The Role of Political Parties in Electoral Competition

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Abstract

This paper analyzes the role of political parties in electoral competition. A generalization of the Alesina (1988) model of electoral competition is proposed and estimated using data from the U.S. House of Representatives. The main extension is the reconsideration of the role of bargaining in the context of political parties. Results from the axiomatic bargaining literature are used to establish testable hypotheses regarding the effect of party representation on relevant parameters of the model including incumbency advantage. The model is estimated and tested using a regression discontinuity design. The predictions of the theoretical model developed here are only partially supported by the data. In particular, there is an increase in the incumbency advantage of the party at the district level while there does not seem to be any variation in the effect of party affiliation. A related implication of the results presented here is that the effect of election on policy outcomes increases with the representation of the party in congress. These results indicate that further analysis of the bargaining process and the role of political parties in electoral competition may provide a more comprehensive understanding of the effect of elections on policy outcomes.

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1 Introduction

In this paper I analyze the role of political parties in electoral competition. I first generalize the model of electoral competition put forth by Alesina (1988) in order to account for the role of parties. This extension of the model focuses on the role of bargaining and includes the original model as a special case. Lee, Moretti, and Butler (2004) (LMB henceforth) estimate Alesina's (1988) model using data from the U.S. House of Representatives. I replicate and extend the main results of LMB and test whether the generalization proposed in this model has empirical validity in the U.S. House of Representatives. While electoral competition has been studied at depth by both economists and political scientists, the role of political parties has not been incorporated into their analysis. In this paper I propose and estimate a model that is a first step towards a more comprehensive understanding of the role of parties in political competition.

The paper proceeds as follows. Section 2 reconsiders Alesina's (1988) model of electoral competition, generalizes it to account for political parties, and identifies relevant empirical predictions. Section 3 reviews regression discontinuity design (RDD) as an estimation strategy and Section 4 discusses the data used in the empirical analysis. Section 5 presents the results of the RDD analysis in graphical and numerical form while Section 6 concludes.

2 Economic Model

Economic models of political competition have disparate predictions regarding the influence of elections on policy outcomes. One branch of the literature assumes politicians are motivated solely by the prospects of holding office. In this vein, models like that of Downs (1957) predict convergence of political platforms. Results in this category are identified by the Median Voter

Theorem. Other models, such as those by Wittman (1977), assume politicians care not only about holding office but about the policy outcome. Consequently, these models predict divergence of policy platforms. Alesina (1988) analyzes these models in a dynamic framework with rational forward-looking voters who realize politicians cannot make binding commitments to policies before they are elected. By modeling the electoral competition and policy-making interaction as an infinitely repeated game, the model of Alesina (1988) predicts partial or full converge of policy platforms.

I follow the notation and framework in Alesina (1988). The two political parties are assumed to have concave and single-peaked preferences. For ease of exposition Alesina (1988) posits quadratic loss functions of the unidimensional policy parameter (l) and adds the benefit from holding office (k) for each of two political parties:

$$u^D(l,k) = -\frac{(l-c)^2}{2} + k \quad \text{and} \quad u^R(l,k) = -\frac{l^2}{2} + k,$$

respectively denoting democrats and republicans, and where $c > 0$. The corresponding bliss-points for each of the parties are given by $x^D = c$ and $y^R = 0$. The democratic party has an underlying popularity represented by its probability of election $\bar{P}$. The republican party's popularity is given by the complementary probability. In a one-shot game without commitment, each party enacts its bliss-point with probabilities $\bar{P}$ and $1 - \bar{P}$ respectively. However, given the concavity of the utility functions, both parties are better-off cooperating by enacting moderate policies in the interval $(0, c)$.

As is well known in the theory of repeated games, a Pareto-improving equilibrium payoff may be obtained through repeated interaction.[1] Moreover, the set of Pareto-improving equilibrium

[1]The modeling of interactions as infinitely repeated games does not require infinitely-lived agents but that agents

payoffs is the set of feasible payoff profiles that are preferred by each player to their corresponding payoff if all players played their min-max strategies (Mailath and Samuelson, 2006). In Alesina's (1988) model the Pareto-improving policy is determined through axiomatic bargaining. The field of axiomatic bargaining posits axioms that describe desirable characteristics of bargaining outcomes and identifies bargaining solutions that fulfill these axioms. While bargaining solutions determine the outcome of a bargaining problem, the bargaining procedure is left unspecified.

Alesina (1988) restricts the profile of equilibrium payoffs to lie on the Pareto-efficient frontier and makes use of the axiomatic bargaining solution proposed by Nash (1950) to select the equilibrium payoffs. By using Nash's (1950) solution, we may relax the assumption of Pareto-efficiency with the much weaker assumption of individual rationality (Roth, 1977). This choice of bargaining solution imposes a strong symmetry assumption that has important economic significance. Moreover, this significance is highlighted when the interpretation of the electoral competition game is in terms of groups of agents comprising a given party as opposed to a pair of agents. Consider first the Nash solution to the bargaining problem.[2]

Theorem 1. *(Nash, 1950; Roth, 1977) The unique solution satisfying strict individual rationality, invariance to utility representation, independence of irrelevant alternatives, and symmetry is given by*

$$f^N = \arg\max_{(u^D, u^R)} (u^D - \bar{u}^D)(u^R - \bar{u}^R),$$

where $\bar{u}^i$ denotes the utility without cooperation to party i.

In the special case where $k = 0$, Alesina (1988) proves the following results.

take into account the probability that interaction might continue in the future. See Rubinstein (1991) and Osborne and Rubinstein (1994) for a lively debate on finite versus infinite models of strategic interactions.

[2]For brevity I do not delve into the intricacies of axiomatic bargaining. See Roth (1979), Osborne and Rubinstein (1990) and Muthoo (1999).

Theorem 2. *(Alesina, 1988) For sufficiently high discount rates we have:*

- *The efficient frontier is given by* $x^* = y^* = \lambda c$ *where* $\lambda(\bar{P}) \in [1 - \sqrt{1-\bar{P}}, \sqrt{\bar{P}}]$.
- *If* $\lambda(\bar{P})$ *is the Nash solution then* $\lambda(1/2) = 1/2$ *and* $\frac{\partial \lambda(\bar{P})}{\partial \bar{P}} > 0$.

Alesina's (1988) first result demonstrates that complete policy convergence ensues once cooperation becomes feasible. The second result gives a useful comparative static result. Given the use of the Nash solution, an exogenous increase in the popularity of the democrat party leads to an outcome closer to the democrats' bliss point. LMB extend this result to the case where $k \neq 0$. That is, when politicians derive ego-rents from holding office. While their results produce the same comparative statics as Alesina (1988), the existence of ego rents implies only partial convergence.

LMB use these results to establish a testable hypothesis. While the hypothesis of full convergence has been tested and refuted by several authors, the object of LMB is to test whether policies converge partially or fully diverge. Their focus is then to test $\frac{\partial x^*}{\partial \bar{P}}, \frac{\partial y^*}{\partial \bar{P}} > 0$ versus $\frac{\partial x^*}{\partial \bar{P}}, \frac{\partial y^*}{\partial \bar{P}} = 0$. Combining Alesina's (1988) two results above we have $\frac{\partial x^*}{\partial \bar{P}} = \frac{\partial y^*}{\partial \bar{P}} = \frac{\partial \lambda(\bar{P})}{\partial \bar{P}} c > 0$. That is, Alesina's (1988) model for the case where $k \neq 0$ predicts partial convergence while the Nash equilibrium of the infinitely repeated game without cooperation predicts full divergence as it implies $\frac{\partial x^*}{\partial \bar{P}} = \frac{\partial y^*}{\partial \bar{P}} = 0$.

LMB use these results and propose the following estimating framework:[3]

$$RC_t = \text{constant} + \pi_0 P_t^{*D} + \pi_1 D_t + \varepsilon_t,$$

where RC_t is a congressperson's roll-call record, P_t^{*D} is a measure of the electoral strength of the democrat party, D_t is a dummy variable indicating whether the district's representative belongs

[3]The algebraic details of this derivation are located in Appendix A of LMB.

to the democratic party, ε_t reflects heterogeneity in bliss points across districts, and where π_0 and π_1 are defined as follows:

$$\begin{aligned} \pi_0 &= \frac{y^*(k, \lambda^*(P_t^{*D}), c) - y^*(k, \lambda^*(P_t^{*R}), c)}{P_t^{*D} - P_t^{*R}}, \text{ and} \\ \pi_1 &= x^*(k, \lambda^*(P_t^{*D}), c) - y^*(k, \lambda^*(P_t^{*D}), c). \end{aligned}$$

The question of whether elections lead to policy convergence as expressed by the conditions that $\frac{\partial x^*}{\partial \bar{P}}, \frac{\partial y^*}{\partial \bar{P}} > 0$ is then reduced to testing $\pi_0 > 0$ against the hypothesis of partial converge represented in $\pi_0 = 0$. LMB call the effect π_1 a party affiliation. The intuition behind the estimating framework is as follows. If voters affect policies, then an increase in the party's electoral strength will lead the representative to vote for policies preferred by voters. However, if voters elect politicians who vote for their preferred policies, then an increase in the party's electoral strength would not change the votes of a representative.

Thus far the analysis of electoral competition has ignored any distinctions between party and politician. Expressly, Alesina (1988) writes "a candidate is completely identified by $[\cdots]$ his political party." In contrast, I consider congresspeople endowed with the same utility function as of the party of affiliation. At this point, I reconsider the use of the Nash (1950) solution and the consequent empirical framework. While the Nash (1950) solution applies not only to two-player problems but generalizes to any given number N of players, it is worth reconsidering its applicability to the current scenario. Consider a given congress at the bargaining table. Is it reasonable to expect that regardless of the relative representation of the political parties the bargaining will settle at the Nash (1950) solution? Kalai (1977) answered this question by considering replications of symmetric Nash (1950) solutions by groups of players with identical utility functions. Let N^D

be the number of democrat congresspeople and define N^R analogously. Define also $\alpha = \frac{N^D}{N^D+N^R}$. Kalai's (1977) result may be stated as follows.[4]

Theorem 3. *(Kalai, 1977) The Nash (1950) solution of the $(N^D + N^R)$-player problem is given by*

$$f^\alpha = \arg\max_{(u^D,u^R)} (u^D - \bar{u}^D)^\alpha (u^R - \bar{u}^R)^{1-\alpha}.$$

This solution is sometimes refereed to as the asymmetric Nash solution as $\alpha = 1/2$ gives back the Nash (1950) solution.

This result accords to the intuition that larger party representation improves the payoff to the political party in at least two ways. First, intuition suggests that an increase in representation would lead to an increase in incumbency advantage. Second, an increase in party representation leads to the enactment of policies closer to the party's bliss point. This point may be derived from the theory above. Consider the impact of an increase in α on π_1. I posit that $\frac{\partial \pi_1}{\partial \alpha} > 0$. This follows from the fact that

$$\frac{\partial \pi_1}{\partial \alpha} = \underbrace{\frac{\partial x^*(k, \lambda^*(P_t^{*D}), c, \alpha)}{\partial \alpha}}_{>0} - \underbrace{\frac{\partial y^*(k, \lambda^*(P_t^{*D}), c, \alpha)}{\partial \alpha}}_{<0} > 0,$$

since x^*, y^* now depend on α. Thus, considering electoral competition as a game of collective individuals yields a testable prediction different than those proposed by LMB.[5] Section 3 establishes conditions for identification of the parameters of interest using the strategy of RDD.

[4] This restatement follows Roth (1979).

[5] In Alesina's (1988) model the Nash (1950) solution plays a crucial role in defining the equilibrium policies. However, the result that dynamic inconsistency leads to partial or full policy convergence through cooperation still holds without the use of the Nash (1950) solution. Indeed, Alesina (1988) mentions the solution proposed by Kalai and Smorodinsky (1975) as an alternative. Although Alesina (1988) makes no reference to the solution proposed by Kalai (1977), his result of policy convergence still holds under the Kalai (1977) solution.

3 Identification Strategy

I begin the discussion of identification by considering the parameters of interest. Recall the estimating framework:

$$RC_t = \text{constant} + \pi_0 P_t^{*D} + \pi_1 D_t + \varepsilon_t.$$

As the measure of electoral strength of a party is not observed, we estimate the remaining parameters using RDD and indirectly estimate the following:

$$\mathbb{E}[RC_{t+1}|D_t = 1] - \mathbb{E}[RC_{t+1}|D_t = 0] = \pi_0[P_{t+1}^{*D} - P_{t+1}^{*R}] + \pi_1[P_{t+1}^{D} - P_{t+1}^{R}] = \gamma \quad (1)$$

$$\mathbb{E}[RC_t|D_t = 1] - \mathbb{E}[RC_t|D_t = 0] = \pi_1, \text{ and} \quad (2)$$

$$\mathbb{E}[D_{t+1}|D_t = 1] - \mathbb{E}[D_{t+1}|D_t = 0] = P_{t+1}^{D} - P_{t+1}^{R}. \quad (3)$$

The intuition behind the decompososition above is as follows. Using an estimate of the incumbency advantage ($P_{t+1}^{D} - P_{t+1}^{R}$) and the causal effect of a democratic representative on the voting record of the district at time t (π_1) one may estimate the unobserved causal effect of elections on the voting record of the district at time $t+1$ ($\pi_0[P_{t+1}^{*D} - P_{t+1}^{*R}]$) by subtracting the product of Equations (2) and (3) from the estimate of Equation (1).

Each of these parameters is identified by the RDD. RDD, as proposed by Thistlethwaite and Campbell (1960), has recently come into vogue as an identification strategy. Recent theoretical results have established the identification of the parameters (e.g. Hahn, Todd, and Van der Klaauw (2001)), its robustness to non-random selection (e.g. Lee (2008)), its properties under specification error (e.g. Lee and Card (2008)), and have developed tests of continuity for the assignment variable (e.g. McCrary (2008)). Similarly, its application to economics and political

science have burgeoned recently (e.g. Gerber and Green (2008)).

The central idea of this identification strategy as pertains the current application is that elections that were barely won are comparable to elections that were barely lost by a given party. This identification strategy yields unbiased estimates with variation that is "as good as random" (Lee, 2008). The validity of a RDD rests on the existence of a discontinuity at the vote share of one half. Several tests may be performed to ensure that the RDD is valid in this context. These tests include the continuity of the density of the running variable, a placebo test for no discontinuity of irrelevant (such as pre-test) variables, and a balance test for covariates around the discontinuity point. As these data have been subject to myriad of these tests I omit them here and refer the reader to Lee (2008), McCrary (2008), and Lee, Moretti, and Butler (2004).

Using Lee's (2008) strategy, LMB use this setup to estimate the incumbency advantage in the next election ($P^D_{t+1} - P^R_{t+1}$) as well as the parameters in Equations (1)–(2) and test whether $\pi_0 > 0$. That is, using the estimate of the incumbency advantage in the next election, the RD design allows the identification of the impact of elections on the electoral competition. In the following section I further exploit this design by comparing estimates of π_1 in congresses that had low and high democratic representation (low and high α's respectively). I follow the guidelines of Imbens and Lemieux (2008) in estimating the parameters of interest.

4 Data

I estimate the parameters of interested following the empirical strategy delineated in the previous section using data from the U.S. House of Representatives. The data are the same as used by Lee, Moretti, and Butler (2004).[6] The data of interest are the roll call voting records at the district level at times t and $t+1$ and the party affiliation of the district representative at times t and $t+1$. This data is available for the 80th through the 104th congresses. Given decennial redistricting, data on years ending in 0 or 0 are dropped from the dataset. Data on roll call voting are proxied using the ADA score of the representative. A higher ADA score denotes a more liberal voting record. For data on historical party divisions of the U.S. House of Representatives I use data from the Office of the Clerk U.S. House of Representatives.[7]

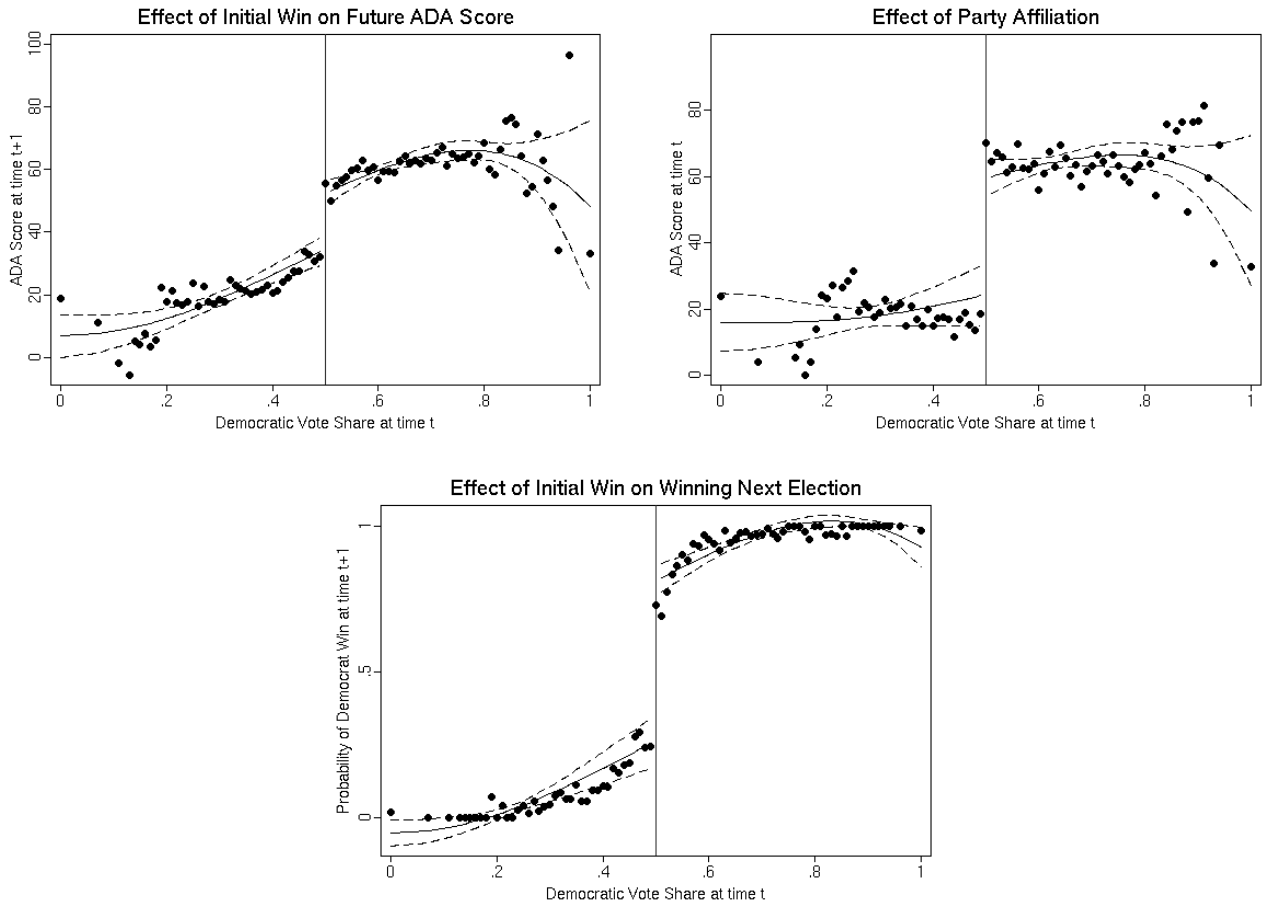
5 Results

Figure 1 presents the replication of the main result in LMB in a graphical manner. Each of the three graphs in Figure 1 plots the outcome of interest against the vote share for democrats at time t. The dots are averages of the outcome variable by bins, each of 1% length. The graphs include the prediction, or fit, of a regression of the outcome variable on a quartic polynomial of the vote share and a dummy for whether or not the democrat won the seat at time t as well as 95% confidence bands around the prediction. The resulting estimate from each graph is the discontinuous jump at a vote share of 1/2. The first graph estimates γ, the second graph estimates π_1 while the third graph estimates $(P^D_{t+1} - P^D_{t+1})$.

[6]This dataset is available at `http://www.econ.berkeley.edu/~ moretti/data3.html`. A detailed description of the dataset in available in Lee, Moretti, and Butler (2004).

[7]These data are available at `http://clerk.house.gov/art_history/house_history/partyDiv.html`.

Figure 1: RDD Graphical Analysis for all Congresses



I now back out the estimate for $\pi_0(P^{*D}_{t+1} - P^{*R}_{t+1})$ using the estimated parameters. While these graphs do not provide numerical estimates, the actual estimation of the parameters at a vote share of 1/2 is a simple comparison of the points below and above the threshold of election 1/2. Table 1 presents the numerical estimates. The first row of the table corresponds to the graphs in Figure 1. I estimate the parameters by comparing the difference between the outcome variable for elections where the democrat's share of votes is between 0.48 and 0.5 with outcome variable for elections where the democrat's share of votes is between 0.5 and 0.52. Standard errors are shown in parentheses below the estimates. As shown in Table 1, the estimate for the affect component (or $\pi_0(P^{*D}_{t+1} - P^{*R}_{t+1})$) is negligible and is statistically insignificant.

Table 1: Results from Close Election Sample

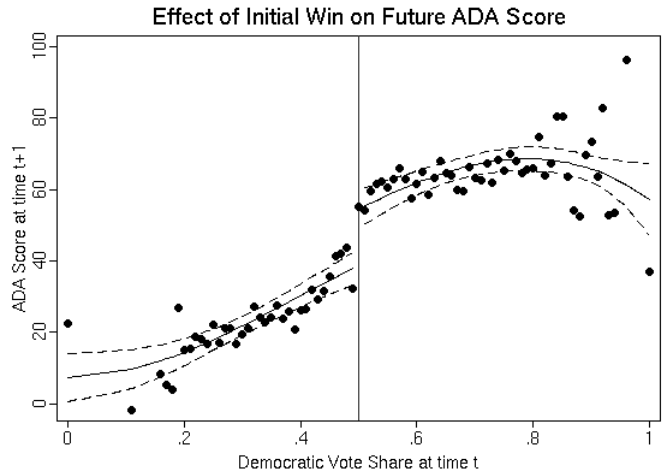
Variable	Total Effect γ ADA_{t+1} (1)	π_1 ADA_t (2)	$(P^D_{t+1} - P^R_{t+1})$ DEM_{t+1} (3)	Elect Component $\pi_1(P^D_{t+1} - P^R_{t+1})$ (col. (2)×col. (3)) (4)	Affect Component $\pi_0(P^{*D}_{t+1} - P^{*R}_{t+1})$ (col. (1)–col. (4)) (5)
Estimated Gap for All Congresses	22.24 (1.7)	51.33 (1.78)	0.49 (0.03)	25.18 (1.78)	-2.94 (2.46)
Estimated Gap for High Dem Congresses	24.53 (2.19)	51.25 (2.49)	0.52 (0.03)	26.42 (2.49)	-1.9 (3.31)
Estimated Gap for Low Dem Congresses	18.33 (2.65)	51.12 (2.53)	0.45 (0.05)	22.89 (2.53)	-4.56 (3.66)

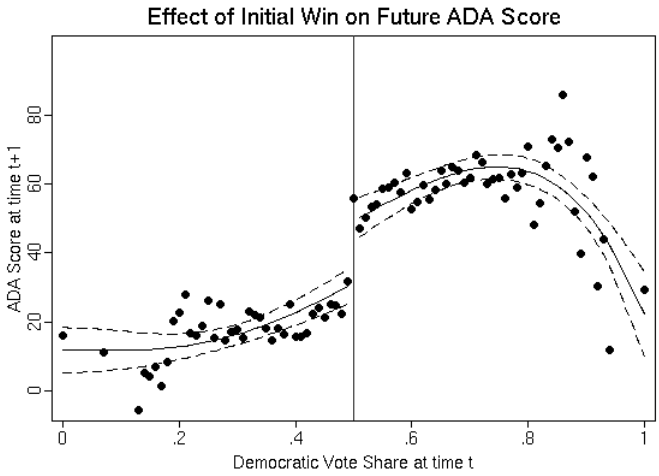
This result implies that $\frac{\partial x^*}{\partial \overline{P}}, \frac{\partial y^*}{\partial \overline{P}} = 0$. That is, that elections serve as a means for people to elect representatives with the desired policy preferences and that elections do not shape the policy proposals of representatives. Given this is the case, it is of interest to understand the dominating component of γ: π_1. At this stage the consideration of political parties is of interest. I now test the hypotheses that both π_1 and the estimate for incumbency advantage increases as α increases. I test this hypothesis by estimating the same model as above on two disjoint subpopulations: congresses with democratic representation (α) above 0.55 and congresses with democratic representation (α) below 0.55.

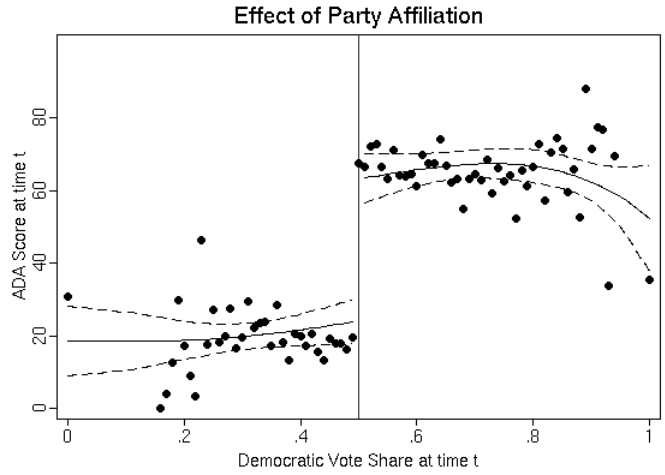
Figure 2 provides a graphical analysis of the relevant estimates for these two subpopulations. Comparing graphs horizontally in Figure 2 we have that the only noticeable difference is in the incumbency advantage. Democrats seem to have a higher incumbency advantage when their representation in congress is high. The second and third rows of Table 1 quantify this inference precisely. It is clear from rows two and three of Table 1 that the only statistically significant difference in the table is the incumbency advantage. In particular we reject the hypothesis that π_1 increases as α increases. It is also worth noting that the main result in LMB is confirmed in this robustness check.

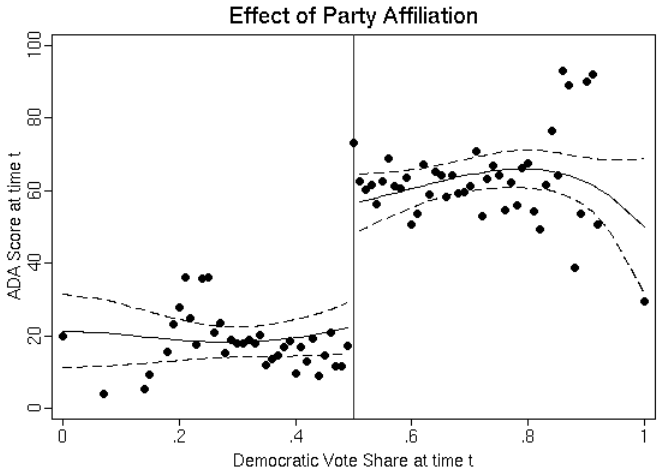
Figure 2: RDD Graphical Analysis for Congresses by Degree of Democratic Representation

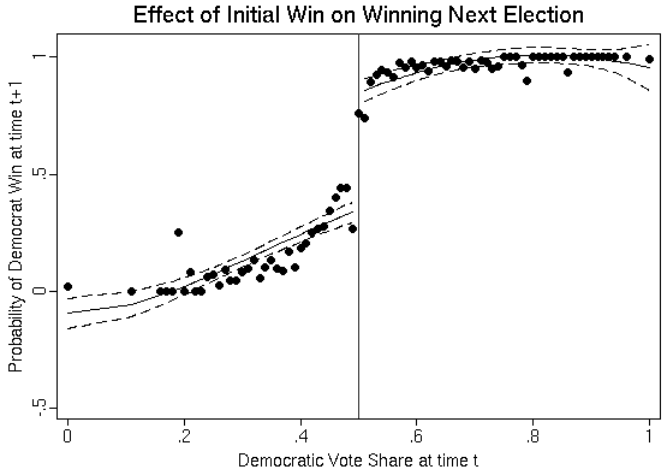
Column (a): High Degree of Democratic Representation Column (b): Low Degree of Democratic Representation

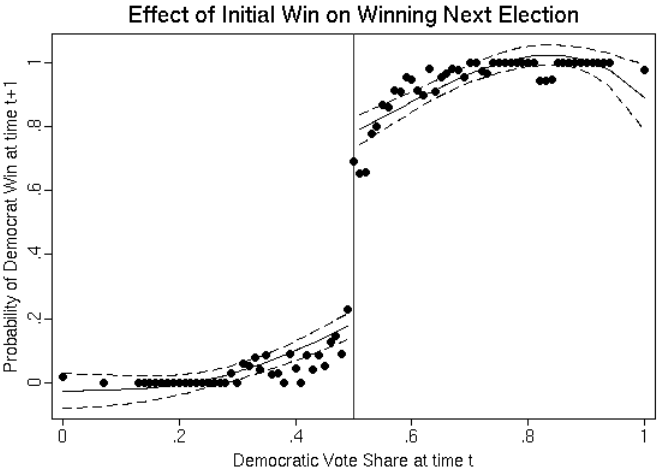












6 Conclusions

The role of political parties on electoral competition is a topic that has received surprisingly little attention. The model proposed in this paper formally tests whether the symmetry assumption that is held in the literature has empirical validity. This paper also serves as a robustness check for the results of Lee, Moretti, and Butler (2004). The prediction of the theoretical model developed here are only partially supported by the data. In particular, there is an increase in the incumbency advantage of the party at the district level while there does not seem to be any variation in the effect of party affiliation. A related implication of the results presented here is that the effect of election on policy outcomes increases with the representation of the party in congress. These results indicate that further analysis of the role of political parties in electoral competition is warranted. The use of axiomatic bargaining in the literature is somewhat disconcerting as it leaves the bargaining process unspecified. In a sense, this is like modeling political interaction with a black box. Replacing this feature of the current model might present further insights into the dynamics of power at the party level.

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