Essays on the Political Economy of Elections

Paul Redmond B.Sc., M.A.

Submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy (PhD)

In the Department of Economics, Finance and Accounting

National University of Ireland Maynooth (NUIM)

Maynooth, Co. Kildare, Ireland.

May 2014

Supervisor: Dr. Tuvana Pastine

Head of Department: Professor Rowena Pecchenino

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Abstract

Elected politicians work as agents on behalf of the citizens of an economy. Once elected they are responsible for shaping the future socioeconomic path of a country. Therefore understanding the determinants of electoral outcomes and the incentives faced by political candidates during the election period is key in understanding the efficacy of elections in selecting the best possible candidates. A functional electoral system should act as a quality filter in which low quality candidates are "weeded out" and the highest quality candidates are successful.

In reality electoral systems may not select and retain the best possible candidates. The presence of incumbency advantage may lead to a dysfunctional system with deleterious effects for welfare. Incumbent candidates may use officeholder benefits to improve their electoral prospects. For example, incumbents typically have access to free postage, printing and greater fundraising capabilities than challengers and may use these officeholder benefits to gain an unfair electoral advantage. As a result, the incumbent could win the election even if the challenger is of higher quality or high quality challengers may decide not to contest the election in the first place. Incumbents are also in a position to announce their policy choices before challengers. As

such the incumbent may enjoy a first mover advantage which may enable the incumbent to implement their own personal policy agenda which may not represent the majority of voters.

The first chapter of this dissertation empirically estimates the magnitude of the incumbency advantage in Irish elections using a regression discontinuity design (RDD). Ireland provides an interesting setting for the study of incumbency advantage as the rate of reelection of Irish politicians is one of the highest in the world. Moreover its electoral system of proportional representation with a single transferable vote (PR-STV) creates strong incentives for incumbent candidates to cultivate a loyal personal following. In very close elections, where there is a narrow margin of victory, it is likely that bare winners are comparable in their unobservable characteristics to bare losers. Regression discontinuity design identifies the causal effect of incumbency by comparing the subsequent electoral outcomes of bare winners and losers. I find that incumbency causes an eighteen percentage point increase in the probability that a candidate is successful in a subsequent election.

In chapter two I study open seat and incumbent-challenger elections in a model of spatial electoral competition between two policy motivated candidates. The candidates differ with regard to non-policy related characteristics which are desired by voters. These may include characteristics such as charisma, charm and intelligence - collectively referred to as valence characteristics. I find that incumbent candidates benefit from being first movers and this allows them to generate favourable post-election policy outcomes. Policy divergence between candidates is typically greater in the incumbent challenger election compared to an open seat contest. I also show that ideo-

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logical shirking occurs once a candidate's valence exceeds a certain threshold as the candidate pursues her own ideology even if this is not representative of the majority of voters.

In chapter three I examine the extent to which electoral selection based on candidate quality alone can account for the pattern of reelection rates in the U.S. Senate. In order to attain incumbency status a candidate has to first win an election. Therefore it is likely that incumbent candidates are of high quality due to political selection and get reelected with a high probability. As such high reelection rates are not definitive evidence of a poorly functioning electoral system. The counterfactual simulation in which candidate quality is the sole determinant of electoral success may provide a simple benchmark for the reelection rate in the absence of officeholder benefits. The simulation delivers a reelection rate which is almost identical to the observed rate prior to 1980, at around 78 percent. In the later sub-sample, quality-based selection generates a reelection rate which is seven percentage points lower than observed. The divergence in the reelection rates in the later sub-sample is consistent with the findings of vote-margin studies that indicate rising incumbency advantage due to officeholder benefits

Acknowledgments

I am extremely grateful to Tuvana Pastine for the guidance, advice and encouragement she provided throughout my graduate career. I feel privileged to have her as an advisor. Tuvana helped make the last four years extremely exciting, enjoyable and rewarding and always inspired me to try and achieve my best.

Donal O'Neill has also provided invaluable advice and guidance for which I am very grateful. He showed me how empirical economics should be done and his advice will remain with me throughout my career.

I would also like to thank Ivan Pastine. His comments and insights have been extremely valuable. The staff of the Department of Economics, Finance and Accounting at NUI Maynooth have always been very generous with their time. In particular I thank Olive Sweetman, Aedín Doris, Dermot Leahy, Simon Broome, Gerda Dewit and Rowena Pecchenino. The administrative staff, Máire Adderley and Sandra Doherty have also been tremendously helpful. I also gratefully acknowledge the financial support of the John and Pat Hume Research Scholarship.

My fellow PhD students at NUI Maynooth have been great fun as well as a great source of encouragement and motivation. In particular I thank Ciara Morley, Lisa Sheenan and Kate Hynes.

A special thank you goes to my parents and family. I would like to dedicate my thesis to my wife Mary. Any success I have enjoyed over the last ten years is down to Mary's unwavering support and patience.

Chapter 1

Incumbency Advantage in Irish Elections: A

Regression Discontinuity Analysis

Abstract

This paper exploits the quasi-experimental features of the system of proportional representation with a single transferable vote (PR-STV) to estimate incumbency advantage in Ireland's lower house of parliament. It is likely that bare winners and bare losers of very close elections are comparable in their unobservable characteristics. Regression discontinuity design (RDD) identifies the causal effect of incumbency by comparing the subsequent electoral outcomes of bare winners and losers. The analysis indicates that incumbency causes an eighteen percentage point increase in the probability that a candidate is successful in a subsequent election.

1.1 Introduction

During the period 1927-2011 incumbent members of Ireland's Lower House (Dáil Éireann) were re-elected, on average, 81.7 percent of the time. This rate of incumbent re-election is amongst the highest in the world. Matland and Studlar (2004) compare re-election rates across twenty five countries and find that Ireland has the fourth highest rate of incumbent re-election.[1] Inordinately high re-election rates may give rise to concerns that incumbency conveys an unfair advantage on incumbents versus challengers (Lee, 2008). This may enable low quality incumbents to retain their seats by defeating challengers of higher quality or deterring challengers from running in the first place. Using election data from 1948-2007, I estimate the incumbency advantage in Ireland's proportional electoral system using a regression discontinuity design (RDD). I find that incumbency causes an eighteen percentage point increase in the probability that a candidate is successful in the next election.

Incumbency advantage may arise due to direct officeholder benefits or indirect "scare off" effects (Cox and Katz, 1996; Levitt and Wolfram, 1997). Direct officeholder benefits are the extra resources and perquisites which an incumbent has at her disposal and which may be used to improve future electoral prospects. Such resources can include access to a staffed office, telephones and printing but can also include local decision making powers granted to incumbents by government decentralisation (de Janvry et al., 2012). Incumbents also enjoy greater media attention than non-incumbents and may benefit from increased name recognition. If a potential challenger

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[1]The three countries which ranked higher than Ireland in terms of incumbent re-election rates were the United States (1st), Australia (2nd) and West Germany (3rd).

knows the incumbent can take advantage of direct officeholder benefits then he may be deterred from contesting the election. This is of particular relevance for high quality challengers with a high opportunity cost of their time.

The existing literature on incumbency advantage typically focuses on plurality voting, namely the first-past-the-post system in the United States. Less is known about the incumbency advantage in proportional electoral systems. The incumbency advantage in Ireland, while sizeable, is lower in magnitude compared to similar studies of the US. There are several features of proportional representation which may limit the incumbency advantage in comparison to plurality systems. For example in Ireland's proportional system multiple incumbents from the same party often hold seats in the same constituency making it difficult for individual incumbents to claim credit for pork barrel spending and the provision of local public goods. Furthermore, there may be increased competition in proportional systems as candidates engage in inter-party as well as intra-party competition. The presence of multiple incumbents in the same constituency could also dilute media attention reducing the political visibility of incumbents and limiting the incumbent's name recognition advantage.

Incumbency advantage has been a contentious issue in Irish politics in recent years in light of a high court ruling seeking to limit any unfair advantage enjoyed by incumbent politicians.[2] A candidate contesting a seat in Dáil Éireann in 2002 was aggrieved that incumbents did not have to include publicly funded officeholder benefits such as free post, travel and telephone

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[2] Kelly v The Minister for the Environment and the Attorney General, 2002.

as election expenses.[3] Kelly (the applicant in the case) argued that this gave incumbents an unfair advantage. The High Court ruled that incumbent legislators must include the value of their office related perquisites as campaign expenditure regardless of whether the perquisites were used explicitly for campaigning. This disclosure only applies to perquisites used during the relatively short period over which the election campaign runs (three weeks in the 2002 election). However, as noted by Benoit and Marsh (2008), it is quite plausible that the real campaign occurs throughout the inter-election period by exploiting office benefits that make a continuous campaign possible.

Ireland's proportional electoral system creates strong incentives for incumbents to utilise direct officeholder benefits. Incumbents typically face competition from within their own party and therefore need to cultivate a loyal personal following among the local electorate to identify themselves as separate from their parties (Marsh et al., 2008). The preoccupation with building a local following is illustrated by Wood and Young (1997) who find that Irish incumbents spend sixty percent of their time on local constituency matters.

The main difficulty in empirically estimating incumbency advantage is omitted variable bias. The multidimensional aspects of a candidate's quality such as charisma, charm and intelligence are typically unobservable and unquantifiable (Levitt, 1994). If higher quality candidates attract more votes, electoral selection will lead to incumbents and challengers possessing different characteristics. Failure to control for these differences may lead to biased

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[3]In 2002, campaign expenditure for candidates was capped in Ireland. For example, in a four seat constituency, expenditure was limited to €31,743.

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estimates of incumbency advantage (Gelman and King, 1990). In order to overcome the problem of omitted variable bias, I use a regression discontinuity design (RDD) which focuses on very close elections which are decided by a narrow margin of victory. The bare winners and bare losers of these close elections are assumed to be comparable in their unobservable characteristics. This implies that bare losers provide a valid counterfactual for bare winners with regard to subsequent electoral outcomes. By comparing these outcomes I identify the causal effect of incumbency.

The application of RDD to estimate incumbency advantage was pioneered by Lee (2008), who uses RDD to estimate the causal effect of incumbency in U.S. House elections. Lee (2008) finds that incumbency causes a 45 percentage point increase in the probability that a candidate contests and wins the subsequent election. Lee's work in applying RDD to estimate incumbency advantage has since been emulated in several subsequent works including Hainmueller and Kern (2008), Eggers and Hainmueller (2009), Uppal (2009 & 2010), Trounstine (2011) and Liang (2013).

Caughey and Sekhon (2011) question the validity of applying RDD to the plurality system of the US House of Representatives due to their finding that bare winners and bare losers from close elections may not be comparable. House elections which are decided by the slimmest of margins tend to be won by the existing incumbent and these outcomes are typically predicted correctly by Congressional Quarterly's pre-election ratings. A House incumbent may have very precise information about the number of votes needed to secure victory in a close election and can make maximal use of her resources to capture these votes. The ability to manipulate the variable which

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determines incumbency could lead to sorting whereby more incumbents end up as bare winners than bare losers. This calls into question the fundamental assumption of random assignment which underpins RDD. Caughey and Sekhon (2011) acknowledge that RDD may perform better in a multi-party electoral system where the threshold for victory is more difficult to predict. The PR-STV system in Ireland provides such a setting. I verify the suitability of RDD to Ireland's multi-party, multi-candidate system by applying tests which show that bare winners and bare losers are comparable in pre-treatment characteristics. This result supports the work of Eggers et al. (2014) who use a dataset of 40,000 close election contests in nine countries to show the assumptions behind the RD design are likely to be met in a wide variety of electoral settings.[4]

Caughey and Sekhon (2011) also caution against over-reliance on parametric techniques when using the RDD methodology. The causal effect of incumbency is identified using outcomes of bare winners and bare losers whose vote share falls within a small bin width on either side of the fifty percent vote threshold. As such, extrapolation using data far from the threshold may not be sufficient in itself. In this paper I use both parametric and non-parametric methods. The parametric estimation procedure is based on polynomials of various orders, while the non-parametric method uses local linear regressions with various bandwidths and kernels.

In addition to RDD, two other empirical strategies have been widely used

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[4]The nine countries examined are Canada, United Kingdom, Germany, France, Australia, New Zealand, India, Brazil and Mexico. Eggers et al. (2014) attribute Caughey and Sekhon's (2011) finding that bare winners and bare losers in post war US House elections are not comparable to statistical chance.

to estimate incumbency advantage; these are the sophomore surge and retirement slump (Erikson, 1971; Alford and Brady, 1988; Gelman and King, 1990; Cox and Katz, 1996; Levitt and Wolfram, 1997; Jacobson, 1997, Ansolabehere and Snyder, 2002). The sophomore surge method looks at the difference in vote shares between the first and second terms for winning challengers and the retirement slump uses the difference between vote shares of retiring incumbents and their freshmen successors. However the popularity of these techniques has declined in light of work by Gelman and King (1990) and Levitt and Wolfram (1997) which show that both methodologies are prone to sample selection bias.

The remainder of the paper proceeds as follows. Section 1.2 discusses the Irish electoral setting and the data. Section 1.3 outlines the regression discontinuity design and shows how to estimate the RDD using both parametric and non-parametric methods. The results are presented in Section 1.4. Section 1.5 provides robustness and validity tests and Section 1.6 concludes.

1.2 The Irish Electoral Setting and Data

Ireland is a parliamentary democracy with two Houses of Parliament. The Upper House is known as Seanad Éireann and the Lower House as Dáil Éireann. Members of Dáil Éireann (referred to as Teachta Dála or TDs) are directly elected at least once every five years. The average length of time between general elections for the period 1948-2007 is 3.3 years. Dáil elections are carried out in multi-seat districts which are comprised of between 3 to 5 TDs. There are 43 districts which elect 165 TDs at each general election.

Elections are conducted using the system of proportional representation with a single transferable vote (PR-STV). This system allows voters to rank candidates in order of preferences on a ballot paper. For example the voter places a 1 beside his highest preference, a 2 beside his second highest preference and so on. A candidate is elected once she gets enough votes to meet a predetermined quota.[5] Only one of the voter's preferences is active at any one time (i.e. for any one vote count). For example a vote stays with the highest preference candidate until that candidate gets elected or eliminated, at which point it transfers to the next highest preference candidate that is still in the running. Following a count, if no candidate has enough votes to secure election, the least voted candidate is eliminated and his votes are transferred. A subsequent count then takes place. The process continues until all seats have been filled. It is extremely rare for all seats to be filled based on first preference votes meaning that virtually all elections involve multiple counts.

Table 1 summarizes every Irish election from 1948-2007. Fianna Fáil has been the dominant party in Irish politics having served in thirteen out of the eighteen governments during this period. Fine Gael, Labour and the Progressive Democrats have also enjoyed electoral success albeit to a lesser extent. Prior to the 1970s, Irish politics was characterized as being very stable with a high degree of government stagnation. Fianna Fáil enjoyed sixteen years of uninterrupted rule from 1957-1973 winning four elections in a row. However from the 1970's onwards, Irish electoral politics became more

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[5]The following formula is used to calculate the election quota; divide the total number of valid votes by the number of available seats plus one, ignore any fraction and add one. For example if there are 10,000 votes and 4 seats to be filled, the quota equals 2,001.

Table 1: Summary of Irish Elections (1948-2007)

Election Date	Successful Party/Coalition	Duration of Government in Days	Reelection Rate (%)
February 1948	FG/L/CP/CT	1,211	84.1
May 1951	FF	1,084	82.3
May 1954	FG/L/CT	1,022	84.9
March 1957	FF	1,674	82.0
October 1961	FF	1,281	82.3
April 1965	FF	1,533	82.8
June 1969	FF	1,351	87.8
February 1973	FG/L	1,569	86.6
June 1977	FF	1,456	75.9
June 1981	FG/L	252	85.8
February 1982	FF	279	86.6
November 1982	FG/L	1,546	86.8
February 1987	FF	849	86.4
June 1989	FF/PD	1,259	82.7
November 1992	FF/L	1,654	81.3
June 1997	FF/PD	1,806	72.9
May 2002	FF/PD	1,788	77.3
May 2007	FF/G/PD	1,373	79.5

Abbreviations: Fianna Fáil (FF), Fine Gael (FG), Labour (L), Progressive Democrat (PD) Green Party (G), Clann na Poblachta (CP), Clann na Talmhan (CT)

competitive and volatile (Farrell, 1994). Of the eleven elections from 1973-2007, only one incumbent government was fully returned to power. Declining party attachment played a role in this increased competitiveness as did the establishment of the Progressive Democrat party in the 1980's.[6]

High reelection rates are a notable feature of Irish politics. The reelection rate has remained above 80 percent for all but four of the eighteen elections. The election of 1997 is notable in that its reelection rate of 72.9 percent is the lowest in the sample. This was largely attributable to a collapse in the Labour Party vote due to the party losing credibility after entering a coalition with Fianna Fáil in 1992.

I estimate the incumbency advantage using a dataset consisting of bare winners and bare losers from constituency level elections during the period 1948-2007. In a multi-seat constituency, the bare winner is the winner of the last available seat and the bare loser is the runner up for that seat. Note however that one constituency election can have more than one bare winner and/or loser. Consider the 2002 Dublin North election. After seven counts, three candidates were left contesting the final two available seats. When the eighth count was tallied, candidates Glennon and Wright were successful achieving 8,640 and 8,617 votes respectively. These two candidates represent bare winners. Candidate Daly failed to get elected achieving 7,523 votes and therefore represents a bare loser. There are 733 constituency elections in the dataset and 1,600 candidates.

RDD compares bare winners and bare losers from election t on their

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[6]Sinnott (1998) reports that by the mid 1990's party attachment in Ireland was the lowest of the twelve EU member states.

subsequent electoral performance at time t+1. As such I use pairs of consecutive elections. The dependent variable uses data from 1951-2007 and the independent (forcing) variable uses data from 1948-2002. The dataset is compiled using three data sources; Michael Gallaghers "Irish Elections 1948-77: Results and Analysis", the "Nealons Guide" publications from 1977-97 and House of the Oireachtas election data.[7]

1.3   Empirical Strategy

Regression discontinuity design (RDD) is a quasi-experimental design that can be used to evaluate the causal effect of treatment when assignment to the treatment changes discontinuously (Hahn et al., 2001; Imbens and Lemieux, 2008). This occurs when an underlying (forcing) variable passes a defined threshold. In the case of elections, treatment is the assignment of incumbency status and the threshold at which this occurs is a specified vote share. RDD is based on the idea that individuals just below the threshold (bare losers) possess comparable traits and characteristics as those just above the threshold (bare winners). I identify the causal effect of incumbency by comparing the subsequent electoral outcomes of bare winners and bare losers.

In a plurality system such as the United States the threshold is simply 50 percent of the vote share (as in Lee, 2008 and Uppal, 2010). Two candidates compete for a seat and the candidate receiving greater than 50 percent of the vote becomes the incumbent. However, the threshold is different in a multi-seat PR-STV system. A candidate typically gets elected after exceeding the

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[7]The Irish House of the Oireachtas publishes election data online at www.oireachtas.ie

quota (discussed in Section 2). However, candidates who contest the last seat of an election, the bare winners and losers, may fall short of the quota and still get elected. For example, if there is one remaining seat which is contested by two candidates after all vote transfers are made, then the highest voted of these two candidates will be elected even if the votes fall short of the quota. As such, I define the vote threshold at which incumbency is assigned as the average of the votes obtained by the least voted winner and the most voted loser in a constituency election. To illustrate the method, take the example of the 2007 election in the constituency of Carlow-Kilkenny. Two candidates, White and Phelan, were vying for the final seat. White, the victor, ended up with 10,464 votes and Phelan, the loser, with 9,815 votes. Therefore, the vote threshold at which incumbency is achieved is 10,140 (the average of the two).

Define $x_{i,t}$ as the ratio of votes received by candidate i at time t to the required vote threshold. $I_{i,t+1}$ is an indicator of incumbency status at the next election such that,

$$
I_{i,t+1} = \begin{cases} 1 & \text{if } x_{i,t} \geq 1. \\ 0 & \text{if } x_{i,t} < 1 \end{cases} \tag{1}
$$

The candidate with $x_{i,t} \geq 1$ achieves at least the minimum number of votes required to get elected. Therefore the threshold at which incumbency status is attained is $x_{i,t} = 1$.

I now turn to a formal motivation for using RDD to estimate incumbency

advantage. Consider the following regression,

$$Victory_{i,t+1} = \alpha + \beta.I_{t+1} + \epsilon_{t+1} \qquad (2)$$

where $Victory_{i,t+1}$ equals one if candidate i is elected at time $t+1$ and zero otherwise. $I_{i,t+1}$ is a dummy variable for incumbency status which is defined above. Unobservable quality is likely to be correlated with incumbency status which means that $E[\epsilon_{i,t+1}|I_{i,t+1}] \neq 0$. This leads to a biased estimate of the incumbency effect in which,

$$E[Victory_{i,t+1}|I_{i,t+1} = 1] - E[Victory_{i,t+1}|I_{i,t+1} = 0] = \beta + BIAS_{i,t+1} \qquad (3)$$

where $BIAS_{i,t+1} = E[\epsilon_{i,t+1}|I_{i,t+1} = 1] - E[\epsilon_{i,t+1}|I_{i,t+1} = 0]$. By examining close elections RDD aims to eliminate this bias. Close elections are ones in which the $x_{i,t}$'s achieved by competing candidates occur in a close neighbourhood around the incumbency threshold (of $x_{i,t} = 1$). By looking at data in an interval which is close to the threshold we get,

$$E[Victory_{i,t+1}|1 \leq x_{i,t} < \eta] - E[Victory_{i,t+1}|\eta < x_{i,t} < 1] = \beta + BIAS*_{i,t+1}$$
$$(4)$$

where η is some arbitrarily small number, and $BIAS*_{i,t+1} = E[\epsilon_{i,t+1}|1 \leq x_{i,t} < \eta] - E[\epsilon_{i,t+1}|\eta < x_{i,t} < 1]$. In the limit as $\eta \to 0$, the margin of votes separating the bare winner and bare loser becomes negligible. The assumption underpinning RDD is that in these very close elections, the predetermined characteristics of the bare winners and bare losers are comparable. Therefore as $\eta \to 0$ the bias disappears and we are left with the true estimate

of the incumbency effect,

$$\lim_{\eta \to 0} E[Victory_{i,t+1} | 1 \leq x_{i,t} < \eta] - \lim_{\eta \to 0} E[Victory_{i,t+1} | \eta < x_{i,t} < 1] = \beta \quad (5)$$

The electoral outcomes at time t+1 are estimated separately for those to the right of the threshold (bare winners) and those to the left of the threshold (bare losers),

$$VictoryL_{i,t+1} = \alpha_L + \beta.f_L(x_{i,t} - 1) + \epsilon_{i,t+1} \quad (6)$$

$$VictoryR_{i,t+1} = \alpha_R + \beta.f_R(x_{i,t} - 1) + \epsilon_{i,t+1} \quad (7)$$

Where $f_R(\cdot)$ and $f_L(\cdot)$ are polynomials in the forcing variable. It is necessary to model the forcing variable in this way as the conditional expectation function $E[Victory_{i,t+1} | x_{i,t}]$ may be non-linear. Failure to do so could result in a non-linearity in the CEF being mistakenly identified as a discontinuity. For convenience, I subtract the threshold value from the forcing variable in equations (6) and (7). This ensures that the incumbency effect at the threshold is equal to the intercept terms. This yields an estimate of incumbency advantage equal to $\hat{\alpha}_R - \hat{\alpha}_L$.

An alternative to estimating two separate regressions for the winners and losers is to estimate one single pooled regression (Lee and Lemieux, 2010). The advantage of this is that it yields direct estimates and standard errors. The pooled regression is,

$$Victory_{i,t+1} = \alpha + \beta.I_{i,t+1} + \rho.f(x_{i,t} - 1) + \lambda.I_{i,t+1}.f(x_{i,t} - 1) + \epsilon_{i,t+1} \quad (8)$$

This specification includes interactions between the polynomial terms and the incumbency dummies. This is to capture any non-linearity which may arise from the interaction of the incumbency dummy with $x_{i,t}$.

Up to this point I have focused on a parametric estimation strategy. The incumbency advantage can also be estimated using non-parametric techniques. For ease of exposition I begin with an explanation of one of the most basic non-parametric strategies, the rectangular kernel regression. The non-parametric regression function is obtained by plotting local averages of the dependent variable evaluated at each $x_{i,t}$ using a bandwidth h. For example, at the point x_0, the estimate, denoted $\hat{Y}_0$ is,[8]

$$\hat{Y}_0 = \frac{\sum\limits_{i=1}^{N} Victory_i \cdot 1\{x_0 - \frac{h}{2} \leq x_i \leq x_0 + \frac{h}{2}\}}{\sum\limits_{i=1}^{N} \cdot 1\{x_0 - \frac{h}{2} \leq x_i \leq x_0 + \frac{h}{2}\}} \tag{9}$$

where N is the number of observations in the interval $x_i \in [x_0 - \frac{h}{2}, x_0 + \frac{h}{2}]$.

As with the parametric approach, identification of the causal effect comes from comparing bare winners with bare losers. To do this I estimate two boundary points, one to the left and one to the right of the threshold. The estimate to the left (right) uses data within the bandwidth h to the left (right) of the threshold. The incumbency effect is given by,

$$\hat{Y}_R - \hat{Y}_L = \frac{\sum\limits_{i=1}^{N} Victory_i \cdot 1\{1 \leq x_i \leq 1 + h\}}{\sum\limits_{i=1}^{N} \cdot 1\{1 \leq x_i \leq 1 + h\}} - \frac{\sum\limits_{i=1}^{N} Victory_i \cdot 1\{1 - h \leq x_i < 1\}}{\sum\limits_{i=1}^{N} \cdot 1\{1 - h \leq x_i < 1\}} \tag{10}$$

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[8]I drop the time subscripts for convenience

Figure 1: Illustration of Bias in Rectangular Kernel Regression
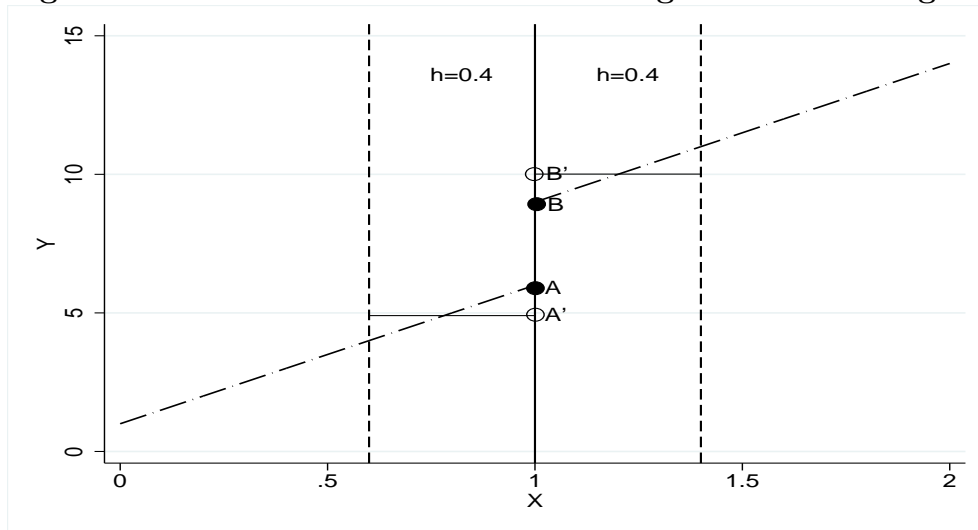
However the rectangular kernel regression is not very desirable in the RDD setting due to a bias in boundary point estimates. The bias can be seen using a graphical illustration (as in Lee and Lemieux, 2010). Figure 1 shows a hypothetical example where the relationship between the dependent variable (Y) and the independent variable (X) is linear. Using a bandwidth of 0.4 I calculate the non-parametric estimates at the boundary points A and B using equation (9). This gives the estimates A' and B'. With upward sloping data the estimated causal effect of interest B'-A' is biased upwards as seen by comparison to the true effect B-A.

This type of bias can be avoided by using local linear regressions. Instead of simply taking averages within a bandwidth h around each data point $x_{i,t}$, I run a local linear regression of Y on X using data within the bandwidth h. In general, for a data point x_0 the following regression is run,

$$Victory_{i,t+1} = \alpha + \beta.(x_{i,t} - 1) + \epsilon_{i,t+1}, \qquad x_{i,t} \in [x_0 - \frac{h}{2}, x_0 + \frac{h}{2}] \quad (11)$$

The predicted value of equation (11) evaluated at x_0 yields the non-parametric estimate. As before, the causal effect of incumbency is estimated by comparing bare losers and bare winners. To the left of the threshold (the bare losers) I run the following regression

$$VictoryL_{i,t+1} = \alpha_L + \beta_L.(x_{i,t} - 1) + \epsilon_{i,t+1}, \qquad x_{i,t} \in [(1-h), 1) \qquad (12)$$

and to the right of the threshold (the bare winners),

$$VictoryR_{i,t+1} = \alpha_R + \beta_R.(x_{i,t} - 1) + \epsilon_{i,t+1}, \qquad x_{i,t} \in [1, (1+h)] \qquad (13)$$

The intercepts give the predicted values at the threshold so that the causal effect of incumbency is given by $\hat{\alpha}_R - \hat{\alpha}_L$ In the hypothetical example shown in Figure 1, the local linear regression produces the boundary estimates A and B thereby removing the bias associated with the rectangular kernel regression. It is possible to combine equations (12) and (13) and estimate one pooled regression,

$$Victory_{i,t+1} = \alpha + \beta.I_{t+1} + \rho.(x_{i,t} - 1) + \lambda.I_{t+1}.(x_{i,t} - 1) + \epsilon_{i,t+1}, \ \ x_{i,t} \in [(1-h), (1+h)]$$

$$(14)$$

The causal effect of incumbency is identified as $E[Victory_{i,t+1}|I_{i,t+1} = 1, x_{i,t} = 1] - E[Victory_{i,t+1}|I_{i,t+1} = 0, x_{i,t} = 1].$[9] Applying this to equation (14) gives β as is the estimate of incumbency advantage. Instead of using the pooled regression we could use equation (13) to get $E[Victory_{i,t+1}|I_{i,t+1} = 1, x_{i,t} = $

[9]The incumbency advantage is identified as the difference between incumbents and non-incumbents at the threshold.

1] $= \hat{\alpha}_R$ and equation (12) to get $E[Victory_{i,t+1}|I_{i,t+1} = 0, x_{i,t} = 1] = \hat{\alpha}_L$ giving $\hat{\alpha}_R - \hat{\alpha}_L$ as the estimate of incumbency advantage. Both approaches are identical and produce the same result. With equations (12) and (13) we estimate the conditional expectation functions above and below the threshold separately. The pooled regression, equation (14), estimates the exact same conditional expectation functions in one step and therefore $\beta = \hat{\alpha}_R - \hat{\alpha}_L$. The pooled regression is more convenient as it yields direct estimates and standard errors.

Some candidates from election t may choose not to rerun in election $t+1$. For example if an incumbent thinks she is likely to lose her seat then she may strategically retire before the election. Therefore, estimating the effect of incumbency on the probability of winning election t+1 conditional on running in t+1 may produce estimates which are biased upwards. As such the dependent variable $Victory_{i,t+1}$ is a binary variable which indicates whether a candidate runs for and wins election $t + 1$.[10]

Studies which look at the U.S. Congress typically focus on candidate vote share. Here I focus on a binary outcome variable which indicates victory. This is consistent with Jacobson (1987) and Carey et al. (2000) who point out that what matters most in elections is winning or losing, not the margin of victory.

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[10]For example consider an incumbent who wins by a razor thin margin at t but does not feel confident of victory at $t + 1$. He may decide to strategically retire before the election. If I only consider the probability of winning conditional on running at $t + 1$ then I ignore the fact that this bare winner at t would likely have lost at $t + 1$ had he decided to run. This would bias the estimate of incumbency advantage upwards and this is why I use the probability of running and winning as the outcome variable.

1.4 Results

Figure 2A plots the probability of a candidate running and winning in $t + 1$ against the forcing variable $x_{i,t}$. Equation (8) is estimated by regressing $Victory_{i,t+1}$ on an incumbency indicator, a fourth order polynomial in $x_{i,t}$ and interactions between the incumbency indicator and the polynomial terms. The solid line plots the predicted values of the probability of victory at time t+1 and the dots are local averages of the indicator of victory at time t+1 taken over 0.02 intervals of $x_{i,t}$. Figure 2A shows a clear discontinuity at the incumbency threshold indicating that incumbency causes an eighteen percentage point increase in the probability that a candidate runs for and wins the subsequent election.

The magnitude of the incumbency advantage in Ireland is lower than similar estimates for the United States. Incumbency increases a candidate's probability of winning a subsequent election by forty percentage points in the US House (Lee, 2008) and thirty percentage points in US state legislatures (Uppal, 2010) and US city council elections (Trounstine, 2011). The lower incumbency advantage may be attributable to Ireland's proportional electoral system which is more competitive due to candidates facing intra-party as well as inter-party competition. In addition, multiple incumbents in the same district make it difficult to claim credit for pork barrel spending and may reduce an incumbent's name recognition advantage.

An indirect or "deterrence" effect of incumbency is often highlighted in the literature (Cox and Katz, 1996, Levitt and Wolfram, 1997, Lee, 2008 and Uppal, 2010). Incumbents may deter challengers from rerunning in the

Figure 2A: Probability of Running and Winning at Time t+1

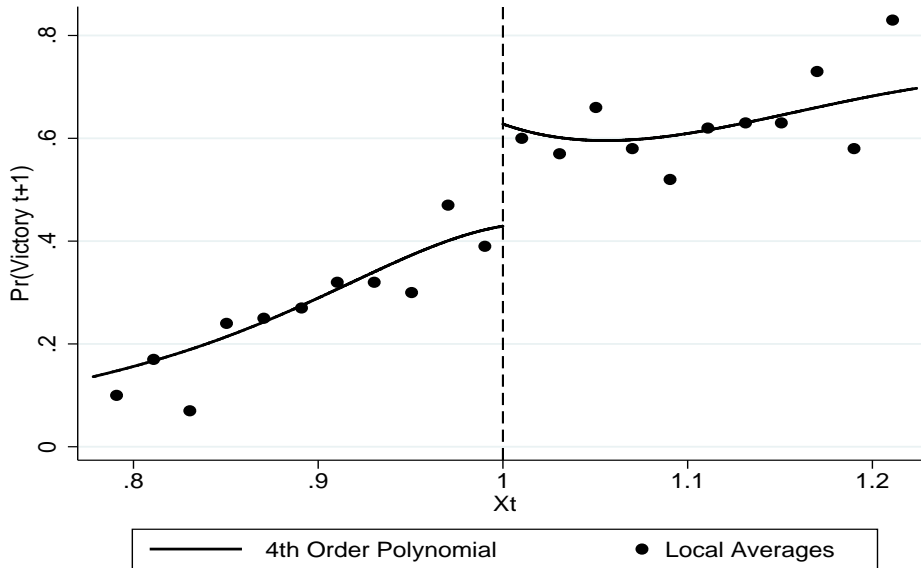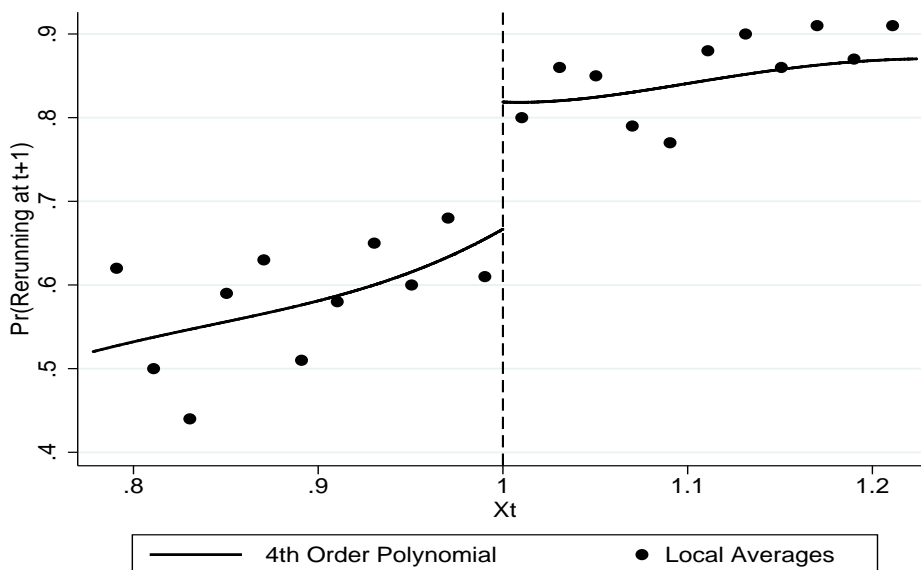**Figure 2B: Probability of Rerunning at Time t+1**

Notes: The solid lines plot the predicted values from regressing the outcome variables at time t+1 on an incumbency indicator, a fourth order polynomial in $x_{i,t}$ and interactions between the incumbency indicator and the polynomial terms. The dots are local averages of the outcome variables at time t+1 taken over 0.02 intervals of $x_{i,t}$.

next election. Figure 2B plots the probability of a candidate rerunning at time $t+1$ against the forcing variable $x_{i,t}$. In equation (8) the dependent variable is a dummy variable which equals one if the candidate reruns in the next election and zero otherwise. Figure 2B is consistent with a significant indirect (deterrence) effect of incumbency. Bare winners are 16 percentage points more likely to rerun than bare losers. As noted by Uppal (2010) this suggests that incumbency may serve as a barrier to the reentry of challengers.

The incumbency advantage estimates are shown in Table 2. In addition to the parametric estimates corresponding to Figures 2A and 2B, the non-parametric estimates using local linear regressions are also shown. Both approaches yield similar results.

Levitt and Wolfram (1997) and Gelman and King (1990) find that incumbency advantage in the United States increased in the latter decades of the twentieth century. I examine whether the incumbency effect has changed over time in Ireland by looking at two subsamples, 1948-1969 and 1973-2007. Apart from the fact that these subsamples each represent roughly half of the time period covered by the data, 1969 represents an interesting point at which to divide the data. The election following 1969 brought an end to sixteen years of uninterrupted Fianna Fáil rule and there followed a structural shift in the electoral strategies of Irish political parties (Marsh, 2000). The parties realised that it was necessary to concentrate more effort into coordinating national campaigns in order to be successful at the polls.

Table 2: Estimates of Incumbency Advantage

Difference in Probability Between Bare Winners and Bare Losers

	Parametric Specification	Non-Parametric Specification
Pr(Victory at t+1)	0.18***	0.18***
	(0.08)	(0.07)
	n=1600	n=970
Pr(Rerunning at t+1)	0.16***	0.16***
	(0.06)	(0.05)
	n=1600	n=1169

Notes: The parametric specification estimates equation (8) using a fourth order polynomial in the forcing variable $x_{i,t}$. The non-parametric specification estimates equation (14) using optimal bandwidths which minimise the mean squared error (as in Imbens and Kalyanaraman, 2009). Standard errors are in parentheses and n indicates the number of observations. *** significant at 1%. ** significant at 5%. *significant at 10%.

Table 3 presents the estimated incumbency effects for the two time periods. From 1948-1969 incumbency causes an increase of approximately 0.20 in the probability that a candidate reruns and wins in the next election. For the later period from 1973-2007, the magnitude of the incumbency advantage is smaller at approximately 0.13. There is also evidence of a stronger deterrence effect in the earlier subsample. From 1948-1969 incumbency causes a 0.21 increase in the probability that a candidate reruns in the next election compared to 0.13 from 1973-2007. The increased electoral competition and

intensity of campaigning following the election of 1969 may be responsible for the declining incumbency advantage in the later period.

Table 3: Estimates of Incumbency Advantage Over Time

Difference in Probability Between Bare Winners and Bare Losers

	Parametric Specification	Non-Parametric Specification
Pr(Victory$_{t+1}$): 1948-1969	0.20*	0.23***
	(0.11)	(0.07)
	n=625	n=406
Pr(Rerunning$_{t+1}$): 1948-1969	0.21**	0.26***
	(0.09)	(0.10)
	n=625	n=367
Pr(Victory$_{t+1}$): 1973-2007	0.13**	0.18**
	(0.07)	(0.08)
	n=975	n=573
Pr(Rerunning$_{t+1}$): 1973-2007	0.13**	0.12*
	(0.07)	(0.07)
	n=975	n=603

Notes: Standard errors are in parentheses and n is the number of observations. *** significant at 1%. ** significant at 5%. *significant at 10%.

Each of the elected governments in the sample involve either Fianna Fáil or Fine Gael as the main party. I estimate the incumbency advantage separately for Fianna Fáil and Fine Gael as well as "other" candidates (non FF and FG). The estimates for each party relate to an incumbent's advantage

over a challenger *from the same party.* For example, the estimate of incumbency advantage for Fine Gael is identified using the subset of bare winners and bare losers who are members of that party. This includes Fine Gael candidates who won (lost) against bare losers (winners) from other parties as well as Fine Gael candidates who won (lost) against bare losers (winners) from the same party. The estimates are shown in Table 4.

Table 4: Political Party Incumbency Advantage		
Difference in Probability Between Bare Winners and Bare Losers		
	Parametric Specification	Non-Parametric Specification
Pr(Victory$_{t+1}$): FF Party	0.03	0.09
	(0.11)	(0.09)
	n=707	n=476
Pr(Rerunning$_{t+1}$): FF Party	0.17*	0.26***
	(0.09)	(0.10)
	n=707	n=360
Pr(Victory$_{t+1}$): FG Party	0.24*	0.44***
	(0.13)	(0.13)
	n=485	n=222
Pr(Rerunning$_{t+1}$): FG Party	0.14	0.19*
	(0.10)	(0.10)
	n=485	n=298
Pr(Victory$_{t+1}$): Others	0.11	0.13
	(0.13)	(0.14)
	n=408	n=227
Pr(Rerunning$_{t+1}$): Others	0.02	0.00
	(0.11)	(0.12)
	n=408	n=244

Notes: Standard errors are in parentheses and n is the number of observations. *** significant at 1%. ** significant at 5%. *significant at 10%.

Fine Gael incumbents appear to enjoy the largest incumbency advantage over rivals from the same party. The parametric estimation procedure indicates that the probability of a bare winner from Fine Gael running for and winning the next election is 24 percentage points higher than a bare loser from the same party. The estimates are positive but not statistically significant for Fianna Fáil and other parties. There is evidence of a deterrence effect in the Fine Gael and Fianna Fáil parties but not for others.

The higher incumbency advantage for Fine Gael could reflect the party's strong desire to protect incumbents once they enter office. For example consider two Fine Gael candidates who compete closely for the last available seat in a constituency at time t. The party may not want a repeat of this at time t+1. They would rather see the incumbent being comfortably reelected than doing battle with a colleague from the same party and running the risk of neither getting elected. Therefore the high incumbency advantage could reflect a party's deliberate campaign strategy designed to protect incumbents. In elections involving Fine Gael candidates competing against each other for the last available seat, of which there are 85, only 55 percent of losers rerun in the next election compared to 90 percent of winners.

I also divide the sample into "ruling" and "non-ruling" candidates. A ruling candidate is part of the ruling party or coalition at election t+1. Note that ruling is different from incumbency; a candidate may be successful in a constituency election and get elected to Dáil Éireann thereby becoming an incumbent TD, however he does not have to be a member of the ruling party. The estimates of incumbency advantage for ruling and non-ruling candidates are shown in Table 5.

Non-ruling incumbents are 17-22 percentage points more likely to be victorious in the subsequent election compared to non-ruling challengers. The magnitude of this effect for ruling incumbents is smaller and not statistically significant. Incumbents from the ruling government are the group of candidates which may be held most accountable for events that occur within a country. It is possible that asymmetric voter reactions, whereby ruling party incumbents are punished more for bad events than they are rewarded for good events, leads to a lower incumbency advantage for ruling incumbents. However while the magnitude of the effect is larger for non-ruling incumbents compared to ruling incumbents, the difference is not statistically significant.

Table 5: Ruling and Non-ruling Candidates		
Difference in Probability Between Bare Winners and Bare Losers		
	Parametric Specification	Non-Parametric Specification
$\Pr(\text{Victory}_{t+1})$: Ruling	0.06	0.08
	(0.08)	(0.08)
	n=720	n=625
$\Pr(\text{Rerunning}_{t+1})$: Ruling	0.14	0.18*
	(0.09)	(0.10)
	n=720	n=408
$\Pr(\text{Victory}_{t+1})$: Non-ruling	0.17**	0.22***
	(0.09)	(0.08)
	n=880	n=560
$\Pr(\text{Rerunning}_{t+1})$: Non-ruling	0.13*	0.16***
	(0.07)	(0.05)
	n=880	n=576

Notes: Standard errors are in parentheses and n is the number of observations. *** significant at 1%. ** significant at 5%. *significant at 10%.

1.5   Robustness and Validity

In Table 6 I show the main results of the paper are robust to alternative parametric and non-parametric specifications. In the parametric specification I estimate the incumbency advantage using a second, third and fourth order polynomial in the forcing variable. For the non-parametric specification I vary the size and shape of the kernel. I use a triangular and rectangular kernel with two different bandwidths; the optimal bandwidth as in Imbens and Kalyanaraman (2009) and half the optimal bandwidth. The estimates of incumbency advantage are similar for all specifications.

Caughey and Sekhon (2011) question the validity of applying RDD to U.S. House Elections due to the apparent "sorting" of incumbents around the fifty percent vote threshold. It appears that an inordinately high number of incumbents end up as bare winners compared to bare losers. The reason put forward to explain this sorting behaviour is that candidates in U.S. House elections have precise information about the number of votes needed to exceed the fifty percent threshold and hence win the election. In very close races incumbents may use their superior resources to ensure they "eke out" close races with the result that almost three-quarters of close elections go to the incumbent thereby violating the assumption that bare winners and bare losers are comparable with respect to pre-treatment characteristics. Caughey and Sekhon (2011) illustrate sorting using a histogram of the incumbent party's margin of victory which shows a significant difference between the bins to the immediate right and left of the incumbency threshold (i.e. the bare winners and losers). I carry out the same procedure using my dataset. In Figure 3 I

Table 6: Robustness of Estimates to Alternative Specifications

Difference in Probability Between Bare Winners and Bare Losers

	Parametric			Nonparametric			
	2nd Order Polynomial	3rd Order Polynomial	4th Order Polynomial	Triangular Optimal	Triangular $\frac{1}{2}$ Optimal	Rectangular Optimal	Rectangular $\frac{1}{2}$ Optimal
$\Pr(\text{Victory}_{t+1})$	0.15***	0.13**	0.18***	0.18***	0.19***	0.20***	0.15*
	(0.05)	(0.07)	(0.08)	(0.07)	(0.09)	(0.07)	(0.09)
	n=1600	n=1600	n=1600	n=970	n=539	n=834	n=428
$\Pr(\text{Rerunning}_{t+1})$	0.17***	0.15***	0.16***	0.16***	0.18***	0.15***	0.19***
	(0.04)	(0.05)	(0.06)	(0.06)	(0.07)	(0.05)	(0.07)
	n=1600	n=1600	n=1600	n=1168	n=766	n=1012	n=603

Notes: Estimates are shown for the parametric specification using second, third and fourth order polynomials in the forcing variable. Nonparametric estimates are shown for both triangular and rectangular kernels using two different bandwidths; the optimal bandwidth as chosen by the Imbens and Kalyanaraman (2009) algorithm and half the optimal bandwidth. Standard errors are in parentheses and n is the number of observations. *** significant at 1%. ** significant at 5%. *significant at 10%.

show a histogram of the forcing variable $x_{i,t}$ for incumbent candidates. There is no significant bin-to-bin jump around the incumbency threshold of $x_{i,t} = 1$ indicating that incumbent sorting does not appear to be prevalent in the case of Irish elections. This may be due to the fact that Ireland's multi-party, multi-candidate electoral system with vote transfers makes the incumbency threshold more difficult to predict.

Figure 3: **Histogram of Forcing Variable for Incumbents**
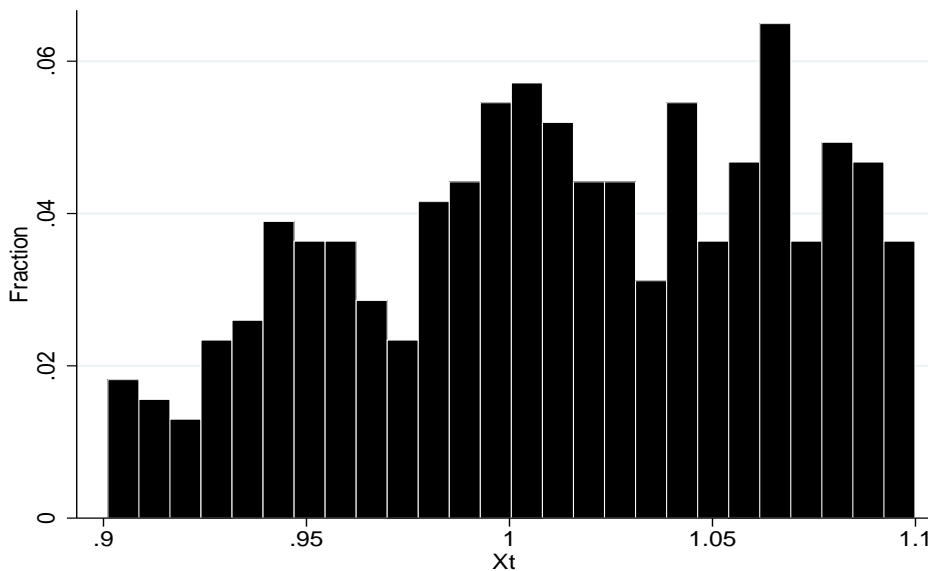
Notes: Histogram of the forcing variable $x_{i,t}$ for incumbent candidates. Bin widths are 0.008. There is no significant difference between the two bins around the threshold of $x_{i,t} = 1$.

I test the assumption that bare losers provide a valid counterfactual for bare winners by examining whether the groups differ in pre-treatment co-variates. Any significant differences in these covariates may invalidate the causal inference relating to the incumbency effect. I test for continuity at the incumbency threshold for the following covariates; the candidate held a seat

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in Dáil Éireann at any time prior to election t, the candidate was a member of the Fianna Fáil party at t-1, the candidate was part of the ruling government at t-1, the candidate won election t-1 and the quota at election t. The results are shown in Table 7. There is no statistically significant difference between bare winners and bare losers for any of the covariates when tested using both the parametric and non-parametric procedure.

Table 7: Covariate Balance Between Bare Winners and Losers

	Parametric Specification	Non-Parametric Specification
Held seat prior to election t	0.03	0.08
	(0.07)	(0.08)
Member of FF at t-1	-0.07	-0.06
	(0.07)	(0.06)
Member of Ruling Party at t-1	0.01	0.11
	(0.07)	(0.07)
Won Election t-1	0.05	0.11
	(0.06)	(0.08)
Quota at Election t	51	24
	(155)	(150)

Notes: I test for covariate balance between bare winners and bare losers on five pre-treatment covariates using both the parametric and non-parametric specifications. Standard errors are in parentheses. *** significant at 1%. ** significant at 5%. *significant at 10%.

Finally, I rerun the parametric estimation procedure and include the pre-treatment covariates as additional regressors. If bare winners and bare losers are comparable then the original estimates should not be sensitive to the inclusion of the additional covariates. From Table 8 it is clear that adding the extra covariates does not change the original results.

Table 8: Inclusion of Pre-Treatment Covariates		
Difference in Probability Between Bare Winners and Bare Losers		
	Covariates Omitted	Covariates Included
Pr(Victory at t+1)	0.18***	0.18**
	(0.08)	(0.08)
Pr(Rerunning at t+1)	0.16***	0.14**
	(0.06)	(0.07)
Observations	1,600	1,600

Notes: Pretreatment covariates are included as regressors in the parametric estimation procedure and results are reported. The same results are obtained regardless of whether the covariates are included are not. Standard errors are in parentheses. *** significant at 1%. ** significant at 5%. *significant at 10%.

The robustness and validity tests provide evidence that RDD is a valid methodology to test for incumbency advantage in Irish elections. There is no indication that incumbent sorting occurs around the incumbency threshold. As pointed out by Caughey and Sekhon (2011) RDD may be more suitable to multiparty electoral systems where the incumbency threshold is difficult to predict. Ireland may provide such a setting. Unlike incumbent politicians in the U.S. Congress, Irish incumbents may not have precise information as to the number of votes needed to secure close elections due to uncertainties surrounding the calculated quota for the constituency and vote transfers.

1.6   Conclusion

Incumbent politicians may enjoy an incumbency advantage due to direct and indirect officeholder benefits. Direct benefits include free postage, free

telephone, free printing and greater media exposure. Indirect benefits involve the incumbent's ability to deter high quality challengers. The study of incumbency advantage in the Irish political system is of particular interest given the incentives facing incumbent politicians in the PR-STV electoral setting. Candidates from the same party must compete against one another and as such need to identify themselves as separate from their parties. An incumbent may achieve this by taking full advantage of perks of office such as free postage and printing in order to boost her personal profile among constituents. It is true that incumbent politicians in Ireland enjoy one of the highest rates of re-election in the world. However this on its own does not provide evidence of an incumbency advantage. High re-election rates may be driven in part by a selection effect; incumbents must be of high enough quality to win an election in the first place in order to become an incumbent. Separating officeholder benefits from selection effects poses a challenge due to unobservable candidate quality which may lead to omitted variable bias.

This paper overcomes this bias by using a regression discontinuity design to exploit the near-random assignment of incumbency generated by close elections in Ireland's lower house of parliament. In doing so, I find officeholder benefits have a significant causal effect on an incumbent's chances of re-election. Bare winners of an election at time t are 18 percentage points more likely to enjoy electoral success at time t+1 compared to bare losers. There is also a strong deterrence effect of incumbency as it poses a barrier to the re-entry of challengers. Bare winners of an election at time t are sixteen percentage points more likely to rerun at time t+1. The estimates reported are robust to various parametric and non-parametric specifications.

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Chapter 2

Incumbent-Challenger Versus Open Seat Elections in a

Spatial Model of Political Competition

Abstract

I study open seat and incumbent-challenger elections in a model of spatial electoral competition. Candidates are policy motivated and may differ in their non-policy attributes which are collectively referred to as valence characteristics. Candidates adopt more divergent policies in the incumbent-challenger election compared to an open seat contest and the divergence is higher when the challenger, as opposed to the incumbent, possesses the valence advantage. Policy motivated incumbents benefit from an incumbency advantage in being able to choose their policy before the challenger. Finally, if a candidate's valence advantage exceeds a certain threshold then ideological shirking occurs as the candidate pursues her own ideology rather than the constituent's interests.

2.1   Introduction

In studying the political economy of electoral competition, three areas have received a great deal of attention by economists and congressional scholars; the policy divergence puzzle, incumbency advantage and ideological shirking. I address each of these strands of literature in a single model of spatial electoral competition.

Downs (1957) shows that office motivated candidates converge to the median voter. However in reality candidates and parties typically adopt divergent policies. The challenge is to reconcile theory with empirical evidence. This paper contributes to the literature on policy divergence by comparing incumbent-challenger and open seat elections using a version of the Groseclose (2001) model in which candidates are policy motivated and possess asymmetric valence.[1] I show that policy divergence is greater in the incumbent-challenger election compared to the open seat election and is greatest when the challenger has the valence advantage. The theoretical predictions of the model may help explain inconsistencies in the empirical literature regarding candidate positioning in incumbent-challenger elections. Ansolabehere et al. (2001) find that incumbents are more moderate than challengers. However Burden (2004) directly contradicts this result in separate work which shows that incumbents are more extreme than challengers. The theoretical results presented in this paper may help to explain this puzzle; if the incumbent has a small valence advantage or a valence disadvantage then the incumbent adopts a more extreme position than a challenger, consistent

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[1]Valence may consist of non-policy characteristics such as competence, integrity, intelligence and dedication to public service.

with Burden (2004), however if the incumbent possesses a large valence advantage over the challenger then the incumbent is more moderate, consistent with Ansolabehere et al. (2001).

A vast literature exists which explores incumbency advantage in terms of direct officeholder benefits, such as free postage, telephone and initial voter disposition and indirect officeholder benefits which include the incumbent's ability to scare off high quality challengers.[2] These benefits typically help an incumbent by boosting their re-election probability. The second contribution of this paper is to show an alternative channel of incumbency advantage which comes from the incumbent's ability to announce policy before a challenger. This first-mover advantage means that an incumbent generates a higher expected utility compared to being a challenger or a candidate in an open-seat. So in addition to direct and indirect officeholder benefits which may boost the incumbent's probability of victory, I show a separate advantage which boosts the incumbent's utility by helping to generate a more desirable policy outcome. The ability to locate first is especially desirable to a valence disadvantaged candidate as it allows them to mitigate some of this disadvantage.

The third contribution is to show ideological shirking in a spatial model of electoral competition with valence asymmetry. Ideological shirking occurs when a candidate "shirks" her duty to represent the ideology of her constituents and instead pursues her own personal policy agenda. This can

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[2]For empirical papers on this type of incumbency advantage see Uppal (2010), Lee (2008), Redmond and Regan (2013) and Levitt and Wolfram (1997). Pastine and Pastine (2012) and Meirowitz (2008) have theoretical models on incumbency advantage and the implications for campaign finance reform.

be seen as a principal-agent problem in which the politician (agent) fails to act in the best interest of the voter (principal).[3] A candidate with a small valence advantage moderates towards the centre of the policy space in the direction of the expected median voter. However once a candidate's valence advantage exceeds a certain threshold the candidate begins to move away from the location of the expected median voter and back in the direction of her own policy preference. Her high valence allows her to engage in ideological shirking by adopting a position which may not be representative of her constituents but still allows her to win the election.

The paper proceeds as follows. Section 2.1.1 reviews some closely related literature. Section 2.2 presents the model and Section 2.3 shows the candidate's reaction functions and how to solve for the open seat and incumbent-challenger equilibria. Section 2.4 presents the results. In Section 2.5 I show the results are robust to an alternative specification in which a candidate's advantage does not come from a valence endowment but rather from the electorate being ideologically predisposed to the candidate's policy preference. Section 2.6 concludes.

2.1.1   Related Literature

Downs (1957) draws on Hotelling's (1929) famous model of spatial competition to examine the policy location choice of two office motivated political parties competing in a one dimensional policy space. The competition between Downsian political parties is analogous to that of Hotelling's firms;

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[3]This is analagous to shirking models in labour economics where employees (agents) act in their own interest by shirking their duties at the expense of the employer (principal).

parties strive to locate as close to the preferred policies of as many voters as possible much like Hotelling's firms locate as close to as many customers as possible. In the Downsian setup convergence to the median voter is a Nash equilibrium − if either party deviates from this point they will lose votes to the opposition.

However contrary to the predictions of Downs (1957), political parties and candidates typically adopt divergent as opposed to convergent policy positions as shown by Poole and Rosenthal (1984, 1997) and McCarty et al. (2006). Recent contributions to the literature have extended the Downsian model to reconcile theory with empirical evidence. The recognition that voters value more than just the policy choice of political candidates has been key in making the Downsian model more realistic. Voters may value traits which are unrelated to policy such as competence, integrity and communication skills. These non-policy characteristics are often referred to as "valence" characteristics following Stokes (1963). The introduction of policy motivated candidates, as pioneered by Wittman (1973, 1977, 1983), has also added to the realism of theoretical models. Wittman (1977) argues that policy motivation is a more reasonable assumption than vote maximization as the latter generates the perverse result in which the only participants in the model who are not interested in policy are the candidates. In the traditional Downsian model, candidates view policy as a means to winning. Wittman (1977) argues that the reverse may be true − candidates view winning as a means to policy. Groseclose (2001) incorporates valence and varying degrees of policy motivation into a single model of spatial competition and generates the realistic outcome of policy divergence focusing on a simultaneous move game.

Ansolabehere and Snyder (2000) and Krasa and Polborn (2012) also employ a simultaneous move game. This type of model may be consistent with an open-seat election in which neither candidate is an incumbent. However Wiseman (2006) suggests that in non-open seat elections the incumbent's policy position is typically chosen before the challengers. As such, a sequential move game involving a first-moving incumbent may be appropriate to consider incumbent-challenger elections.

Berger et al. (2000), Ingberman (1992) and Bernhardt and Ingberman (1985) consider incumbent-challenger elections where vote maximizing candidates compete in a model where reputation matters and incumbents are perceived as less risky than a challenger when it comes to implementing a pre-election promise. However Bernhardt and Ingberman (1985) find the incumbent-challenger equilibrium is the same as the simultaneous move equilibrium which does not always exist. In Berger et al. (2000) the incumbent is forced to run on a fixed record as opposed to choosing a policy point. In Anderson and Glomm (1992) the candidates are policy motivated only to the extent that they dislike compromising their own ideal point. If a candidate loses the election she gets zero utility regardless of the policy of the opponent. Anderson and Glomm (1992) find that incumbents only benefit from a first-mover advantage if they also enjoy a sizeable valence advantage. Wiseman (2006) considers policy motivated candidates with endogenous valence which can be increased by costly campaign support. Wiseman (2006) employs a deterministic model with complete and perfect information. In Palfrey (1984) and Weber (1992), two dominant parties choose policies simultaneously while anticipating entry of a third party. The two dominant

parties play a Cournot-Nash game and both are Stackelberg leaders with regard to the third party. Candidates are vote maximizers and there is no valence dimension. The dominant parties choose divergent platforms and the third party typically loses.

Ideological shirking occurs when a candidate pursues their own ideology rather than their constituents' interests as in Kau and Rubin (1993). Berger et al. (2000) and Yakovlev (2011) illustrate ideological shirking in a reputational model where risk averse voters prefer the more well known and predictable incumbent as opposed to the lesser known challenger.

2.2   The Model

A left-wing candidate L and a right-wing candidate R compete by choosing policies from a one dimensional policy space with candidate $c \in \{L, R\}$ choosing a policy $P_c \in [-1, 1]$. In the incumbent-challenger election, the incumbent L chooses her policy position P_L^I before the challenger. The challenger R observes the incumbent's policy and reacts by choosing a policy position P_R^C. The timing of the game is different in an open seat election as both the left and right wing candidates simultaneously choose their policies P_L* and P_R* respectively.

Voters derive utility from a candidate's exogenous valence endowment as well as the proximity of the candidate's chosen policy platform to the voter's ideal point. If both candidates choose the same policy platform the voter prefers the candidate with the higher valence. The utility of voter i with

ideal point m_i if candidate $c \in \{L, R\}$ wins is

$$U_i(P_c, v_c) = v_c - (P_c - m_i)^2 \tag{1}$$

where v_c is the valence and P_c the policy choice of candidate c.[4] The candidate who captures the median voter wins the election. The election outcome is probabilistic due to incomplete information about the median voter. The candidates do not know the median voter's exact location but they know the median voter is drawn from a continuous uniform distribution with support $[-1, 1]$. The cumulative distribution function is denoted by $F(\cdot)$.

For every combination of candidate policy choices and valence endowments, there exists a unique point on the policy space at which the voter is indifferent between the two candidates. I denote the indifferent voter as m_β. The probability that candidate L wins is the probability that the median voter lies to the left of the indifferent voter, $F(m_\beta)$. The probability that R wins is $1 - F(m_\beta)$. An expression for the indifferent voter m_β is obtained by equating the voter utility for candidate L with that of candidate R,

$$v_L - (P_L - m_\beta)^2 = v_R - (P_R - m_\beta)^2 \tag{2}$$

Defining $v = v_L - v_R$ and solving for m_β yields the following expression,

$$m_\beta = \frac{v - P_L^2 + P_R^2}{2(P_R - P_L)} \tag{3}$$

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[4]Voter preferences are quadratic on the policy space and voter utility is separable in valence and policy as in Wiseman (2006), Ansolabehere and Snyder (2000), Adams et al. (2011), Ashworth and de Mesquita (2009).

By using equation (3) in the uniform CDF I can define L's probability of victory as follows,

$$F(m_\beta) = \frac{1}{2} - \frac{v - P_L^2 + P_R^2}{4P_L - 4P_R}, m_\beta \in [-1, 1] \qquad (4)$$

Lemma 1 $\frac{\partial F(m_\beta)}{\partial v} > 0$ and $\frac{\partial F(m_\beta)}{\partial P_L} > 0$. If $P_R \geq m_\beta$ then $\frac{\partial F(m_\beta)}{\partial P_R} > 0$.
Proof: See appendix.

An increase in L's valence advantage leads to an increase in L's probability of victory. With higher valence L becomes a more appealing candidate which increases her probability of capturing the median voter. A move by L towards the centre of the policy space also increases her probability of victory.[5] Similarly, a move by R to the right increases L's chances of winning provided that R's location is to the right of the indifferent voter. This is always the case − if R found himself to the left of the indifferent voter then he could alter his position by moving right which would actually improve his probability of victory while at the same time allowing him to locate closer to his ideal point.

Candidates are purely policy motivated; that is they place no intrinsic value on holding office and view it simply as a means to implementing policy as in Wittman (1973 & 1977) and Wiseman (2006). Traditional Downsian models of political competition typically assume vote maximizing candidates. However Wittman (1973 & 1977) argues that policy motivation is a more reasonable assumption as the assumption of vote maximizing candidates gener-

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[5]Recall that in a Downsian model the vote maximizing candidate moves to the centre of the policy space to maximize his vote share.

ates the perverse result in which the only participants in the model who are not interested in policy are the candidates themselves. Wittman also considers analagous models of profit maximzing firms to support the argument for policy motivated candidates. For example a firm typically does not seek to maximize sales, but rather maximizes profits. Depending on the market structure the firm might choose to sell fewer cars at a higher price. Likewise it may be the case that the candidate or party does not seek to maximize votes but rather maximizes expected utility with the real winner of the election being the candidate who gets closest to their preferred policy rather than the candidate with the most votes.

Following an election, the utility of candidate $c \in \{L, R\}$ with ideal policy position x_c is

$$V_c = -(P_w - x_c)^2 \tag{5}$$

where P_w is the policy location of the winning candidate.[6] As in Groseclose (2001) I assume that candidate ideal points are symmetric about the expected median voter. Candidate L's ideal point is x_L=-1 and candidate R's ideal point is x_R=1. If we take the view that candidates are chosen by parties then x_L and x_R can be interpreted as the ideal points of the median members from two polarized parties.

Candidate $c \in \{L, R\}$ chooses a policy position to maximize the following

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[6]If we consider L and R to be ideologically opposed parties then the model does not preclude office motivated candidates. As noted by Wiseman (2006), in order to win the party's endorsement a candidate may accept the platform offered to them by the party. As such candidates may be office motivated but are subject to the party's "take-it-or-leave-it" policy platform.

pre-election expected utility function,

$$EU_c = F(m_\beta)[-(P_L - x_c)^2] + (1 - F(m_\beta))[-(P_R - x_c)^2] \qquad (6)$$

When $c = L$ candidate L chooses P_L to maximize equation (6). Likewise when $c = R$ candidate R chooses P_R.

2.3 Reaction Functions

I begin by assuming that any valence advantage that exists accrues to candidate L with $v = v_L - v_R \geq 0$.[7] Valence is categorized as "low" or "high". With a low valence advantage L's policy does not guarantee victory in the election. However if valence is high enough to exceed a certain threshold denoted $\underline{v}$ then the equilibrium outcome results in L winning with a probability of one.

Lemma 2 *Define $\underline{v}$ as the level of valence advantage such that if $v \geq \underline{v}$ then $F(m_\beta) = 1$ meaning L guarantees victory in equilibrium in both the incumbent-challenger and open seat elections. Furthermore, it is shown that L's policy choice always lies within $P_L \in [-1, 1 - \sqrt{v}]$*

Proof: See appendix.

If $0 < v < \underline{v}$ then interior solutions, defined as $-1 < P_L < 1 - \sqrt{v}$, exist for both the incumbent-challenger and open seat contest. Corner solutions occur

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when L possesses a high valence advantage ($v \geq \underline{v}$). In what follows I focus on the low valence case. This is of primary interest as neither candidate is guaranteed of victory and different outcomes are observed in the open seat and incumbent-challenger elections. Moreover in reality close elections are generally more interesting compared to one-sided elections where the outcome is a foregone conclusion. Nonetheless the high valence case with corner solutions is interesting in itself as it leads to ideological shirking and is considered in Section 4.2.

In the open seat election both candidates simultaneously choose a policy position to maximize their expected utility. Candidate $c \in \{L,R\}$ chooses P_c to maximize equation (6). The first order condition of the optimization problem $\frac{\partial EU_c}{\partial P_c}$ yields the reaction function for candidate $c \in \{L,R\}$ — the candidate's optimal response to each possible policy choice by their opponent. L's reaction function is,

$$R_L(P_R, v) = -\frac{4}{3} + \frac{2(P_R{}^2 + 2P_R + .75v + 1)^{1/2}}{3} - \frac{P_R}{3} \tag{7}$$

and R's reaction function is,

$$R_R(P_L, v) = \frac{4}{3} - \frac{2(P_L{}^2 - 2P_L - .75v + 1)^{1/2}}{3} - \frac{P_L}{3} \tag{8}$$

A simultaneous move Nash Equilibrium is a pair of policy positions (P_L*, P_R*) such that

$$P_L* = R_L(P_R*, v), P_R* = R_R(P_L*, v) \tag{9}$$

From this it follows that P_L* and P_R* are implicitly defined by

$$P_L* = R_L(R_R(P_L*, v), v) \tag{10}$$

$$P_R* = R_R(R_L(P_R*, v), v) \tag{11}$$

Proposition 1 $\frac{\partial R_L(P_R,v)}{\partial P_R} > 0$ and $\frac{\partial R_R(P_L,v)}{\partial P_L} > 0$. *A move along the policy line by a candidate causes their opponent to react by moving in the same direction.* $\frac{\partial R_L(P_R,v)}{\partial v} > 0$ and $\frac{\partial R_R(P_L,v)}{\partial v} > 0$. *An increase in* L*'s valence advantage causes* L *to moderate her position and* R *to move to the right.*

Proof: See appendix.

The more right-wing R's policy is the more L moves towards the centre to reduce the likelihood of R winning and implementing a distasteful right-wing policy. This is illustrated by the upward sloping reaction functions in Figure 1.[8] The point at which the reaction functions cross is the Nash equilibrium from the simultaneous move game.

With an increased valence advantage L moderates her position to drive home her advantage by locating closer to her opponent. Consider two candidates who adopt similar policies but one candidate has a valence advantage. The voters observe that neither candidate differs greatly on policy and therefore valence becomes the deciding factor in the voter's decision. Therefore L

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[8]There is strategic complementarity in policy; a move along the policy line by one candidate induces the other candidate to move in the same direction. See Bulow et. al (1985) and Vives (2005) for a detailed discussion on strategic complementarities in economics.
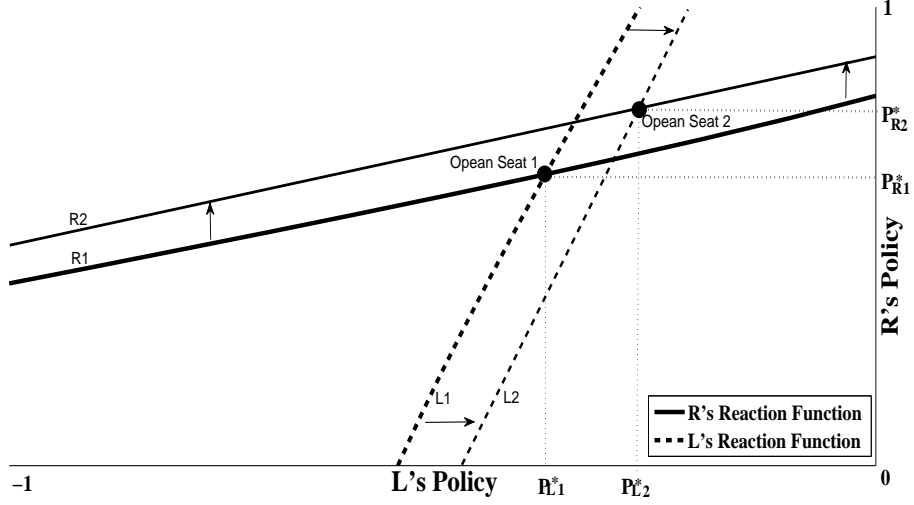
Figure 1: Reaction Functions

Figure 1: If $0 \leq v < \underline{v}$ a movement along the policy line by a candidate causes their opponent to react by moving in the same direction, hence the upward sloping reaction functions. An increase in L's valence advantage shifts L's reaction function from L1 to L2 and R's reaction function from R1 to R2.

is willing to move away from her ideal point towards the centre of the policy space as she is compensated by a large increase in the probability of victory. Furthermore, an increase in L's valence advantage causes R to move further right. R figures that his chances of winning are small and as such decides he might as well locate closer to his ideal point. The effect of an increase in valence is illustrated by the shifting reaction functions in Figure 1.

In the sequential move game the incumbent L takes the challenger R's optimal response into consideration when choosing policy. Substituting R's reaction function, equation (8), into L's expected utility function gives,

$$EU_L^I(P_L^I, v) = F(m_\beta(P_L^I, v, R_R(P_L^I, v)))[-(P_L^I - (-1))^2]$$
$$+ (1 - F(m_\beta(P_L^I, v, R_R(P_L^I, v))))[-(R_R(P_L^I, v) - (-1))^2] \qquad (12)$$

and using equations (4) and (8) in equation (12) gives,

$$EU_L^I(P_L^I, v) = \frac{v}{2} - \frac{14P_L^I}{9} + \frac{vP_L^I}{6} + (\frac{2P_L^I}{9} - \frac{2}{9})\sqrt{4P_L^{I2} - 8P_L^I - 3v + 4}$$
$$+ \frac{(4P_L^{I2} - 8P_L^I - 3v + 4)^{3/2}}{54} - P_L^{I2} - \frac{4P_L^{I3}}{27} - \frac{35}{27} \tag{13}$$

The utility maximization problem for L yields the first order condition,

$$\frac{\partial EU_L^I}{\partial P_L^I} = \frac{v}{6} - \frac{1}{\sqrt{4P_L^{I2} - 8P_L^I - 3v + 4}}(\frac{16P_L^I}{9} + \frac{8}{9} + \frac{8P_L^{I2}}{9}) - P_L^I(2 + \frac{4}{9}P_L^I)$$
$$+ \frac{2P_L^I\sqrt{4P_L^{I2} - 8P_L^I - 3v + 4}}{9} - \frac{14}{9} = 0 \tag{14}$$

Implicitly defined in equation (14) is the incumbent's equilibrium policy location P_L^I for different valence endowments. When P_L^I is known then the challenger's response P_R^C is found using R's reaction function, equation (8).

Endogenising R's response in this way enables L to choose a point on R's reaction function. L chooses the point which yields the highest utility. This is the equilibrium from the incumbent-challenger election and occurs where L's iso-utility line is tangent to R's reaction function as shown in Figure 2.

2.4   Results

2.4.1   Low Valence Advantage: $0 \leq v < \underline{v}$

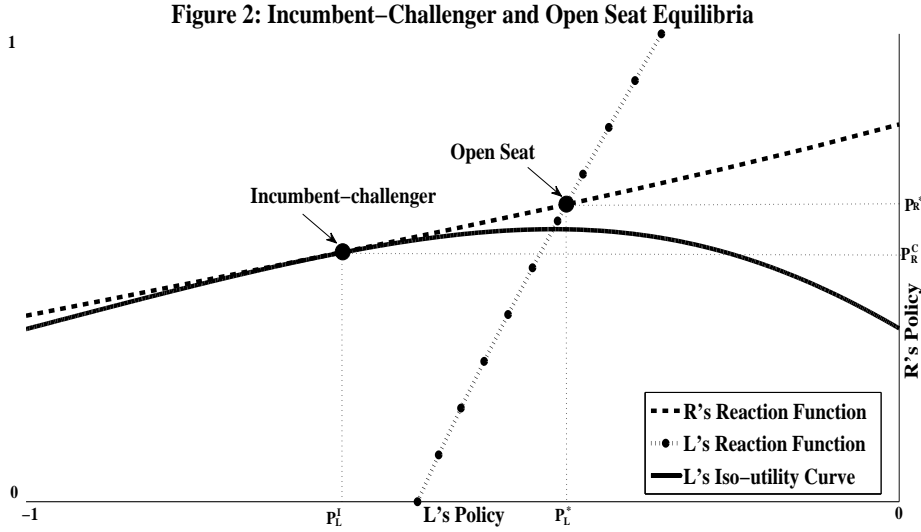First consider the case where neither candidate has a valence advantage such that $v = 0$.

Figure 2: Incumbent–Challenger and Open Seat Equilibria

Figure 2: The equilibrium from the open seat and the incumbent-challenger game with L as the incumbent and first-mover are shown for $0 \leq v < \underline{v}$. When L is first mover she chooses a point on R's reaction function which maximizes her utility. This is the equilibrium from the incumbent-challenger election and it occurs where L's iso-utility line is tangent to R's reaction function.

Proposition 2 P_L^I and P_R^C are the incumbent-challenger equilibrium positions and P_L* and P_R* are equilibrium positions from the open seat election. If $v = 0$ then $P_L^I = x_L = -1$, $P_R^C = \frac{1}{3}$, $P_L* = -\frac{1}{2}$ and $P_R* = \frac{1}{2}$. In the open seat election $F(m_\beta) = 1 - F(m_\beta) = 0.5$ and $E(U_L*) = E(U_R*)$. In the incumbent-challenger election $F(m_\beta) < 1 - F(m_\beta)$ and $E(U_L^I) > E(U_R^C)$.

Proof: See appendix.

In the open seat election where both candidates are equal on valence, they locate symmetrically about the centre of the policy space. However in the incumbent-challenger election the incumbent as first mover strategically locates at the far left of the policy space at her ideal point. As this is her preferred policy location she will obtain maximum utility if she wins. Furthermore, she knows that once her challenger R observes her extreme left

wing policy choice, he will be forced to moderate away from his ideal right wing point and locate closer to the policy centre. Therefore even in the event that L loses, the policy implemented by R is reasonably moderate so as not to be too detrimental to L's utility. This strategy results in the incumbent having a higher expected utility than the challenger despite the fact that the challenger has a higher probability of victory. However recall that candidates are policy motivated and winning is simply seen as a means to implementing policy. Therefore a candidate may accept a lower probability of victory if the expected policy outcome from the election is more desirable.

As valence increases from zero to a small value then the advantaged candidate moderates towards the centre of the policy space and the disadvantaged candidate moves to a polarized position close to their ideal point. For now assume L is the advantaged candidate ($v = v_L - v_R \geq 0$).[9]

Proposition 3 $\left.\frac{\partial P_L*}{\partial v}\right|_{v=0} > 0$, $\left.\frac{\partial P_R*}{\partial v}\right|_{v=0} > 0$ and $\left.\frac{\partial P_L^I}{\partial v}\right|_{v=0} > 0$, $\left.\frac{\partial P_R^C}{\partial v}\right|_{v=0} > 0$.
Proof: See appendix.

As L benefits from a small valence advantage she moves right to a policy position closer to the centre and R also moves right to a more polarized position.

The result showing the advantaged candidate in the simultaneous move

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[9]I consider the alternative case with R as the advantaged candidate in Section 4.3. Note that in the open seat election where both candidates move simultaneously there is no loss of generality in conveying the valence advantage on L. If we want to consider what happens when L is disadvantaged then we simply observe R's outcomes and reverse the sign. However in the incumbent-challenger election the outcomes of an election involving an advantaged incumbent are different to a disadvantaged incumbent.

game moderating towards the centre has already been shown by Groseclose (2001) who refers to it as the "moderating frontrunner" result. Likewise Groseclose (2001) refers to the result in which the disadvantaged candidate in the simultaneous move game moves away from the centre as the "extremist underdog" result. I show the moderating frontrunner and extremist underdog results also occur in the incumbent-challenger election. This is unlike Anderson and Glomm (1992) where the advantaged incumbent does not moderate but moves closer to her ideal point. Note however that in Anderson and Glomm (1992) the incumbent only cares about compromising her own ideal point − if the challenger wins then the incumbent gets zero utility regardless of how extreme the challenger's position is.

Proposition 4 *If $0 \leq v < \underline{v}$ then,*

(i) $P_L^I < P_L*$ and $P_R^C < P_R*$

(ii) $|P_L^I - P_R^C| > |P_L * - P_R *|$

Proof: See appendix.

The policies of both candidates lie closer to the advantaged candidate's ideological preference when that candidate is an incumbent as opposed to an open seat contestant. Moreover policy divergence is greater in the incumbent-challenger election − while both the incumbent's and challenger's policies are to the left of the open seat equilibrium, the leftward move by the incumbent is greater than the challenger's.[10]

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[10]Anderson and Glomm (1992) have a different result whereby in an incumbent-challenger election both candidates adopt a polarized position close to their ideal points.

2.4.2 High Valence Advantage: v≥v

A candidate with a high valence advantage can deviate from the median voter's policy preference without fearing defeat in the election. Put simply, the candidate has the luxury of indulging her own policy agenda even if this is not representative of the majority of voters. Kau and Rubin (1993) refer to this as ideological shirking.

Note that for any given level of valence advantage there is a point at which L could locate and guarantee victory. I refer to this as a win point denoted P_L^{win}. To be guaranteed of victory it must be the case that the indifferent voter, m_β is located at $+1$ on the policy space. From Lemma 1 we know that $P_R \geq m_\beta$ so therefore $P_R = 1$.

Using $m_\beta = P_R = +1$ in equation (3) and solving for P_L gives an expression for L's win-point, $P_L^{win} = 1 - \sqrt{v}$. From Lemma 2 we know that this is the corner solution from the utility maximization problem; L never moves beyond the win-point as she is already guaranteed of victory at this point. With a low valence advantage it never makes sense to locate at the the win-point as to do so would mean L adopting a very right-wing policy. However when L has a high valence advantage, $v \geq \underline{v}$ she maximizes utility at the corner solution (her win-point) $1 - \sqrt{v}$ in both the incumbent-challenger and open-seat elections. Her valence is high enough to allow her to locate at her win-point while maintaining a left-wing position. Once valence exceeds the threshold $\bar{v}$ then L can locate at her ideal point at -1 and guarantee victory

making this the best possible outcome of the election. Any further increase in valence above $\bar{v}$ has no effect.[11] Therefore if $\underline{v} \le v \le \bar{v}$ then L's optimal location is given by,

$$P_L^I = P_L* = 1 - \sqrt{v} \tag{15}$$

Proposition 5 *If $\underline{v} \le v \le \bar{v}$ then $\frac{\partial P_L^I}{\partial v} = \frac{\partial P_L*}{\partial v} < 0$*

Proof: $\frac{\partial (1 - \sqrt{v})}{\partial v} = \frac{-1}{2\sqrt{v}}$.

When L's valence advantage changes from low to high she moves back along the policy line towards her ideal left-wing point. She engages in ideological shirking; by moving further left she chooses policies further away from the expected median voter. However even though her policy may not represent the constituent's interests she still guarantees victory due to her high valence.

2.4.3 A Disadvantaged Incumbent

Consider elections in which the challenger (second mover) benefits from the valence advantage such that $v = v_L - v_R < 0$.

Proposition 6 *If $v = v_L - v_R < 0$ then,*

(i)$P_L^I = x_L = -1$

(ii)$|P_L^I - P_R^C|$ *is higher compared to when $v = v_L - v_R > 0$.*

Proof: See appendix.

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[11]Given $P_L^{win} = 1 - \sqrt{v}$ then $\bar{v} = 4$.

The disadvantaged incumbent locates at the extreme left of the policy line at her ideal point. Her reasons for doing this are twofold. Firstly, the disadvantaged incumbent de-emphasizes the importance of her opponents valence advantage by adopting a policy far from the opponent's. Secondly, as L is the first mover she knows that if she adopts an extreme left position, her opponent R will moderate to reduce L's likelihood of winning. However even though L chooses an extreme left-wing policy and R chooses a moderately right-wing policy, the expected policy outcome is right-wing as R's probability of victory is much greater than the L's. Furthermore, policy divergence is greatest when the incumbent is disadvantaged.

2.4.4   First Mover Advantage

Proposition 7 If $-\underline{v} < v < \underline{v}$ then $E(U_L^I) > E(U_L*) > E(U_L^C)$. *The incumbent benefits from a first-mover advantage irrespective of whether the incumbent or challenger benefits from the valence advantage.*

Proof: See appendix.

There is an incumbency advantage which results from the incumbent's strategic ability to choose her policy first. The incumbent as first-mover can locate at, or close to, her ideal policy point and in doing so forces her opponent (the second-mover) to adopt a more moderate policy position. A candidate's expected utility is higher when the candidate is an incumbent as opposed to a challenger or an open seat contestant for $-\underline{v} < v < \underline{v}$. As discussed previously, once a candidate's utility exceeds $\underline{v}$ the type of election becomes

irrelevant as the candidate locates at their win-point regardless of the timing of the policy choice.

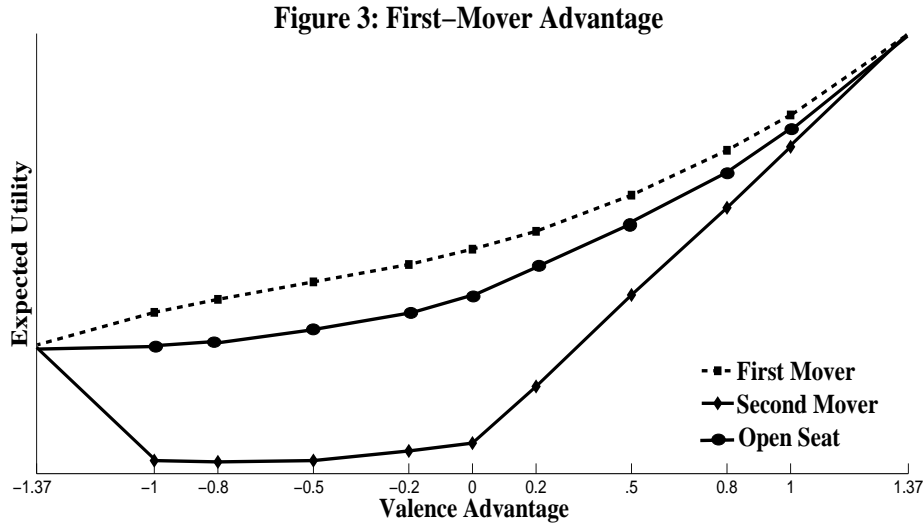**Figure 3: First–Mover Advantage**

Figure 3: Expected utility is plotted for three scenarios in which the candidate is either an incumbent, challenger or open seat contestant. Note that negative valence means the candidate is at a valence disadvantage.

Figure 3 shows that a candidate unambiguously benefits from being an incumbent as opposed to a challenger or open seat candidate for $-\underline{v} < v < \underline{v}$. Moving second is typically more detrimental for candidates who are at a valence disadvantage as shown by the magnitude of the gap between the expected utility from being an incumbent versus a challenger for $v < 0$. A candidate with a valence disadvantage can mitigate some of this disadvantage if they are a first-mover. However if the candidate is valence disadvantaged and second mover then they take a double hit; not only is the candidate forced to take up a more distasteful policy position by moderating away from her ideal point, but she receives little reward for doing so in terms of her probability of victory.

An additional striking result emerges from Figure 3. A second moving

challenger at a severe valence disadvantage may generate a higher expected utility compared to a challenger who scores higher on the valence dimension. This is shown in Figure 3 by the improvement in expected utility for second movers as valence advantage declines below -1. Note that unlike elections in which the candidates are trying to maximize the percentage of votes, the electoral model used in this paper is a non-zero sum game. For example, when an incumbent's valence increases she moderates her position and the challenger adopts a more extreme position. The incumbent benefits because she reduces the chances of the challenger winning and implementing a right-wing policy. In this sense, we can think of the incumbent as being risk averse; she is willing to moderate away from her ideal point in order to reduce the risk of a right-wing policy being implemented. Now consider the challenger. As the incumbent moderates, this is also good news for the challenger as the worst case scenario (in terms of the possible left-wing policy that could be introduced) has improved. In addition, the challenger reacts by moving closer to his ideal position, which again could be good news if he wins and implements this policy. Of course where the challenger's utility disimproves is in his reduced likelihood of winning, but the former improvement in utility can dominate the latter and this is what happens for second movers when their valence disadvantage declines below -1. What is shown in Figure 3 is that when a candidate is severely disadvantaged he benefits from the incumbent's desire to moderate significantly.

The implications are very interesting for electoral competition. It reveals a type of "scare off" effect at an incumbent's disposal which has not yet been discussed in the literature. Consider a party tasked with choosing a

challenger to face an incumbent. The party would rather choose a very weak candidate (on valence) rather than a "mediocre" candidate as they know the weak candidate will entice the incumbent to adopt a very centrist policy.

The literature on incumbency advantage typically refers to direct office-holder benefits and indirect "scare off" effects which arise due to a challenger's poor electoral prospects. The first-mover incumbency advantage shown in this model is separate to any direct officeholder benefits which may accrue to the incumbent. In addition, it shows that an incumbent may "scare off" challengers for reasons other than poor electoral prospects; namely weaker challengers may be fielded to try and entice the incumbent to moderate.

Note that the incumbency advantage in this paper is different from the traditional Downsian model with office motivated candidates where the candidate actually prefers moving second. If a candidate has a valence advantage and is purely motivated by winning then she would like to first observe her opponent's location and guarantee victory by copying this position.

2.4.5 Numerical Examples

I present some numerical examples to help illustrate the theoretical predictions of the model. Table 1 shows the equilibrium electoral outcomes for both the incumbent-challenger and open seat elections for low valence advantage $0 \leq v < \underline{v}$. The incumbent's policy location is found by substituting in values for v in equation (14) and solving for P_L^I. The challenger's reaction to the incumbent's policy is then found by using v and P_L^I in equation (8). The equilibria for the open seat elections are found by parameterizing the

reaction functions with different values of v and solving simultaneously.

Table 1: Small Valence Advantage					
Incumbent-Challenger Election	v=0	v=0.2	v=0.5	v=0.8	v=1
P_L^I	-1.00	-0.82	-0.67	-0.54	-0.46
P_R^C	0.33	0.42	0.52	0.63	0.70
Policy Divergence	1.33	1.24	1.19	1.17	1.16
Pr(L wins)	0.33	0.44	0.57	0.69	0.78
Pr(R wins)	0.67	0.56	0.43	0.31	0.22
E(Policy)	-0.11	-0.13	-0.15	-0.18	-0.20
$E(U_L^I)$	-1.19	-1.14	-1.06	-0.96	-0.88
$E(U_R^C)$	-1.63	-1.65	-1.68	-1.69	-1.67
Open Seat Election	v=0	v=0.2	v=0.5	v=0.8	v=1
P_L*	-0.50	-0.45	-0.38	-0.31	-0.27
P_R*	0.50	0.55	0.64	0.73	0.81
Policy Divergence	1.00	1.00	1.02	1.04	1.08
Pr(L wins)	0.50	0.58	0.69	0.80	0.87
Pr(R wins)	0.50	0.42	0.31	0.20	0.13
E(Policy)	0.00	-0.03	-0.06	-0.10	-0.13
$E(U_L*)$	-1.25	-1.20	-1.10	-0.99	-0.90
$E(U_R*)$	-1.25	-1.30	-1.35	-1.38	-1.40

Table 1 shows that while moving first boosts a candidate's expected utility it does not mean L has an increased chance of victory, in fact the opposite is the case. Recall that candidates place no intrinsic value on holding office

and therefore accept a lower probability of victory if this means improving the post-election policy outcome.

Table 2 shows results for high valence advantage, $v \geq \underline{v}$. P_L is calculated using equation (15) and P_L is then used in R's reaction function, equation (8), to find P_R. Recall that when $v \geq \underline{v}$ the incumbent-challenger and open seat elections produce the same outcome as L locates at the corner solution $1 - \sqrt{v}$ in both. With a high valence advantage L engages in ideological shirking. As the valence advantage increases L can locate closer to her ideal point on the far left of the policy line and still guarantee victory even though this may not be representative of the majority of voters. Note that when $v = 4$ there is maximum policy divergence and also maximum divergence in candidate utility; the furthest left-wing policy is certain to be implemented making this the best possible outcome for L and the worst possible outcome for R.

Table 2: High Valence Advantage

	v=1.5	v=2	v=3	v=4
P_L	-.225	-.414	-.732	-1
P_R	1	1	1	1
Policy Divergence	1.225	1.414	1.732	2
Pr(L wins)	1	1	1	1
Pr(R wins)	0	0	0	0
E(Policy)	-.225	-.414	-.732	-1
E(U_L)	-0.601	-0.343	-0.072	0
E(U_R)	-1.500	-2.000	-3.000	-4

Table 3 shows numerical examples when the incumbent is at a valence disadvantage ($v < 0$). Comparing Table 3 with the incumbent-challenger election in Table 1 we clearly see that policy divergence is greater when the incumbent is at a valence disadvantage. Note also that the incumbent benefits from a first-mover advantage regardless of whether she is valence advantaged or not.

Table 3: A Disadvantaged Incumbent, v<0				
Incumbent-Challenger Election	v=-0.2	v=-0.5	v=-0.8	v=-1
P_L^I	-1,00	-1.00	-1.00	-1.00
P_R^C	0.31	0.27	0.24	0.21
Policy Divergence	1.31	1.27	1.24	1.21
Pr(L wins)	0.29	0.22	0.15	0.10
Pr(R wins)	0.71	0.78	0.85	0.90
E(Policy)	-0.07	-0.01	0.05	0.09
$E(U_L^I)$	-1.22	-1.26	-1.30	-1.33
$E(U_R^C)$	-1.50	-1.29	-1.09	-0.95

Tables 1-3 provide an insight which may help explain some empirical irregularities in empirical work on incumbent-challenger positioning. When the incumbent's valence advantage is low or when she is at a valence disadvantage then her position is more extreme than the challenger's. This is consistent with empirical work of Burden (2004). However when the incumbent has a high valence advantage then we get the opposite result in which she is more moderate than the challenger. This is consistent withAnsolabehere et al. (2001). Furthermore the predictions of the model are consistent with the

finding of Ansolabehere et al. (2001) that high quality non-incumbents are more moderate than other non-incumbents. Table 1 shows that as the quality of non-incumbents (either challengers or open seat candidates) declines relative to the incumbent their policy becomes more extreme.

2.5 A Partisan Electorate

Proposition 8 *If* L *benefits from a favourable partisan electorate then the equilibrium outcomes are consistent with the results of elections in which* L *has a valence advantage. Specifically,*

(i) $P_L^I < P_L*$ and $P_R^C < P_R*$

(ii) $|P_L^I - P_R^C| > |P_L * - P_R * |$

(iii) $E(U_L^I) > E(U_{L*})$

Proof: See appendix.

The main results of the paper hold when a candidate's advantage comes from a partisan electorate as opposed to a valence endowment. To represent this partisan advantage, I allow the median voter to be a random draw from the triangular distribution shown in Figure 4 such that candidate L benefits from the partisan electorate.

Certain districts may contain a population which inherently favours left or right wing policies making the electorate predisposed to a certain candidate or party − so called "blue states" and "red states" in the case of American politics.

Figure 4: Partisan Distribution of Median Voters

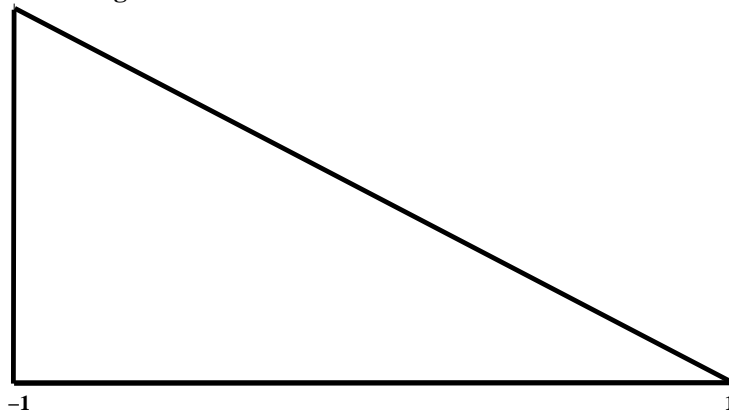−1   1

Figure 4: The median voter is a random draw from the triangular distribution with support [-1,1].

2.6   Conclusion

Spatial electoral competition with policy motivated candidates can produce different electoral outcomes depending on the timing of policy announcements. It may be reasonable to assume that an open seat contest involves candidates announcing policy simultaneously whereas an incumbent typically announces policy before a challenger.

Compared to being a candidate in an open-seat, an incumbent typically locates closer to her ideal policy position which forces the challenger to moderate towards the expected median voter. The resulting policy divergence from the incumbent-challenger election is higher than in an open seat contest and the incumbent enjoys a first-mover advantage. This result holds in the model of asymmetric valence but I also show that it holds when one of the candidates has a non-valence advantage arising from a partisan electorate whereby the distribution of voters in a district is tilted in favour of the incumbent.

If the incumbent benefits from a high valence advantage then ideological shirking occurs. The candidate is so far ahead on valence that she can pursue her own policy agenda without fearing defeat in the election even if her policy is very far from the median voter's ideal point.

There is a strand of literature exploring incumbency advantage which arises due to direct and indirect officeholder benefits which boosts an incumbent's reelection prospects. I highlight an additional source of incumbency advantage which takes the form of a first-mover advantage. The incumbent's ability to locate before the challenger boosts the incumbent's expected utility by generating a more favourable policy outcome.

Appendix

Lemma 1 $\frac{\partial F(m_\beta)}{\partial v} > 0$ and $\frac{\partial F(m_\beta)}{\partial P_L} > 0$. If $P_R \geq m_\beta$ then $\frac{\partial F(m_\beta)}{\partial P_R} > 0$.

Proof. $\frac{\partial F(m_\beta)}{\partial v} = \frac{-1}{(4P_L - 4P_R)} > 0$ as $P_L < 0$ and $P_R > 0$. $\frac{\partial F(m_\beta)}{\partial P_L} = \frac{v}{4(P_L - P_R)^2} + \frac{1}{4} > 0$. $\frac{\partial F(m_\beta)}{\partial P_R} = \frac{1}{4} - \frac{v}{4(P_L - P_R)^2} > 0$ if $v \leq (P_L - P_R)^2$. Given $m_\beta = \frac{v - P_L^2 + P_R^2}{2(P_R - P_L)}$ it is straightforward to show that the inequality $v \leq (P_L - P_R)^2$ is the same as $P_R \geq m_\beta$. It cannot be that $P_R < m_\beta$ because then $\frac{\partial F(m_\beta)}{\partial P_R} < 0$ meaning that R could locate closer to her preferred point while at the same time increasing her probability of victory. Therefore R never locates to the left of the indifferent voter.

Lemma 2 *Define $\underline{v}$ as the level of valence advantage such that if $v \geq \underline{v}$ then $F(m_\beta) = 1$ meaning L guarantees victory in equilibrium in both the incumbent-challenger and open seat elections. Furthermore, it is shown that*

L's policy choice always lies within $P_L \in [-1, 1 - \sqrt{v}]$

Proof. L has a 100 percent probability of victory when $m_\beta = 1$. From Lemma 1 we know that $P_R \geq m_\beta$ so if $m_\beta = 1$ then $P_R = 1$. Using $P_R = m\beta = 1$ in equation (4) gives the policy point which L can locate and guarantee victory which is a function of valence, $P_L^{win} = 1 - \sqrt{v}$. Clearly L will never move further right beyond this point as she is already guaranteed of victory so therefore $P_L \in [-1, 1 - \sqrt{v}]$. Using $P_R = 1$ in L's utility function and taking the first order condition $\frac{\partial EU_L}{\partial P_L}$ yields $\frac{v}{4} - \frac{5P_L}{2} - \frac{3P_L^2}{4} - \frac{3}{4} = 0$. Using $P_L = 1 - \sqrt{v}$ and solving for v gives $v = 1.37$. Therefore when $v \geq 1.37$ L is guaranteed victory so $\underline{v} = 1.37$.

Proposition 1 $\frac{\partial R_L(P_R, v)}{\partial P_R} > 0$ and $\frac{\partial R_R(P_L, v)}{\partial P_L} > 0$. *A move along the policy line by a candidate causes their opponent to react by moving in the same direction.* $\frac{\partial R_L(P_R, v)}{\partial v} > 0$ and $\frac{\partial R_R(P_L, v)}{\partial v} > 0$. *An increase in* L's *valence advantage causes* L *to moderate her position and* R *to move to the right.*

Proof: $\frac{\partial R_L(P_R, v)}{\partial P_R} = \frac{4P_R + 4}{3\sqrt{4P_R^2 + 8P_R + 3v + 4}} - \frac{1}{3} > 0$ when $P_R > 0$ and $v < 1.37$. $\frac{\partial R_R(P_L, v)}{\partial P_L} = -\frac{4P_L - 4}{3\sqrt{4P_L^2 - 8P_L - 3v + 4}} - \frac{1}{3} > 0$ when $P_L < 0$ and $v < 1.37$. $\frac{\partial R_L(P_R, v)}{\partial v} = \frac{1}{2\sqrt{4P_R^2 + 8P_R + 3v + 4}} > 0$ and $\frac{\partial R_R(P_L, v)}{\partial v} = \frac{1}{2\sqrt{4P_L^2 - 8P_L - 3v + 4}} > 0$.

Proposition 2 P_L^I and P_R^C *are the equilibrium positions from the incumbent-challenger election and* P_L* *and* P_R* *are the equilibrium positions from the open seat election. If* $v = 0$ *then* $P_L^I = x_L = -1$, $P_R^C = \frac{1}{3}$ *and* $P_L* = -\frac{1}{2}$, $P_R* = \frac{1}{2}$. *In the open seat election* $F(m_\beta) = 1 - F(m_\beta) = 0.5$ *and* $E(U_L*) = E(U_R*)$. *In the incumbent-challenger election* $F(m_\beta) < 1 - F(m_\beta)$ *and* $E(U_L^I) > E(U_R^C)$.

Proof: If $v = 0$ the reaction functions simplify to $R_L(P_R, v) = \frac{-2+P_R}{3}$ and

$R_R(P_L, v) = \frac{2+P_L}{3}$. Solving the equations simultaneously gives the policy

locations for the open-seat election as $P_{L^*} = -0.5$ and $P_{R^*} = 0.5$. For the

incumbent-challenger election I substitute $v = 0$ into the incumbent's first

order condition, equation (14), and solve to give $P_L^I = -1$. Using this in R's

reaction function gives $R_R(P_L, v) = \frac{2+(-1)}{3} = \frac{1}{3}$ so $P_R^C = \frac{1}{3}$. For the open

seat election, using $v = 0$, $P_{L^*} = -0.5$ and $P_{R^*} = 0.5$ in equation (4) gives

$F(m_\beta) = 1 - F(m_\beta) = 0.5$. From equation (6) $E(U_{L^*}) = E(U_{R^*}) = -1.25$.

For the incumbent-challenger election equation (4) gives $F(m_\beta) = .33$ and

$1 - F(m_\beta) = .67$. From equation (6) $E(U_L^I) = -1.19$ and $E(U_R^C) = -1.63$.

Proposition 3 $\frac{\partial P_{L^*}}{\partial v}\Big|_{v=0} > 0$, $\frac{\partial P_{R^*}}{\partial v}\Big|_{v=0} > 0$ and $\frac{\partial P_L^I}{\partial v}\Big|_{v=0} > 0$, $\frac{\partial P_R^C}{\partial v}\Big|_{v=0} > 0$.

Proof: From equations (9) and (10), $P_{L^*} = R_L(P_{R^*}, v) = R_L(R_R(P_{L^*}, v), v)$.

Taking the partial derivative with respect to v gives $\frac{\partial P_{L^*}}{\partial v} = \frac{\partial R_L}{\partial R_R} \frac{\partial R_R}{\partial P_{L^*}} \frac{\partial P_{L^*}}{\partial v} +$

$\frac{\partial R_L}{\partial R_R} \frac{\partial R_R}{\partial v} + \frac{\partial R_L}{\partial v}$. Solving for $\frac{\partial P_{L^*}}{\partial v}$ gives the expression, $\frac{\partial P_{L^*}}{\partial v} = \frac{\frac{\partial R_L}{\partial P_R} \frac{\partial R_R}{\partial v} + \frac{\partial R_L}{\partial v}}{1 - \frac{\partial R_L}{\partial P_R} \frac{\partial R_R}{\partial P_L}}$.

I determine the sign of $\frac{\partial P_{L^*}}{\partial v}\Big|_{v=0}$ by analyzing the RHS terms. $\frac{\partial R_L}{\partial P_R}\Big|_{v=0} =$

$\frac{2P_R+2}{3\sqrt{P_R^2+2P_R+1}} - \frac{1}{3} > 0$. $\frac{\partial R_R}{\partial v}\Big|_{v=0} = \frac{1}{4\sqrt{P_L^2-2P_L+1}} > 0$. $\frac{\partial R_L}{\partial v}\Big|_{v=0} = \frac{1}{4\sqrt{P_R^2+2P_R+1}} >$

0. $\frac{\partial R_R}{\partial P_L}\Big|_{v=0} = -\frac{2P_L-2}{3\sqrt{P_L^2-2P_L+1}} - \frac{1}{3} > 0$. Finally, $\frac{\partial \widehat{P_L}}{\partial P_R} \frac{\partial \widehat{P_R}}{\partial P_L} < 1$ so $1 - \frac{\partial \widehat{P_L}}{\partial P_R} \frac{\partial \widehat{P_R}}{\partial P_L} > 0$

and therefore $\frac{\partial P_{L^*}}{\partial v}\Big|_{v=0} > 0$. In the same way it can be shown that $\frac{\partial P_{R^*}}{\partial v}\Big|_{v=0} >$

0. For the incumbent-challenger election recall from Proposition 2 that when

$v = 0$, $P_L^I = -1$. Using this in the incumbent's first order condition, equation

(14), gives $\frac{\partial EU_L^I}{\partial P_L^I}\Big|_{P_L^I=-1} = \frac{1}{6}\left(v\left(\frac{4}{\sqrt{16-3v}} + 1\right)\right)$. Clearly when $v = 0$ this equation

equals zero as utility is maximized. However notice that when v goes from

zero to a positive value we have $\frac{\partial EU_L^I}{\partial P_L^I} > 0$ meaning candidate L moves to the

right to increase her utility. Therefore $\left.\frac{\partial P_L^I}{\partial v}\right|_{v=0} > 0$. We have already seen that $\frac{\partial R_R}{\partial P_L} > 0$ so as the incumbent L moves right so too does the challenger R and as such $\left.\frac{\partial P_R^C}{\partial v}\right|_{v=0} > 0$.

Proposition 4 *If $0 \leq v < \underline{v}$ then,*

(i) $P_L^I < P_L*$ and $P_R^C < P_R*$

(ii) $|P_L^I - P_R^C| > |P_L * - P_R *|$

Proof: (i) The incumbent's expected utility function is written as $EU_L^I(P_L^I, R_R^C(P_L^I, v), v)$. The first order condition for the expected utility optimization problem is $\frac{\partial EU_L^I}{\partial P_L^I} = \frac{\partial EU_L^I}{\partial P_L^I} + \frac{\partial EU_L^I}{\partial R_R^C}\frac{\partial R_R^C}{\partial P_L^I}$. Evaluating the FOC at the open seat equilibrium position P_L* means that the first term on the RHS of the FOC satisfies L's open seat utility optimization problem, $\left.\frac{\partial EU_L^I}{\partial P_L^I}\right|_{P_L*}$. Therefore the sign of the second term, $\frac{\partial EU_L^I}{\partial R_R^C}\frac{\partial R_R^C}{\partial P_L^I}$ tells us whether, as an incumbent, L can improve her utility by locating at a point which is different to the open seat election. $\frac{\partial EU_L^I}{\partial R_R^C} = -\frac{P_L^{I\,2}}{4} + \frac{P_L^I P_R^C}{2} + \frac{3P_R^{C\,2}}{4} + \frac{v}{4} - 1 < 0$ if $-1 \leq P_L^I < 1 - \sqrt{v}$. In the proof of Proposition 1 I show that $\frac{\partial R_R}{\partial P_L} > 0$. Therefore $\frac{\partial EU_L^I}{\partial R_R^C}\frac{\partial R_R^C}{\partial P_L^I} < 0$ meaning when L is the incumbent she does better by locating to the left of her open seat position so $P_L^I < P_L*$. From Proposition 1, $\frac{\partial R_R(P_L,v)}{\partial P_L} > 0$ meaning that $P_L^I < P_L*$ implies $P_R^C < P_R*$. (ii) It is straightforward to show that $0 < \frac{\partial R_R}{\partial P_L} < 1$ so a move to the left by L causes R to move to the left by a smaller amount. Given $P_L^I < P_L*$ it must be that $|P_L^I - P_R^C| > |P_L * - P_R *|$

Proposition 6 *Define $v = v_L - v_R < 0$. Then,*

(i)$P_L^I = x_L = -1$

(ii)$|P_L^I - P_R^C|$ is higher compared to when $v = v_L - v_R > 0$.

Proof. If $v = 0$ then $P_L^I = -1$. The incumbent's expected utility function is $EU_L^I(P_L^I, R_R^C(P_L^I, v), v)$. From this, $\left.\frac{\partial EU_L^I}{\partial P_L^I}\right|_{P_L^I = -1} = \frac{v}{6} + \frac{32}{9\sqrt{16-3v}} - \frac{2\sqrt{16-3v}}{9}$. In this equation $v = v_L - v_R$ so when the incumbent is at a disadvantage $v < 0$. If $v < 0$ then $\left.\frac{\partial EU_L^I}{\partial P_L^I}\right|_{P_L^I = -1} < 0$. As the incumbent becomes disadvantaged she would like to move further left than $P_L^I = -1$ however this is not possible as $P_L \in [-1, 1 - \sqrt{v}]$. The furthest left-wing policy choice available is -1. Therefore L stays at the extreme left of the policy line. For (ii), note that $\frac{\partial R_R}{\partial P_L^I} = \frac{4P_R^C + 4}{3\sqrt{4P_R^{C2} + 8P_R^C + 3v + 4}} - \frac{1}{3}$ giving $0 < \frac{\partial R_R^C}{\partial P_L^I} < 1$. A move to the left by L causes R to move left by less than L. Given that the disadvantaged incumbent locates further left compared to when she is advantaged, it is the case that $|P_L^{inc} - P_R^{cha}|$ is higher for $v = v_L - v_R < 0$ compared to when $v = v_L - v_R > 0$.

Proposition 7 If $-1.37 < v < 1.37$ then $E(U_L^I) > E(U_{L*}) > E(U_L^C)$. *The incumbent benefits from a first-mover advantage. This is true irrespective of whether the incumbent or challenger benefits from the valence advantage.*

Proof: This follows directly from Proposition 4 and its proof. When a candidate is an incumbent she locates further left than her open seat equilibrium resulting in a higher expected utility.

Proposition 8 *If* L *benefits from a favourable partisan electorate then the equilibrium outcomes are consistent with the results of elections in which* L *has a valence advantage. Specifically,*

(i) $P_L^I < P_L*$ and $P_R^C < P_R*$

(ii) $|P_L^I - P_R^C| > |P_L * - P_R *|$

$(iii) E(U_L^I) > E(U_{L*})$

Proof: With no valence advantage the indifferent voter m_β is simply the midpoint between P_L and P_R so $m_\beta = \frac{P_L + P_R}{2}$. The CDF of the triangular distribution gives L's probability of victory as $F(m_\beta) = 0.75 + 0.5m_\beta - 0.25m_\beta{}^2$. Substituting in the expression for m_β into the CDF gives $F(m_\beta) = -\frac{(P_L + P_R + 2)(P_L + P_R - 6)}{16}$. L chooses P_L to maximize $EU_L = F(m_\beta)[-(P_L+1)^2] + (1 - F(m_\beta))[-(P_R+1)^2] = \frac{(P_L+1)^2(P_L+P_R+2)(P_L+P_R-6)}{16} - \frac{(P_R+1)^2(P_L+P_R-2)^2}{16}$. Taking the first order condition gives $\frac{\partial EU_L}{\partial P_L} = -\frac{(P_L+P_R+2)(-2P_L^2 - P_L P_R + 7P_L + P_R^2 - 3P_R + 6)}{8}$. Solving this for P_L gives L's reaction function as $R_L(P_R) = \frac{7}{4} - \frac{\sqrt{9P_R^2 - 38P_R + 97}}{4} - \frac{P_R}{4}$. In a similar fashion I get R's reaction function to be $R_R(P_L) = \frac{P_L + 1}{2}$. Solving the reaction functions simultaneously gives the equilibrium policies from the open seat election as $P_L* = -0.68$ and $P_R* = 0.16$. For the incumbent challenger election, R's reaction function is substituted into L's utility function and L maximizes utility by choosing P_L^I. This gives $P_L^I = -1$ and $P_R^C = 0$ which proves (i) and (ii) above. Proof of (iii) is straightforward by simply inputting the equilibrium outcomes into the candidate's utility functions and solving. In the open seat we get $E(U_{L*}) = -0.60$ but when L is the incumbent we get $E(U_L^I) = -0.56$.

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Chapter 3

Quality Based Political Selection in the U.S. Senate

Abstract

I examine the extent to which electoral selection based on candidate quality
alone can account for the pattern of reelection rates in the U.S. Senate.
In the absence of officeholder benefits, I simulate electoral selection using
observed dropout rates from 1946 to 2010. This provides a benchmark for
the reelection rate that would be generated by incumbent quality advantage
alone. The simulation delivers a reelection rate which is almost identical to
the observed rate prior to 1980, at around 78 percent. In the later sub-sample,
quality-based selection generates a reelection rate which is seven percentage
points lower than observed. The divergence in the reelection rates in the later
sub-sample is consistent with the findings of vote-margin studies that indicate
rising incumbency advantage due to officeholder benefits. In addition I find
that the quality-based selection first-term reelection rate is significantly lower
than the observed first-term reelection rate. This result supports sophomore
surge vote-margin studies of officeholder benefits.

3.1 Introduction

Incumbents in the U.S. Congress are typically reelected.[1] In an environment with significant officeholder benefits, incumbents who would otherwise be defeated may be able to retain their seats. High reelection rates are therefore often taken as *prima facie* evidence of a poorly functioning political system where lesser quality incumbents are not replaced. However the literature on congressional races does not provide a yardstick to gauge what constitutes an overly high reelection rate. Even in the absence of officeholder benefits, it is likely that an incumbent would be reelected since he must be of a relatively high quality given his previous electoral success. Incumbents who have served many terms have defeated multiple opponents and so are likely to be of very high quality. Hence their reelection rates are likely to be very high. In this paper I examine the extent to which electoral selection based on candidate quality alone can account for the pattern of reelection rates in the U.S. Senate. The counterfactual setup may provide a simple benchmark for the reelection rate in the absence of officeholder benefits.

As in Dix and Santore (2002) I consider candidate "quality" to be the immutable characteristics of a candidate that are desired by voters. In the terminology of Adams et al. (2011), this definition of quality captures "character valence" based on traits such as integrity, competence and diligence.[2]

Disentangling quality-based selection effects from direct officeholder benefits such as superior media exposure, franking privileges, fundraising ad-

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[1]Matland and Studlar (2004) find that the US has the highest re-election rate among the 25 countries covered in the study: 82 percent from 1980 to 1994.

[2]Stone et al. (2004) also suggest that these personal traits are likely to reflect the voter's concept of quality.

vantages and indirect officeholder benefits such as entry deterrence of high-quality challengers, can be difficult as the full extent of candidate quality is typically unobservable. A strand of the literature attacks this problem directly; for example Stone and Simas (2010) and Stone et al. (2010) use expert informants to score incumbents and challengers in the U.S. House electoral contests. McCurley and Mondak (1995) compiles indicators of competence and integrity. However one can never be certain that all aspects of candidate quality are addressed and failing to fully control for quality may lead to biased estimates of officeholder benefits (Gelman and King, 1990). To bypass the problem, Levitt and Wolfram (1997) exploits information contained in contests of repeat challengers; Lee (2008), Uppal (2009 and 2010) and Redmond and Regan (2013) employ regression discontinuity design making use of the electoral history of bare-winners and bare-losers who generate similar electoral support.[3]

I take a simple but complementary approach. I examine a counterfactual framework where candidate quality is the sole determinant of electoral success. I assume that candidate quality is perfectly observable by the voter and the median voter strictly prefers the higher quality candidate. I simulate an electoral process where the higher quality candidate wins irrespective of incumbency status. The simulation is calibrated using the observed dropout rates in the U.S. Senate over the period from 1946 to 2010. Reelection rates from the simulation are then compared to the observed reelection rates in

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[3]Empirical challenges remain. Using only repeat challengers leads to small sample size, especially in Senate data. In relation to regression discontinuity design studies, Caughey and Sekhon (2011) suggest that despite the fact that bare winners and bare losers in U.S. elections generate similar electoral support, they differ on pretreatment covariates too drastically to be considered as assigned randomly to treatment and control groups.

the U.S. Senate across terms in office and across time periods. Prior to 1980 the reelection rate from the simulation is almost identical to the observed rate, at 78 percent. From 1980 to 2010, however, the rates diverge; while the observed reelection rate is 85 percent, the simulated rate based on candidate quality is only 78 percent. The seven percentage point divergence in the later part of the sample may be indicative of an increase in electoral stagnation in excess of what quality-based selection would generate.

The methodology of this simulation analysis is quite different from that employed by regression analysis vote-margin studies. Therefore the results can provide an indirect robustness check. The divergence in the observed and simulated reelection rates from 1980 to 2010 is consistent with the findings of vote-margin studies that indicate rising incumbency advantage. Moreover I find that the divergence in the reelection rates is greatest for first-term senators. This result supports the findings of sophomore surge vote-margin studies.

Section 3.2 provides a brief discussion of closely related literature. Section 3.3 presents the setup of the simulation. Section 3.4 describes the data. Section 3.5 summarizes the results. Section 3.6 conducts a sensitivity analysis and Section 3.7 concludes.

3.2   Related Literature

While the literature on congressional races typically focuses on vote shares rather than reelection rates, Jacobson (1987) argues that what matters most is winning or losing, not the size of the victory. However, reelection contains

less information than vote margin since the former is dichotomous while the latter is continuous. Therefore Ansolabehere and Snyder (2002) suggests that studying the margin enjoyed by the candidate due to incumbency status is the first step to understanding reelection rates. Depending on the methodology used, since the 1980s incumbency advantage is estimated to be around four percent vote share for low-level state offices and around eight percent vote share for high-level federal and statewide offices (see Hirano and Snyder, 2009). While vote margins are clearly closely related to reelection rates, the relationship is not necessarily one to one. Jacobson (1987) shows that from the 1950s to the 1980s vote shares of House incumbents increased, but there was no rise in the reelection rates. Likewise, Garand (1991) and Jewel and Breaux (1988) demonstrate that the vote margins of incumbents grew substantially in state legislative races in the 1970s and 1980s, but reelection rates barely increased. Hence I analyze reelection rates directly.

Carey et al. (2000), Stone et al. (2004 and 2010), Diermeier et al. (2005) and Gowrisankaran et al. (2008) have results on the factors that influence the reelection rate. I address a different question by examining how much of the observed reelection rate can be accounted for by incumbent quality alone.

The closest work is Zaller (1998) on House elections. Methodologically the papers are very similar. However Zaller (1998) investigates the relative importance of forces external to the candidates − the role of non-skill factors. Hence Zaller (1998) introduces a number of features other than candidate quality into the framework which are designed to increase its realism. Here, on the other hand, I am interested in establishing a benchmark reelection rate

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in the absence of officeholder benefits that would result if candidate quality were all that mattered. So a key aspect where the analyses differ is in our treatment of indirect officeholder benefits. In Zaller (1998) the existence of an incumbent reduces the competitiveness of the opposition primary and hence the resulting reelection rate incorporates an implicit scare off effect — on average the opposition fields a weaker candidate when faced with an incumbent. Here I analyze electoral stagnation generated by selection based solely on quality, absent any source of officeholder benefits including scare-off effects which may lead to significant incumbency advantage. Hence I assume that the competitiveness of the opposition party's primary is unaltered by the existence or non-existence of an incumbent.

3.3   Simulation Setup

I start with an open seat contest where two candidates run for office. The qualities of both candidates are drawn independently from the same continuous distribution function $F(q)$. Each candidate's quality score (q_i) is permanent over the life time of his political career. The electoral outcome is deterministic given the quality scores of the candidates; the candidate with the higher quality wins the election and becomes a first-term senator.[4] Since the c.d.f. is continuous, ties occur with zero probability. At the end of his first term the incumbent either drops out with an exogenous probability p_1

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[4]Note that this implies that in this framework voters are not forward looking. In Gowrisankaran et al. (2008), even if voters only care about quality, sophisticated voters may vote for a somewhat lower-quality challenger in case they expect the high-quality incumbent not to run in the subsequent election. This is because voters may anticipate future open-seat candidates to be of lower quality than the candidate who is currently challenging the incumbent.

or runs for reelection with probability (1-p_1). If he drops out, then there is a new open seat and the process repeats. If he runs for reelection, his quality score remains unaltered and a new challenger contests the seat. The challenger's quality is randomly drawn from F(q) and the election goes to whoever has higher quality. If the incumbent is defeated, I record a "defeat" for a first term senator. If the incumbent wins I record a "reelection" for a first-term senator. If the senator goes on to serve a second term, at the end of the second term, he either drops out with exogenous probability p_2 or reruns with probability (1-p_2). If the incumbent wins, I record a "reelection" of a second term incumbent. If the incumbent loses, I record a "defeat" of a second term incumbent; the challenger becomes a new first-term officeholder and the process continues with the new incumbent. I follow this process for 500 million iterations resulting in precise estimates of the reelection rates implied by the framework for each tenure of incumbent.

Any quality distribution function F(q) with continuous c.d.f. is permitted.[5] For instance, F(q) may be the result of a primary system. If each of the k candidates in the primary has quality drawn from a distribution G(q), then F(q) will be the distribution of the kth order statistic of k draws from G(q). If the number of candidates in the primary is stochastic then the p.d.f. implied by F(q) may be multi-peaked.[6]

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[5]In the simulation I work with the quantile of q_i. So rather than drawing an absolute level of quality, I use the fact that F(q) is continuous to find each candidate's position in the c.d.f. with a draw from U(0,1). Because F(q) can be any general continuous distribution I cannot back out the absolute level of quality. But candidates with a higher position in the c.d.f. have strictly higher quality which is sufficient to determine the winner.

[6]By making specific assumptions about the distribution of quality, Zaller (1998) is able to analyze the magnitude of the electoral selection effect when non-skill factors, termed luck, have different degrees of importance in the electoral process. The cost of permitting any distribution of quality is that we can no longer address this important issue. However,

Note that the electoral selection in the simulation abstracts from scare-off effects. In elections where the incumbent reruns, drawing challenger quality from the same distribution as used for open seat contests implies that the existence of an incumbent does not reduce the competitiveness of the opposition party's primary. Scare-off effects can arise from direct officeholder benefits, where the electoral benefits of incumbency discourage high quality challengers. Quality-based scare-off effects may also exist where potential challengers are deterred from running against high-quality incumbents as they view their reelection prospects as too low. Potential challengers may also be reluctant to challenge high-quality incumbents if they intrinsically value having a high-quality politician in office as in Stone et al. (2004) and Adams et al. (2011).

The critical set of parameters of the simulation are the incumbents' dropout rates p1, p2, . . . for each term. These may differ for different terms in office. I employ the observed U.S. Senate dropout rates from 1946 to 2010. Since the problem is identical at each open seat, it has a recursive structure. However, because there are an infinite number of possible states (the term of the current incumbent and the number of elections since the last open seat) I calculate the reelection rates via simulation.

realistic assumptions about the primary process can generate a quite complicated implied distribution of quality and we know very little about the actual distribution of candidate quality. So foregoing specific assumptions about $F(q)$ allows for more robust results.

3.4 Data

Each U.S. state is represented by two senators. Senators can serve unlimited six-year terms. Elections are staggered with approximately one-third of the Senate seats up for election every two years. Data for U.S. Senate elections from 1946 to 2010 is garnered from the Office of the Clerk of the U.S. House of Representatives.[7] Biographical details for individual senators are obtained from the Congressional Biographical Directory. For each election I have information on the names of senators and challengers contesting the election, the election outcome, whether the incumbent was reelected or defeated and an indicator for open-seat elections.

In addition, the dataset contains information on how senators initially entered office; by general election, appointment or special election. When an incumbent senator dies or resigns before the end of his term in office, the governor of the state makes an appointment to fill the vacancy until a special election can be held.[8] The appointed senator can then decide whether to contest the special election or retire. In the counterfactual setup, elections serve to weed out low-quality candidates and holding office does not in itself provide any electoral benefits. Hence in my data, candidates who run after being appointed to office are not coded as incumbents as they have not yet gone through the crucible of an election. This is different from the usual treatment in studies with incumbency advantage where they are treated as incumbents since in those studies holding office provides an electoral advan-

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[7]One advantage of Senate rather than House data is the lack of gerrymandering in the Senate.

[8]This is with the exception of Alaska, Oregon and Wisconsin where the governor cannot make interim appointments.

tage.

The data contains a total of 1,154 elections. 268 of these were open-seat elections.[9] This leaves 886 elections that were contested by an elected incumbent seeking reelection.[10] The reelection rate in these 886 elections is equal to 81.72 percent.

An incumbent senator can either be re-elected, defeated or he can simply drop out. Table 1 gives the observed dropout rates of incumbents over the period of study. The longest tenure of any incumbent in the data is 51.5 years of service in the Senate.

Incumbents may drop out due to outside opportunities in the private or public sector, poor health and death. The simulated setup takes these observed dropout rates as exogenous dropout probabilities. This is different from Zaller (1998) where dropout rates are assumed to be zero until 34 years in service (equivalent to just under 6 terms if applied to U.S. senators). Both approaches have the potential to suffer from bias due to their treatment of dropout rates. With no interim dropout, high-quality incumbents keep rerunning which raises the simulated re-election rate. In the simulation, incumbents may drop out before retirement. But note that the dropout probabilities do not depend on quality. In reality an incumbent may drop out to preempt defeat if she observes a higher quality challenger. Hence if strategic retirement in anticipation of defeat were prevalent in the data, the reelection rates from the simulation would be biased downwards.

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[9]This figure includes 98 special elections, 61 of which were contested by appointed senators who ran in the election following their appointment.

[10]Note that in my setup defeated candidates do not rerun in future contests. In actuality, of the 886 elections contested by an incumbent, 54 involved repeat challengers. Of these, 19 previously defeated candidates were successful in their later attempt.

**Table 1: Observed Dropout Rates,
1946-2010 (in Percentiles)**

Term 1	12.00
	n=425
Term 2	20.26
	n=306
Term 3	31.03
	n=203
Term 4	35.19
	n=108
Term 5	28.00
	n=50
Term 6	48.15
	n=27
Term 7	54.55
	n=11
Term 8	25.00
	n=4
Term 9	100.00
	n=2

n is the number of senators elected to at least x terms

However studies cast doubt on the empirical importance of strategic retirement in the analysis of reelection rates. From 1968 to 1978, Peters and Welch (1980) find that House incumbents who were involved in a corruption scandal were no more likely to drop out than those that were not. Ansolabehere and Snyder (2004) use term limits as an instrument to correct for strategic retirement; traditional estimates of incumbency advantage that do not take strategic retirement into account are only marginally different from

estimates that do.

3.5 Simulation Results

Simulations are run for 500 million iterations yielding negligible standard errors for the simulated reelection rates. Hence differences from actual reelection rates reflect either model misspecification or chance in the actual election process rather than imprecision in the estimates.

Table 2 summarizes the observed and the simulated reelection rates for each term of office during the period from 1946 to 2010, as well as the overall observed and simulated reelection rates. The simulated reelection rates are monotonically increasing in the number of terms. For an incumbent to reach a high term in office, she must have defeated numerous challengers along the way. Therefore on average candidates that reach higher terms have high quality and as such have a higher probability of reelection, leading to electoral stagnation.[11] Note that incumbent-quality advantage is quite high even for first-term senators which results in a 72.61 percent first-term reelection rate in the simulation. First-term senators who enter office by contesting an open seat are reelected two thirds of the time. But the first-term senators who enter office by defeating an incumbent are on average of exceptionally high quality. Hence their reelection rate is correspondingly higher, bringing up the overall first-term reelection rate.

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[11]After n elections since the last open seat, while the seat may have changed hands in the interim elections, the quality of the current incumbent is the $n + 2^{nd}$ order statistic of $n + 2$ draws from F(q). Hence the expected quality of an incumbent is increasing in the number of elections since the last open seat.

Table 2: Observed and Simulated Reelection Rates
in the U.S. Senate (1946-2010)

	Observed Rate (%)	Simulated Rate (%)	Difference (%)
Term 1	80.21 n=374 (2.06)	72.61 n=141.1m (0.00)	7.60***
Term 2	83.61 n=244 (2.37)	79.30 n=81.7m (0.00)	4.31
Term 3	80.00 n=140 (3.38)	83.26 n=44.7m (0.01)	-3.26
Term 4	80.00 n=70 (4.78)	85.89 n=24.1m (0.01)	-5.89
Term 5	91.67 n=36 (4.61)	87.77 n=14.9m (0.01)	3.90
Term 6	85.71 n=14 (9.35)	89.19 n=6.8m (0.01)	-3.48
Term 7	80.00 n=5 (17.89)	90.27 n=2.8m (0.02)	-10.27
Term 8	100.00 n=3 (-)	91.21 n=1.9m (0.02)	8.79
Overall	**81.72 n=886 (1.30)**	**78.16 n=318.1m (0.00)**	**3.56**

Notes: ** signifcant at 5%, *** significant at 1%. n is the number of observations (in millions for the simulation). Standard errors in parentheses.

The simulated overall reelection rate (78.16 percent) is close to the observed reelection rate in the data (81.72 percent). However the difference (3.56 percentage points) is statistically significant. The benchmark generates lower electoral stagnation compared to the observed data. This is largely driven by the first term. The simulated first-term reelection rate is 7.60 percentage points lower than the observed.

Since the simulation abstracts from all incumbency advantages other than the incumbent-quality effect, it might be tempting to attribute the difference between the observed and simulated reelection rates to incumbency advantage arising from direct and indirect officeholder benefits. However caution is called for in interpreting the results. One of the dimensions in which the counterfactual setup probably diverts from reality is the term-invariant quality of the incumbent.[12] With experience senators may get sharper in early terms and then become more and more detached from their constituents over time, cancelling the positive effect of further experience.[13] If in reality incumbent quality increases at a decreasing rate while the simulation assumes term-invariant quality, the reelection rates from the simulation would be too low in early terms. This pattern is consistent with the positive differences in the first two terms in Table 2.[14]

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[12]The assumption on term-invariant candidate quality is often employed in the literature, see for example Gelman and King (1990), Levitt (1994) and Levitt and Wolfram (1997).

[13]Erikson and Palfrey (1998) provides evidence for increasing vote shares of incumbents in the sophomore year, followed by a modest increase in their junior year. However seniority is neutral on votes in higher terms. Erikson and Palfreys (1998) findings are consistent with larger officeholder benefits which incumbents enjoy, especially in early terms, due to increased name recognition. But they are also consistent with increasing incumbent quality due to experience.

[14]McCurley and Mondak (1995), Stone et al. (2004 and 2010) and Stone and Simas (2010) make use of expert informants and of the Almanac of American Politics to score candidate quality. However measures of changes in incumbent quality across terms in office have been more elusive. Hence it is difficult to differentiate between the term-variant quality and the early officeholder benefit explanations for the rise in the vote margins in early terms.

Likewise, by assuming that the distribution of candidate quality is unaffected by challenger/open seat status the simulation abstracts from the scare-off effect. And by assuming that challengers' quality distribution is unaffected by the quality of the incumbent it abstracts from competent-government motivated candidates' lesser desire to replace high-quality incumbents as discussed in Stone et al. (2004) and Adams et al. (2011). Both these effects would lead to higher re-election rates as they result in fewer high-quality challengers. Hence to the degree that experience increases incumbent quality or that incumbents are able to scare off high-quality challengers, attributing all of the difference between the observed and simulated rates in the first two terms (7.60 and 4.31 percent) to direct and indirect officeholder benefits may be exaggerating their magnitude.

However, there is also reason to believe that simple attribution of the difference between the simulated and observed reelection rates to officeholder benefits may understate their magnitude. The simulated setup assumes no partisan swings. Jacobson (1989) finds that the effect of national partisan tides on the probability of reelection of congressional incumbents is negative and statistically significant. With an average reelection rate of about 80 percent, incumbents have more to lose with partisan tides then they have to gain. A partisan swing can increase the average win probability of the incumbents it favours by at most 20 percent. However it can reduce the average win probability of the incumbents who experience a negative swing by up to 80 percent. The fact that the counterfactual setup assumes no partisan swings makes the reelection rates from the simulation higher than otherwise. Hence incumbency advantage due to direct and indirect officeholder benefits may be responsible for stagnation by more than the difference between the observed and the simulated reelection rates in Table 2.

The literature exploiting vote margins indicates an increase in incumbency

advantage over time. Levitt and Wolfram (1997) estimate that incumbency advantage in the 1980's was more than double that of the 1950's. Hirano and Snyder (2009), Gelman and Huang (2008) and Gelman and King (1990) also document an increase in incumbency advantage in the latter decades of the twentieth century. As such I split the data into two subsamples, 1946 to 1978 and 1980 to 2010 and examine the reelection rates across time periods. The counterfactual setup is calibrated with the dropout rates from each sub-sample from Table 3. Table 4 reports the results.

Table 3: Observed Dropout Rates from the U.S. Senate in Two Sub-Samples (in Percentiles)

	1946-1978	1980-2010
Term 1	13.68	9.95
Term 2	19.88	20.69
Term 3	26.47	35.64
Term 4	40.74	29.63
Term 5	28.57	27.59
Term 6	70.00	35.29
Term 7	100.00	44.44
Term 8	-	25.00
Term 9	-	100.00

In the sub-sample from 1946 to 1978 the observed reelection rate in the U.S. Senate and the reelection rate generated from the electoral selection simulation are almost identical at around 78 percent. However the rates diverge in the 1980-2010 sub-sample. While the observed reelection rate is about 85 percent, the simulated

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rate based on electoral selection is only about 78 percent. The nearly seven percentage point difference in the later part of the sample may be indicative of an increase in electoral stagnation for reasons other than incumbent-quality advantage. This finding on reelection rates is consistent with the wealth of empirical work based on vote margins which document an increase in incumbency advantage. Growth in the size of government and the rise of TV are among factors cited in the literature that may be driving forces behind an increase in incumbency advantage in the U.S. congress.[15]

Table 4: Observed and Simulated Reelection Rates in Two Sub-Samples

	Observed Rate %	Simulated Rate %	Difference %
1946-1978	78.29 n=456 (1.93)	77.75 n=312.2m (0.00)	0.54
1980-2010	85.35 n=430 (1.71)	78.40 n=322.8m (0.00)	6.95***

Notes: ** significant at 5%, *** significant at 1%. n is the number of observations (in millions for the simulation). Standard errors in parentheses.

However, it is also possible that the higher observed reelection rate in the later sub-sample is due to factors other than an increase in direct and indirect office-holder benefits. For example, growth in partisan polarization has been identified as

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[15]The number of TV channels have been increasing rapidly since 1952 and Garrett and Rhine (2006) shows that government has been increasing in size since the early 20th century. Fiorina (1989) argues that the larger the government the greater are direct officeholder benefits such as administrative office resources and improved ability to raise campaign funds from interest groups. Prior (2006) claims that television gives incumbents free coverage throughout their term and improves name recognition. Increase in direct officeholder benefits can lead to challenger scare off, indirectly increasing incumbency advantage. Levitt and Wolfram (1997) shows that reduction in the relative quality of challengers since the 1960s appears to be a major contributor to the rise in incumbency advantage.

a trend in US politics since the 1980s. Lang and Pearson-Merkowitz (2013) claims that in the last two decades parties have increasingly positioned themselves with clear ideological divides on selected issues such as the social safety net, environmental protection and immigration. This allowed the electorate to sort themselves politically in a more consistent fashion which led to geographical polarization since people live in more or less like-minded communities. As such Democratic states may have become more Democratic and Republican states may have become more Republican.[16] Hence incumbents from red and blue states may not face as serious competition from the opposing party as they would in swing states. So incumbents' electoral prospects are favourable in the more polarized states. The simulated electoral selection model based on candidate quality precludes any effect of party affiliation. If one party had an electoral advantage, candidates from that party would be more likely to be elected in the first place and would have an easier time fighting off challengers. Hence the simulated reelection rate would be higher than in the baseline model. This suggests that polarization and sorting may be contributing to the seven percentage point reelection rate gap between the simulated and observed reelection rates in the subsample since the 1980s.

3.6 Sensitivity of Reelection Rates to Dropout Rates

Below I carry out sensitivity analysis to explore the robustness of the results to changes in the dropout rates. Two approaches are taken. First, I examine changes

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[16]A variety of causes of political polarization have been identified including pressures related to campaign fundraising and more polarized pundit coverage on TV in the last three decades. See Kaiser (2010) for fundraising and Hollander (2008) and Hetherington (2009) for TV coverage.

around the observed dropout rates to see whether reelection rates are likely to vary significantly due to changes in the actual dropout rates. Then I examine more dramatic changes in dropout rates to see the range of reelection rates that can be supported by the framework.

First consider modest changes to the dropout rates from the baseline calibrated scenario. The first row in Table 5A reports the dropout rate sensitivity of the simulated reelection rate for the period 1946-2010. The exercise involves increasing the dropout rates by ten percent over and above the observed rates for each of the terms. So I multiply the observed dropout rates in Table 1 by 1.1. This yields dropout rates 13.2, 22.28, 34.13, 38.70, 30.80, 52.96, 60.00, 27.50 and 100 percent for term 1, 2, etc. Naturally the simulated reelection rate based on higher dropout rates is lower than the reelection rate employing the observed dropout rates. Higher dropout rates imply that some of the high quality senators retire at an early term even though they could have won in subsequent elections; the reelection rate goes from 78.16 to 77.55 percent. Table 5A also reports the dropout rate sensitivity of the simulated reelection rate for the two sub periods, employing the relevant dropout rates. An increase in the rates by 10 percent for each term (over and above the observed dropout rates reported in Table 3) leads to a decline in the simulated reelection rates from 78.4 to 77.77 percent for the early sub sample from 1946 to 1980, and from 77.75 to 77.22 percent for the later sub sample from 1980 to 2010. In each case the change in the simulated reelection rate is quite small. This suggests that moderate evolution of senatorial dropout rates over time is unlikely to have significant effects on simulated reelection rates.

Table 5A: Dropout Rate Sensitivity Analysis

Time period	Simulated reelection rates based on observed dropout rates (baseline simulation)	Simulated reelection rates based on dropout rates 10% higher than observed
1946-2010	78.16	77.55
1946-1978	78.40	77.77
1980-2010	77.75	77.22

For the time period 1946-2010, the sensitivity analysis dropout rates employed are 1.1 times the observed dropout rates in Table 1. For the time periods 1946-1978 and 1980-2010 the sensitivity analysis dropout rates are 1.1 times the observed dropout rates from the relevant line of Table 3.

Even though small changes in the dropout rates around the rates observed in the Senate have very modest effects on the simulated reelection rates, dropout rates are central to the analysis. In order to explore the range of reelection rates that can be generated by electoral selection, I consider more substantial changes to dropout rates. These results are tabulated in Table 5B. Scenario 1 is the baseline simulation from the calibrated model from Section V. Scenario 2 assumes that incumbents never drop out (which would require that they lived forever). In that case an incumbent is replaced only if he is defeated by a higher quality challenger. The quality score of the incumbent senator at any round of the simulation is weakly higher than the score of all previous incumbents. Hence the simulated reelection rate converges to 100 percent as the number of rounds goes to infinity. In Scenario 3, I maintain the nine-term limit on senatorial careers but remove interim dropout for terms one to eight, senators of high quality who make it to later terms would always run for reelection. In this scenario, the simulated overall reelection rate increases from the baseline 78.16 percent to 86.58 percent. In Scenario 4 senators serve a maximum of two terms in office (the shortest span that allows for a reelection attempt) and first-term senators never drop out. In that case the simulated reelection rate is 69.61 percent which is just slightly above the reelection

rate of 66 percent that incumbents who came to office by contesting an open seat have in their first reelection attempt. Challengers who defeat an incumbent are on average of very high quality and hence are typically subsequently reelected. But since in this specification they do not hang around for multiple reelection attempts, they have only a modest effect on the overall reelection rate.

Table 5B: Dropout Rate Sensitivity Analysis

Scenario	Simulated Reelection Rates (%)
1. Baseline calibrated scenario	78.16
2. No dropout (senators live forever)	converges to 100
3. No dropout until term 9 and term limit of max 9 terms	86.58
4. No dropout until term 2 and term limit of max 2 terms	69.61

Table 5B suggests that the simulated reelection rates vary depending on the institutional setup. If this methodology were to be applied to different legislatures, simulated rates would respond to their specifications. For instance in Missouri, both the State House of Representatives and the State Senate have term limits, four two-year terms and two four-year terms respectively. We would expect to see a higher simulated reelection rate in the Missouri House than in the Senate, since high quality incoming House incumbents are likely to be victorious in subsequent elections. Therefore a higher observed reelection rate in the Missouri House compared to the Missouri Senate does not indicate that the reelection rate is overly high in the House.

In the time period from 1980 to 2010, the reelection rate in the U.S. House of Representatives was 94% as opposed to 85% in the Senate. The intuition gained from the simulation methodology suggests that there is no a priori reason to expect

the reelection rates to be similar since the U.S. House and the U.S. Senate have different characteristics; one term in the U.S. House of Representatives lasts only two years as opposed to six years in the U.S. Senate. As such, members of the House Representatives can serve a greater number of terms and the increased frequency of elections may lower dropout rates at each term of office. Both of these factors would serve to increase the simulated reelection rate for the House. In addition, the minimum age requirement for the Senate is 30 while the age requirement for the House of Representatives is 25. This may also lead to higher simulated reelection rates in the House, since a high-quality representative would have a longer expected life span in office.[17]

3.7   Conclusion

This paper explores one explanation for the repeated electoral success of incumbents in the U.S. Congress - electoral selection based on quality. Incumbents would not have been elected to office if they were not of relatively high quality, and hence they are typically victorious in subsequent elections. I find that electoral selection based on quality alone may be sufficient to explain the observed reelection rates in the U.S. Senate in the early part of the sample from 1946 to 1978. However electoral selection based on quality alone fails to account for the electoral stagnation with high rates of reelection in the later part of the sample from 1980 to 2010. Since the 1980s, observed electoral stagnation has been higher than what

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[17]The main difficulty with applying the methodology to the U.S. House is related to gerrymandering. As pointed out by Gowrisankaran et al. (2008), it is unclear how to treat elections involving two incumbents running against each other following redistricting in the U.S. House. Mann and Wolfinger (1980) argues that the Senate also differs from the House in terms of the media coverage received and the level of public interest. Hence Ashworth and Bueno de Mesquita (2008) points out that there is a higher likelihood of the voter correctly identifying the higher quality candidate in Senate races.

would be anticipated if the only driving force of incumbents' electoral success was candidate quality. I am unable to account for the high reelection rates of the last thirty years using candidate quality alone.

Indeed if the sole reason for higher reelection rates in the later subsample were due to an increase in incumbent-quality advantage, one would expect to observe an improvement in the public's opinion of the Congress. However this is not the case. According to Gallup public opinion polls since 1977, people's approval of the Congress and of their individual representatives have fallen drastically.[18] In 2013 Gallup polling, only 16 percent of the voting age population is reported to "approve" of the U.S. Congress. This approval rate is the lowest in nearly four decades. Furthermore to the question "[d]o you approve or disapprove of the way the representative from your congressional district is handling his or her job?" 41 percent of the respondents replied "disapprove" in 2013. The rate of disapproval recorded for the same question was 31 percent in 1992 and 18 percent in 1977. One potential explanation for high reelection rates in spite of public disapproval of incumbents may be related to rising incumbency advantage due to officeholder benefits. Voters may find it optimal to vote for the incumbent who is likely to occupy seats in important congressional committees as a senior politician and who has the power to grant political favours, even though in principle they might not approve of the politician for his or her integrity, competence and diligence.

If the gap between the actual reelection rate and the reelection rate generated by candidate quality since 1980 is due to increased officeholder benefits, then the implications of the simulation results are bleak for American politics. Overly high reelection rates may have deleterious effects on social welfare. Even if the challenger is of higher quality, he may have a smaller probability of victory than the

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[18]See http://www.gallup.com/poll/165809/congressional-approval-sinks-record-low.aspx

incumbent. High quality candidates with high opportunity cost may be deterred from running for office because of weak electoral prospects. This implies that some sub-optimal (on quality) senators will remain in office. Furthermore safer seats may induce officeholders to be less responsive to their constituents, since they would have little reason to fear defeat.

While simple, the methodology of this paper is very different from the methodology of vote margin studies that estimate direct and indirect officeholder electoral benefits. As such it may provide a robustness check on the results of these studies. The fact that in the later sub-sample a seven percentage point gap opened up between the actual reelection rate and the reelection rate generated in the framework driven solely by candidate quality is consistent with the established finding from vote margin studies that incumbency advantage has increased in the last thirty years. The difference between the observed and simulated reelection rates is driven by observed high first-term reelection rates, which is consistent with estimates of incumbency advantage based on the sophomore surge approach.

3.8 References

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