

**The Mechanical and Psychological Effects of Electoral Systems:
A Quasi-Experimental Study**

André Blais, Université de Montréal
(andre.blais@umontreal.ca)

Romain Lachat, University of Zurich
(mail@romain-lachat.ch)

Airo Hino, Tokyo Metropolitan University
(hino@tmu.ac.jp)

Pascal Doray Demers, Université de Montréal
(pascal.doray-demers@umontreal.ca)

Abstract

Having two votes for the same election or two simultaneous elections with different electoral systems provides a golden opportunity to ascertain the impact of the electoral system and to sort out the relative magnitude of mechanical and psychological effects on parties and voters. We propose a new methodology for estimating such effects and we apply that methodology to thirteen elections, nine in Switzerland and four in Japan. We find mechanical effects to dominate in half of the elections examined, most particularly in the more recent Swiss elections. We discuss the implications of these findings.

Keywords: Electoral systems, Mechanical effects, Psychological effects, Mixed systems, Two votes, Japanese elections, Swiss elections

Introduction

There is a vast and growing literature on the consequences of electoral systems. Our understanding of how the electoral formula and/or district magnitude affect electoral outcomes has improved considerably (see most especially Lijphart 1994; Cox 1997; Katz 1997; Taagepera and Shugart 1989). That understanding is far from complete, however. We wish in this paper to fill an important gap in our understanding of the mechanisms through which electoral systems affect electoral outcomes.

Since Duverger (1951), we know that electoral systems have mechanical and psychological effects. Among the latter, it is useful to distinguish those pertaining to voters and to parties (Blais and Carty 1991). The mechanical effect is produced after the vote and refers to the transformation of votes into seats. Psychological effects occur before or at the moment of the vote. Voters decide which party or candidate to support partly on the basis of their perceptions of the chance that their vote will count (Cox 1997). Strategic considerations play differently in different electoral systems; the consequence is that voters make different choices depending on the rules of the game. Parties also react to electoral systems. Politicians anticipate the mechanical impact of the electoral system as well as voters' strategic behavior. This may induce some parties not to run candidates or to make alliances with other parties when the probability of success appears to be too small.

We sort out the specific role of these three mechanisms: the mechanical effect, the psychological effect on voters, and the psychological effect on parties. To this end, we use a quasi-experimental design, which consists in comparing two sets of elections that occur at the same time and place and with the same electorate, under different voting rules. This approach provides a more robust estimate of the consequences of voting rules than cross-sectional research.¹ Cross-sectional studies show that there are correlations between types of electoral systems and 'consequences' such as the number of parties, but there is always doubt that the correlation may be spurious. Researchers typically include a number of potentially

¹ There is only one drawback, as noted by Cox (1997, 21). It is possible that parties and voters' behavior in one election is affected by their behavior in the other and thus that outcomes are different in a place where all elections are held under one system. For this reason our study provides an appropriately conservative estimate of the impact of electoral systems.

distorting variables and these controls reduce the risk of spurious relationships. But the possibility that some omitted variable is ‘responsible’ for the reported result is still there.

We propose a methodology for estimating the size of the mechanical and psychological effects. To ascertain the mechanical effect, we determine how different final outcomes (that is, the number of seats won by the various parties) would have been if we let the electoral system vary while keeping constant the vote distribution. We estimate the psychological effect on voters by determining how different the vote obtained by the various parties would have been, with the same set of choices but in the absence of strategic voting incentives. Finally, the psychological effect on parties corresponds to what is left unaccounted by the mechanical effect and the psychological effect on voters. As far as we can tell, no previous study has measured each of these effects and compared their magnitude (for previous attempts see Blais and Carty 1991; Clark and Golder 2006).

We apply this method to two different cases.² The first case is composed of the simultaneous lower and upper house elections in Switzerland. The second case corresponds to the lower house elections that take place in Japan where under a mixed system some of the seats are contested under the plurality rule while others are distributed according to the D’Hondt method.

Lower house (National Council) elections in Switzerland are held under a PR system with the Hagenbach-Bischoff rule, which is equivalent to d’Hondt (Gauglhofer 1988). District magnitude varies from 1 to 34 with the mean being 7.7. In contrast, elections for the upper house (Council of States) take place under a two-round system. In most (20 out of 26) cantons, voters have two votes (which they cannot cumulate) and there are two candidates to be elected. In order to be elected on the first round, candidates must obtain the support of the absolute majority of voters.³ If

² We wished to apply our methodology to more than one case in order to show that it can be generalized to different contexts. We also thought important to have a sound understanding of elections and parties in the countries to be examined. The third constraint was the availability of data. This combination of considerations led to the choice of Switzerland and Japan.

³ There are two exceptions: one canton applies PR for both elections, and one has a single-round election for the upper chamber with a plurality rule. These two cases are excluded from our analyses.

necessary, a second round takes place under the plurality rule. Six cantons have single member districts.

Nothing else but the electoral system distinguishes these two elections. All those who have the right to vote in one election have the right to vote in the other, all those who have the right to be a candidate in one have the same privilege in the other, the election takes place at the same time, and the two chambers have exactly the same powers, and so the stakes are the same (Kriesi 1998; Kriesi and Trechsel 2008).⁴

The study deals with the nine simultaneous National Council and Council of States elections that were held between 1971 and 2003. We exclude the few cases where the two elections are not held simultaneously, the canton where the election of the Council of States is based on PR, as well as indirect elections or elections in public meetings. Missing cases correspond to about 6 percent of the seats in the National Council since the 1980s, and about 25 percent in the 1970s. For the Council of States, the excluded cases correspond to a proportion of seats varying between 17 and 30 percent.

The second case is a comparison of the two votes that take place since 1996 in the Japanese Lower House elections. Those elections are held under a mixed (parallel) system (Massicotte and Blais 1999); voters have two votes, one for a candidate in their local district and one for a party list in their region. In 1996, 300 seats were allocated in single-member districts under the plurality rule and 200 additional seats in 11 regional districts under the (PR) d'Hondt formula. In the 2000, 2003, and 2005 elections, the number of PR seats was reduced to 180. We compare the results of the two votes to ascertain the effects of the electoral system.

In each case we contrast the outcomes of two simultaneous elections, one held under PR and one under a non-PR system. The expectation is that there will be more parties under PR than under a plurality or a majority system.⁵ Our main purpose is to

⁴ Two qualifications must be made. First, a few cases (i.e., canton-year combinations) have to be excluded because the elections did not take place on the same day or because the members of the upper house were elected through a popular assembly (*Landsgemeinde*) or through the cantonal parliament. Second, in a very small number of cases, women or people aged from 18 to 20 could vote for one of the two elections only.

⁵ In each case, the difference between the two sets of elections could be imputed to the difference in the electoral formula (PR versus plurality or majority) or to the difference in district magnitude (the PR districts have a mean magnitude of 8 in Switzerland, against 2 for the majority Council of States

determine whether mechanical effects are more or less important than psychological effects and whether psychological effects on parties are more or less influential than those on voters. To the extent that parties and voters are rational actors who adjust to the incentive structure provided by the electoral system, we would predict psychological effects to trump mechanical ones. Likewise, because the stakes are higher for parties than for voters, we predict the former to be more strongly influenced by the rules of the game, and as a consequence psychological effects on parties should be more substantial than those on voters. These predictions are in line with Cox (1997,98), who state that “my personal bias is strongly towards the elite-level hypotheses.”

The same pattern should emerge in Japan and Switzerland. We expect, however, psychological effects to be weaker in Japan, especially in the early elections, because the mixed system had just been adopted before the 1996 election, and it might take some time for both parties and voters to properly understand the logics of a new electoral system.

Decomposing electoral system effects

The electoral system affects electoral outcomes in three ways. First, before the vote, there is a psychological effect on parties, which decide to run or not to run. Afterward, at the time of the vote, there is a psychological effect on voters, who decide to vote sincerely or strategically. The combined effect on parties’ and voters’ behavior corresponds to the (total) psychological effect. Finally, there is the mechanical effect, which is about how votes are transformed into seats.⁶

These three effects impact on different aspects of the electoral process: the psychological effect on parties affects the number of competitors; the psychological effect on voters influences the distribution of votes; and the mechanical effect determines the distribution of seats. In order to compare their magnitude, these three

elections; in Japan the regional districts have a mean of 17 seats while the plurality elections are all held in single-member districts). We are not able here to disentangle the effects of the electoral formula and those of district magnitude. For the sake of simplicity, we sometimes refer to the contrast between PR and non-PR elections, but in fact we estimate the effect of the electoral system, which includes both the formula and district magnitude.

⁶ Of course, the *expected* mechanical effect feeds psychological effects. But we are concerned here only with the *actual* mechanical effect, which necessarily takes place after the vote.

effects must be expressed as effects on the distribution of seats, which represents the final outcome of the electoral process. The corresponding distribution of seats can be characterized by the *effective number of parliamentary parties (ENPP)* (Laasko and Taagepera 1979), which is the most frequent indicator of party system shape.

We use the PR system as a base of reference. In other words, PR elections are the control group and non-PR elections (with smaller district magnitude) are the experimental group. The goal is to determine how much of the difference in outcomes in the two sets of elections can be imputed to psychological effects on parties and voters and to mechanical effects.

The overall difference in the seat outcomes of the two sets of elections corresponds to the total effect of the electoral system, that is, a non-PR system (with small district magnitude) rather than a PR system. Since the two elections involve the same voters voting at the same time to elect representatives of the same lower house in Japan and of two houses with equal power in Switzerland, difference in outcomes can be assumed to flow from the existence of different electoral systems.⁷

$$\text{Total effect} = \text{ENPP}_{nonpr} - \text{ENPP}_{pr}$$

This total effect is the combination of the mechanical and the psychological effects, therefore we have this equality:⁸

$$\begin{aligned} \text{Total effect} &= \text{Mechanical effect} + \text{Psychological effect} \\ &(\text{voters}) + \text{Psychological effect} (\text{parties}) \end{aligned}$$

⁷ The parties are not necessarily exactly the same in the two elections but, as we show, the absence of some parties in non-PR elections can be imputed to the incentives provided by the electoral system. There remains the possibility that some voters who vote for party A in the PR election and a candidate from party B in the non PR election do so for reasons that are not related to the electoral system, that is, their non PR vote is a candidate based vote while their PR vote is party based. We assume that the vote is mostly party based and that the candidate based vote does not bias our results in any consistent fashion.

⁸ The assumption that the three effects are additive is consistent with standard conceptualizations (see Blais and Carty 1991 and Lijphart 1994, 72). The approach is similar to the one used to sort out the composition and effects components of gender or regional differences (see Kraus 1986; Gidengil 1995; Gidengil et al. 1999).

To estimate mechanical and psychological effects we use simulated distributions of seats.⁹ The first simulation (SIM1) consists in determining the distribution of seats under a scenario in which the psychological effects (of the non-PR system) are allowed to play but not the mechanical effect. This means taking the vote in the non-PR system (influenced, as it is, by psychological effects) as given but using the PR formula (with the corresponding district magnitude). In short, SIM1 indicates the distribution of seats that we would have with the non-PR vote but a PR electoral system. Because the only difference between the two terms is that the mechanical effect of the non-PR formula (relative to PR) is neutralized in SIM1, the difference in the seat distribution between the actual non-PR outcome and this simulated outcome corresponds to the mechanical effect:¹⁰

$$\text{Mechanical effect} = \text{ENPP}_{\text{nonpr}} - \text{ENPP}_{\text{sim1}}$$

By extension, the total psychological effect (on parties and voters) corresponds to the total effect minus the mechanical effect. Thus:

$$\begin{aligned} \text{Psychological effect} &= (\text{ENPP}_{\text{nonpr}} - \text{ENPP}_{\text{pr}}) - (\text{ENPP}_{\text{nonpr}} - \text{ENPP}_{\text{sim1}}) \\ &= \text{ENPP}_{\text{sim1}} - \text{ENPP}_{\text{pr}} \end{aligned}$$

The next step is to estimate the psychological effect on voters. The idea is to determine how different the vote and seat distribution would have been in the absence of this psychological effect, that is, in the absence of strategic desertion of weak candidates. To do this, we estimate a regression model of the vote obtained by the various parties in the non-PR districts, in which one of the independent variables captures the strategic incentives. On the basis of that regression, we compute two simulations, one that allows strategic voting to play (SIM2) and the other in which strategic voting is neutralized (SIM3). By comparing the predicted vote under SIM2

⁹ A step-by-step example of our procedure for decomposing the three effects can be found in the online appendix to this article, available at http://www.romain-lachat.ch/cps_2011/index.html.

¹⁰ In the two cases examined here the non PR districts all fall neatly within the PR districts. Turnout is very similar in the two elections. The median difference is one percentage point in Switzerland (higher in PR elections) and one tenth of a percentage point in Japan.

and SIM3, we estimate how many more or fewer votes each party would have obtained if the vote had been entirely sincere, and how many more or fewer seats this would have produced under the PR formula and larger district magnitude (since we wish to neutralize the mechanical effect as well). The difference in the seat distributions predicted under SIM2 and SIM3 indicates the psychological effect on voters since the two psychological effects are incorporated in SIM2 and the effect on voters is neutralized in SIM3.

$$\text{Psychological effect (voters)} = \text{ENPP}_{sim2} - \text{ENPP}_{sim3}$$

Finally, the psychological effect on parties is simply the total psychological effect minus the psychological effect on voters.¹¹ Thus:

$$\text{Psychological effect (parties)} = (\text{ENPP}_{sim1} - \text{ENPP}_{pr}) - (\text{ENPP}_{sim2} - \text{ENPP}_{sim3})$$

Our approach builds on previous research but also proposes a step forward. For instance, Lijphart (1994, 72) argues that “the effective number of elective parties is affected solely by the psychological effects of electoral systems...whereas the effective number of parliamentary parties is influenced by both these expectations (psychological effects) and the actual (mechanical) process of translating votes into seats.” From that perspective, and ours, ENPP reflects the total effects of the electoral system and the idea is to measure mechanical effects by subtracting psychological effects from total effects.

Our procedure departs from standard approaches in one important regard. Many researchers would define the mechanical effect of each electoral system as corresponding to the difference between the effective number of parliamentary parties and the effective number of electoral parties. Under such a perspective, the (implicit) reference point is a hypothetical pure PR system under which seat shares

¹¹ The estimated psychological effects on voters and parties are derived from a regression model and are thus surrounded by some uncertainty (contrary to the mechanical and *total* psychological effects, which depend only on the known distribution of votes and on the electoral formula). We discuss below how confidence intervals can be computed to reflect that uncertainty.

equal vote shares and thus the effective number of electoral parties equals the effective number of parliamentary parties. We use as the reference point the actual PR election rather than a hypothetical pure PR election, and our goal is to determine how much of the observed difference between the outcomes of the PR and non PR elections can be accounted by psychological and mechanical effects.

Model specification

In order to sort out the psychological effect on voters, we estimate how much impact strategic considerations appear to have had on the vote in non-PR elections. To that effect, we develop a model of the vote obtained by each party that competed in the non-PR elections. That vote is regressed on their vote share in the PR elections, a *Viability* variable designed to capture voters' propensity to desert non viable parties to the benefit of more viable options in the non PR election, as well as the interaction between *Viability* and parties' PR vote share. *Viability* reaches its maximum value of 1 when a party is the strongest (in terms of PR vote) in the district or when the party has an incumbent running in the district. Otherwise, *Viability* corresponds to the votes obtained by a given party divided by the votes received by the strongest party. The highest the ratio, the most viable the party is.¹²

Estimating such a model is linked with several problems. The dependent variable is bounded to the 0-1 range and the observations are not independent from one another, as the total vote share must sum to 1. Several models have been suggested to deal with such aggregate level results in multiparty elections (Katz and King 1999; Honaker et al. 2002; Jackson 2002; Tomz et al. 2002; Kamakura and Mazzon 2007). The use of such models is impossible in our case because of variation across districts in the supply side of electoral competition. Models for multiparty electoral data typically assume that the same parties run in all districts. In our sample, by contrast, there is much variation across districts in the configurations of parties.

¹² The viability measure is based on outcome of the present rather than the previous election because we assume that voters' perceptions are based only partly on the outcome of the previous election, as these perceptions are updated on the basis of poll information (Blais and Bodet 2006). This is a standard procedure in the literature (see Alvarez et al. 2006; Alvarez and Nagler 2000). Like these studies, we assume that distance from the strongest party is a good indicator of viability. It also makes sense to believe that being an incumbent conveys a signal of viability.

Katz and King (1999) suggest dealing with partially contested districts by focusing not on the *actual vote*, but on the estimated *effective vote*, that is, the vote share a party would have received had all parties been competing. However, this method makes no sense when the configuration of candidates reflects regional cleavage structures, as it is the case in Switzerland. It makes little sense, for example, to ask how the entry of a Christian-Democratic Party would change the results in a district where this party has never been present and where no party specifically articulates the interests of Catholics. A second possibility is to estimate a separate model for each pattern of competitors, as suggested by Tomz et al. (2002). This is still problematic with our data, however, as there are many different patterns, some of them represented by only a handful of cases. Models designed specifically for multiparty electoral data are thus unfortunately not an option in our case.

Instead, we have estimated our model with a simple OLS regression, making a few changes to our variables and to the model specification in order to correct, as far as possible, for sources of bias. We compute an unbounded dependent variable (y) by taking the log of the odds of parties' vote share in the majority election (V), that is,

$$y_i = \ln\left(\frac{V_i}{1 - V_i}\right).$$

Then, we transform in two ways the independent variable measuring a party's share of vote in the PR election. The relationship between vote shares obtained with the two electoral systems could be biased, as we can only consider parties who run in both elections. When comparing elections for the two houses of the Swiss Parliament, for instance, the higher the number of parties who compete only in the lower house election, the stronger the average increase in the vote shares of those who field candidates in both contests. The reason is simple: The share of votes is divided among a smaller number of contenders in the majority election. To avoid a potential bias, we express parties' results in the PR election as a proportion of the total vote share received by all parties *running in both elections*. Second, we take the log of the odds of this quantity. This is necessary, as the relationship with the

dependent variable would otherwise be non-linear. Further, we correct for dependency among observations. On average, parties will fare better the smaller the number of competitors, as the total vote share is always 1. To account for this, we include a variable measuring the number of parties in competition in a given election. We also compute robust standard errors for clustered data, assuming that our observations are independent across elections, but not within each of these groups. Finally, as predicted vote shares will not sum to 1, we rescale the predicted values computed from our simulations, so that this constraint is respected. On this basis, we specify the following model:

$$y_i = \alpha + \beta \cdot Share_i + \gamma \cdot Viability_i + \delta \cdot Share_i \cdot Viability_i + \phi \cdot Parties_i + \varepsilon_i,$$

where $Share_i$ is the log of the odds of party i 's vote share in the PR election (relative to the total share of votes of the parties competing in both elections), $Viability_i$ is the measure of parties' chances in the non-PR contest defined above, and where $Parties_i$ is the total number of parties competing in the non-PR election in the same district as party i . In Japan, as explained below, we also take into account support for independent candidates, because of their crucial role in many single-member districts. It is not uncommon in Japan for some politicians to run independently when they fail to obtain an endorsement from their own parties. This was exemplified by the number of ex-LDP *independent* candidates who opposed to the postal reform proposed by the Koizumi cabinet in 2005.

The Effects of the Electoral System in Switzerland

Table 1 shows the seat outcomes, in terms of effective number of parties, of the elections for the Council of States (non PR) and the National Council (PR), as well as the estimated effects.¹³

¹³ For this and for all further analyses, we estimate the size of the various effects of the electoral system on the basis of a subset of observations including only those where both elections took place on the same day and where the upper house is elected by a two-round majority-plurality system.

‘Table 1 about here’

The mean effective number of parties in the Council of States is 3.7, compared to 5.5 in the National Council, a reduction of 1.8 parties. Because nothing else but the electoral rule and district magnitude distinguishes these two elections, this reduction corresponds to the *total effect of the electoral system*, that is, of the electoral formula and of district magnitude. Table 1 indicates that this impact has grown over time, the mean effect evolving from 1.4 in the first four elections to 2.1 in the last five.

We then move to sorting out mechanical and psychological effects. We start with the former. As it occurs after the vote, we can ascertain it by estimating how many seats the various parties would have obtained in the Council of States *with the same vote shares* but with the PR system (and larger district magnitude) prevailing in the National Council elections (SIM1).

The difference between the effective number of parties estimated under such a scenario (SIM1) and the actual number observed in the non PR election corresponds to the mechanical effect, since both numbers are based on the same vote distribution (observed in the non PR election) and the only difference is that under SIM1 we are using the PR formula instead of the two round rule. Furthermore, by definition, the difference between that simulation and the actual distribution of seats in the National Council is equal to psychological effects. Both sets of numbers are based on the same electoral system (PR), so that the mechanical effect is neutralized. The only difference has to do with different vote distributions, which by definition are associated with psychological effects.

Table 1 presents the results. They indicate that the mechanical and the total psychological effects tend to be of similar magnitude, on average. Each accounts for the reduction of about one effective party in non PR elections and thus for about half of the total effect of the electoral system. These results also show that the size of the effects has changed over time. The mechanical effect has increased over time while the psychological effects have weakened.

The fact that the magnitude of the mechanical effect varies over time may appear surprising. Is not the mechanical effect more or less “automatic” and thus constant

over time? In some limited sense, the mechanical effect is always the same: for a given distribution of votes, the mechanical effect will be constant. But the distribution of votes changes across elections, and hence the amplitude of the mechanical effect. The mechanical effect is strongest when prior psychological effects have failed to materialize, which makes perfect sense.

The next step in the analysis consists in sorting out the psychological effect on voters. To that effect, we develop a model of the vote obtained by each party that competed in the Council of States elections. That vote is regressed on their vote share in the simultaneous National Council elections, the *Viability* variable, the interaction between *Viability* and parties' vote share in the National Council election, and the number of parties running in the election. *Viability* is here the crucial variable, that captures voters' propensity to desert weak (non viable) parties in non PR elections. We expect the variable to have a positive coefficient. Everything else being equal, non viable parties, whose support lags far behind the leading party, should obtain lesser support in two round elections. We also expect a positive interaction effect between *Viability* and vote share; the handicap suffered from being non viable should be greatest for the very small parties.

The corresponding results fit largely with what we expected (Table 2). Parties' vote share in the upper house is positively related to their vote share in the lower house. Furthermore, parties with the best chances of winning a seat, that is those presenting incumbents and with the largest vote shares in the lower house, enjoy a bonus in terms of votes in the upper house, as indicated by the positive coefficient associated with *Viability*. The weak coefficient of the interaction term suggests, however, that the impact of non viability is not clearly contingent on vote share. Finally, we also observe that, other things being equal, parties' vote share decreases when more parties compete in the upper house election.

'Table 2 about here'

Using these results, we can now simulate party vote shares, and then seat shares and the effective number of parliamentary parties under two different scenarios. We can

predict the electoral results under a scenario where viability is not allowed to have an effect, that is, viability has no influence on the outcome of the election. This corresponds to the hypothetical situation where voters would not penalize parties which are non viable. This is SIM3. We can compare this with the predictions that we obtain when we allow strategic considerations to affect the vote (SIM2). On the basis of these two scenarios, we can estimate by how much the effective number of parties is reduced depending on whether we do (SIM2) or do not (SIM3) allow strategic desertion of weak parties in non PR elections. The difference is our estimate of the psychological effect on voters.¹⁴

The psychological effect on parties, finally, is simply obtained by subtracting the estimated psychological effect on voters from the total psychological effect.

The results are presented in Table 1. We find that parties' strategic decisions have an impact that is about the same magnitude as voters' choice. There is a temporal pattern. The role of voters has increased while that of parties has declined. The total psychological effect has become smaller over time. At the beginning of the period considered here, parties' response to the incentives of the majority election system explained most of the difference between the two houses of Parliament. Their impact was much larger than that of voters, and the contribution of the mechanical effect was small. In recent elections, by contrast, the total psychological effect has been largely reduced, and the portion due to parties has become negligible.

This highlights the conditional nature of the effects of electoral systems. While the electoral system has remained the same, the size of the effects, even that of the mechanical effect, has changed. This may be surprising if one thinks of the mechanical effect as a stable characteristic of a set of electoral rules. This is not so. The size of the mechanical effect varies because parties' and voters' success at anticipating the effects of institutions varies across elections. Parties in Switzerland have become less willing to refrain from presenting candidates when their chances

¹⁴ As mentioned above, we have also computed confidence intervals around the estimated psychological effects on both voters and parties. We did this following a procedure similar to what King et al. have suggested (King et al. 2000). This involves simulating the distribution of the regression parameters by drawing values from their multivariate normal distribution. We have drawn 1000 sets of simulated parameters and, for each of them, computed the corresponding model predictions in terms of vote shares and seat shares. The corresponding confidence intervals are reported in Table A1 in the appendix, for both Switzerland and Japan.

of winning are weak. This has led to an increase in the number of candidates.¹⁵ This trend appears most clearly in the case of the Swiss People's Party (SVP). It used to present candidates for the upper house in a few strongholds only, but began in the 1980s to compete in an increasing number of races (Lachat 2006) even though these candidatures have had a relatively low rate of success. This trend has extended in the more recent elections to small parties, which increasingly tend to present candidates for the upper house, even if their chances of success are very low.¹⁶

Looking back at the overall impact of the electoral rule, we see that the impact of the two-round system (combined with small districts) on parties' share of seats is quite substantial. The effective number of parties in the upper house is reduced by one third (compared to the PR system). This effect is both mechanical and psychological and the psychological effect concerns both voters and parties. But, all in all, the mechanical effect is the largest of the three, especially in the more recent elections.

The Effect of the Electoral System in Japan

We now perform the same kind of analysis for the Japanese lower house elections between 1996 and 2005. As in Switzerland, we will be comparing two simultaneous elections, one held under PR and relatively large districts and one under a non PR system and small (single-member) districts. In this case, however, the two elections concern the same institution (the lower house), and the electoral formula for the non PR elections is plurality rather than two rounds.

Table 3 shows the effective number of parties in the two sets of elections. The mean effective number of parties is 3.7 in PR elections and 2.2 in the single-member plurality system, a reduction of 1.5 parties. This corresponds to the total effect of the electoral system. This total effect is of the same magnitude as that observed in Switzerland, slightly smaller in absolute terms (1.5 versus 1.8) but slightly larger

¹⁵ In the cases analyzed here, the average number of parties fielding candidates for the Council of States has increased from 2.9 per constituency in 1971 to 5.3 in 2003

¹⁶ In the 1970s, there were about two cases by election only where a party with less than five per cent of the vote in the lower house presented a candidate for the upper house. In the 1995 to 2003 elections, there were 16 such cases on average. This development also explains the surprising positive value of the psychological effect on parties in recent elections. It is due to an *asymmetry* in the strategic behavior of small and large parties. Smaller parties have been even less willing than larger ones to refrain from presenting chanceless candidates.

relatively speaking (41% versus 31%). The number of parties in both systems seems to be decreasing a little but there is no clear trend with respect to the difference, that is, the impact of the electoral system. This is different from Switzerland, where the total effect of the electoral system appears to be increasing.

‘Table 3 about here’

We then move to an estimation of the mechanical and (total) psychological effects. We simulate how many seats the parties would have obtained in the plurality elections with the same share of the vote but a different electoral system, that is, PR and larger regional districts. The difference between these estimates (SIM1) and the actual outcome of the plurality elections corresponds to the mechanical effect while the difference between SIM1 and the outcome of the PR elections represents the total psychological effect.

On average, the mechanical effect accounts for a reduction of about 0.4 party; the psychological effect is more than twice as large. There is no time trend. This is not surprising given that the Japanese party system has been under realignment and that party configurations differ each election since 1996. The psychological effect is particularly strong for the 2000 election when the supply of political parties changed dramatically after the split of New Frontier Party, the second largest party, into several parties including New Komeito. It is also the first election when an electoral alliance was formed (between the LDP and New Komeito) in the single-member districts, which allowed New Komeito to increase its vote share in the PR districts.

The psychological effect is about the same magnitude as in Switzerland. The mechanical effect is somewhat smaller, comparable to the situation in Switzerland in the 1970s; it is much weaker than what is observed in recent Swiss elections.

The last stage of the analysis consists in sorting out the psychological effects on parties and voters. Our approach is to estimate the impact of strategic considerations on voters' behavior through a regression model of the vote obtained in the plurality election. Table 2 shows the results, which are quite similar to those reported in

Switzerland. The viability variable is highly significant, while the number of parties and support for independent candidates have the appropriately negative coefficients. On the basis of this regression we can predict how many votes and seats each party would have received in the absence of strategic voting, that is, if viability had had no influence on the vote (SIM3), and we can compare the predicted effective numbers of parliamentary parties depending on whether we do or do not allow viability to play (SIM2 versus SIM3). The difference between these two simulations is our estimation of the psychological effect on voters, and the gap between the latter and the total psychological effect corresponds to the psychological effect on parties.

Table 3 suggests that the psychological effect on voters is of similar magnitude in Japan and Switzerland.¹⁷ That effect has considerably increased over time in the latter country, however; the Japanese pattern is midway between where Switzerland used to be and where it is now. The same holds for the psychological effect on parties. The effect is modest in three of the four Japanese elections, which is between Switzerland in the 1970s (strong effects) and Switzerland today (nil effects).

Discussion and Conclusion

Having two votes for the same election or two simultaneous elections for two different legislatures with the same power, with different electoral formulas and/or district magnitude, provides a golden opportunity to ascertain the effects of the electoral system and most importantly to sort out the relative importance of mechanical as well as psychological effects on parties and voters.

We have proposed a new methodology for estimating such effects and we have applied that methodology to thirteen elections, nine in Switzerland and four in Japan. We have considered the PR election/vote as the control group and the non PR election/vote as the treatment. From such a perspective, the difference between the two elections regarding the effective number of parliamentary parties corresponds to the total effect of the electoral system. The mechanical effect corresponds to the

¹⁷ Like for Switzerland, the corresponding confidence intervals are reported in Table A1 in the appendix.

difference between the non PR outcome and the outcome that would have resulted in the non PR election keeping the vote distribution constant but using a PR formula (and larger districts). The psychological effect on voters is estimated by comparing the predictions of the vote when viability is or is not allowed to play. The psychological effect on parties is what is left of the total effect, after the mechanical effect and the psychological impact on voters are taken into account.

Our findings are somewhat surprising. We expected psychological effects to trump mechanical effects and the psychological effect on parties to be more substantial than the impact on voters. We also thought that psychological effects would be weaker in Japan, where the electoral system is relatively new, than in Switzerland.

In Switzerland, as expected, the psychological impact on parties dominates in the first three elections. But the mechanical effect is clearly the largest in the last six elections. In Japan, there is much variation; the most important effect is mechanical in 1996, replaced by the psychological effect on parties in 2000 and strategic voting in 2003. Finally, the three effects are more or less equal in 2005.

Perhaps the most striking result concerns the psychological impact on parties. We find evidence of such impact in both countries. Weaker parties are less prone to run candidates in plurality or two round elections than in PR elections. That effect emerges as the most important in the first three Swiss elections and in one Japanese election. But most of the time it is not the most powerful factor. Furthermore, its impact has been declining in Switzerland.

The point is that quite a few parties decide to contest plurality or two round elections even when they have no chance at all of winning. Perhaps the clearest case is the Japanese Communist Party. Election after election, the party presents candidates in 90% or more of the single-member seats.¹⁸ Yet the party has failed to win any single-member seat, except two in 1996. In an overwhelming number of cases, the party has no reasonable chance. The standard prediction is that under such circumstances the party would not enter the race (Cox 1997).

¹⁸ The Japanese Communist Party fielded candidates in almost all 300 single-member districts until 2003. In 2005, the party changed its policy and ran candidates in “only” 275 districts.

Such prediction holds if parties are short-term seat maximizers. The fact that many parties enter the race even if chances of winning are infinitesimal suggests that they have long-term goals, and/or that there are other benefits in presenting candidates, such as nurturing party members in local constituencies and increasing vote share in PR districts.

This seems to be indeed the case for the Japanese Communist Party. Despite the low chance of winning in single-member districts, the party has been for a long time keen on keeping its own candidates in every district with a view to mobilizing its PR vote. This does not come without cost as the entry deposit for each single-member district in Japan is three million yen and the deposit is returned only if the candidate garners one-tenth of the valid vote.¹⁹ The party has decided to drastically restrict the number of its candidates in 2009 but it still keeps its candidates in the main districts where prefectural capitals are situated to promote its support in the PR tier.

The fact that strategic non entry has been declining in Switzerland is even more intriguing. As mentioned above, the case of the SVP is particularly interesting here. The party used to present candidates for the Council of States elections only in the five/six cantons where it enjoys strong support. In the most recent elections, the party has decided to run candidates almost everywhere.

This change of strategy parallels the change in the party's ideological orientation, from a moderate agrarian formation to a right-wing populist party (Kriesi et al. 2005). Its success has been impressive in the lower house, where it has raised from the fourth position in 1995 to the first one since 2003. Its success in the upper house remains limited, though, where its relatively extreme position fails to attract a majority of voters (Lachat 2006). The decline in the psychological effect on Swiss parties has been further intensified by the behavior of small parties, which also run in an increasing number of constituencies, even when such candidatures have virtually no chance of success.

The reasons for such a behavior have been well described by Lago and Montero (2009, 179): "...by placing a candidate in the SMD tier, a small party might heighten

¹⁹ The party lost its deposit in 109 districts in 1996, 130 districts in 2000, 235 districts in 2003, and 223 districts in 2005.

voter awareness and potentially gain more votes (and eventually seats) for the PR portion of the election. In addition, by running many SMD candidates, small parties can develop their own internal strategies – for instance they may fill in the requisites for receiving public funding or decide to test new, aspiring politicians...” The consequence is lesser party coordination (see also Cox and Schoppa 2002 and Ferrera and Herron 2005). This is what we observe in both Japan and Switzerland.

The findings concerning the psychological effect on voters, that is, strategic desertion of weak candidates, are less surprising. These effects are present almost all the time, they are not negligible, but they are seldom the most crucial. This is consistent with survey evidence that strategic considerations do affect vote choice but that they are not particularly powerful (Alvarez and Nagler 2000; Blais et al. 2009).

Finally, mechanical effects have proven to be more substantial than expected. In half of the elections examined in this study, the mechanical effect is the largest of the three effects. The reason is simple. Parties often fail to coordinate and strategic voting is relatively modest. Whenever parties and voters fail to adjust to the incentives of the electoral system, the mechanical effect comes into full force.

The quasi-experimental design that is proposed here can be strictly applied only in cases with two simultaneous votes because the differences in the outcomes can be assumed to derive from differences in the electoral systems. This is a limitation of our approach but also its strength as it allows us to sort out psychological and mechanical effects. But there may be some contexts where it makes sense to believe that whatever difference we observe between two non simultaneous elections in the same country are basically due to the electoral law. Furthermore, the logic of our approach for sorting out mechanical and (total) psychological effects could be extended to any type of comparison that researchers wish to make. For instance, it would be possible, with the methodology laid out here, to determine how much of the difference in the effective number of parliamentary parties between Spain and Britain is accounted by mechanical and (total) psychological effects.

References

- Alvarez, R. M., F. J. Boehmke, and J. Nagler. 2006. "Strategic Voting in British Elections." *Electoral Studies* 25: 1-19.
- Alvarez, R. M., and J. Nagler. 2000. "A New Approach for Modelling Strategic Voting in Multiparty Elections." *British Journal of Political Science* 30: 57-75.
- Blais, A., and M. A. Bodet. 2006. "How Do Voters Form Expectations about the Parties' Chances of Winning the Election?" *Social Science Quarterly* 87: 477-493.
- Blais, A., and K. Carty. 1991. "The Psychological Impact of Electoral Laws : Measuring Duverger's Elusive Factor." *British Journal of Political Science* 21: 79-93.
- Blais, A., E. Dostie-Goulet, and M. A. Bodet. 2009. "Voting Strategically in Canada and Britain." In B. Grofman, A. Blais, and S. Bowler (ed.) *Duverger's Law of Plurality Voting: The Logic of Party Competition in Canada, India, the United Kingdom and the United States*. New York: Springer.
- Clark, W., and M. Golder. 2006. "Rehabilitating Duverger's Law: Testing the Mechanical and Strategic Modifying Effects of Electoral Laws." *Comparative Political Studies* 39: 679-708.
- Cox, G. W. 1997. *Making Votes Count: Strategic Coordination in the World's Electoral Systems*. Cambridge: Cambridge University Press.
- Cox, K.E., and L.J. Schoppa. 2002. "Interaction Effects in Mixed-Member Electoral Systems." *Comparative Political Studies* 35: 1027-1053.
- Duverger, M. 1951. *Les partis politiques*. Paris: Seuil.
- Ferrara, F., and E.S. Herron. 2005. "Going It Alone? Strategic Entry under Mixed Electoral Rules." *American Journal of Political Science* 49:16-31.
- Gaughhofer, M. 1988. *Analyse der Sitzverteilungsverfahren bei Proportionalwahlen*. Chur: Rüegger.
- Gidengil, E. 1995. "Economic Man-Social Woman? The Case of the Gender Gap in Support for the Canada_United States Free Trade Agreement." *Comparative Political Studies* 28: 384-408.
- Gidengil, E., A. Blais, R. Nadeau, and N. Nevitte. 1999. "Making Sense of Regional Voting in the 1997 Canadian Federal Election: Liberal and Reform Support outside Quebec." *Canadian Journal of Political Science* 32: 247-272.
- Honaker, J., J. N. Katz and G. King. 2002. "A Fast, Easy, and Efficient Estimator for Multiparty Electoral Data." *Political Analysis* 10: 84-100.
- Jackson, J. E. 2002. "A Seemingly Unrelated Regression Model for Analyzing Multiparty Elections." *Political Analysis* 10: 49-65.
- Kamakura, W. A. and J. A. Mazzon. 2007. "Accounting for Voter Heterogeneity within and across Districts with a Factor-Analytic Voter-Choice Model." *Political Analysis* 15: 67-84.
- Katz, J. N. and G. King. 1999. "A Statistical Model for Multiparty Electoral Data." *American Political Science Review* 93: 15-32.
- Katz, R. S. 1997. *Democracy and Elections*. New York: Oxford University Press.

- King, G., M. Tomz and J. Wittenberg. 2000. "Making the Most of Statistical Analyses: Improving Interpretation and Presentation", *American Journal of Political Science* 44(2): 347-361.
- Kraus, V. 1986. "Group Differences: The Issue of Decomposition." *Quality and Quantity* 20: 181-190.
- Kriesi, H. 1998. *Le système politique suisse*. Second Edition. Paris: Economica.
- Kriesi, H., R. Lachat, P. Selb et al. (eds). 2005. *Der Aufstieg der SVP. Acht Kantone im Vergleich*. Zürich: Verlag Neue Zürcher Zeitung.
- Kriesi, H. and A. H. Trechsel. 2008. *The Politics of Switzerland: Continuity and Change in a Consensus Democracy*. Cambridge: Cambridge University Press.
- Laakso, M. and R. Taagepera (1979). " 'Effective' Number of Parties: A Measure with Application to West Europe", *Comparative Political Studies* 12(1): 3-27.
- Lachat, R. 2006. "A tale of two Councils. Explaining the weakness of the SVP in the upper house of the Federal Parliament." *Swiss Political Science Review* 12: 77-99.
- Lago, I., and J. R. Montero. 2009. "Coordination between Electoral Arenas in Multilevel Countries." *European Journal of Political Research* 48: 176-203.
- Lijphart, A. 1994. *Electoral Systems and Party Systems: A Study of Twenty-Seven Democracies, 1945-1990*. Oxford: Oxford University Press.
- Massicotte, L., and A. Blais. 1999. "Mixed Electoral Systems: A Conceptual and Empirical Survey." *Electoral Studies* 18: 341-366.
- Taagepera, R., and M. S. Shugart. 1989. *Seats and Votes: The Effects and Determinants of Electoral Systems*. New Haven: Yale University Press.
- Tomz, M., J. A. Tucker and J. Wittenberg. 2002. "An Easy and Accurate Regression Model for Multiparty Electoral Data." *Political Analysis* 10: 66-83.

Table 1. The Impact of the Electoral System in Switzerland

Years	Actual outcomes and simulations (ENPP)				
	Non PR	PR	SIM1	SIM2	SIM3
1971	3.5	5.4	4.2	3.9	4.1
1975	3.4	4.9	3.9	3.9	4.2
1979	4.0	4.9	4.0	4.0	4.1
1983	4.0	5.3	4.6	4.6	4.8
1987	3.9	5.9	5.1	4.6	5.0
1991	3.7	7.0	5.4	5.5	6.2
1995	3.5	5.7	5.1	5.1	5.9
1999	3.5	5.2	4.8	4.8	5.3
2003	3.8	5.0	4.8	4.7	5.6
Mean	3.7	5.5	4.6	4.6	5.0

Years	Effects (change in ENPP)				
	Total	Mechanical	Psychological	On voters	On parties
1971	-1.9	-0.6	-1.2	-0.1	-1.1
1975	-1.5	-0.5	-1.0	-0.3	-0.8
1979	-0.9	0.0	-0.9	-0.0	-0.9
1983	-1.4	-0.6	-0.7	-0.4	-0.4
1987	-2.0	-1.2	-0.8	-0.4	-0.4
1991	-3.3	-1.6	-1.7	-0.7	-1.0
1995	-2.3	-1.6	-0.7	-0.9	0.2
1999	-1.8	-1.3	-0.5	-0.9	0.4
2003	-1.2	-1.0	-0.2	-0.9	0.7
Mean	-1.8	-0.9	-0.9	-0.5	-0.4

Table 2. The Impact of Viability on the Vote in Switzerland and Japan

	Switzerland		Japan	
	Coefficient	Robust standard error	Coefficient	Robust standard error
Relative vote share in PR (log-odds)	0.50***	0.08	0.51***	0.04
Viability	1.06***	0.21	1.64***	0.13
Relative vote share × viability	0.03	0.09	0.02	0.10
Number of parties	-0.10***	0.02	-0.21**	0.02
Independent vote (%)			-1.13**	0.17
LDP associated IND vote (%)			-1.34**	0.14
Constant	-0.92***	0.18	-0.72*	0.18
R ²	0.78		0.91	
N	525		4078	

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Note: The dependent variable is the log of the odds of parties' vote share in the Council of States (Switzerland) and in the House of Representatives (Japan). The model was estimated with an OLS regression.

Table 3. The Impact of the Electoral System in Japan

Years	Actual outcomes and simulations (ENPP)				
	Non PR	PR	SIM1	SIM2	SIM3
1996	2.4	3.8	3.1	3.2	3.6
2000	2.4	4.7	2.8	2.8	3.4
2003	2.3	3.0	2.4	2.3	2.7
2005	1.8	3.1	2.2	2.2	2.6
Mean	2.2	3.7	2.6	2.6	3.1

Years	Effects (change in ENPP)				
	Total	Mechanical	Psychological	On voters	On parties
1996	-1.5	-0.8	-0.7	-0.5	-0.2
2000	-2.4	-0.4	-1.9	-0.5	-1.4
2003	-0.8	-0.1	-0.7	-0.4	-0.2
2005	-1.3	-0.4	-0.9	-0.4	-0.4
Mean	-1.5	-0.4	-1.1	-0.5	-0.6

Appendix

Table A1. Confidence intervals for the psychological effects

Switzerland						
Years	Effect on voters			Effect on parties		
	Estimate	95% CI		Estimate	95% CI	
1971	-0.1	-0.2	-0.0	-1.1	-1.2	-1.0
1975	-0.3	-0.4	-0.1	-0.8	-0.9	-0.6
1979	-0.0	-0.2	0.0	-0.9	-0.9	-0.8
1983	-0.4	-0.7	-0.1	-0.4	-0.6	-0.0
1987	-0.4	-0.8	-0.1	-0.4	-0.7	-0.0
1991	-0.7	-1.1	-0.3	-1.0	-1.4	-0.5
1995	-0.9	-1.2	-0.5	0.2	-0.2	0.5
1999	-0.9	-1.3	-0.4	0.4	-0.1	0.8
2003	-0.9	-1.5	-0.6	0.7	0.4	1.3

Japan						
Year	Effect on voters			Effect on parties		
	Estimate	95% CI		Estimate	95% CI	
1996	-0.5	-0.6	-0.4	-0.2	-0.3	-0.1
2000	-0.5	-0.7	-0.5	-1.4	-1.4	-1.2
2003	-0.4	-0.5	-0.3	-0.2	-0.4	-0.1
2005	-0.4	-0.5	-0.3	-0.4	-0.6	-0.4