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The Electoral Consequences of Size in American Politics

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The Electoral Consequences of Size in American Politics

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Political Science

by

James Alexander Keena

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Professor Charles Anthony Smith, co-chair
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2016

DEDICATION

To Jessie,
with faith, love, and endless patience,
you have supported me through it all

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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I am indebted to Tony Smith and Tony McGann for their guidance and mentorship in training me as a political scientist. I came in as a novice, and they had enough confidence in me to accept me as their apprentice. They valued my contributions, respected me as a collaborator, and most importantly, gave me the opportunity to fail, which has been the key to my success thus far.

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ABSTRACT OF THE DISSERTATION

The Electoral Consequences of Size in American Politics

By

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Doctor of Philosophy in Political Science

University of California, Irvine, 2016

There are two philosophies for how elected officials should posture to voters. One approach holds that officials should appeal to the centrists in their district, while another suggests that they should ignore the middle and appeal to the partisan base. In this book, I posit that the number of citizens living within an electoral district determines the viability of each strategy. When a district has a low population, the quality of "representational relationship" is high and the average citizen has an incentive to participate in democratic elections. In this context, public officials should posture to the centrists in order to capture the median voter. But when a district is very populous, there is little value in engaging in democracy for the average citizen. Here, it makes sense for officials to appeal to the partisans, who are more likely to turnout to vote.

I outline a theory of size and electoral engagement that holds that, as an electoral district population increases, the electorate becomes less engaged in elections, such that fewer citizens turnout to vote and support candidates. I test the empirical implications of this theory with a number of analyses. My analysis of thousands of returns from national, state, and local elections in America shows that size depresses voter turnout. I observe similar effects on campaign contributions during U.S. Senate elections. The effects of size on voter engagement have

implications for how legislators behave strategically in order to secure reelection. I find that senators discount the views of their states' median citizen as the size of their state increases.

This analysis has far-reaching implications for the study of democracy beyond the context of American politics. The primary contribution of this book is that it provides a rigorously-tested, logically-grounded theoretical framework that explains the role of population size in structuring political behavior on both sides of the representational relationship.

INTRODUCTION

In American democracy – that is, in an electoral system with single-member districts, first-past-the-post voting rules and two major parties – there are two strategies for getting elected. The first strategy, which follows from the Median Voter Theorem[1], holds that a candidate ought to appeal to the moderates in the district in order to capture the median voter. In this view, drifting towards the ideological center of the electorate is the best strategy for winning because the choice for voters is between two candidates. Candidates can afford to discount the views of the most extreme voters because the extremists must choose one of two alternatives; voters will favor the candidate closest to their views. Thus, because the challenge is to capture the median voter, an election-minded official should support centrist policy to maximize the electoral base.

For decades, this logic has prevailed in American politics (Fiorina 1999). After appealing to the party base during the primary process, candidates should drift towards the ideological center to compete for the "undecideds". Yet the campaign strategies developed in the 2000s serve as a rebuke of this logic. Republican strategist Karl Rove was at the forefront of these innovations, which are premised on the notion that mobilizing the partisan base is a better strategy than appealing to the moderates.[2] If campaigns are able to convince enough partisan extremists to turnout to vote, then the moderates will be unnecessary. In this view, drifting towards the center may actually undermine electoral success insofar as it erodes the enthusiasm

[1] Hotelling (1929); Black (1948); Downs (1957)

[2] Rove pioneered the technique of "microtargeting", which involves compiling data on and party affiliated voters in order to make personalized appeals for support during campaign season.

of core supporters, who are more likely to turnout on Election Day than the moderate, undecideds. Thus, the Rove philosophy holds that winning elections in America is primarily a battle over voter turnout, which implies that election-minded officials should support policy that reflects the preferences of the ideological extremists in their base.

This approach to campaigning challenges one of the core assumptions of the median voter model: *that the voter base is fixed*. Whereas the Rove philosophy is premised on a dynamic and impressionable electorate with an undetermined voting population, the median voter model takes the voting population as a point of departure. It assumes a finite and stable population of voters who must decide between the choices presented to them. The battle is over the ideological center, and candidates will respond with centrist policies – even if these positions alienate much of their support base – because voters must accept one of two alternatives. The partisan extremists will choose whichever candidate is closest to their ideal point.

The extent to which one strategy is more effective than the other is determined by the engagement of the electorate and the stability of the voter population. When the voter pool is nearly as large as the pool of eligible voters, the median strategy prevails. Under the conditions of universal participation, electoral politics is not a battle over turnout. Turnout is assured, and the decision for voters is a one-step process. But once the additional decision step is incorporated into the model – whether to vote or abstain –this strategy is no longer viable.

In American politics, the voter base is not fixed. Each election cycle, millions of eligible voters decide that there is no value in choosing between the alternatives presented to them and decide to stay home rather than cast a vote. In this context, winning requires of a strategy of mobilization. The success or failure of a campaign hinges on a candidate's ability to convince

more voters to turnout than the opposition. Here, appealing toward the ideological extremes can be an effective strategy for garnering enthusiasm among the partisan base. This is because it is less costly to convince the partisan extremists to come to the polls than it is to convince the undecideds.

In this dissertation, I illuminate a key structural determinant of the public's engagement in elections: district population size. I posit that the number of citizens living within an electoral district represents a physical determinant of the level of access between citizens and their elected officials that determines the value of democratic engagement for the average citizen. When the size of an electoral district is small—that is, when a district has a low population of citizens—citizens on average have more opportunities to contact their representatives and to communicate with them in person to seek help if necessary. In this regard, the value of the "representational relationship" is high, and most citizens have an incentive to participate in elections as a means of influencing future political outcomes. But when the size of an electoral district is very large and there are many citizens competing for a public official's attention, access must be restricted. This means that, on average, citizens have fewer opportunities to contact their representatives and obtain political goods and services. In this context, the quality of the representational relationship is diminished, and for most citizens, there is little incentive to participate in electoral politics.

The effect of size on citizen engagement in elections has implications for the strategic behavior of an elected-minded official. In small districts, a large portion of the electorate will turn out to vote and support a political candidate during campaign season. This leads to a struggle between candidates over the support of an *existing* median voter. In this context, when voter engagement is high and stable over time, candidates can adopt the median voter strategy and pursue centrist positions that appeal to the moderates. However, in very large districts, the

voting population represents only a small subset of the electorate, and mobilization becomes the primary concern for campaigns. The strategy shifts to garnering enthusiasm among the base and get-out-the-vote efforts that increase turnout.

In contrast with small districts, where engagement is very high, the spatial location of the median voter along an ideological axis is yet to be determined in very large districts. In this sense, it is an *outcome*, rather than an *a priori* fact. Because turnout tends to be systematically low in highly-populated districts, campaigns can directly influence the location of the median through their mobilization efforts. Thus, rather than a permanent fixture of the field of play, the median voter is a movable target. Winning candidates shift the median point to their preferred position by virtue of having mobilized more of their supporters to the polls than their opponents.

The Puzzle of the Legislative Responsiveness

A large body of empirical research has attempted to test the implications of the median voter model and its implications for legislative politics. Although this literature has yielded mixed results (see Romer and Rosenthal 1979; Stratmann 1995), it suggests that the median voter model works better under certain conditions. The median model is better at predicting legislative behavior when legislators represent politically homogenous districts (Gerber and Lewis 2004; Kalt and Zupan 1990), and does not work well when voters are uninformed, have weak or non-single-peaked preferences, or when elections do not serve as a direct referendum on specific policy positions (see Krehbiel 2004). When legislators position themselves away from the estimated median point, it is assumed to be the result of a deficit in the electoral process that allows legislator to "shirk" the district's preference in order to advance their own personal policy preferences (e.g. Levitt 1996; Uslaner 2001).

One of the challenges of testing the validity of the median voter model is data accessibility. In modern legislative districts, which have very large citizen populations, there are substantial barriers to gaining access to voters' ideal points in order to identify the location of the median. As a solution to this problem, scholars tend to rely on survey based measures of citizen ideology that assign a single value to the preferences of the district mean or median point (see Gerber and Lewis 2004). Yet this approach overlooks the distinction between the voting population and the district population. When voter engagement is low and a small portion of the public turns out to vote, the difference between the location of the median voter and the location of the median citizen in the district may be considerable. In this regard, the observed failure of the median voter model might instead be explained as legislators responding to the preferences of their supporters, who turnout to vote, rather than the preferences of the district centrists, who do not turnout to vote. Thus, one of the common problems with empirically studies of the median voter model is that they often do not account for the effects of variations in voter turnout on legislative behavior.

In contrast to the research on legislative politics, which tends to conflate the district population with the voting population, research within the political behavioral tradition approaches citizen engagement as a central problem and offers insight into the determinants of political participation and its consequences for legislative behavior. On an individual level, people are more likely to participate and engage in electoral politics when they have access to political resources and are affiliated with political organizations, such as parties and interest groups. Delli Carpini and Keeter (1997) argue that political knowledge is the "currency of politics" and that "the less informed one is…the less likely one is to participate, and the less likely it is that one's participation will be effective" (pp. 8-9). American democracy is highly

stratified, and political resources, such as information or connections political elites, are unequally distributed to citizens. While much of the American electorate possesses a general knowledge of politics, large segments of the public lack access to political information and are thus unable to effectively engage with the political system.

This may be related to the long-term decline of the political party system. Historically, political parties have been instrumental in organizing electoral support for political candidates and mobilizing their members to turnout on Election Day. The decline party membership in America since the 1970s suggests that the appeal of modern political parties is narrowing and a large subset of the electorate has become alienated by the party system (Gray and Caul 2000; Miller and Shanks 1996; Wattenberg 2002, 2009). This is particularly evident among younger generational cohorts of citizens, who tend to reject conventional modes of participation, such as voting (Boyd 1981; Dalton 2002; Kaase 1990; Lyons and Alexander 2000; Miller and Shanks 1996). That interest in politics remains relatively high and has even increased among citizens born after World War II (van Deth 1990) suggests that most young citizens today simply find old ways of participating ineffective and inconsistent with their values.

Although the appeal of the political party system has waned in recent decades, interest groups appear to have gained relevance by connecting citizens with democratic politics (see Bishin 2009). Insofar as citizens lack the ability to influence their representatives as individuals, interest groups provide an alternative means of engaging with politics (Olson 1971). Groups provide a venue for organizing citizens with shared interests in order to pressure elected officials to adopt their desired policy positions. In this regard, they represent a valuable resource to election-minded legislators. As Bishin (2009) argues, interest groups "are disproportionately valuable to candidates because their members are not only more likely to vote but also more

likely to provide other important resources" (p.13). Thus, like parties, groups play an important role in connecting members with the electoral process.

This literature offers important practical lessons for campaigning and electoral strategy. In the context of American politics, where engagement is historically depressed and unequally distributed, candidates are best served by aligning themselves with organizations that promote the shared interests of their members. This is because organizations, such as political parties and interest groups, play an important role in mobilizing their supporters and driving turnout on Election Day. By reflecting the "positions of the groups to which they appeal" (Bishin 2009, p.13), candidates can expand their coalitions to include party members and single-issue voters who vote as a bloc in support or opposition to a candidate based on their policy stances or group identities. In short, winning elections means obtaining a mathematical majority of partisans and issue voters, who are less costly to mobilize and more reliable in their electoral participation. This means that candidates can appeal to the partisans and ideologues, even if it means deviating from the ideological center, because the centrists are unorganized and unlikely to vote, and thus less likely to punish candidates who deviate from their preferences.

Size and Electoral Engagement

As we have seen, the median voter model expects election-minded officials to appeal to the moderates. When legislators do not respond to the median, it is often believed to be the result of self-interested legislators shirking the views of their constituents. But this view does not account for the possibility that low voter engagement may skew the spatial location of the median voter relative to the location of median citizen in the district. Whereas empirical research on legislative behavior takes the voting population for granted, research on political behavior

approaches voter engagement as a central problem. This view holds that, in the context of low voter engagement, it is more effective for a candidate to appeal to well organized groups, such as parties and interest groups, than to voters as individuals. This is because unaffiliated voters are less likely to embrace conventional modes of participation, like voting, while members of political organizations, such as parties and interest groups, consistently vote. Thus, appealing to the partisans and ideologues offers a more effective strategy than appealing to the moderates.

At face value, these perspectives appear to contradict each other in terms of campaign strategy and appear to offer mutually exclusive predictions for legislative behavior. Yet when we appreciate the logical effect of voter engagement in a district on campaign strategy, it is clear that both views are valid in different contexts. When the voter base is highly engaged and participation is nearly universal, then capturing the median voter becomes a necessity, and candidates should position themselves as centrists. Because the choice before citizens is not *whether* to vote but *how* to vote, there is no risk in alienating the partisan extremists – they will simply choose the closer of two candidates. But when electoral engagement is depressed, the real battle is convincing citizens to vote in the first place, and a strategy of appealing to the extremists is more effective. Candidates can afford to discount the views of the undecideds in favor of the partisans, because the partisans turnout to vote and the undecideds do not.

Size matters for understanding engagement of the voter base within a district. As a single variable, the population size of an electoral district represents a simple solution to the complex puzzle of engagement. Because the size of a district imposes physical limitations on the ability of citizens to access their elected officials, it undermines the quality of the representational relationship and diminishes the value of democratic engagement for the average citizen. When size is small and elected officials serve only a small number of citizens, each citizen on average

has more direct influence over the political process, vis-à-vis their ability to communicate with their representatives. In this context, voting serves not simply as an empty gesture of civic duty or self-expression, but as a means of securing future access and influence. But when size is very large and elected officials must represent large constituencies, only a small portion of the public finds value in the democratic process. In short, because size determines the *electoral context* that candidates face, it affects campaign strategy and has consequences for how legislators position themselves in order to get elected.

Roadmap of the Dissertation

In this introductory chapter, I have argued that district population size provides a solution to the problem of campaign strategy. On the one hand, the median voter model holds that candidates should adopt centrist policy positions in order to capture the median voter. On the other hand, the realities of modern campaigning in America imply that candidates are better served by appealing to their partisan base and ignoring the undecided moderates. Although both strategies appear to represent mutually exclusive approaches to campaigning and governing, both models are valid under different circumstances. When an electorate is highly engaged, as is the case with smaller districts, then voters face a single decision: how to vote. Candidates, then, should position themselves to capture the median voter. But when an electorate has low engagement, as is the case with large districts, voters face a two-step decision: whether to vote, and if so, how to vote. For candidates, this means appealing to the partisans and ideologues, who are most likely to vote.

In the first half of this book, I outline and test a theory of size and electoral engagement. Because my argument about the relationship between size and campaign strategy hinges on the

claim that size structures electoral engagement, I must support this claim with theoretical and empirical evidence. In Chapter 1, I outline a theoretical model for the relationship between size and engagement based on the work of Rein Taagepera on "ignorance based modeling" (1999; 2008). In Chapters 2 and 3, I test the implications of framework in the context of American elections. In Chapter 2 I conduct an analysis of the effects of size on voter turnout. I analyze thousands of election returns from races at the national, state and local level, and find results that are consistent with the expectations of the size theory on engagement. Then, in Chapter 3, I test the implications of the size theory in the context of a different form of engagement, campaign finance, by analyzing campaign donations to U.S. Senate candidates. My results, which are consistent with the expectations of the size theory, show that donors make fewer contributions, per capita, to U.S. Senate candidates in large states than in small states.

In the second half of the book, I shift the focus on my analysis to the candidates. Chapter 4 studies the role of affluent donors in funding U.S. Senate campaigns. In large states, where candidates tend to communicate with voters through mass-marketing, candidates are more reliant upon the support from wealthy donors to fund their campaigns. In Chapter 5, I analyze legislative behavior in the U.S. Senate and find that state size structures the degree to which legislators deviate from their state's median citizen. These results suggest that, because size affects electoral engagement, size also determines the strategic positioning of a legislator. I also provide an assessment of the Median Voter Theorem and its ability to predict the spatial voting of U.S. Senators. The results show that the model is better at predicting legislative behavior in small states than in large states.

In the concluding chapter of this book, I consider the implications of this investigation on research in political science. The size theory of electoral engagement has far-reaching

implications for a number of fields, including political participation and voting behavior, campaigns and elections, legislative behavior, and political representation.

CHAPTER 1: A Theory of Size, Access and Electoral Engagement

Thus far, I have argued that the strategic behavior of an elected official is affected by the population size of the electoral district. This is because voters in large districts and voters in small districts behave differently, which affects the viability of the "median voter" strategy. The electoral conditions in large districts challenge one of the common underlying assumptions in empirical studies of median voter model, that the district population and the voter population are the same. When district size is small and most everyone votes, the voter pool closely resembles the district population, meaning that the battle between candidates is over *how* voters will decide. But when district size is very large, turnout is systematically low and the voting population represents a small subset of the total population. For the average citizen, the choice is not over which candidate to choose, but whether the election presents a choice that is meaningful enough to justify voting in the first place. This means the battle between candidates is about convincing more voters to turnout on Election Day, and the spatial location of the pivotal voter is yet to be determined. The median voter is an electoral *outcome* that is the byproduct of which side is more engaged. Under these conditions, candidates win elections by mobilizing their supporters for maximum engagement, not by posturing to the moderates. Thus, size determines the circumstances that dictate which electoral strategy to adopt. When the population size of an electoral district is small, the median voter strategy is effective, and legislators should position themselves toward the spatial center of their district. But when population size is very large, it makes more sense to appeal to party loyalists and interest group members, even if this means alienating the moderates by diverging from the spatial median, and leaving the undecideds on the sidelines.

The validity of this argument rests on the claim that district population size affects how voters behave in elections. In this chapter, I present a theory of size and electoral engagement, which holds that, because size imposes *physical* constraints on the access that citizens have to their representatives, size reduces the value of participating in elections. In the first part of this chapter, I consider the logical relationship between size and access. I argue that size imposes limits on how accessible a representative can be to constituents. The demand for accessing a representative in order to obtain political goods and services rises in proportion to the number of citizens being represented. When an electoral district is very populous, there are many demands for a representative's time and attention, and representatives must ration the amount of access they grant to constituents by giving special priority to their most important constituents, their supporters. In this regard, size determines the quality of representational relationship for the average citizen. In the second part of this chapter, I consider the logical implications of size on electoral engagement. Because size reduces the instrumental value of participating in elections, I theorize that citizens will become less engaged in elections as an electoral district becomes more populous, all else equal. Because there is no logical maximum limit on the population size of an electoral district, the nature of this decline is exponential; the relationship between size and engagement is only observable through a non-linear, logarithmic scale.

Access and Political Representation

Communication between citizens and their elected officials is a fundamental part of representative democracy. "Being represented" requires that citizens have the opportunity to voice their opinions to their representatives and ask them for help, should the need arise. In the American Congress, legislative representation entails more than simply public policy (Griffin and Flaven 2011; Harden 2013). Citizens also seek personal favors and other types political

goods, including subsidies, protections, letters, endorsements, investigations, hearings, U.S. flags, and earmarks, and other goods (Mayhew 1974). These types of services, dubbed "casework" in Washington, are inherently personal, and obtaining them requires open lines of communication between citizens and legislators (Mansbridge 2009). When citizens can contact their elected officials and communicate with them on individual terms, they have more influence over the political process and a personal stake in the relationship with their representatives. When elected officials are inaccessible and do not listen to citizens, the quality of representational relationship is poor, and citizens have less personally invested in this relationship and little incentive to support them during election season.

In this regard, *access* plays a key role in determining the value of the "representational experience" for citizens (Oppenheimer 1996). In the context of democratic politics, "access" is the means of gaining the attention of, or an audience with, a gatekeeper of political power (e.g. a member of Congress, a committee chair, a union president, a party boss, etc.) in order to request a political good or service, or to simply express an opinion (see Barzilai-Nahon 2009). In a representative democracy with a large citizen population, in which there are many citizens seeking to obtain political goods and services through elected officials, access is inherently scarce and becomes a valuable commodity in and of itself.

From the perspective of an election-minded legislator, access is a valuable resource that is distributed to constituents in a deliberate manner. Decisions about the allocation of time and personal attention reflect judgments about the relative value and influence of constituents. When there are many demands for a legislator's time and attention and access is scarce, access is distributed in a way that maximizes electoral security. Empirical evidence suggests that, as a general rule, legislators reward the most important supporters—those who are key to electoral

security—with personal attention and special access, and restrict access for those who are inconsequential to their electoral security (Fenno 1978, 1982, 1996; Kalla and Broockman 2016).

Legislators' judgements about who gains access have tangible consequences for the value of engaging in democratic elections from the perspective of citizens. When citizens enjoy access to their elected officials, they have the opportunity to communicate with their representatives in order to influence the political process or acquire political goods and services. In a real sense, they are invested in the personal relationship with their representative. But when access to representation is restricted or cut off and there is little hope of communicating with an elected official, citizens have little to gain by supporting their representatives during election season.[3]

One of the challenges of studying access systematically from an institutional perspective is that it is difficult to measure. Like money, access is an instrumental good that is possessed and exchanged as a means of securing other types of goods (i.e. policy, constituent services, earmarks, endorsements, etc.). But unlike money, access is does not exist in physical or material form. Quantifying access is difficult because in a very real sense it is invisible—we can only see indirect evidence of its existence. But by appreciating the logical relationship between access and the physical world, it is possible to quantify the physical limits of access and investigate the structural effects of these limits on political behavior.

Size represents a physical determinant of access that constrains the relationship between a representative and constituents. The size of an electoral district—the number of individuals an

[3] This is the basic premise of the "personal vote" in American politics. Research by Cain, Ferejohn and Fiorina (1984) suggests that constituency service increases support for incumbent candidates.

elected official must represent—determines the demand for a representative's time and attention. Because such resources are inherently finite, size determines to extent to which access to a representative must be restricted. When a district is small, access is abundant, and the scope and impact of these restrictions are minimal. But when a district is highly populated, access must be rationed. In an imaginary world where legislators treat all constituents equally, size provides a direct measure of the access each citizen has (or could have) to a representative. In the real world, where legislators do not treat all constituents equally, size determines the necessity of favoring some over others. Here, I posit that district population size, as a single variable, provides a direct measure for quantifying the limits of access within a political system. Because size determines the amount of political access that each citizen gets on average, it has key implications for political behavior.

Size and the Representational Relationship

The notion that population size affects the public's engagement in elections is supported by a growing, but disparate body of scholarship. In general, this research is limited and theoretically underspecified, but it suggests that the population size of an electoral district undermines the quality of the "representational relationship" between citizens and public officials by hindering communication and reduces the incentive to actively support a candidate for office.

Fenno observed that legislators carefully balance their time between Washington, where they pursue legislative activities, and their home districts, where they interact with constituents and market themselves to voters (1978). He noted that the geography and demographic features of a legislator's constituency create challenges for communicating and interacting with

constituents that influence a legislator's "home style"—that is, the manner in which they provide representation to constituents and market themselves to voters. Senators from small states tend to campaign in a manner similar to House members and rely upon personal interactions with constituents, such as handshaking and small-scale town hall gatherings (1978, 1982). In contrast, senators of large states tend to communicate with constituents through the mass-media and large scale campaign events that are inherently less personal. Similarly, Lee and Oppenheimer (1999) show that state size affects legislators' approach to campaigning and their strategies for serving their constituents in the U.S. Senate. Small state senators tend to seek committee assignments that allow them to pursue "credit claiming" activities for earning electoral support through particularized benefits (i.e. pork), while large state senators adopt "position taking" activities that are more likely to receive media attention back home.

These activities have important consequences for citizens' perceptions of their public officials and the accessibility of their representations. Citizens of small states report more contact with their representatives, including meeting personally with a senator, attending a meeting where a senator spoke, meeting with a senator's staff, and receiving mail. Residents of small states are more likely to contact their senator to seek help, while residents of large states are more likely to contact a senator to express an opinion (Lee and Oppenheimer 1999; Oppenheimer 1996). Frederick, in his study of citizens' attitudes in the U.S. House (2008) has found similar results. The effects of size on citizens' attitudes and perceptions about their elected officials appear to have meaningful implications for how citizens behave in elections. Research demonstrates that district size negatively affects voter turnout in U.S. state legislative elections (Bowen 2010) and in municipal elections (Oliver 2000). Outside of American politics, a number of studies show that polity size constrains the communications between legislators and

constituents and affects the democratic process in fundamental ways (Gerring et al 2015; Taagepera 1972, 2007; Taagepera and Shugart 1989).

Although these studies consider the implications of district population size from different perspectives and in different theoretical contexts, they each underscore the importance of population size and its role in mediating the relationship between citizens and their representatives. It is clear that size affects the incentives for both sets of actors that have consequences for their strategic behavior. Yet, from a theoretical perspective, the causal link between size and behavior remains obscure. In the next section, I illuminate the theoretical chain linking district population size and citizens' political behavior in elections. As I have suggested, the central component of this relationship is access, which affects citizens' perceptions of the value of supporting a candidate for office. Because the population size of an electoral district represents a structural determinant of access to political representation, it affects the perceived "payoff" of supporting a candidate for office, and thus reduces the likelihood that citizens will participate in elections as a means of securing future political influence.

Size and the Value of Elections

"Electoral engagement" is an abstract concept that encompasses a range of activities related to the electoral process in a democracy. Individuals are "electorally engaged" if they donate money to a political candidate; volunteer time for a political campaign; cast a vote on Election Day; attend a campaign rally; watch a televised debate or campaign speech; debate the relative merits of the candidates with a stranger; talk about a political candidate with friends; host a private gathering on behalf of a desired candidate; and perhaps many other activities as well. In general, these activities vary in terms of their relative costs, ranging from very high (e.g.

donating money or volunteering for a political candidate) to very low (e.g. discussing a campaign with friends), and do not necessarily require formal citizenship or voting rights. The quintessential form of electoral engagement, which has received the bulk of the attention within the scholarship, is voting. Broadly, the motivation for voting can be divided in two categories: (1) voting as a means to an end ("investment voting"); (2) voting for the sake of voting ("consumptive voting"). Here I consider both types of voting and how they are affected by size and scale.

Voting as a Means to an End

In one sense, voting has value insofar as it brings about future goods. Sometimes this is referred to as "investment voting" or instrumental voting". Here, the act of voting represents an investment of time and other costs incurred with the promise of a return in the future. Investment voting occurs when people vote with the hope that their vote will determine the outcome of the race (Riker and Ordeshook 1968), or when people vote in order to provide some future benefit, such as securing access to a candidate or strengthening their political connections. Investment voting may also entail non-selfish motives, such as altruism, in which case the act of voting serves as a means to enhance the public good (Jankowski 2002). Here, people vote as a means of bringing about some outcome in the future, even if the individual "costs" of voting exceed the individual payoffs and do not necessarily enhance their personal utility. The key point is that, because value of voting is not immediately realized, it represents an investment in the political system.

Research suggests that well-educated citizens tend to be more instrumental in their voting, perhaps because educational attainment enhances the skills necessary to communicate

with candidates or acquire political resources (Brady et al 1995). People who closely identify with a political party or interest group may be more inclined to cast a vote for its value as an investment good. For example, voting may serve as a means of securing public policy or advancing shared interests. Here, the act of voting is an instrumental action insofar as an individual perceives their share of these future goods to be conditional upon their participation in an election. Investment voting may also take the form of a "relational good", in which case the act of voting serves as a means to further one's ties to a particular candidate, or to strengthen one's "claim to membership" within particular group or political party (Uhlaner 1989a; 1989b p. 257).

Voting for the Sake of Voting

Voting may also be valued for its intrinsic value, or its value as a "consumption good." Here, voting may represent an act of self-expression, or a form of entertainment, or people may derive a feeling of personal satisfaction from doing their "civic duty" or conforming to the ritual of voting on Election Day. Others may vote because they feel pressured to conform to a social norm of voting (Gerber, Green and Larimer 2008). In these cases, voting is valued not for the potential reward it brings in the future, but because the act of voting itself serves as the reward.

That citizens perceive an intrinsic value in voting is largely a product of social convention and reflects social values that are tied to a larger set of historical processes. Research suggests that, while older voters in Western democracies are more likely to vote out of civic duty, this is not the case with younger generations of voters, who tend to possess different value sets and pursue different forms of political engagement (Inglehart 1997; Jennings, van Deth, et al 1990). Younger voters are more likely to abstain from the polls and instead pursue non-

conventional forms of political participation, such as political consumerism or political protest (see Dalton 2002). In this regard, the dynamics of generational change and shifting values likely have tangible effects on the consumptive value of voting. In theory, while the number of consumption voters should be relatively stable within a given generational cohort of citizens, from the perspective of the entire electorate, consumption voting should gradually decrease. This is because newer generational cohorts will replace older generational cohorts over time, and the conventional social norms of civic duty and peer pressure will gradually lose their force.

Size and the Value of Voting

Size directly affects the value of some forms of voting, and indirectly affects the value of others. Size directly affects the value of "investment" forms of voting. The most obvious effect of size, as early scholars of social choice theory noted (i.e. Riker and Ordeshook 1968), is on the likelihood that an individual's vote will directly determine the outcome of an election. Here, the value of voting decreases as a function of the size of the voter population; when more citizens cast votes, each vote becomes less valuable. But what is less obvious is that size also reduces the value associated with other forms of investment voting. Because size determines the limits of accessing a candidate (i.e. a future elected official), it determines the future "payoff" of voting as a "down payment" on future access or as a share of future policy goods, as well as the value of voting as a means of enhancing ties to a candidate or political party. In all these cases, the instrumental value of voting decreases as the voting population becomes more numerous. When each individual vote matters less for a candidate or party's electoral success, these actors are likely to provide fewer direct benefits, such as access or policy influence, in exchange for votes. In terms of voting as a means of enhancing a group identity (voting as a "relational good"), the link between size and value is less direct. While the size of an electorate may not necessarily

undermine the value of a group identity, it makes connections to candidates and parties less personal and thus less appealing for younger citizens who have not yet formed lifelong ties with a party or candidate. Thus, although size may not affect the value of identifying with a party or candidate in the short term, it may reduce the appeal of joining a party or political campaign in the long term, as older voters leave the electorate and younger voters take their place.

In terms of the intrinsic value of voting, size may have less direct relevance. In the short term, size does not affect the value of expressive or conformity voting, or voting for civic duty. Citizens who have been socialized to enjoy the ritualistic aspect of voting are unlikely to be affected by changes in the population size of the electorate. Yet in the long term, size may weaken the social norms that serve to habituate citizens to vote. Under the conditions of historical population growth, fewer citizens may go to the polls due to the effects of size on investment voting, and this may serve to undermine the social and cultural relevance of voting as an expression of civic duty or form of self-expression. Thus, while size may not affect the intrinsic value of voting for those who have already been habituate to vote, size may serve to weaken the forces of peer pressure and conformity voting over time as fewer citizens go to the polls as a means of obtaining future political goods.

A Theory of Size and Electoral Engagement

In order to lay the groundwork for a theory of size and electoral engagement, I borrow from the work of Taagepera (1999; 2007; 2008) to develop an "ignorance based" model. This approach assumes that predictive models are more credible when they are built from the "ground up", using logic and intuition, rather than in reverse and based solely on empirical observation. Whereas empirical models are constructed using the information gathered from the observable

world and thus may not account for all theoretically possible outcomes, the Taageperan approach emphasizes the importance of incorporating into a model the logical "boundary conditions" that limit the range of theoretically possible outcomes. By eliminating logically impossible outcomes from consideration, the task of building a theory is simplified. The logical boundaries provide "a base line against which our observations can be compared" (1999, 423).

Recall that the logical relationship between size and electoral engagement is that size reduces the value of participating in elections, for example, by voting, as a means of obtaining future goods. As I have argued, when the population size of an electoral district is very small, the instrumental value of engagement is high. Because elected officials can provide expansive access to their supporters, citizens have a stake in the representational relationship and incentive to participate in elections in order to advance their political interests by supporting a candidate. In this context, casting a vote has real meaning and is not simply a symbolic gesture driven by habit. Thus, when size is small, electoral engagement should be high.

But when size is very large, candidates must restrict access to citizens. For most citizens, this means that there is little value in endorsing a candidate or turning out to the polls because these actions are unlikely to yield future returns. Few individuals will find participating in an election a worth-while investment. In this context, the voting base is likely to be composed primarily of intrinsic voters – those who vote out of social convention, such as civic duty or peer pressure, and those who find value in voting as a symbolic form of expression. Eventually, over time, the value of this type of engagement will diminish as old social norms give way to the shifting values of new generations of citizens. Of course, even in very large districts, there is likely to be a small number of citizens who see real "investment" benefits in engaging in an election. This is because, in practice, elected officials do not treat their constituents equally; they

prioritize the constituents who matter most for their electoral security. A minority of well-connected citizens will continue to vote because there is instrumental value in doing so, and voting represents a good investment. Thus, in very large districts, the voter base is likely to be made up of intrinsic voters, along with citizens who participate as a means of enhancing their partisan identities or securing their share of future goods, and a small share of citizens who are well-connected to candidates and believe that they will receive future rewards in exchange for their endorsements and support. The remaining population, the abstaining population, is likely to include citizens who are not connected to any candidate, non-partisans and others who are alienated by parties, those who reject voting as a form of expression or civic duty, citizens who deliberately stay home as a "protest gesture", and others who have calculated that their vote does not matter. Historically, this pool tends to include citizens who are members of disenfranchised social classes, ethnic minorities and the poor (see Piven and Cloward 2000). Their decision to abstain is in part a calculation that the costs of voting are too great to justify voting, and in part a reflection of the incentives of candidates to focus their energies primarily on the conventional support bases and party organizations.

Now that I have outlined the theoretical relationship between size and electoral participation in its most basic form (engagement decreases as size increases), the next task is to improve this model by delineating the conceptual boundary conditions that limit the range of theoretically possible outcomes. Note that at this stage, I am working with an abstraction, rather than concrete variable, with regard to electoral engagement. Conceptually, "electoral engagement" may apply to wide range of observable human practices, and assessing the validity of this framework through empirical analysis will require specific and measurable form of

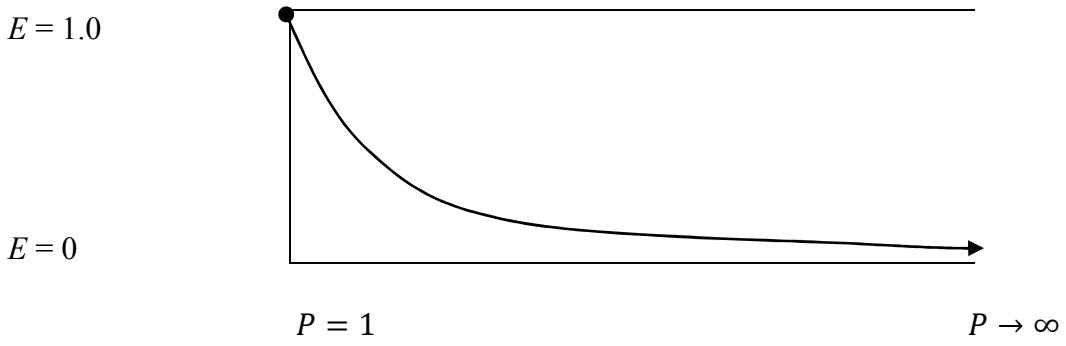
electoral engagement, such as voting. At this stage, however, the purpose is to create a generalizable, theoretical framework that will apply to all forms of electoral engagement.

Conceptually, there can be considerable variation between legislative districts in terms of how engaged its residents are. At one extreme, there may be very few people participating in election activities, such as donating to a candidate or turning out to vote, and a legislative district can be said to have very low – or perhaps close to zero – electoral engagement by the public. In this case, while a small number may be actively engaged, most will not participate in an election in any meaningful way. At the other extreme, there may be districts in which most people are highly engaged in electoral politics and virtually all adults participate in an election in some capacity, in which case electoral engagement can be said to be very high.

Suppose that, in this way, electoral engagement can be measured along a scale of 0 – 1.0, where a value of 0 represents no engagement by the public, while a value of 1.0 represents full engagement by the public. Now suppose that the size of an electoral district, as measured by the number of adult citizens within the district boundaries, can have a minimum possible value of 1 citizen and can trend infinity larger, such that there is no logical maximum value. Under these conditions, there are two logical boundaries that occur when constituency size is at its minimum and maximum possible values. At the smallest possible constituency size, when a district has a citizen population, *P*, of a single individual, such that $P = 1$, the investment value of participating in an election is at its highest point. Here, citizens directly determine the outcome of the election and have full access to their elected officials. At this point, electoral engagement, *E*, will approach its theoretical maximum. This point (1, 1.0) represents the logical Y-intercept.

The other boundary occurs when the constituency population size, P, approaches infinity, such that $P \rightarrow \infty$. At this point, on average, there is little to no investment value in participating in electoral politics because the average voter has effectively zero likelihood of determining the outcome of an election through their actions and no realistic hope of accessing elected officials. As the size trends larger and larger, the number of engaged citizens becomes a smaller and smaller subset of the total population. Although a few intrinsic voters remain, and an even smaller number of investment voters, eventually these citizens will represent a negligible share of the population. Thus, as the size of a district approaches infinity, electoral engagement gradually decays to zero (see Figure 1.1).

Figure 1.1: District Population Size and Election Engagement



Now that I have outlined the boundary conditions of the model – that is, what happens to engagement when size is as small as possible and as large as possible – the next task is to apply an "ignorance based" approach to predict the nature of the relationship in between the logical extremes. Note that by considering the logical limits of the variables and eliminating conceptually impossible outcomes from consideration (i.e., "what happens to engagement when population size = -10, 000"), the problem has been simplified. Because there is no logical

maximum value for size, the decline of engagement takes the form of a limit: it gradually approaches zero as size trends larger, but conceptually never reaches it. Under an "ignorance based" approach, absent other information, the best guess for what happens to campaign engagement in between the boundary conditions is that there is a smooth and gradual decline (as opposed to peaks and valleys) between full engagement and zero engagement as district size trends larger.

Thus, through a simple exercise of logic, I have arrived at four criteria that the model must conform to:

(1) The range of possible values of electoral engagement, *E*, is such that: $E \in [0\text{-}1.0]$

(2) The range of possible values of population, *P*, is such that: $P \in [1\text{-}\infty)$

(3) The model includes a Y-intercept of: $E(1) = 1.0$

(4) The model includes a limit of: $\lim_{x \to \infty} E(x) = 0$

The simplest equation that means all of these criteria is the exponential equation, $E = kP^{m}$, where $k = 1$ and $m < 0$. Under log-log scale, the equation takes the form of a linear equation: $\log E = m \log P + \log k$. Although this exercise is rather simple, it does provide basic falsifiable implications for political behavior in the real world. In the next two chapters, I assess the validity of this model by attempting to falsify these implications empirically.

Conclusion

In this chapter, I have outlined a generalizable theory of size and electoral engagement. I have argued that the effects of size on political behavior stem from the intimate relationship between size and access. Size represents a physical determinant citizens' access to political

representation. That is, the number of citizens living within an electoral district determines the opportunities that citizens have to contact their elected officials for help. When size is small, there are very few demands for a representative's time and attention and access is abundant. But when a district is highly populated, a representative must negotiate many more demands and restrict access strategically to those who do not affect their electoral prospects. In this regard, size undermines the quality of the relationship between citizens and their elected officials, and size reduces the ability of the average citizen to advance their interests through the political process and find value through electoral participation.

Using logic and ignorance based modeling (Taagepera 1999; 2007; 2008), I have outlined a theoretical framework that clarifies the nature of the relationship between district population size and electoral engagement that has a host of implications for political behavior in the empirical world. In the next two chapters, I subject this model to empirical scrutiny. In Chapter 2, I analyze one particular form of electoral engagement, voting, in American elections at the state, local and national level. In Chapter 3, I investigate another form of engagement, campaign contributions in the context of the U.S. Senate, in order to test the validity of this model.

CHAPTER 2: Voting and Abstention in American Elections

Thus far I have argued that size affects representative democracy in fundamental ways. The population size of an electoral district determines citizens' ability to access to their representatives, which shapes citizens' perceptions of the value of participating in elections and the incentives of supporting candidates for office. When size is small—that is, when the population of an electoral district is low—the value of participation as an investment good is high. But when size is large, the value of participating in an election as a means of acquiring future goods decreases. The result is that candidates representing large districts must mobilize the electorate by strategically appealing to partisans and group members, who are more likely to find value in voting, as opposed to moderates and unaffiliated citizens. To this end, I have outlined a theory of size and electoral engagement that holds that formal participation in elections will decrease as size trends larger. This theoretical model has direct, testable implications for turnout at the district level in democratic elections.

In this chapter, I present an empirical analysis of voter turnout in American elections. I analyze recent election returns from the U.S. Senate, state gubernatorial elections, and thousands of state legislative elections in an attempt to falsify my theoretical model, which predicts that district population size will reduce the likelihood that a citizen will participate in an election. Ultimately, the results of this analysis provide evidence that is consistent with my expectations. In all three types of elections, I find that constituency size is associated a strong, statistically significant, negative effect on voter turnout. These results hold even after controlling for a number of other variables that might bias the observed outcomes, such as the closeness of an election, and the magnitude of the "size effect" is consistent across institutions. Moreover, when I enhance the logical value of the empirically-generated equation by adding the theoretical

"anchor point" (the Y intercept), the "fitness" of the resulting model is virtually unchanged. In fact, the slope and intercept of the theoretical "best fit" line versus the empirical "best fit" line are remarkably similar, adding weight to my theoretical model. I estimate that the effect of district population size, P, on turnout, T, for both U.S. Senate and Gubernatorial elections, is captured by the equation: $T = P^{-0.06}$. This means that, as the constituency population grows, the rate of growth of voter population, V, does not keep pace, such that: $V \propto P^{0.94}$. In the next section, I detail my empirical approach to testing the size theory of electoral engagement in the context of voter turnout.

Turnout in American elections

In order to investigate the effects of district population size on voting, I analyze voter turnout for elections across three levels of American government: the U.S. Senate, U.S. state gubernatorial elections, and U.S. state legislative elections. The advantage of studying these three types of democratic offices is that they represent substantial variation in term of district size, competitiveness, prestige and salience. If each of these separate analyses yield results that are consistent with my theoretical expectations and similar in magnitude, this will suggest that the size effect is not simply a statistical artifact or false positive, and will lend credibility to the theoretical model.

Voter Turnout in U.S. Senate Elections

For the purposes of this study, the U.S. Senate serves as the ideal venue. First, there is "natural" variation in constituency size among states. Senators represent constituencies ranging from very small (as in the case of Vermont and Wyoming, which have populations of less than 700,000) and very large, as in California and Texas, which contain roughly 39 and 27 million,

respectively. Second, Senate races are among the most salient and contested elections, and the public tends to be more engaged in these elections than in lower-order races. For the range of my analysis, I study the most recent mid-term elections that occurred in 2006, 2010 and 2014. Limiting the analysis to mid-term elections serves as a control for the potential "coattail effects" of a concurrent U.S. presidential election, which may artificially boost turnout for lower order races by decreasing the cost of casting a vote. I have also excluded from the sample three uncontested races in which an incumbent faced neither a major-party challenger, nor a viable independent challenger. (These elections were held in Indiana in 2006, North Dakota 2010, and Alabama in 2014.)

Voter Turnout in U.S. State Gubernatorial Elections

In my analysis of U.S. gubernatorial elections, I study the even-year races that occurred between 1994 and 2010. This amounts to 230 separate elections in 45 states. Limiting my analysis to even-year elections means that I have omitted election results from the five states that hold governor elections during "odd years" (Kentucky, Louisiana, Mississippi, New Jersey, and Virginia), either the year before or the year after a presidential election, in which turnout is suppressed.

Like U.S. senators, governors represent state-wide constituencies, and there is substantial variation in terms of district size. But unlike U.S. senators, governors are frequently subject to term limits, and there is a relatively high turnover among office holders. This means that, in general, governor races are more competitive. This analysis serves as a compliment to the analysis of the U.S. Senate, particularly in states that are noncompetitive nationally. For instance, in many large states, such as California and New York, where U.S. Senate elections feature

popular incumbents who are electorally safe, analyzing U.S. gubernatorial elections provides an additional test for validity.

Voter Turnout in U.S. State Legislative Elections

Unlike elections for US Senate and state governor, US state legislative elections are relatively low in terms of salience and tend to be systematically low in voter turnout. Most states hold elections every two years in even numbered years. A few states hold elections in odd numbered years, which represses turnout even further. In order to provide a more accurate estimate of the size effect, I have excluded these states from my analysis. I have also excluded states with multi-member districts, because in these types of elections, in which voters can cast multiple votes for a single office, it is not possible to estimate the number of ballots cast based on the total vote count. I limit my analysis of U.S. State legislative election to lower house races (and Nebraska) that occurred between 2002 and 2010. This amounts to over 18,000 separate elections in 35 states.

Measuring Voter Turnout

For each analysis, I measure constituency population size by using the Voting Age Population (VAP) estimates published in the U.S. Census Bureau's Current Population Survey. McDonald and Popkin (2001) argue that VAP is a biased measure for estimating turnout because it includes non-eligible voters, such as disenfranchised felons and non-citizens legal residents. Because the growth in the population of these ineligible voters has historically outpaced population growth, it creates the appearance of a decline in voter participation since the 1970s. In response to this problem, they have published an adjusted measure of voting age population that excludes non-eligible voters, the Voting Eligible Population (VEP). Although I include results

based on both measures of population, I primarily focus on VAP. The problem with using an eligibility measure of population is that eligibility is in fact a product of politics. In highly populated districts legislators have incentive to limit size of the voter pool by restricting access to voter registration. This is because enfranchising new voters is risky and provides new opportunities for political challengers to expand their bases by mobilizing new voters, and because it dilutes the power of establishment voters who are well-connected to candidates and elected officials. Thus, removing disenfranchised felons from population estimates may serve to underestimate the true effects of size, particularly if there is a correlation between state size and ineligible population.

For U.S. Senate and U.S. Governor elections, turnout, T, is calculated as:

$$T = \frac{Total\ Votes\ Cast}{Voting\ Age\ Population}$$

I use the same equation for measuring turnout in state legislative districts, except that the denominator, VAP, is divided by the total number of districts in the state. This assumes that legislative districts are roughly equal in size. Although the measure is not as accurate as the statewide VAP measure, the analysis by McGann et al (2016; see Chapter 2) suggests that this assumption is valid.

A Logical Model for Turnout

My next task is to apply the theoretical model for electoral engagement developed in Chapter 2 to the specific context of turnout. As I argued in Chapter 2, "electoral engagement" is an abstract concept that encompasses many possible forms of behavior, including voter turnout. Because turnout is a measurable phenomenon with clear, definable boundaries (turnout can be as

high as 100% and as low as 0%), it is possible provide concrete theoretical data points to anchor the predictive model and to limit the range of possible outcomes. When size is very small – a VAP of one individual – turnout will reach its theoretical maximum, 100%. This is because instrumental value in voting is at its theoretical maximum: the vote cast by the single individual directly determines the outcome of the race, and the investment value of a vote is at its maximum. Thus, we have an "anchor point" that occurs at (1, 1.0). When size is very large – when VAP approaches infinity – the investment value in casting a vote becomes negligible. Turnout will diminish and hit a floor that represents the participation by consumption voters, a value trending towards to zero. Thus, through a simple exercise of logic and by using an "ignorance based approach", I have illuminated four criteria to which the model must conform (see Chapter 1 for a detailed discussion of this):

(1) The range of possible values of voter turnout, T, is such that: $T \in [0\text{-}1.0]$

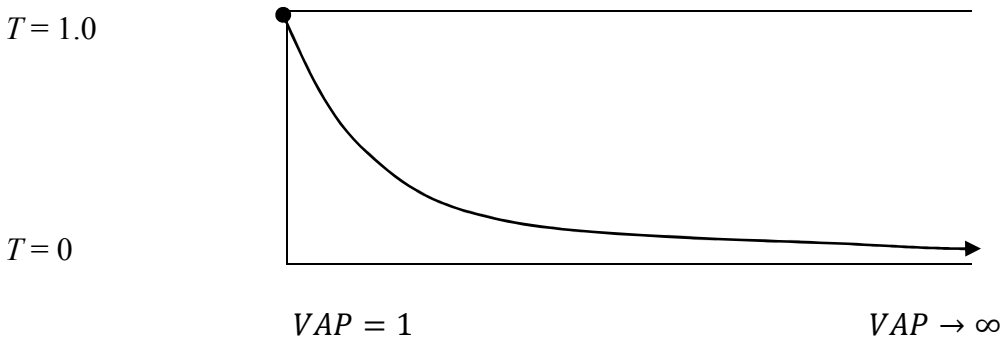
(2) The range of possible values of voting age population, P, is such that: $P \in [1\text{-}\infty)$

(3) The model includes a Y-intercept of: $T(1) = 1.0$

(4) The model includes a limit of: $\lim_{x \to \infty} T(x) = 0$

Under an ignorance based approach, the simplest equation that conforms to each of these criterion is the equation $T = k\,P^{m}$, where $m < 0$ and $k = 1$ (see Figure 2.1). In log-log scale, this takes the appearance of a straight line with a negative slope, $\log T = -m \log P + \log k$. In the next section, I analyze this model against the empirical data on turnout in order to test the validity of my theoretical model and provide a more precise estimate of the slope of this line.

Figure 2.1: District Population Size and Voter Turnout



Turnout in U.S. Senate elections

For my first analysis, I simply analyzed the correlation between state VAP and voter turnout. Figure 2.2 plots the voter turnout in 101 contested races included in my analysis of U.S. Senate elections in log-log scale with empirical and theoretical "best fit" lines included. As is evident, the data reveal a clear, negative correlation between district size and turnout. In general, the smallest states, with a VAP of under one million, appear to have higher turnout (above 50%) compared to the states with a VAP of over ten million, which cluster around 30% turnout. A simple, ordinary least squares regression calculates that size alone accounts for approximately 12% of the variation in turnout in the sample, with a slope of -0.062.

One of the problems with the empirically-generated, "best fit" line (denoted by the solid line) is that it predicts logically impossible outcomes. The slope of the line implies that when size is at its minimum possible value of a single individual, turnout will exceed 100%. Of course, this is an absurd prediction, and it underscores the limits of models that are generated purely through empirical observation. The solution to this, as discussed above and in Chapter 1, is to

anchor the equation to the logical minimum value of size, the logical Y-intercept, which occurs at the point (1,1.0). This equation, represented in Figure 2.2 by the hashed line, is virtually identical with the empirically generated "best" fit line in terms of fitness and in terms of the magnitude of the effect of size (-0.061), but it has the advantage of comporting with logical predicting theoretically possible outcomes.

Figure 2.2: Turnout in U.S. Senate Elections (2006, 2010, 2014)

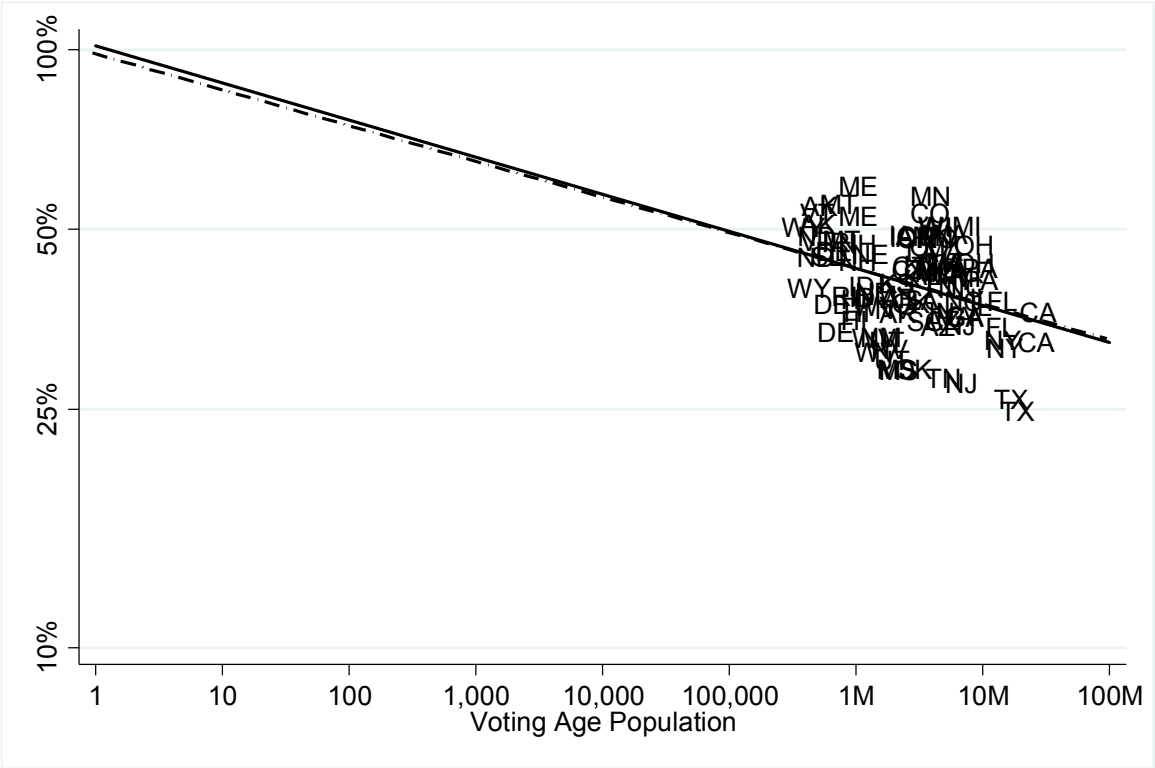


Figure 2.2 graphs the relationship between state voting age population and voter turnout in midterm U.S. Senate elections. The solid line reflects the empirical "best fit" line based on the observed values ($T = e^{0.013} P^{-0.062}$), while the dashed line reflects the logical "best fit" line ($T = P^{-0.061}$), which includes the theoretical anchor point of (1, 1.0). For both lines, the fitness is approximately identical ($R^2=0.118$).

As a supplementary analysis, I ran an OLS regression with standard errors clustered by state to test the effect of size on turnout in the presence of control variables. In addition to an independent variable measuring state VAP in log scale, I include a variable measuring the closeness of the election, *Closeness*, which is one minus the vote percentage total of the plurality winner; a variable measuring the portion of the state population with a bachelor's degree, *Education*, based on the U.S. Census Bureau's 2009 American Community Survey; and the dummy variable *Open Seat*, to signify that no incumbent ran on the general ballot. I also expanded my sample to include returns from the presidential year Senate elections held in 2008 and 2012 and coded these elections with the dummy variable *Presidential Year*, and I ran a separate version of this model using McDonald and Popkin's (2001) Voting Eligible Population measure (VEP) for calculating turnout.

The results of these analyses, which are reported on Table 2.1, provide results that are consistent with the previous analysis. Expanding the sample to include presidential year elections and controlling for the effects of electoral competition enhance the fitness of the model considerably ($R^2 = 0.57$) and does not substantially alter the magnitude of the effect associated with constituency size ($m = -0.072$). Moreover, the second model, which uses the VEP measure of turnout, reports results that are similar. Thus the size effect suggested by the model is not simply a statistical false positive stemming from how population is calculated. Even after non-citizen aliens and disenfranchised felons are removed from the denominator in the measure for turnout, the size effect on turnout is observed.

Table 2.1: Turnout in U.S. Senate Elections, 2006 – 2014

	log Turnout (VAP)	log Turnout (VEP)
log Voting Age Population	-0.072*	
	(0.02)	
log Voting Eligible Population		-0.047*
		(0.02)
Closeness	0.177*	0.168*
	(0.06)	(0.06)
Education	0.247*	0.323*
	(0.09)	(0.08)
Open Seat	-0.023	-0.027
	(0.02)	(0.02)
Presidential Year	0.337*	0.339*
	(0.02)	(0.02)
Constant	0.656	0.406
	(0.33)	(0.28)
R^2	0.602	0.643
N	167	167

* $p<0.05$

Turnout in Gubernatorial Elections

As the analysis of U.S. Senate elections reveals, there is a clear relationship between size and turnout. Moreover, the empirically generated "best fit" equation comes remarkably close to the logically predicted "best fit" line, adding weight to the validity of my theoretical framework. Yet it is entirely possible that the relationship between size and turnout is limited to a single institution and is not generalizable. There are a number of reasons to believe this may be the case. First, because the U.S. Senate is one of the highest national, elected offices, Senate elections are particularly salient and well publicized. However, in large states, such as California and New York, citizens tend to perceive the state governorship as an office of greater import. After all, in each state there are two senators, both of whom are limited in power, and many senators from large states are relatively safe electorally. Thus the observed correlation between size and turnout may amount to a spurious relationship. It may appear that turnout is systematically lower in large states, simply because in these states the Senate elections analyzed featured popular incumbents who won by large margins.

Analyzing turnout in the context of state governor races will shed light on whether this potential challenge is justified. Unlike U.S. senators, governors are the chief executives of their states, they tend possess expanded lawmaking powers, and many exercise a great deal of discretion in overseeing budgets and staffing. In many states, because governors are subjected to term limits, gubernatorial elections tend to be more competitive. Thus, analyzing gubernatorial election provides an additional test of the validity of my theoretical model.

Figure 2.3: Turnout in "Even Year" U.S. Gubernatorial Elections (1994-2010)

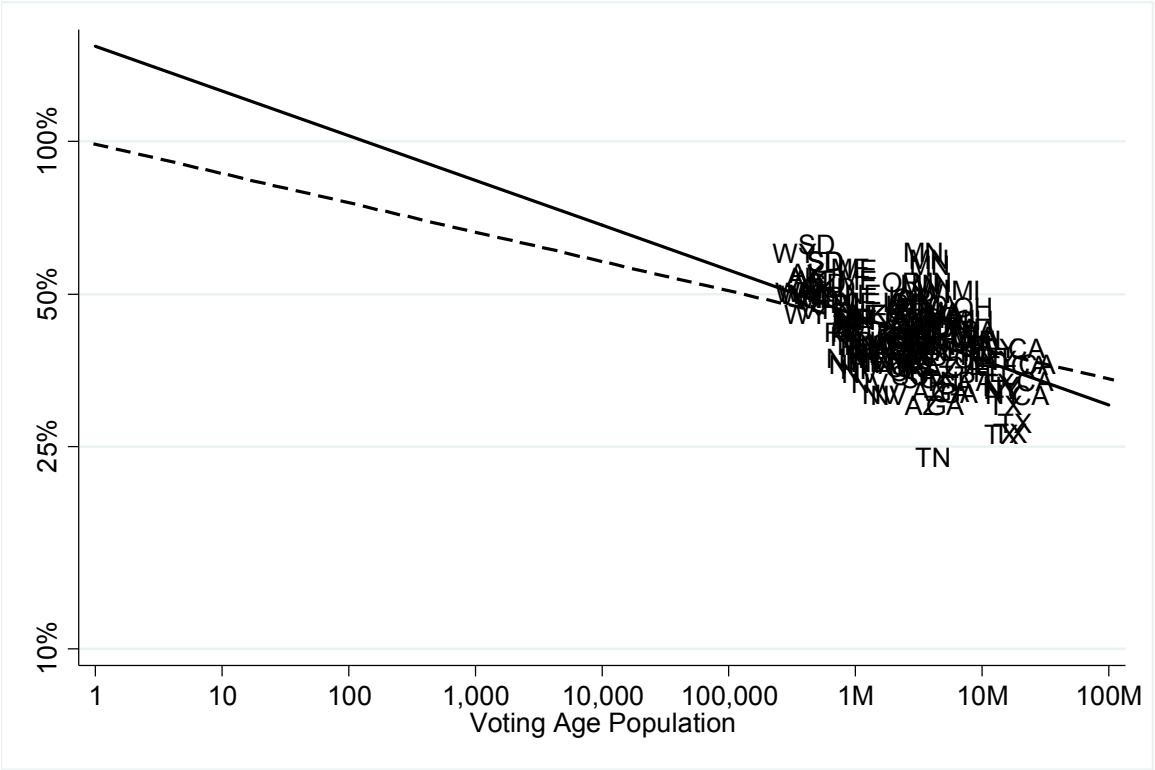


Figure 2.3 graphs the relationship between constituency size and voter turnout (number of votes cast by Voting Age Population) in U.S. state governor elections held in midterm and presidential election years. The solid line reflects the "best fit" line based on the observed values ($T=e^{0.431}P^{-0.088}$) while the dashed line reflects the logical "best fit" line ($T=P^{-0.059}$), which includes the theoretical anchor point of (1, 1.0). The difference between the fitness of the empirical line ($R^2=0.297$), and the fitness of the theoretical line ($R^2=0.265$) is negligible.

Figure 2.3 plots the voter turnout in the 230, even-year gubernatorial races that occurred between 1994 and 2010. The results of this analysis demonstrate that size is associated with a negative effect on turnout. As in previous analysis of U.S. Senate elections, the impact of size as a single parameter to explain variation in turnout is remarkably high. The empirically generated

"best fit" line accounts for about 30% of the variation in turnout (R^2=0.297). When the empirical values are anchored to the logical Y-intercept (1, 1.0), there is a negligible drop off in fitness (R^2=0.265), although the logical, predictive value of the model is enhanced. After all, the empirical line implies a turnout exceeding 100% in districts smaller than 100 individuals. In terms of the slope of the logical "best fit" line (approximately -0.059), the value is remarkably similar to the slope estimate from the previous analysis.

Table 2.2: Turnout in Governor Races

log Voting Age Population	-0.082*
	(0.01)
Closeness	0.400*
	(0.14)
Open Seat	0.032
	(0.02)
Presidential Year	0.287*
	(0.03)
Constant	0.459*
	(0.20)
R^2	0.588
Clusters	45
N	230

* p<0.05

Like the analysis of U.S. Senate elections, I ran an OLS regression model with standard errors clustered by state to account for the effects of competition and election timing. These results (reported on Table 2.2) do not provide evidence to refute the previous findings or cast doubt on the theoretical model. Including the control variables in the OLS model enhances the fitness model (R^2=0.59) to a degree that is comparable to the fitness of the U.S. Senate model. Although the magnitude of the effect of VAP (m = -0.08) is marginally larger in magnitude in the OLS model, the results are generally consistent with the logical "best fit" equation.

Turnout in State Legislative Elections

For the last analysis of this chapter, I test the effect of size on turnout in the context of lower house U.S. state legislative elections. This test represents a departure from the previous analysis, which analyzed top-of-the-ticket elections. Unlike U.S. Senate and gubernatorial elections, state legislative elections are relatively low both in salience and voter participation. In order to control for a number of effects that may conflate the results, such as election timing and district magnitude, I have included only state legislative elections held in even-numbered years in states with single member districts between 2002 and 2010. This amounts to approximately 18,000 separate, district-level elections held in 35 states.

Figure 2.4 illustrates the correlation between district VAP and turnout in U.S. state legislative elections included in this sample. These results provide further evidence in support of my theoretical model that predicts a negative relationship between size and turnout. Although there is a large difference between the empirical and logical "best fit" equations in the magnitude of the effect of size, the goodness of fit associated with the models are roughly identical. Like the previous analyses, I ran an OLS regression analysis with standard errors clustered by state

provides to control for the effects of a number of other variables that may affect turnout. These results (reported on Table 2.3) are largely consistent with my theoretical expectations. While controlling for competitiveness and election timing enhances the fitness of the model substantially ($R^2 = 0.44$), the magnitude of the effect associated with size is roughly unchanged.

Figure 2.4: Turnout in U.S. State Legislative Elections (2002-2010)

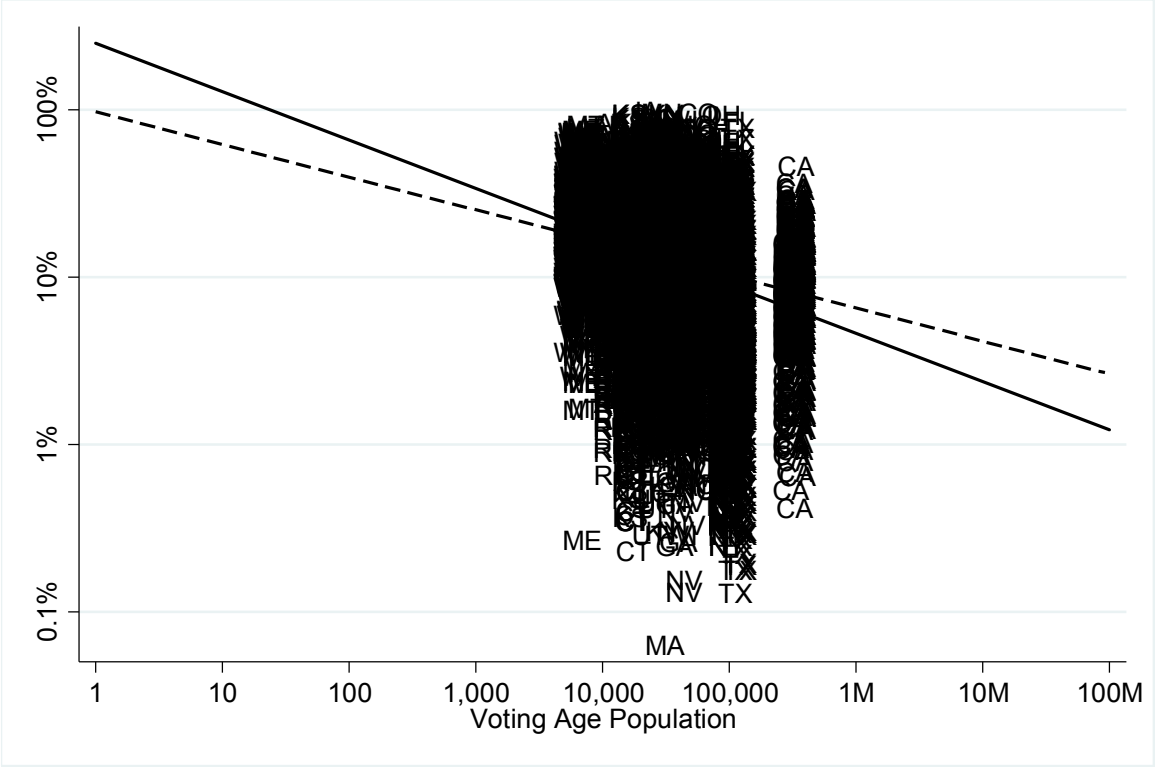


Figure 2.4 graphs the relationship between district VAP (log) and voter turnout (log) in lower house U.S. state legislative elections in states with single member legislative districts held in even-numbered years. The solid line reflects the "best fit" line based on the observed values ($T=e^{0.395}P^{-0.125}$) while the dashed line reflects the logical "best fit" line ($T=P^{-0.088}$), which includes the theoretical anchor point of (1, 1.0). The difference between the fitness of the empirical line ($R^2=0.069$) and the fitness of the theoretical line ($R^2=0.063$) is negligible.

Table 2.3: Turnout in State legislative Elections

log Voting Age Population	-0.115*
	(0.02)
Closeness	0.909*
	(0.08)
Presidential Year	0.370*
	(0.01)
Constant	0.296
	(0.24)
R^2	0.439
Clusters	35
N	18,153

* $p<0.05$

Conclusion

In this chapter, I have tested the implications of size theory of electoral engagement. One of the logical implications of this theoretical framework is that, because district population size reduces the value of participating in electoral politics for citizens, fewer citizens will vote in large districts than in small districts. I tested this claim by analyzing voter turnout in American elections in a number of institutions ranging in size and scale. My analysis included hundreds of recent election results from U.S. Senate elections and state governorships, along with results

from thousands of state legislative elections. Despite testing for the effects of size in a range of institutional contexts and controlling a number of alternative hypotheses, the evidence presented in this chapter does not invalidate the basic expectations of my theoretical model. Indeed, each of the above analyses reveals that size is associated with a statistically significant effect on voter turnout. In small districts containing fewer citizens, voter turnout is substantially higher than in large districts with large populations. This is not simply an artifact of salience or prestige of office. Indeed, the same general effect is present in top-of-the-ballot office and lower order elections. Nor is it a spurious relationship between collinear variables of size and competitiveness. Although many U.S. Senate elections in large states feature popular incumbents whose electoral security is virtually assured, this is not the case in gubernatorial elections. Yet for both offices, the magnitude of the size effect is remarkably similar.

My findings go beyond the conventional approach to predictive model-building in which a mathematical equation is generated in reverse based on empirically observed data. Although the empirical "best fit" equations estimated in the above analyses produce results that are consistent with my theoretical expectations, my analysis shows that the predictive value of these models can be enhanced by including the logically-predicted Y intercept value (1, 1.0). For each analysis, I show that anchoring the model with the logically-predicted Y intercept enhances the logical, predictive value of the model without impacting the "fitness" of the model relative to the empirical "best fit" model. Moreover, the logical models are remarkably similar in each analysis in terms of the magnitude of the size effect (m = -0.06). Both the U.S. Senate and state gubernatorial models produce the equation: $T = P^{-0.06}$.

These findings have implications beyond the immediate context voter turnout—they suggest that the size of the voter population and the district population diverge with growth. In

other words, the rate of growth of the voting population, V, is slower than the rate of growth of the total population, P, such that $V \propto P^{0.94}$. This challenges of the implicit assumptions of median voter model and its implications for legislative behavior—that the voter population and the total population are identical. In the context of campaign strategy, this means that candidates must contend with low mobilization problem in large districts. Getting voters to the polls is a much bigger problem than in small districts. As I show in Chapter 5, the effects of size on electoral engagement have implications for understanding voting behavior in the Senate and for the value of the median voter model in predicting the spatial positioning of U.S. senators. In the next chapter, however, I subject my theory of size and electoral engagement to further scrutiny by investigating the relationship between size and another form of engagement, campaign gifts to U.S. Senate candidates by political donors.

CHAPTER 3 – Political Giving in US Senate Elections

In the previous chapter, I studied one specific form of electoral engagement, voting. I analyzed thousands of returns from national, state and local elections in America to understand the relationship between district population size and voter turnout. The results of this study are consistent with the expectations of my theoretical model. They show that district population size, as a single variable, provides remarkable power in explaining political behavior, even after controlling for a number of alternative hypotheses. Indeed, the magnitude of the effect of size on turnout is consistent across institutions and suggests that the growth of the voter population, V, does not keep pace with the growth of the total district population, P, such that: $V \propto P^{0.94}$.

Despite the weight of this evidence, however, voter turnout is only one form of electoral engagement, which conceivably may encompass many different observable practices. From the perspective of political behavior research, from an individual level of analysis, voting is one of the least costly and most accessible forms of participation. This means that the "payoff" of casting a vote need not be high to persuade an individual voter to turnout on Election Day. Thus, voter turnout represents a rather liberal test of the "size hypothesis". If the size theory is valid, the effects on engagement should be observable on other, more costly forms of electoral engagement.

In this chapter, I conduct an analysis of an alternative form of electoral engagement—donating money to a campaign. It may seem counterintuitive to devote an entire chapter to studying a form of political behavior that is inherently restrictive and unrepresentative of the public (donors account for less than 1% of the entire population). Indeed, there is a popular sentiment that campaign financing threatens democracy and imposes unfair entry costs to

political representation that exclude all but the very rich from accessing politicians. Nevertheless, a gift to a political campaign is an indicator of electoral engagement, and one that entails considerable costs. Like voters, campaign donors may be motivated "to give" by the promise of future access, or perhaps in order to directly influence the outcome of an election. In these cases, a donation has value as an "investment". Like voting, a campaign donation may also have intrinsic value as a form of political expression or social ritual. Donors may contribute money to a campaign because they feel connected to a candidate or want to express their support of a candidate, in which case a donation has value as a "consumption good" (Ansolabehere, de Figueiredo and Snyder 2003).

In sum, money donated to a candidate, like a vote cast in support of a candidate, may hold investment value, consumptive value, or both. Unlike voting, the costs of donating to a candidate are high, and the pool of participants is very small relative to the total population. Yet, like voting, size presents a problem in terms of value: the larger the pool of donors, the less value a single donation has as an investment good. Thus, the basic implications of the size theory of electoral engagement should also apply to the specific context of political gift-giving. When the population grows larger, the value of supporting a candidate through a donation should gradually decrease for the average donor. This means that the number of citizens making donations in a district should decrease as the district size increases.

Campaign Donations to U.S. Senate Candidates

In this study, I investigate campaign contributions made by individuals to candidates running for the U.S. Senate. For the purposes of this study, focusing on the U.S. Senate has a few important advantages. In addition to "natural" variation in constituency size among states, which

allows me to limit my analysis to a single legislative institution, Senate races are among the most salient and expensive elections, and the public tends to be more engaged in these elections than in lower-order races. And because Senate elections are regulated under federal campaign finance law, there is a reliable and publicly available source of data on the political behavior of the public in funding Senate campaigns. For the range of my analysis, I study the most recent mid-term elections that occurred in 2006, 2010 and 2014. Limiting the analysis to mid-term elections serves as a control for the potential "coattail effects" of a concurrent U.S. presidential election, and thus provides a more direct test of determinants of campaign giving in U.S. Senate elections.[4]

To compare political donations across state electorates, I employ data published by the Federal Election Commission (FEC) on the itemized campaign contributions by private individuals. During the course of an election cycle, individuals may choose to write checks to political candidates, to non-candidate political action committees (PACs), or both. As mandated by federal law, campaigns and PACs must disclose the personal information of individual donors who give cumulatively more than $200 over the course of an election cycle. The FEC keeps a master record of all "Contributions by Individuals" for each two-year national election cycle. During the 2013-2014 election cycle there were approximately 2 million of these donations.

[4] A concurrent presidential election may affect campaign financing in lower-order races in two ways. First, in certain instances, a salient presidential race may suppress political giving by citizens who feel that their donations are better served in the presidential race. On the other hand, a concurrent presidential race may artificially boost campaign donations to political allies of the winning presidential candidate. In short, the model becomes increasingly complex when accounting for the effects of a concurrent president race.

Combined, the three mid-term election cycles between 2006 and 2014 contain roughly 6 million individual itemized donations.

Measuring Political Giving

As a measurement of how states differ in their donations to Senate candidates, I took frequency counts of all itemized donations to Senate candidates and coded them by state using the state listed in the donor's mailing address. Using these observations, I created a normalized variable for the number of checks written by state, per capita, during a given Senate election. The variable, *Number of Donations* is simply:

$$\text{Number of Donations} = \frac{\#\ of\ Reported\ Contributions\ to\ US\ Senate\ candidates}{State\ Voting\ Age\ Population\ (in\ hundreds)}$$

In estimating state population size, I used data from the U.S. Census Bureau's Current Population Survey on the voting age population (VAP) for the years 2006, 2010 and 2014. Unlike voter turnout, where there is a legitimate argument against using the VAP measure because it includes non-eligible citizens, federal law does not prohibit disenfranchised felons or non-citizen permanent residents of the U.S. from contributing money to a federal candidate. As such, I chose to measure state population by using Voting Age Population because it most closely reflects the legal threshold for eligibility. Any citizen or legal U.S. resident is permitted to give to a political campaign provided they are not a government contractor and (in most cases)

they are over 18 years of age. The total sample includes 104 Senate races in all 50 states, although I have omitted three races in which incumbent senators ran unopposed on the ballot.[5]

A Logical Model of Size and Political Giving

My next task is to outline the implications of the size theory of electoral engagement in the specific context of political giving to Senate campaigns. Given the basic premise of the size theory—that district population size reduces the instrumental value of participating in elections—what effect should size have on the financing of political campaigns by citizens? Answering this question through the Taageperan approach to predictive modeling requires that I simply the problem by considering the extreme cases. As a first step, I must specify the boundary conditions that limit the logical possibilities (Taagepera 1999, 2007, 2008). At the minimum and maximum extremes of size, what values of political giving might we expect? In the previous analysis, which focused on turnout, this answer was simple: turnout has a clear maximum possible value (100%) and minimum limit (0%). This revealed the logical anchor point of (1, 1.0) and a limit approaching zero engagement as size trends larger.

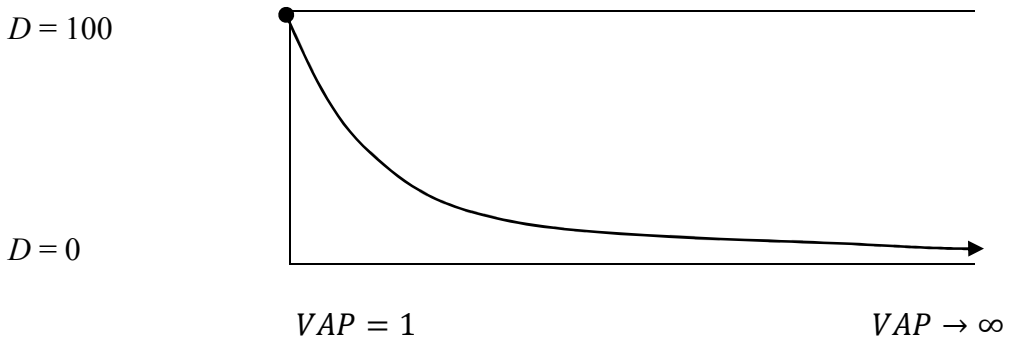
In the context of political giving, the answer is more complex because there are no clear logical limits on the number of donations an individual can make. The only limit is imposed by federal law, which restricts the amount an individual can donate to a single campaign during an election to $2700 (for 2015-2016). Thus it is possible, though unlikely, for a donor to write 2700 separate $1 checks to a candidate, in which case the true logical maximum for giving is 270,000

[5] These races were Indiana in 2006, North Dakota 2010, and Alabama in 2014. In the case of Indiana, Dick Lugar was challenged by Libertarian candidate Steve Osborn; however, Lugar took over 87% of the vote.

donations per 100 citizens. The size theory of engagement expects this logical maximum point to occur when size is at its smallest value of one individual, but this poses an additional problem. Campaign financing is only necessary when running for office is expensive. In very small districts of, say, less than 100 individuals, running for office may not be expensive. If a candidate is campaigning in a densely populated urban neighborhood, then the only resources necessary for running for office may be the filing fees required for ballot access, along with some hard work and a bit of enthusiasm. This dilemma suggests that there is no "true" logical anchor point that occurs when district size is a single individual. Instead, I assume that there is a "virtual" anchor point of 100 per capita donations (one donation by each individual) when district population size reaches is minimum value of one individual. In practice, this means that in a district with a population size of one, the costs of financing a campaign is funded entirely by a single citizen through a single donation. In the context of U.S. Senate races, in which the smallest state has an approximate VAP of 10^5, the model's uncertainty about what happens in very small districts will not undermine the expected, logical relationship between size and giving.

Figure 3.1 graphs the predicted relationship between size, *VAP,* and the per capita number of donations, *D*. At the smallest value of size, 1 individual, donations reach a "virtual" maximum value of 100 per capita donations, *D*, which represents one citizen writing one check to a candidate. When size trends larger, the number of donations drops off and gradually approaches zero. Under an "ignorance based" model, absent other information, the best guess for what happens to campaign engagement in between the boundary conditions is that there is a smooth and gradual decline (as opposed to peaks and valleys) between 100 checks per capita and zero checks per capita. Under log-log scale, the equation becomes linear with a slope, *m*, of $m<0$.

Figure 3.1: District Population Size and Political Giving



Number of Donations to U.S. Senate Campaigns

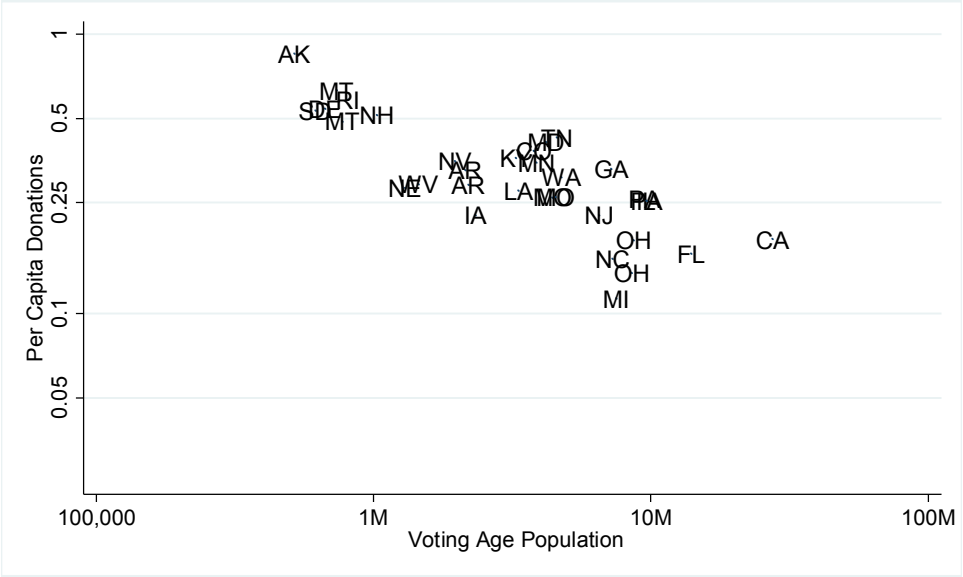
For my first analysis, I examine the relationship between state VAP and the gifts to Senate candidates within a state, which is simply the per capita number of donations made. My theoretical model holds that more citizens will write checks in small states than in large states, all else equal. Figure 3.2 shows the correlation between the *Number of Donations* made to Senate candidates and state VAP in log-log scale for each election cycle. In each of the election cycles studied there is a negative, linear relationship between state size and the number of donations.

Nevertheless, many of the races included in Figure 3.2 featured popular incumbents who won landslide victories in the general election. For instance, in the 2006 North Dakota race Kent Conrad won with nearly 70% of the vote, and this clearly suppressed the campaign financing by the public. The per capita donations in North Dakota in 2006 falls below the levels for other states with small populations and well below the level of North Dakota in 2010 when no incumbent candidate ran. Thus, it is clear that the effect of constituency size on the number of donations is weakened when an election is non-competitive; political giving should be most sensitive to the effects of size when the outcome of an election is relatively open-ended.

Figure 3.2: Number of Donations to U.S. Senate Candidates

In order to control for the effects of competitiveness on the number of donations made, I created a subsample of states that had competitive Senate races. Figure 3.3 plots the per capita donations to Senate candidates in states with Senate races that were forecasted by analysts to be competitive.[6] Note that there is much less variation and the slope of the line is steeper than in Figure 4.2. A simple OLS regression model calculates that constituency size alone explains about 64% of the total variation in this sample of race, and estimates the effect of size on the number of donations as: $D = e^{-.040} P^{-0.36}$.

Figure 3.3: Number of Donations to U.S. Senate Candidates in Close Races



These initial results suggest that constituency size influences the rate of campaign giving by the public. Although only a relatively small portion of the public writes checks to political candidates, there appears to be substantial differences in terms of state size. In small states, such

[6] Based on predictions made in January of the election year by Larry Sabato's *Crystal Ball*, Center for Politics, University of Virginia (see http://www.centerforpolitics.org/crystalball)

as Alaska in both 2010 and 2014, a larger portion of the electorate is actively supporting a Senate candidate by donating money. Conversely, in large states, such as California and Texas, a much smaller share of the electorate donates to Senate candidates.

In order to provide a more systematic estimate of the effect of state size on political giving, I ran a multiple regression analysis and included a number of control variables. The dependent variable, *Number of Donations*, and the main explanatory variable, *State Voting Age Population*, are both calculated using log scale. I also included other variables that potentially affect the number of donations, such as the median income of the state (log scale); the Sullivan index of diversity to account for demographic heterogeneity within a state (Sullivan 1973)[7]; a dummy variable indicating whether the Senate election was filling an open seat; and dummy variables for the 2006 and 2010 electoral cycles to control for historical idiosyncrasies.[8] To

[7] Based on replication data provided by Levendusky and Pope (2010); observed values range from 0.48 (least heterogeneity) to 0.67 (most heterogeneity).

[8] I also tested a number of other variables to control for the potential effects of geography, self-funded candidates, and local media market prices on campaign financing. To control for the possibility that geography constrains fund-raising and political giving, I created variables for both state population density and total land area. I used a dichotomous variable to account for the seven Senate races that included candidates who made large contributions or loans to their campaigns. To account for the possibility that local media market prices affect campaign financing, I employed a dummy variable coded 1 for states that host the top 10 most expensive television markets, based on Neilson's Local Television Market Universe Estimates for 2009-2010. Including these variables did not improve the fitness of the model, and in each case, the variable was associated with a small effect that fell outside the range of statistical significance.

control for the competitiveness of the Senate election in the donor's home state, I used the continuous variable, *Closeness*, which is simply one minus the largest vote share in the general election. I also ran an identical version of the model that employs a measure of election competitiveness based on analysts' forecasted predictions about Senate race competitiveness, which is reported in the appendix of this chapter. Although both models report the similar results, the model with the *Closeness* variable performs slightly better. As a validity test for my dependent variable, I ran two identical models with donations to U.S. House candidates and donations to ideological interest groups (termed "non-connected PACs" by the FEC) as the dependent variables.

The results of these analyses, reported on Table 3.1, show that state VAP is associated with a negative effect on the number of donations per capita to Senate candidates within a state. As the size of a state increases, its residents on average write fewer checks to Senate candidates: a 172% increase in voting age population (a natural log increase) is associated with a 27% reduction in donations to Senate candidates, all else equal. While the magnitude of this reduction may appear modest when comparing population differences of 100% or 200%, this effect becomes substantial when population increases by several orders of magnitude, such as the difference between the largest and smallest states, which is roughly 10,000%. Another way to understand the effect of size on the number of donations is to consider the size of the donor population relative to the total population. Assuming that the number of donations made by the average donor does not vary widely from state to state, this analysis suggests that the size of the donor pool, D, is proportional to the size of the citizen population, such that: $D \propto P^{0.68}$. This means that, as the total population trends larger, the population of the "donor pool" also increases, but at a slower rate.

Table 3.1: Number of Donations (log) to Political Campaigns

	US Senate	*US House*	*PACs*
log Voting Age Population	-.320*	.0079	0.011
	(.055)	(.040)	(0.06)
log State Median Income	.628*	.693*	2.014*
	(.292)	(.213)	(0.33)
Closeness	4.136*		
	(.637)		
Open Seat	.309*		
	(.102)		
Diversity Index	2.69*	1.137	0.466
	(1.34)	(1.27)	(1.50)
2006 election cycle	.082	-.096	-0.558*
	(.107)	(.010)	(0.12)
2010 election cycle	.003	.122	-0.541*
	(.103)	(.010)	(0.12)
Constant	-11.52*	-8.477*	-22.113*
	(3.114)	(2.99)	(3.54)
N	101	101	101
R^2	.486	.173	0.443

* p<.05

As for the U.S. House and non-connected PAC models, in each case state VAP is associated with an insignificant and negligible effect on per capita donations. It is not simply that people in larger states are less generous to political candidates or less inclined to give to interest groups; people in large states are less generous only to Senate candidates, who represent statewide constituencies. In both models, the control variable for state median income is positive and significant, which suggests that states with wealthier citizens tend to have slightly higher rates of campaign contributions.

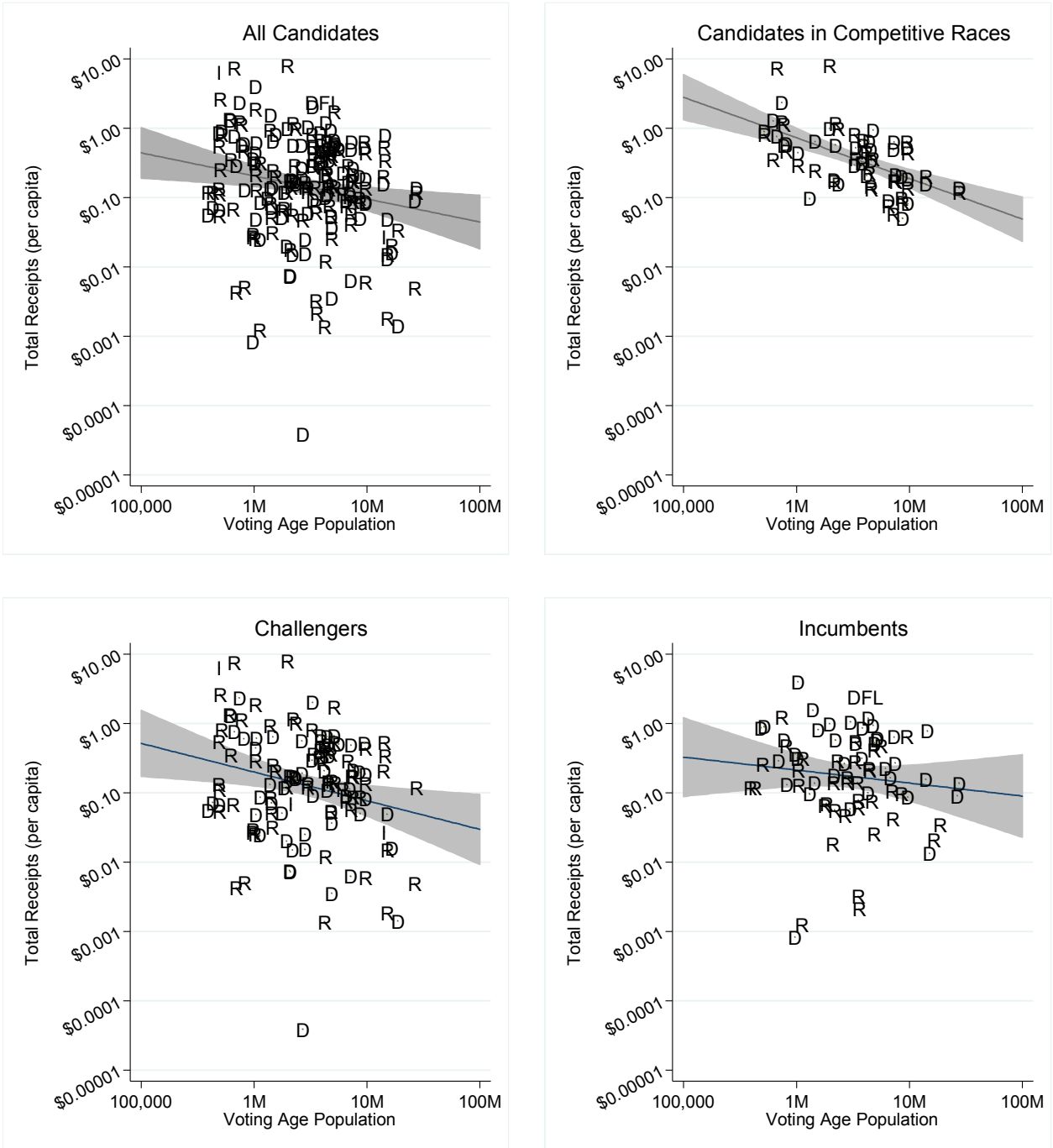
Receipts from Small Donors

Another source of data on campaign donations by a state electorate is candidates' receipts from unitemized, "small" donors. These are donors who have given less than $200 cumulatively during an electoral cycle. Campaigns are legally required to report the total amount received from this source in dollars, but not the total number of donors or their identities. Although this data has a few shortcomings—namely, it does not specify where the donors live or how many donors are included in this pool—it nevertheless provides an additional window into the public's role in donating money to campaigns. In general, the amount of money received from small donors indicates the level of grassroots giving and the extent to which a candidate has mobilized the mass public to support his or her campaign.

Figure 3.4 shows the per capita money received by candidates from small donors by state VAP in log-log scale. While state size appears to have a negative effect on the money received from small donors in all groups, this effect is most pronounced among challengers and candidates in competitive races. These findings are largely consistent with the conventional

wisdom about the "incumbent advantage" in congressional elections and the importance of grassroots support for non-incumbents building new electoral coalitions.

Figure 3.4: Senate Candidate Receipts from Small Donors (2006, 2010, 2014)



It is also clear that the effect of constituency size on small donations is conflated by other variables, and more complex modeling is necessary. To control for the effects of incumbency and electoral competitiveness, I analyzed candidates' per capita receipts from small donors using OLS regression analysis. For the dependent variable, per capita *Receipts from Small Donors*, I use the per capita unitemized receipts from small donors (in log dollars) reported by candidates, and I have included the top-two voting receiving candidates in each election.

The results of this model (reported on Table 3.2) provide a more precise estimate of the unique effect of size on small donor receipts. For each 2.72 fold increase (a natural log increase) in a state's adult population, there is a corresponding 28% decrease in per capita dollars received from small donors. The magnitude of this effect is comparable to the effect estimated in the previous analysis on itemized donations. In other words, constituency size has roughly the same effect on campaign giving across multiple measures. Senate candidates in larger states receive less per capita funding in small donations than Senate candidates from smaller states. These results provide an addition window into the role of state population size in shaping campaign giving and suggest that candidates from large states are less successful in mobilizing support from the public than candidates from small states.

Table 3.2: Senate Candidate Receipts from Small Donors, log dollars per capita

log Voting Age Population	-.323*	(.136)
log State Median Income	1.527*	(.742)
Closeness of General Election	8.957*	(1.277)
Incumbent	.859*	(.247)
Open Senate Seat	.738*	(.298)
State Diversity Index	-.099*	(.034)
2006 election cycle	.291	(.271)
2010 election cycle	-.358	(.266)
Constant	-12.23	(7.931)
N	197	
R^2	.317	

* significant at the .05 level

Conclusion

In this chapter, I provided additional empirical analyses of the size theory of electoral engagement by investigating the role of state size in structuring political giving by citizens to U.S. Senate candidates. I analyzed two different measures of campaign giving: the per capita number of checks written to U.S. Senate candidates, and the receipts from "small donors" (measured in U.S. dollars), as reported by campaigns. The results of these analyses provide additional support for the size theory of electoral engagement: in small states, a larger portion of the total population writes checks to candidates than in large states. In the study of per capita donations, the observed, empirical "best fit" equation conforms to the basic predictions of the theoretical model, that size should approach the maximum value of political giving (100 donations per capita) when VAP is at its minimum value of one individual (the Y-intercept) and decrease toward zero as VAP trends larger. In my study of small donor receipts, I found similar results. Candidates from large states received less money per capita from small donors than candidates from small states.

These results also provide a window into how the population of the donor pool is related to the total district population. Like the previous analysis of turnout in Chapter 2, the rate of growth of the citizen population, P, outpaces the growth in the donor population, D. The approximate relationship between the donor pool and the population is: $D \propto P^{0.68}$. This analysis also supports the basic contention that, as the population size of a district increases, it becomes less profitable to donate to a candidate as a form of "investment" for future access or influence. In other words, the donor pool becomes less inclusive as the district size trends larger.

In the context of campaign strategy, this suggests that, although candidates from large districts must mobilize larger voter populations, they must rely on proportionally fewer donations than candidates with small voter populations. This implies that campaigns must change *who* they are engaging with. In the next chapter, I investigate how candidates alter their fundraising strategies based on the electoral challenges posted by population size.

CHAPTER 4 – Who Donates? The Role of Affluent Donors

Thus far, my empirical analyses have focused primarily on the logical implications of the size theory of engagement on political participation in elections. In Chapter 2, I analyzed voter turnout in thousands of American elections and found that larger districts are associated with systematically depressed levels of voter participation. In Chapter 3, I analyzed a different form of electoral participation, campaign financing, and found similar results. My study of campaign donations to U.S. Senate candidates revealed that, in larger states, citizens tend to write fewer checks to candidates and candidates receive less money from "small donors" than in small states. These findings are consistent with the expectations of the size theory of engagement and lend weight to the basic premise of theory, that size erodes the value of engaging in democratic elections.

In this chapter, I pivot to the other side of the "representational relationship" in order to test the effects of size from the viewpoint of candidates and their campaign strategies. Once we accept that citizens behave differently in districts with large populations, we can begin to understand how elected officials will respond to the constraints posed by size. In this analysis, I extend my study of campaign financing in the Senate to understand how the effects of population size on electoral engagement influence candidates' strategic appeals to supporters. I posit that state size presents a conflicting set of challenges for Senate candidates in their campaigning. First, because large state Senate candidates must contend with the structural problem of low electoral engagement by the public, they must devote their resources to mobilization of the public and get-out-the-vote efforts directed toward their base. One such tactic, developed by Karl Rove, is the "micro-targeting" of voters, which involves reaching out to party loyalists who have voted reliably in the past and who are easier to mobilize. Another tactic is using mass-media to

communicate with a large number of voters, either to spread positive information about the campaign or to spread negative information about the opposition.

Yet these tactics are inherently costly and require extensive fundraising by candidates to maintain. Lee and Oppenheimer's investigation into the effects of state size and campaign financing show that senators from large states spend more of their time asking for money than senators from small states (1999). This problem is compounded by the fact that, because large state candidates face considerable time restrictions and must be less accessible on average to constituents than small state candidates, citizens from large state are *less likely* to donate to campaigns (see Chapter 3). Thus, although large state candidates are *more* dependent upon campaign money, the donor pool is inherently restricted. The practical solution, as I argue here, is for candidates to appeal for the support of affluent donors who can afford to write very large checks to their campaigns. This means that candidates from large states must devote more of their time to hosting fundraising events where wealthy supporters receive special access to candidates and the opportunity to speak with them in private.

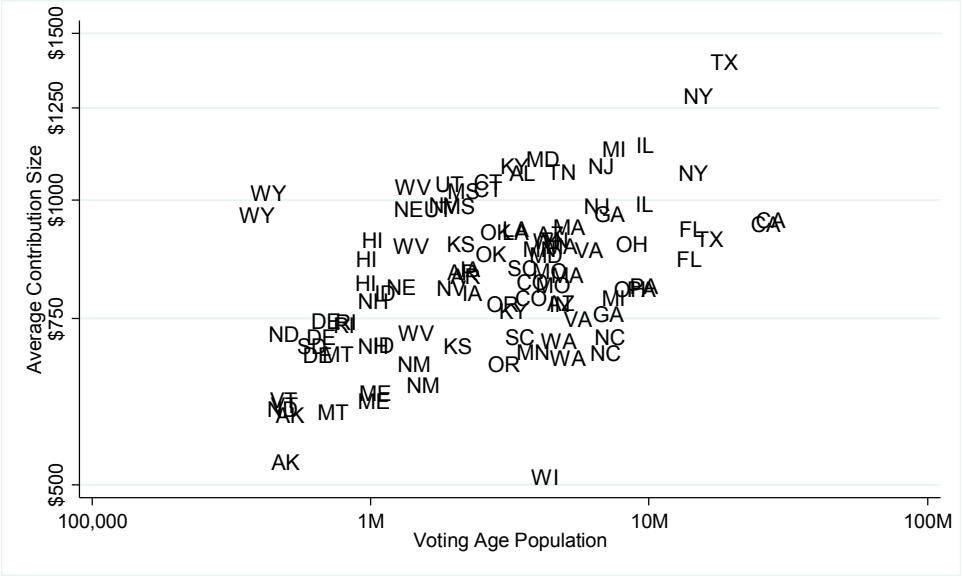
In this chapter, I test this claim by analyzing the donations given to Senate candidates in terms of the dollar amount. If state size determines the strategic necessity of appealing to the wealthy, as I have suggested, then donors from larger states should give larger sums of money in their contributions, on average, than donors from small states.

Who is Donating to Senate Campaigns?

To test my claim that size determines the necessity of support from wealthy donors, I analyzed the contribution amount (in U.S. dollars) for each donation to a Senate candidate listed on the "Contributions by Individuals" master list published by the Federal Election Commission

for each of the three midterm elections held in 2006, 2010, 2014 (see Chapter 3 for an explanation of this data). If large state senators are indeed more reliant upon affluent donors to fund their campaigns, this will result in donors from large states writing larger checks, on average, than donors from small states. Figure 4.1 plots the dollar amount of the average contribution to Senate candidates by state size.[9] Although the increase is gradual, there is a strong, positive correlation between state VAP and average contribution amount (R=0.48), which suggests that donors write larger checks to Senate candidates as the size of their state increases. In the smallest states, the predicted average donation size is roughly half of the predicted average donation in the largest states.

Figure 4.1: Average Dollar Amount Donated to U.S. Senate Candidates



[9] The figure excludes large donations from candidates to their own campaigns in seven races: Greg Orman in Kansas (2014); John Raese in West Virginia (2010); Linda McMahon in Connecticut (2006 and 2010); Jeff Greene in Florida (2010); Jim Pederson in Arizona (2006); and Richard Tarrant in Vermont (2006).

As an additional test, I ran a multilinear regression model with *Average Donation Size* (log scale) as the dependent variable with a variety of control variables included. The results, which are reported on Table 4.1, show that even in the presence of various control variables, state VAP is associated with a positive independent effect on contribution size.

Table 4.1: Average Amount Donated to Senate Candidates (log U.S. dollars)

log Voting Age Population	0.080*	(0.02)
log Median Income	-0.012	(0.11)
Closeness	-0.427	(0.24)
Open Seat	0.059	(0.04)
Diversity Index	1.015	(0.51)
2006 election cycle	-0.081	(0.04)
2010 election cycle	-0.075	(0.04)
Constant	5.288***	(1.19)
R^2	0.324	
N	101	

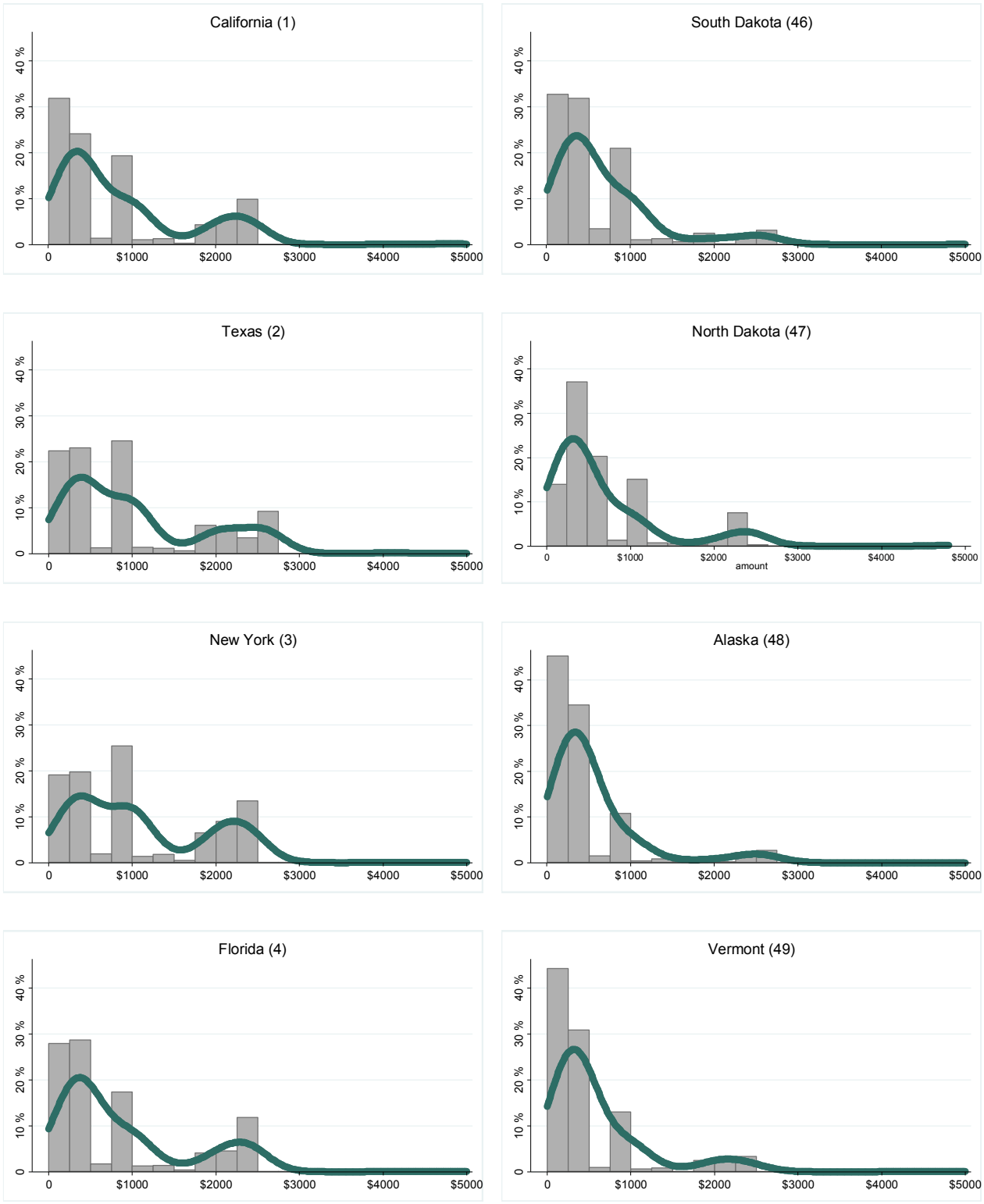
* p<0.05

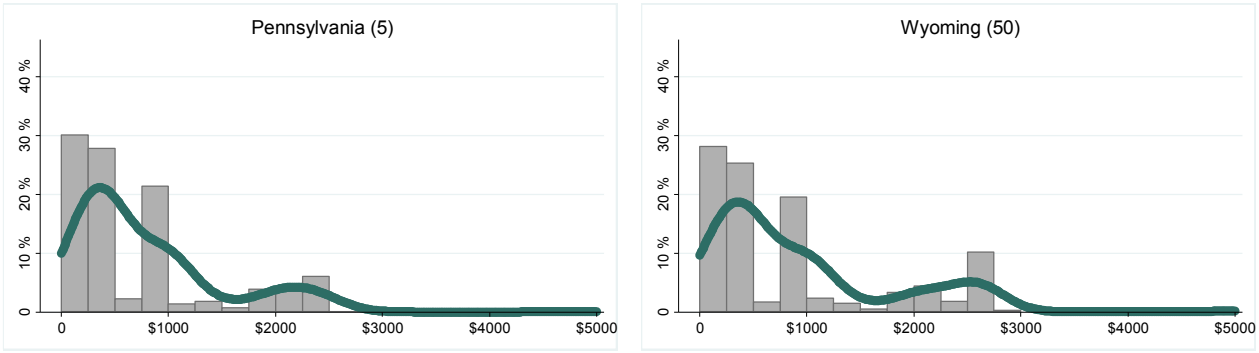
Distribution of Donations by State

The results of this analysis suggest that state size determines the affluence of a candidate's donor pool—as a state becomes more populous, its donors tend to give larger and larger gifts to Senate candidates. There are two possible explanations for these results. A first possibility is that this trend is driven by the portion of very large donors in a state, as I have argued. If large states have a higher proportion of affluent donors writing very large checks, this would account for why the average donation is higher in large states. If this is indeed the case, this should have observable implications for the distribution pattern of donations. As the number of very large donations increases, the distribution of donations by amount (in U.S. dollars) will become skewed towards the right, and the mean donation amount in a state will deviate from the median donation amount. But a second possibility is that the correlation between state size and average contribution amount has nothing to do with the number of very large donations. Rather, larger states have larger average donation amounts simply because all donors tend to write larger checks, perhaps because the residents of large states tend to be more economically advantaged. If this is the case, the distribution of donations will not be affected by state size; the same general distribution pattern will occur in states regardless of their size. Instead, the entire distribution curve will simply be shifted to the right, suggesting that all donors are writing larger checks.

In order to evaluate these alternatives, I compared the distribution patterns of donations to Senate candidates in the biggest states with distribution patterns of donations in the smallest states. Figure 4.2 provides histograms with kernel density estimations for each the top five largest states and smallest states, which illustrate the distribution curves and provide a visual basis for comparing differences in the size of donor pools.

Figure 4.2: Distribution of Gifts to Senate Candidates, Largest and Smallest States





In each of these states, the donation distribution pattern appears bimodal, or double-peaked. The larger peak includes donations between $200 and $1000, which indicates that the vast majority of donations fall into this range. A second, smaller peak occurs in very large donations in the range of $2000, which indicates the presence of affluent donors writing very large checks. One of the most striking differences between the big states and the small states is the height, or density, of this second peak. In the largest states, the second peak is more pronounced, as the portion of very large donors is noticeably higher. This indicates that donations clustering around $2000 account for a larger portion of all donations, while donations under $1000 account for a noticeably smaller portion of all donations when compared to the smallest states. One notable exception to these trends is Wyoming, which resembles the distribution pattern of a large state more so than a small state.

While this approach provides visual evidence of how the largest and smallest states differ in the distribution patterns of donations to Senate candidates, it offers only a limited view. In order to provide a more systematic analysis of the distribution patterns of all states, I analyzed the standard deviation of donations to Senate candidates for all states, which provides a measure for estimating the variation of donations made in a given state. In general, a very large standard deviation represents a large difference between the average donation amount and the median

donation amount, while a very small standard deviation would suggest only a small difference between the average and median donation. In the context of political donations to Senate candidates, a larger standard deviation suggests that a higher concentration of very large donations is skewing the average donation amount away from the median value.

Figure 4.3: Standard Distribution of Amount Donated to Senate Candidates

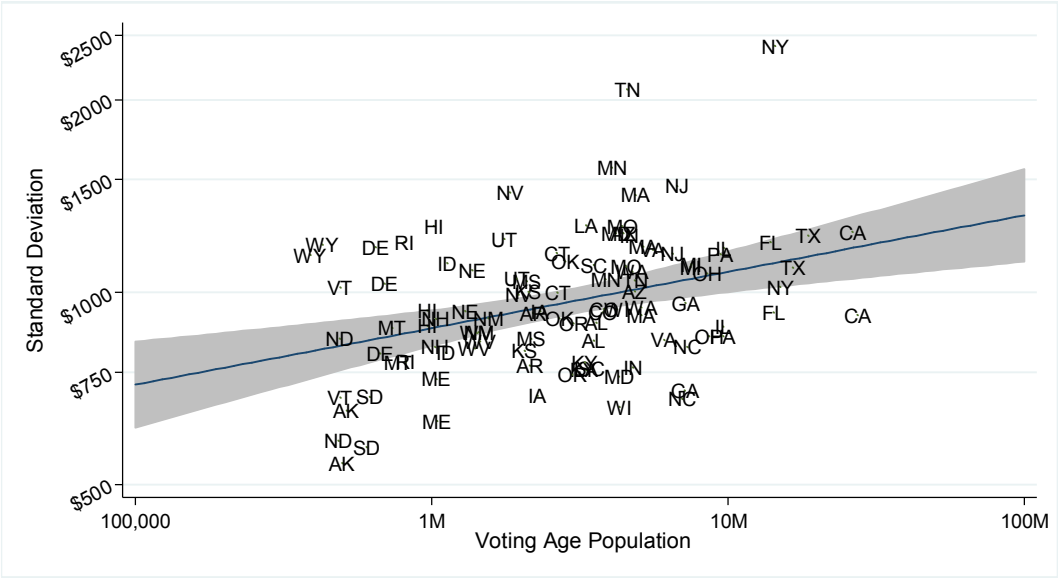


Figure 4.3 plots the correlation between state VAP and standard deviation of donation amount in log-log scale with a regression line and 95% confidence intervals. While there are a few notable outliers, such as Tennessee, which has a very large standard deviation compared to other states of similar size, in general there is a moderate-to-strong, positive correlation between a state's adult population and the standard deviation of the amount donated to Senate candidates (R=0.30). In large states the average donation size deviates from median donation size more so than in small states, which suggests that the distribution of donations is skewed by a high portion of very large donations. As additional test, I estimated the effect of state size on standard

deviation by using multilinear regression analysis and included a number of control variables. The results, which are reported on Table 4.2, yield similar results; state size is associated with a positive effect on standard deviation, although the effect falls just outside the range of statistical significance ($p = 0.08$).

Table 4.2: Standard Deviation of Amount Donated (log U.S. dollars)

Log Voting Age Population	0.057	(0.03)
Log Median Income	0.183	(0.13)
Closeness	-0.429	(0.34)
Open Seat	0.060	(0.04)
Diversity Index	1.351	(0.74)
2006 election cycle	-0.278*	(0.05)
2010 election cycle	-0.197*	(0.04)
Constant	3.464*	(1.41)
R^2	0.431	
N	101	

* p<0.05

Conclusion

In this chapter, I set out to investigate the effects of size on candidates' fundraising strategies. One of the central arguments of this dissertation is that the population size of an electoral district affects campaign strategy insofar as it determines the engagement of the electorate during campaign season. In small districts, where voter turnout tends to be high, candidates can position themselves to capture an existing median voter in order to win. In this context, candidates need only convince a majority of voters that they represent the best alternative in the race. They do not need to worry about investing in costly mobilization efforts in order to convince voters to turnout. Moreover, because the electoral is small, candidates do not need to invest the bulk of their resources in media outreach. Thus, there are many reasons to believe that running a campaign in a small electoral district requires a minimal amount of fundraising.

By contrast, in large districts, where voter turnout is systematically repressed, candidates must convince voters to come to the polls. This means that they must target their resources to mobilization efforts, and because they must appeal to a larger electorate, they must invest in mass-marketing and media campaigns. These types of campaign tactics are expensive to maintain and require substantial support from campaign donors. Yet, as we saw in Chapter 3, citizens from large states appear less inclined to give money to candidates. One possible solution to this problem, which I have proposed in this chapter, is for candidates from highly populous districts to spend their time courting affluent donors, who can afford to write larger checks.

These results of this chapter provide evidence in support of this claim. In small states, donors give on average smaller sums of money to candidates. This implies that the donor pool is

less affluent and more representative of the general public. But in large states, very large donations account for a much bigger share of all donations given to candidates, which suggests that the donor pool is disproportionately wealthy. These results shed light into how large state candidates resolve the problem of having to run a costly campaign amid an environment of low donor engagement. The evidence here suggests that candidates from large states turn to the wealthy to fill the fundraising gap. These results have obvious implications for representation and responsiveness. If only the wealthiest citizens can afford to access a candidate through a fundraising event, then it means that the rest of the public—those who cannot afford to make very large campaign donations—gets a diminished form of representation. In the next chapter, I investigate whether the effects of size extend to how elected officials behave in a legislator. If the population size of an electoral district determines the "price" of accessing a candidate through a fundraising event, then size likely has effects on representational responsiveness that extend to legislative politics.

CHAPTER 5 – Legislative Responsiveness in the U.S. Senate

In this dissertation, I have argued that size affects elections in fundamental ways. In Chapter 1, I presented a theory of size and electoral engagement, which holds that the number of citizens living within a legislative district determines citizens' access to political representation and shapes the value of participating in elections. This theoretical framework has implications for campaign strategy. As I argued in the introduction, when size is small, candidates can win by appealing to moderate voters. This is because in small districts, voter engagement is systematically high. The battle for candidates, then, is over the undecided voters. Candidates can amass a winning coalition by strategically positioning themselves toward the spatial median of the electorate to increase their proximity to the pivotal voter. However, this is not a feasible strategy for candidates in large districts, in which electoral engagement is systematically repressed. Chapters 2 and 3 show that, in large districts, fewer citizens turnout to vote and donate money to support political candidates. For candidates, this presents a problem that undermines feasibility of the median voter strategy. In large districts, because turnout is not a foregone conclusion, the spatial location of the pivotal voter is yet to be determined. The number of voters who turnout on Election Day is the direct outcome of the candidates' efforts to mobilize and coordinate their supporters. Thus, the median voter is a part of the game that the candidates (the "players") deliberately shape, rather than an immobile fixture of the field. Rather than battling over the undecided moderates, who may or may not turnout to vote on Election Day, it makes more sense for a candidate to generate enthusiasm among the partisan base by adopting extremist positions in order to bring many partisans and ideologues to the polls as possible.

In this chapter, I test the implications of this framework in the context of legislative behavior. If it is true that candidates from highly populous districts must adopt a partisan-

mobilization strategy in favor of a median voter strategy, there should be observable consequences for how election-minded legislators position themselves along a one dimensional voting space during floor votes. Legislators from large districts should take spatial positions that are closer in proximity to the ideal points of the partisans and ideologues in their districts than the median point of the district whole. In Fenno's (1978) terms, this means that legislators from large districts must be more responsive to the "reelection constituency", which includes all those who have voted for them in the past, than to the "geographic constituency", which includes everyone legally residing within the district. When the reelection constituency is a small subset of the geographic whole – as is the case with very large districts – then legislators may take positions that diverge considerably from popular opinion within their district in order to please their support base. The role of district population size, then, should dictate whether legislators take extreme positions (positions that diverge from their district median) or centrist positions (positions that overlap with their district median). In what follows, I test these hypotheses by analyzing how legislators in the U.S. Senate position themselves in roll call voting.

Vote Positioning and Responsiveness in the U.S. Senate

In order to test these claims, I analyze floor voting in the U.S. Senate. The advantage of studying the Senate, as noted in previous chapters, is that it is the most malapportioned legislative body in the world (Lee and Oppenheimer 1999) and thus provides a unique opportunity to study how variation in district size affects legislative behavior within a single institution. Second, because the previous analyses have focused predominantly on the U.S. Senate, it provides a direct test of the political implications of the size effect on electoral engagement. For the range of this analysis, I study Senate floor voting over a 30 year period,

between 1983 and 2012. This allows me to study the voting behavior of 275 senators from all 50 states, most of whom served in multiple, two-year legislative sessions.

In estimating the location of senators' ideal points, I use the standard measure developed by Poole and Rosenthal (1997), NOMINATE scores. The first dimension NOMINATE measure assigns a score to each legislator for each legislative session that reflects their estimated spatial position based on their floor voting record. Legislators who regularly oppose each other on votes are assumed to hold opposing ideological preferences, while legislators who frequently join each other in roll call votes are assumed to hold convergent preferences. Values of first dimension NOMINATE scores from -1 to 1, where a value of -1 signifies extreme liberalism and +1 represents extreme conservativism. Because the most ideologically extreme legislators should be the least likely to join opposing legislators on floor votes, the measure should assigned them a position toward the polls (either -1 or 1). Conversely, because ideological moderates are more likely to join with legislators with opposing views, they should be assigned a relatively centrist position. In this regard, the NOMINATE measure has obvious intuitive appeal for locating senators' positions along a one-dimensional special axis.

There are a number of drawbacks with the NOMINATE measure of legislative behavior. Firstly, it captures one specific activity that amounts to a relatively narrow part of the legislative process in the Senate. Roll call voting is important, but it does not embody the full spectrum of legislative behavior. Much of the bargaining and negotiation occurs behind the scenes, beyond the view of public. Thus, because roll call voting is public, it is likely that NOMINATE scores exaggerate the ideological differences between the parties. Francis Lee (2009) has found that ideological scores are high in the Senate because partisan legislators have an interest in appearing more principled in their behavior. Others have shown that, because voters punish

legislators for being too loyal to the party, parties in Congress use floor voting as a tool for forcing their opponents into embarrassing or electorally undesirable positions (Carson et al 2010). This literature suggests that NOMINATE may largely reflect the strategic posturing of legislators to voters. Yet this critique does not necessarily undermine the value of NOMINATE as a measure of how election-minded legislators position themselves strategically in order to appeal to their bases. That legislators use floor voting to strategically posture to voters is important because it reveals *who* legislators are posturing to. In this regard, NOMINATE is an ideal measure because it reflects legislators' strategic value judgments about their constituents. When legislators care about representing the views of the geographic constituency, they will respond by taking centrist positions on the floor. When legislators care more about pleasing their partisan supporters, their polarized positioning on the floor should reflect this judgment.

In measuring district ideology, I employ Berry et al.'s measure of citizen ideology (1998, 2010) for the U.S. states. The advantage of Berry et al.'s approach is that it combines data from congressional election returns and interest groups ratings of candidate ideology to create statewide estimates of citizen ideology. Candidate ideology is weighted by district according to the vote share to produce a statewide measure of citizen ideological preference. In this regard, it provides a proxy for identifying the spatial location of the median citizen within a state. Although it does not *directly* measure the location of the median citizen, this method provides a more reliable and more robust measure of state median ideology than the common alternative measures that use public opinion polling data, which are often historically incomplete and may rely problematically on very small sample sizes in estimating statewide ideology.

In order to normalize both the legislative and citizen measures so that they can be directly compared, I modified the first dimension NOMINATE scores to conform to the Berry et al.

scale, which measures citizen liberalism on a scale of 0 to 100, with 100 being the most liberal. Thus, for each senator for each session, the NOMINATE score was scaled using the following equation:

$$Senator\ Liberalism = (-50 * NOMINATE\ score) + 50$$

My next task to create a variable to measure the distance between a senator's spatial position and the location of median citizen of a state. My theoretical framework holds that, as size increases, legislators will discount the preference of the district median and position themselves toward their support base. Unfortunately, there is no simple method of measuring the views of a legislator's supporters. Here, I simply make the assumption that the position of the median supporter is more polarized than the position of the median citizen, such that a drift away from the spatial center of the district represents a movement towards the median point of the support base.

In order to measure the distance between a senator's voting position and the location of the state median, I consider three different approaches. For the first variable, *Ideological Slack*, I simply take the absolute value of the difference between both measures, so that a senator with a liberalism score of 33 who represents a state with a citizen liberalism score of 57 would be assigned a value of 24. An alternative approach involves using the Percent Difference or Percent Error formulas commonly used in the natural sciences, which are calculated as such:

1. $$Percent\ Difference = \frac{|\ Citizen\ Liberalism - Senator\ Liberalism\ |}{(\frac{Citizen\ Liberalism + Senator\ Liberalism}{2})} * 100$$

2. $$Percent\ Error = |\frac{Senator\ Liberalism - Citizen\ Liberalism}{Citizen\ Liberalism}| * 100$$

However, both of these formulae are biased insofar as they tend to exaggerate the effects of differences for certain legislators. As Figure 5.1 shows, Percent Difference appears to over-estimate the divergence of some Republicans, while Percent Error is biased against Democrats. To avoid these problems, I employ the *Ideological Slack* measure throughout my analysis, although I report the results of all three measures in my tables.

Figure 5.1: Biases in Measures of Ideological Divergence

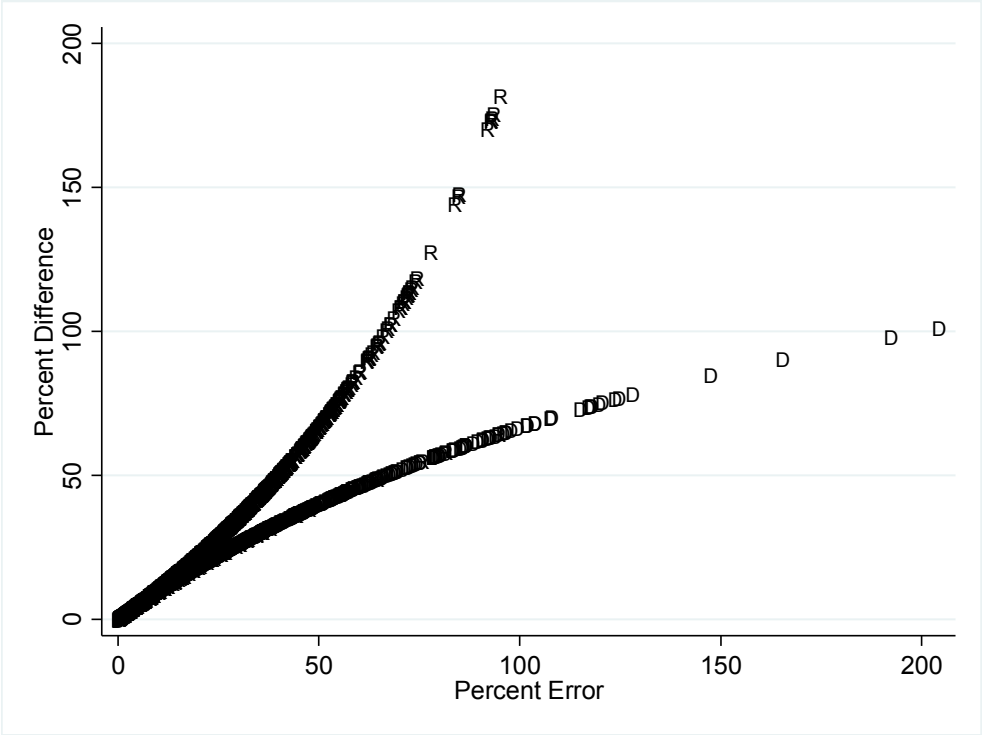


Figure 5.1 plots the Percent Error measure of ideological divergence against the Percent Different measure of ideological divergence for all senators serving in each two-year Senate between 1983 and 2012. As is evident, both measures are biased and tend to over-estimate the divergence of certain types of legislators.

A Logical Model of Ideological Divergence

In order to predict the effects of district size on legislator-citizen ideological divergence, it is first necessary to specify the logical boundary conditions that limit the range of possibilities (Taagepera 1999, 2007, 2008). When district size is at its smallest possible value of a single individual, citizens have direct control over their legislators. Because the median ideology of the district is simply the ideal point of the single constituent, responsiveness will be full, such that ideological divergence is at its minimum possible value of zero. Therefore, the logical anchor point of this model (the Y-intercept) occurs at (1, 0). When size grows larger and constituents become more numerous, citizens, on average, have less control over their representatives and find less value in supporting candidates and participating electoral politics. Thus, an election-minded legislator can afford to discount the views of the district median in order to respond more faithfully to the preferences of core supporters. In principle, although the maximum level of divergence using the *Ideological Slack* measure outlined above is 100, it is not clear that ideological divergence will approach this value as size increases. It is possible that the ideological preferences of the candidate's support base may overlap considerably with the district ideological median. Consider, for example, the state of Vermont, which has a citizen liberalism score of around 80%. This constrains the degree to which a senator can diverge from the ideological median point. Assuming a candidate's support base is more liberal than the state median, the most a liberal senator could diverge from the constituency average is 20%. Of course, it is also possible for a conservative senator from Vermont to take an extreme conservative position, in which came the true maximum is 80%. For the present purposes, I simply expect that an increase in size will lead to a gradual increase in divergence.

Results

In order to evaluate the empirical implications of this model, I conduct three separate analyses. First, I begin by graphing the correlation between size Voting Age Population (VAP) and *Ideological Slack*, which is presented on Figure 5.2. As is evident by the empirical "best fit line" (represented by the solid line), there is linear relationship between state size and slack with a negative slope. Moreover, the slope of the empirical "best fit" line is similar in magnitude to the logical "best fit" line, which is anchored to the logical Y-intercept value of (1,0). These results suggest that senators from the largest states tend to deviate from the state median point to a greater extent than senators from small states. Moreover, because the empirical "best fit" line overlaps substantially with the logical "best fit" line, it improves the logical relevance of these results and adds weight to the central claim of this chapter, that size increases ideological divergence.

Of course, there are some obvious limitations of this analysis. Namely, because this model only accounts for the effects of size on ideological divergence, there are a number of alternative control variables unaccounted for that may bias these results. One of the strongest, as suggested by the literature, is the political heterogeneity of the district. When senators must represent diverse districts, they must avoid emboldening their opponents in order to avoid a challenger. Thus, they must be less extreme, or so the explanation holds.

Figure 5.2: Ideological Divergence of U.S. Senators from State Median, 1983-2012

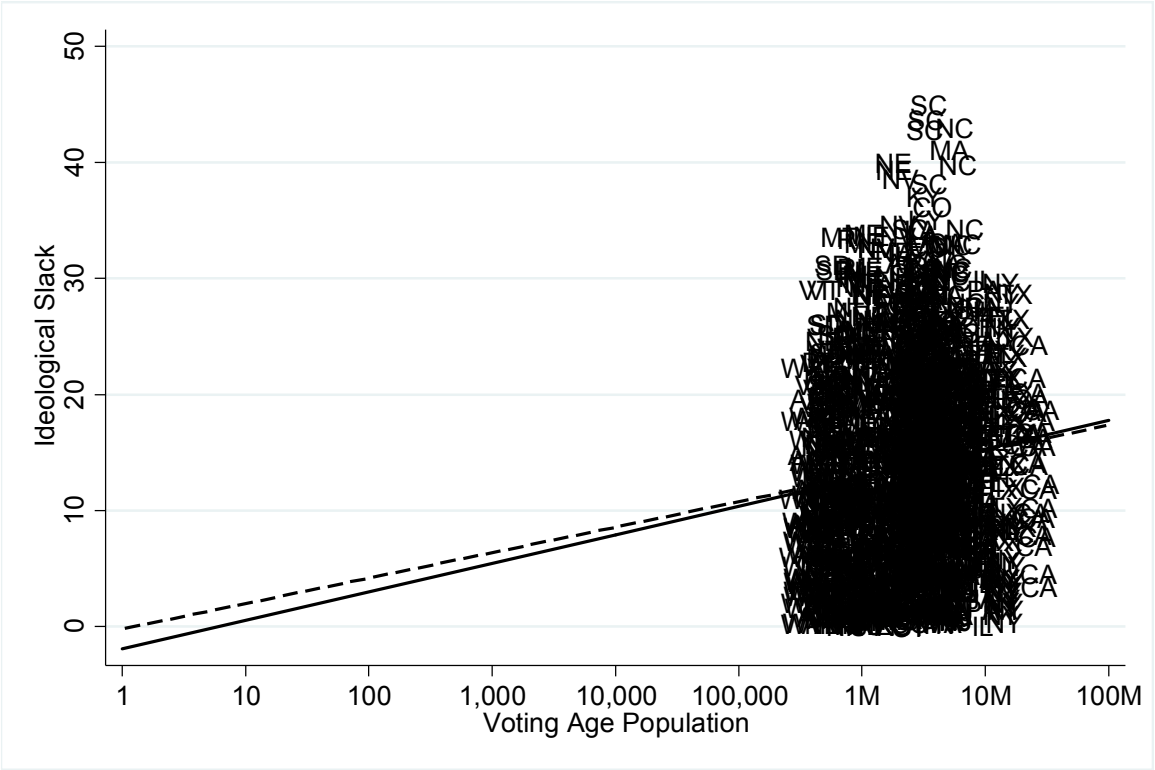


Figure 5.2 plots the Voting Age Population by state against the Ideological Slack, for each senator by session, which represents the distance between their floor voting spatial locations and the state median ideal point. A value of 1 represents a 1% drift away from the median along a single dimension with a width of 100. As is evident, there is substantial overlap between the logical "best fit" line, anchored to the predicted Y intercept of (0,1), and the empirical "best fit" line.

As a second analysis, in order to provide a basic control for state diversity, I analyzed the mean values of *Ideological Slack* in the largest and smallest states and in the least diverse and most diverse states. I measured constituent diversity by using the Sullivan index (see Chapter 3), which is a composite of a number of demographic variables that assign states a value of diversity

ranging from 0 to 1, with 1 indicating the most diverse states. Table 5.1 reports the results of this analysis. As is clear, senators from the states with the largest population sizes have on average higher levels of *Ideological Slack*. This effect represents an increase of approximately 28%, and the observed difference in slack between senators in the largest and smallest states is statistically significant at the p=0.05 level. The effects of diversity, however, are less clear. The effects are so small in both size groups that very little can be gleaned about the role of homogeneity from this analysis.

Table 5.1: Average Level of Ideological Slack

MEAN SLACK	Least Diverse Districts (bottom 25%)	Most Diverse Districts (top 25%)
Smallest Districts (<3M)	0.25 (n=124)	0.24 (n=43)
Largest District (>3M)	0.32 (n=33)	0.31 (n=110)

One of the main drawbacks of these analyses so far is that they have not accounted for members serving in multiple sessions, which may serve to skew the slope of the regression line and underestimate the standard error of the effect. Moreover, it is possible that other control variables that I have not accounted for may conflate the effect of size. To study the effects of size more systematically, I used ordinary least squares regression analysis and clustered the standard errors by senator. I incorporated a number of control variables, including measures for demographic diversity; the variable *Party Advantage,* which is the vote share that a presidential candidate from a senator's party received in their state above or below their national average,

averaged across the presidential elections by decade (values range from -100 to 100; a positive increase indicates more party strength in the state); a dummy variable to indicate that a legislator is in the minority party; the senator's previous margin of victory in the most recent election; a dummy variable for Democratic membership; and a dummy variable to indicate that a senator is retiring at the end of the term. I also included dummy variables for each Senate to control for historical idiosyncrasies and long-term institutional increases in slack, although these results are not reported. The results of this analysis are reported on Table 5.2.

What is evident is that, even in the presence of a number of control variables, the effects of size are strong and significant in all three models. In terms of ideological slack, each log-increase in state VAP is associated with a deviation of 1 ¼ percent away from the state median. In other words, senators from large states tend to discount the views of their state's median citizen and position themselves toward the spatial poles, while senators from small states adopt spatial positions that are more proximate to the location of the state's median citizen. These results provide additional support for the claim of this chapter that size, as a single variable, can explain why some legislators appear to shirk the centrists in their state and adopt positions that represent the preferences of the partisan extremists.

Table 5.2: Ideological Divergence in the Senate, standard errors clustered by senator

	Ideological Slack	Percent Error (log)	Percent Difference (log)
log VAP	1.255*	0.194*	0.180*
	(0.42)	(0.05)	(0.05)
log Diversity	-9.681	-2.481*	-2.072*
	(8.25)	(1.07)	(1.00)
Party Advantage	-20.341*	-1.662*	-1.524*
	(2.86)	(0.32)	(0.33)
Retirement	1.722*	0.173*	0.168*
	(0.77)	(0.09)	(0.08)
Minority Party	2.634*	0.206*	0.216*
	(0.36)	(0.05)	(0.05)
Victory Margin	-0.039	-0.005	-0.006*
	(0.02)	(0.00)	(0.00)
Democrat	-1.784	-0.352*	-0.616*
	(0.93)	(0.11)	(0.10)
Constant	-3.532	-0.198	0.332
	(8.53)	(1.09)	(1.03)
R^2	0.177	0.137	0.171
Clusters	275	275	275
N	1522	1522	1522

* $p<0.05$

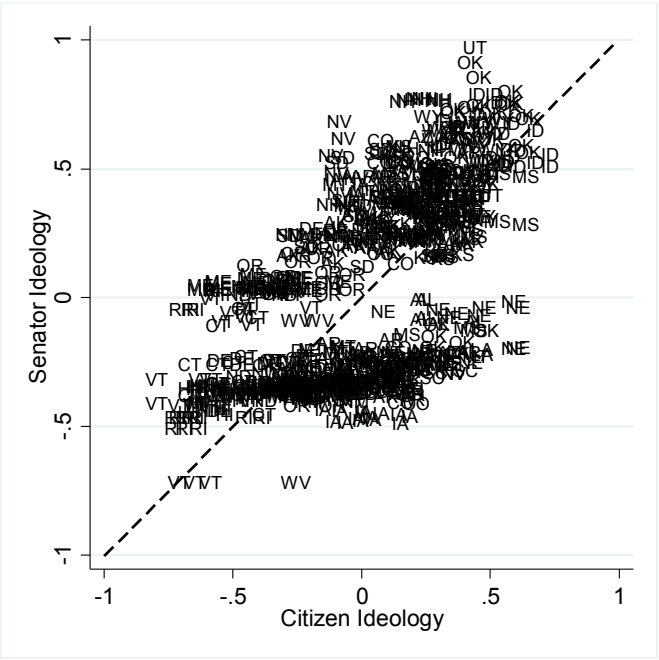
Size and the Median Voter Theorem

Another way to assess the role of size is by looking at how size affects the "goodness of fit" of the Median Voter Theorem (MVT) in explaining the voting behavior of legislators. If legislators are perfectly responsive to the district median points, as the median voter model holds, this would take the form of a perfect correlation between citizen ideology and legislator ideology. Of course, by "Median Voter Theorem" we really mean "median citizen theorem". One of the problems with studies that empirically assess MVT is that they conflate voters with citizens. Here, I am assessing the degree to which the spatial location of senator (based on floor votes) conforms to the spatial location of the median citizen in the state. One simple way to test the effect of size is to compare the correlation between citizen and legislative ideology in the smallest and largest states. Figure 5.3 shows the smallest 50% of states with voting age populations of less than 3 million, compared to the largest 50% of states with adult populations exceeding 3 million.

One of the most striking differences between the big states and the small states is the level of variation and scatter. In small states, senators tend to cluster closer to the predicted line. In this sample of states, MVT serves as a *better* predictor of the location of senators' spatial locations in floor voting. There is a closer relationship between a state's median citizen and a senator's voting position in the small states. By contrast, there is a noticeable increase in scatter in the sample that includes only the largest states. Despite the fact that many of the states included in this sample have relatively centrist median citizen locations, many if not most of the senators are very polarized in their positioning. Of course, there is less scatter when the location of the median citizen is either extreme left or extreme right. After all, if a state's electorate is already extreme, a senator won't have the same opportunities to diverge from the median.

Figure 5.3: Correlation between Citizen Ideology and Senator Ideology

(a) Smallest States



(b) Largest States

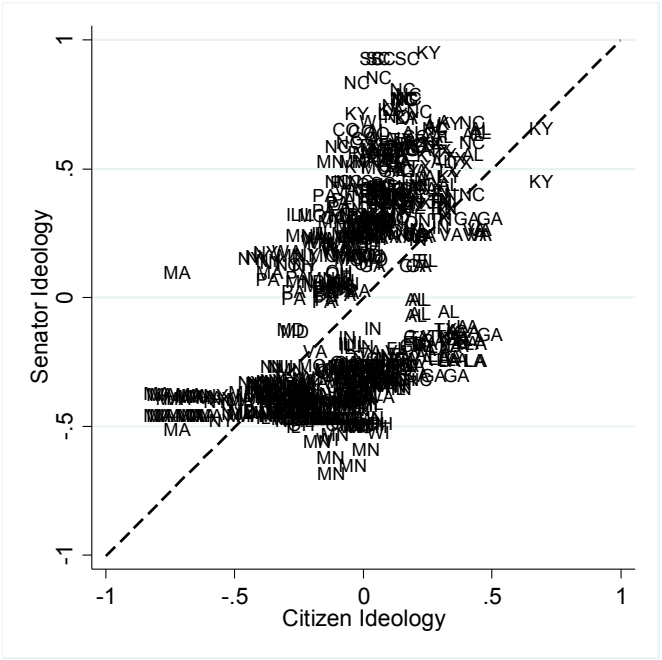


Figure 5.3 illustrates the correlation between citizen ideology and legislative ideology in the Senate between 1983 and 2012. Citizen ideology is measured using normalized Berry et al. measures for state citizen ideology. Senator ideology is measuring using the first dimension DW-NOMINATE scores. Both measures have been adjusted so that a value of -1 represents extreme liberalism and +1 represents extreme conservatism. The hashed line represents the values predicted by median voter model, which expects that legislators will position themselves toward the median voter in their districts. Figure5. 3a includes states in the bottom 50% of voting age population (below three million); Figure5.3b includes states in the upper 50% of voting age population (above three million). Whereas many of the observations in Figure 5.3a straddle the theoretical line, far fewer straddle the line in Figure 5.3b, which suggests that the value of median voter model in explaining legislative behavior is affected by district size.

For a closer look at the relationship between size and fitness of MVT, I conducted a regression analysis of the effects of citizen ideology on roll call vote positioning, with standard errors clustered by senator. I ran analyses on small states and big states separately, and compared the goodness of fit of each model. I also ran separate analyses with Southern states removed, to provide a rough control for the potential shirking effects of Southern Realignment. The results of this analysis are on Table 5.3. What is clear is that the small state model performs much better than the big state model. Although removing the South has a small impact on the fitness, the same effects for size are present.

Table 5.3: Citizen Ideology as a Predictor of Senator Ideology

Size:	Under 3M	Above 3M	Under 3M – South removed	Above 3M – South removed
R^2	0.39	0.26	0.42	0.24
Slope (Beta coefficient)	.705	.819	.714	.809
Individuals	137	148	112	88

Conclusion

In this chapter, I have argued that size matters for understanding legislative behavior. Whereas previous chapters have predominantly focused on the relationship between size and citizen behavior, this chapter considered whether the effects of size translate to the behavior of legislators. This is an important question because if the effects of size are limited to just the citizens and not their elected officials, then the representational consequences of unequal engagement would be minimal. This would mean that, although size affects citizens'

participation in electoral politics, elected officials are not influenced by these disparities when they take strategic positions on a legislative floor. But this is not the case. Legislators do not treat all citizens equally. They prioritize their most active supporters – those who are most pivotal to their reelection campaigns. The rest of the district population – the non-voters and the general public – are less important to legislators as a means to reelection, so they do not need to consider their views when making strategic decisions.

I have argued that one of the consequences of the effects of size on electoral engagement is that size will influence the responsiveness of a legislator to the preferences of the public – that is, the preferences of the median citizen in the geographic constituency. Insofar as legislators are aware of the policy preferences of the average citizen, they are more likely to respond to these views when the average citizen is highly engaged in electoral politics than when the average citizen plays a minimized role in electoral politics. In terms of size, this means that in very small districts legislators must be more faithful to public opinion because it more closely conforms to the preferences of their supporters. Indeed, in small districts, this is because only a small portion of the geographic constituency does not vote. By contrast, large districts have a much larger share of non-voters. As conventional wisdom holds, those who participate more actively tend to be more politically extreme and politically informed than non-voters. This means that legislators from large districts must respond to their supporters by taking positions that are generally more extreme than the preferences of the average citizen in the district.

I tested these claims by analyzing ideological slack in the U.S. Senate over a period of 30 years. My analysis provides evidence that state size affects discounting by legislators. First, I found that senators from large states tend to take voting positions that deviate from the location state's median citizen to a greater extent than senators from small states. This effect is

statistically significant and persists even after controlling for a number of alternative explanations. The magnitude of this effect is such that a natural log increase in state size will result in a legislator drifting 1.26 % away from a state's median citizen. Second, I found that state size determines the predictive value of median voter model in explaining legislative behavior. Among small states, citizen ideology performs relatively well as an explanatory variable for predicting the vote positioning of a senator. The fitness drops off among larger states. These results have implications for understanding how legislators position themselves strategically in order to maintain power through elections. Insofar as the median voter model performs better in small states than large states, this implies that responding to the preferences of the state's median citizen is a more effective strategy for legislators in small states than in large states. In other words, the "value" of the median voter approach to representation declines as the population size of a district increases.

CHAPTER 6 – Conclusion and Implications

The central premise of this dissertation is that *size matters* in a representative democracy. I have set out to show that the number of citizens living within an electoral district determines the behavior of political actors on both sides of the representational relationship. In Chapter 1, I presented a theory of size and electoral engagement that holds that, as the population size of an electoral district increases, citizens increasingly abstain from electoral politics. This is because, from the perspective of citizens, size determines how much access each citizen gets on average to their political representatives. When size is small and there are only a few citizens competing for the time and attention of a public official, access is abundant. For citizens, there is real value in the representational relationship, and there is an incentive to participate in the electoral process as a means of acquiring future access and influencing the political system. But when size is large and there are many demands placed upon a public official, access must be rationed and restricted. For the average citizen, this means that there is little personally at stake in the representational relationship. Elections lose their value as a means of acquiring future political goods and services, and there is little incentive to support a particular candidate by voting or donating to a campaign.

In Chapters 2 and 3, I tested the logical implications size theory of the electoral engagement in the context of American elections. In Chapter 2, I analyzed thousands of election returns at the state and national level in American government in an attempt to invalidate the basic premise of the size theory, that size reduces the incentive to participate in elections. My results show that citizens are less likely to turnout to vote an election as the population size of an electoral district increases. Moreover, the magnitude of the size effect that I observed is remarkably consistent across institutions and conforms to the basic features of the "ignorance

based" predictive model outlined in Chapter 1. In Chapter 3, I tested the implications of the size theory in the context of campaign financing of U.S. Senate campaigns. This analysis shows that the "size effect" extends to another form of electoral engagement, donating money to a campaign. I found that citizens living in small states make more donations, on average, to Senate campaigns than citizens living in more populous states. Moreover, candidates from small states report higher levels of money received in the form of "small donations". Combined, my results in Chapters 2 and 3 provide evidence in support of the size theory of engagement: size reduces the likelihood that a citizen will participate in an election and support a candidate.

Given the effects of district population size on political behavior in elections, size also has important implications for understanding campaign strategy and legislative behavior. From the perspective of elected officials, size determines the necessity of restricting access and communications with constituents. When an elected official represents a very small constituency, there is little incentive to restrict access to some and treat constituents unequally. Because there are relatively few demands for an official's time and attention, it is possible to maintain a personal relationship with a large portion of the constituency. But when an elected official must represent a highly populated district with a great many constituents, being accessible to all becomes unfeasible. In this context, elected officials must be deliberate in whom they grant access to. Because access becomes a scarce resource, it makes more sense to reward the most loyal and influential constituents with access and attention, and limit the amount of time devoted to constituents who have no impact on electoral security. Thus, treating constituents unequally becomes a necessity for elected officials as the size the constituency trends larger.

In Chapter 4, I analyzed campaign donations to Senate candidates and found that donors from large states give larger sums of money, on average, than donors from small states. This

suggests that the "costs" of accessing a candidate are higher in large states than in small states, and that candidates from large states are more reliant upon affluent donors to fund their campaigns than candidates from small states.

The effects of size on representation appear to extend to legislative behavior, as well. Because size determines the electoral context that elected officials face, size may also determine the types of policies that an elected official supports. For elected officials representing small districts, a highly engaged electorate means that citizens face a one-step decision process during election season: which candidate to support? In this context, the median voter strategy prevails. Because most or all of the citizens within a district can be expected to turn out to vote, it makes sense to posture to the median voter by supporting centrist policies. But for elected officials representing very populous districts, this form of representation is not a viable means of securing power. This is because in large districts, turnout is systematically repressed. Only a small portion of the electoral can be expected to turn out to vote and support a candidate. Traditionally, this has been members of political parties and interest groups, along with the wealthy and well-connected. Thus, it makes more sense for an elected-official to appeal to the partisans and special interests in the district by supporting policy that generates enthusiasm among the base. This may require an elected official to diverge away from the spatial center and drift toward the poles.

In Chapter 5, I analyzed floor voting in the U.S. Senate to understand whether size can explain the location of senators' spatial positions. I found that state population size is positively correlated with the level of divergence from the state's median citizen. In other words, senators from large states position themselves farther from the state median than citizens from small states. I also found that citizen ideology is a better predictor of legislative behavior in small

states than in large states. In other words, as predicted, the median voter model works better as a predictive model for legislative behavior in small states than it does in large states.

The findings of this dissertation provide support for the size theory of electoral engagement that I have presented and offer compelling evidence that size affects representative democracy in fundamental ways. Nevertheless, this thesis represents only a preliminary investigation into the effects of size. Much more research is necessary to understand the effects of size beyond American politics and in electoral systems with proportional representation. In what follows, I devote the remainder of this concluding chapter to outlining the generalizable implications of this study and potential areas of inquiry for future scholarship.

Population Size as a Determinant of Political Participation

The theory of size and electoral engagement that I have outlined in Chapter 1, and subsequently tested in Chapters 2 and 3, has direct implications for the scholarship on political participation. Studies of political participation tend to employ an individual level unit of analysis. That is, they approach questions like "who votes" and "why" from the vantage point of the individual and his/her personal attributes. As a consequence, less is known about the structural determinants of political behavior—that is the broader socio-economic and institutional forces that structure behavior at the level of the individual and create the context in which citizens make decisions about politics. The findings here point to district population size as an institutional determinant of political decision making by citizens that may provide value to future studies of political participation and voting.

In Chapter 1, I argued that the size of an electoral district—that is, the number of citizens living within the district boundaries—directly shapes the electoral context in which political

actors behave. When there are few citizens living within an electoral district, there are relatively few demands for the attention of an elected representative. This means that, on average, citizens enjoy expansive access to public officials. In this context, there is real value in representative democracy. Citizens have a stake in who gets elected and who represents them. This means that, for the average citizen, the electoral process is a venue for exerting real influence. Citizens have an incentive to support a candidate for office and turn out on Election Day in order to secure future benefits, such as special access or policy influence. But when an electoral district is highly populated, each citizen gets on average less access. There are many demands for an elected official's time and attention, and citizens have less direct stake in who gets elected. Unless a citizen happens to be well connected to a particular candidate or can afford to "buy" special access through campaign donations, there is little hope for influencing democracy by accessing an elected official. In this context, elections have less "investment" value as a means of acquiring future access or influence. For most voters, turning out on Election Day has more value as a ritual or social convention than as a means of influencing the future outcomes or acquiring future political goods.

In this regard, size has direct effects on political behavior that are not immediately apparent from an individual level of analysis. Because size shapes the contextual environment in which citizens interact with representative democracy, the effects of size are visible only when behavior is analyzed and compared at different scales. As I showed on Chapter 2 and Chapter 3, these effects translate to substantial differences in terms of voting and donating to candidates, but they can only be appreciated by comparing behavior across institutions that vary dramatically in size, such as state legislatures and state governorships, or in the U.S. Senate, where the state population sizes vary by orders of magnitude.

The results of these analyses add complexity to the research on voting and political participation. In general, this research tends to associate the problem of non-voting and abstention with the individual. Insofar as individuals from minority groups or economically disadvantaged communities are less likely to vote, it is tempting to view the problem of voter abstention and low participation as a lack of individual resources, such as education or experience (Delli Carpini and Keeter 1997). That nonvoters tend to be less educated may suggest that information costs or cognitive requirements of voting are simply too high. The size theory of engagement suggests that this problem is more complicated than individual-level cognition or educational attainment. Members of historically marginalized groups, such as racial minorities and the poor, do not vote simply because they have no incentive to do so. In the context of highly populated electorates in states such as California, Texas, or New York, there are simply too many demands to for a public official to accommodate. Elected officials have an incentive to be most responsive to those constituents who have the greatest impact on their electoral prospects, such as affluent campaign donors, party loyalists and interest groups. In the context of a very large electorate, the value of a single vote is negligible. This means that citizens from historically marginalized groups will continue to be ignored by the political system regardless of whether or not they vote. In this regard, the decision to not vote does not reflect ignorance or lack of cognition; it is a deliberate calculation on the part of the individual. Voting for candidate is simply a waste of time because it will not provide future access to political representation and will not provide a means of influencing the political system. In this context, for historically marginalized groups, non-conventional modes of participating are more effective than conventional modes of participation. This is perhaps why protest movements, such as the Civil Rights movement, have been historically more effective at advancing the political interests of

minority groups than conventional forms of participation, such as voting. Moreover, this may also explain why younger generations of voters are less likely to engage in conventional forms of participation and more likely to embrace new forms of participating, like political consumerism or online activism (Dalton 2002). In short, the size theory of electoral engagement provides evidence that inequalities in political participation stem, at least in part, from institutional arrangements.

Size may also explain the proliferation of interest groups in American politics. One of the consequences of long-term population growth is that the value of an individual vote has diminished over time. Since the early 1900s, the population of the United States has more than tripled. What's more, the right to vote has been formally expanded to include women (with the 19th Amendment in 1919) and effectively expanded to include historically disenfranchised minorities with the passage of the Voting Rights Act in the 1965 (McGann et al 2016). This means that the effective size of the electorate has grown more than six-fold in the past century. All of this means that the voters of today have, on average, less influence and less power than the voter of the past. Interest groups provide a solution to the problem of diminishing individual power. For disaffected citizens, groups provide a means of gaining the attention of legislators in order to advance common interests (Bishin 2009). By voting as a bloc, members of groups can enhance their individual power and gain access to political resources previously unavailable to them as individuals. One potentially fruitful line of inquiry is to study the role of long-term population growth in driving the proliferation of interest groups in American politics beginning around the 20th century.

Size, Campaign Strategy, and Polarization

The findings here demonstrate that the size of an electoral district directly determines the electoral context in which a candidate for public office must campaign. When size is small, candidates must contend with a highly engaged electorate. In practice, this means that most or nearly all of the voting age citizens will actively support a candidate for office and turn out to vote on Election Day. In this environment, candidates win by appealing to as many citizens as possible. Rather than convincing voters to show up on Election Day, candidates simply have to convince a majority of voters that they represent the best alternative among the candidates. This means that there are real risks in alienating the centrist voters, and candidates have little to gain by taking hardline positions or being overtly partisan. Candidates can afford to ignore the hardliners and partisan extremists as long as they represent the better alternative. But when an electoral district is very large, electoral engagement is systematically repressed and turnout is not assured. In this context, candidates must devote their energies to convincing more voters to show up on Election Day than their opponents. It makes more sense to appeal to the most active and engaged citizens, voters who are affiliated with political parties and interest groups, or those who have personal connections to candidates or strong ideological views. Here, ignoring the moderates and undecideds carries little risk because these voters are less likely to find value in turning out to vote.

The effects of size on campaign strategy have logical implications for the behavior of an election-minded legislator. Legislators from small districts have an incentive to support policies that have broad, popular appeal within their district in order to maintain a majority coalition. This is because in small districts electoral participation is systematically higher, and most citizens are engaged during election season. In this regard, citizens are faced with a one-step

process: *how to vote?* For legislators, the challenge is to be the best alternative for a majority of voters. This means that legislators should position themselves toward the ideological center of the district in order to capture the median voter. At the institutional level of analysis, the implications of a legislature with small district sizes are that the parties will converge in terms of ideology and policy. When legislators represent very small constituencies in which voters are highly engaged, there is little incentive to alienate voters by taking extremist positions that diverge from the district center. But for very large districts, the opposite holds. When a district has a very large citizen population, this creates a systematically repressed electorate. Only a small portion of the district population can be expected to turn out to vote. Thus, candidates will maximize turnout by appealing to the party loyalists and group members, who can be counted upon to turnout to vote. In terms of legislative behavior, this means that legislators will avoid alienating interest groups and partisans by taking centrist positions. Instead, a legislator will support policies that garner enthusiasm among the base. In practice, this has the effect of pushing a legislator toward the spatial extremes. At the institutional level, when a legislature has very large districts, the parties will diverge. That is, individual members have an incentive to diverge from the spatial median and adopt polarizing policy positions.

In this regard, it is possible that population growth has contributed to the historical increase in polarization observed in Congress and in state legislatures since the 1970s. This is because, whereas the citizen population is fluid and continuously expanding, the size of state assemblies and the U.S. Congress are fixed. Although the House of Representatives and state legislatures have the authority to expand their membership size, this has rarely been done since the beginning of the 20th century. In Congress, the most recent expansion of the House of Representatives occurred during the 1911 apportionment cycle. This means that the average

House district size has tripled in population over the last 100 years. Insofar as large districts reduce the value of engaging in elections and create incentives for elected-officials to drift away from the spatial median, long-term constituency growth may have the effect of increasing ideological and partisan polarization.

Size, Representation and Inequality

The size theory has direct implications for understanding the "representational relationship" between citizens and their elected officials. Most notably, the analysis here adds value to Fenno's landmark study of representation in the U.S. Congress (1978). Fenno outlined the "concentric circle" model of representation, which posits that legislators view their districts as a series of concentric circles that vary in size and importance to electoral success. Figure 6.1 provides an illustration this model with slight modifications.[10] The implicit assumption of this model of political representation is that the relative population sizes of these sub-constituencies are fixed relative to the geographic constituency. In other words, it is assumed that the population size of the geographic constituency has no effect on the nature of the inner circles. The theory that I have presented in this analysis challenges assumption and provides a method of measuring the size of the inner circles as a function of the outer-most circle, the geographic constituency.

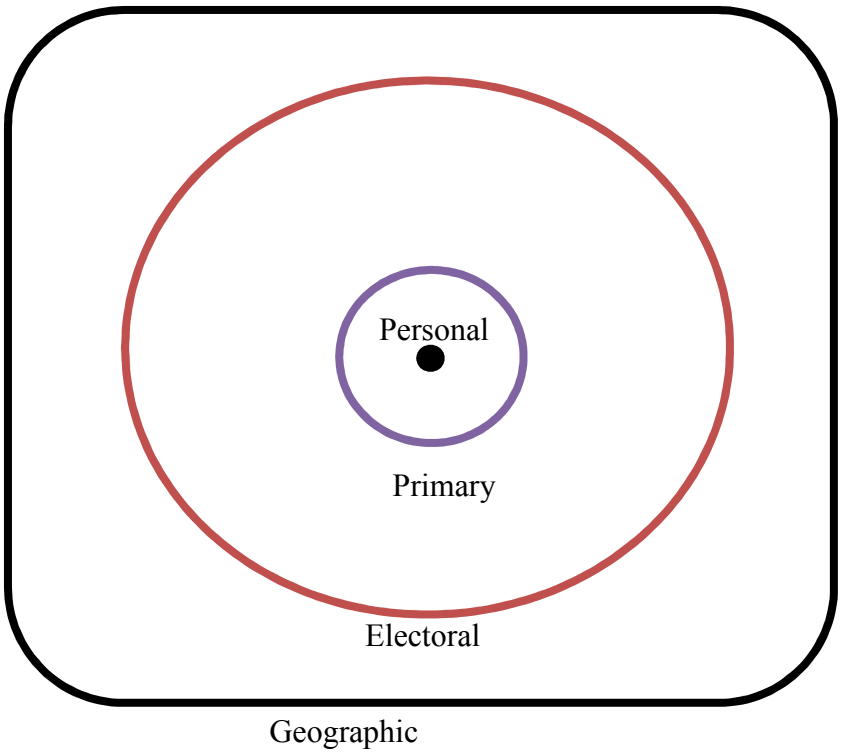
My analysis of voter turnout (Chapter 2) estimated that the size of the voter population, V, is proportionally related to the district population, P, so that: $V \propto P^{0.94}$. Thus, this provides a

[10] Fenno refers to the second outer-most circle as the "reelection constituency," which includes all those who has voted for an incumbent. Here, I refer to this circle as the "electoral constituency," to account for all those who have voted for *any* candidate.

direct measure of the electoral constituency and illuminates how growth in the geographic constituency affects the relative size of this group of citizens. The implication is that, in larger districts, the voter population will represent a smaller subset of the geographic constituency. Similarly, in Chapter 3, I found that the size of the Donor Pool, *D*, is proportional to the district population so that: $V \propto D^{0.68}$. This measurement most closely aligns to the second, innermost circle, the "primary constituency", which includes the closest supporters of both an incumbent and challengers.

The value of measuring the size of the inner-most circles is that it reveals the role of population size in contributing to representational inequalities. When a district is very small, the differences between the population size of the primary constituency and the geographic constituency are small. These differences increase as the geographic constituency becomes more populated. In very large districts, the size of the primary constituency becomes a small subset of the geographic constituency. Consider an example. Suppose District A contains a total population of 1,000 citizens. According to the models produced in Chapters 2 and 3, the predicted size of the voter population would be about 661 voters, in which case the turnout rate would be about 66%. The predicted size of the primary constituency would be 110 donors, or a donor rate of about 11%. Now suppose District B includes a total population of 1 million. In this case, the predicted voter population would be about 437,000 (a turnout rate of 44%) and the predicted size of the primary constituency would be about 12,000 (a donor rate of 0.12%). Thus, whereas District A has a much more engaged electorate and a more inclusive primary constituency, this is not the case with District B, in which only a minority of citizens vote and less than 1% donate.

Figure 6.1: Fenno's "Concentric Circle" Model of Representation



These differences may have profound effects on the responsiveness of a public official to constituents. Insofar as legislators are most accessible to those who have supported them in the past (those who have voted for them or donated to their campaigns), this means that a legislator from District A must provide access to a much larger share of the total district population than a legislator from District B. In short, the necessity of treating some constituents better than others becomes greater in large districts. In this regard, district population size represents a determinant of representational inequality. In particular, it is possible that historic population growth has exasperated the growth of political inequality in American government that scholars have observed in recent years, as legislative candidates must increasingly rely on the support of

wealthy citizens to finance their campaigns (i.e. Bartels 2009; Flavin 2014; Gilens 2012; Keller and Kelly 2015; McCarty, Poole, and Rosethenal 2006).

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Appendix A: Number of Donations to Senate Candidates

Appendix A reports the results of Table 3.1 – Per Capita Donations (ln) to Political Campaigns – with a different measure for race competitiveness. Competitive Race is coded 1 for those races that were forecasted to be competitive races ("Leans D" or "Leans R"; "toss-up"; "D-R"; or "R-D") based on the predictions made by Larry Sabato's Crystal Ball in January of the election year. Model A includes the variable Competitive Race; Model B is a version of the model that includes in its sample only competitive races. Model C includes only non-competitive races.

	(A)	(B)	(C)
log State Voting Age Population	-.243*	-.443*	-.159*
	(.054)	(.058)	(.071)
log State Median Income	1.152*	.271	1.500*
	(.298)	(.351)	(.379)
Competitive Race	.582*		
	(.098)		
Open Senate Seat	.143	.057	.249
	(.110)	(.106)	(.157)
State Diversity Index	2.6	2.0	2.4
	(1.4)	(1.7)	(1.7)
2006 election cycle	.070	.192	-.101
	(.110)	(.120)	(.145)

2010 election cycle	.032	.192	-.056
	(.105)	(.122)	(.134)
Constant	-16.66*	-3.684	-21.55*
	(3.185)	(3.669)	(4.083)
N	101	33	68
R^2	.457	.731	.350
Adjusted R^2	.417	.669	.286

* p<.05

Appendix B: Donations Made to Senate Candidates, Presidential Years

Appendix B reports the results of an OLS regression analysis of the effect of size on the *Number of Donations* per (capita) to Senate Candidates (log) during the 2008 and 2012 Presidential Elections**.**

log Voting Age Population	-0.364*	(0.08)
log Median Income	0.520	(0.44)
Closeness	1.294*	(0.36)
Open Seat	-0.149	(0.19)
Diversity Index	4.250*	(2.07)
2008 Election Cycle	-0.689*	(0.15)
Constant	-7.544	(4.77)
R^2	0.525	
N	66	

* $p<0.05$