptions to two-party dominance in SMD systems. Explanations for these exceptions have, to a large degree, focused on district-level determinants of party competition. Exceptions to Duverger's law are likely to occur when party strengths differ

across regions; or stated differently, when party support is heavily concentrated within districts (e.g. Riker, 1976; Kim and Ohn, 1992; Chhibber and Kollman, 1998; Chhibber and Murali, 2006). Of course, the regionalization of support is a persuasive explanation of why SMD systems may have more than two parties in the legislature. But for party system fragmentation to have increased at the electoral level, but not at the legislative level, we need a more nuanced account of regionalization. Specifically, regionalization must have occurred in a manner that provided incentives for parties to run in districts without regard for national representation, such as an increase in the importance of regional offices.

Even if new parties have emerged, however, strategic voters should still opt to vote for one of the traditional major parties that have a more certain chance of winning. But importantly, this expectation may not be met if none of the major parties are accurately representing voter preferences. In the utility calculus of voting, the (un)likelihood of a minor party winning an election has to be balanced against the benefit of the most preferred major party winning the election. If the major parties stray too far from a voter's preferences, decreasing the benefits of having either major party in office, then the voter has a higher incentive to cast a sincere ballot. What we may be observing, then, is a failure of the major political parties to respond adequately to the demands of a changing electorate. This situation is likely to be more dramatic in SMD systems, where minor parties may not be perceived as credible threats to the dominant status of major parties. Thus, the focus here should be on changes in voter preferences and party positions.

The extant research on social cleavages, partisanship, and the changing value structures in advanced democracies tells us that the old political order of electoral politics has changed (e.g. Inglehart, 1977, 1984; Dalton et al., 1984; Franklin, 1985; Franklin et al., 1992; Karnoven and Kuhnle, 2001; Dalton and Wattenberg, 2002). As the societies of Western democracies have become more educated and affluent, as welfare states have arguably reached their breaking point, and as the structure of the labour force has diversified, the societal divisions that once underpinned electoral politics have been fraying. In PR systems, adaptation to the changing preferences of voters may be accomplished through the formation of new political parties. If the established parties fail to address voter concerns, a new party may capitalize on this failure with relative ease. Consequently, established parties in PR systems have strong incentives to respond to changes in voter preferences. In SMD systems, however, the situation is completely different. Harsh barriers to new party entry into the legislature prevent the party system from responding to changes in voter preferences through the creation of new political parties. Absent this threat, established parties may be slow to adequately respond to changes in the voter preferences. Thus, what we might be witnessing is the unwillingness or inability of parties in SMD systems to respond to the changing demands of voters.

The findings presented here suggest that representational congruence between voters and parties should be fully investigated in SMD systems, since the changes occurring in electoral politics appear to pose specific

difficulties for Western nations operating under these electoral laws. Electoral laws are commonly cited as important determinants of party system size, but an account of the changes in party system size over the post-WWII era must include a more nuanced view of democratic representation.

Acknowledgements

A previous version of this paper was presented at the 2007 annual meeting of the Midwest Political Science Association, Chicago, IL, April 12–15. I would like to thank Michael D. McDonald, Mikhail Filippov, William Heller, Olga Shvetsova, and the anonymous reviewers for their helpful comments and suggestions.

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