Voting and Abstaining in the U.S. Senate: Mr. Downs Goes to Washington

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Abstract

Rothenberg and Sanders (2000a) find little support for a Downsian theory of voter participation in the (104th) U.S. House of Representatives. Vote abstentions are common in legislative bodies. In the 2nd session of the 110th United States Senate, for example, the abstention rate was approximately 0.057. The present paper uses logistic regression models with fixed effects as well as random effects in an alternative legislative setting to determine whether vote participation in the 110th Senate conforms to "Downsian rationality." Throughout the analysis, we find substantial evidence that legislators in the 2nd session of the 110th Senate made vote participation decisions in a manner consistent with Downsian rationality.

Key terms. Calculus of Voting, Senate, Shirking**,** Logit, Closeness, Expressive Voting, Instrumental Voting

Introduction

Voter turnout results from the decisions of individual voters as discussed by Downs (1957) who expresses an individual's decision to vote as:

$$V=PB-C \quad (1)$$

where:
V = the value of a vote, where a positive value indicates an incentive to vote and a negative value indicates a greater incentive to abstain;
P = the subjective probability that one's vote is pivotal in the election;
B = the value of getting the voter's more preferred outcome rather than the next most likely outcome; and
C = the cost of the act of voting (e.g., the time cost of voting and the psychic and information-gathering cost of deciding which way to vote).

Downs identifies one component of this decision, the B term in equation 1, as the individual voter's value of changing the group decision from what she views as a less preferred outcome to what she views as a more preferred outcome. The individual realizes the value *B* only if her vote is pivotal (i.e., outcome-changing). Expected closeness of vote, then, affects the probability that a voter's choice is pivotal. In most cases of citizen voting, the objective probabilities of affecting the outcomes are vanishingly small. As Schwartz (1987:118) points out so vividly, "…saying that closeness increases the probability of being pivotal … is like saying that tall men are more likely to bump their heads on the moon." Even so, closeness is often found to be positively related to voter turnout in general elections (Barzel and Silberberg 1973, Settle and Abrams 1976, and Silberman and Durden 1975).

Riker and Ordeshook (1968), concerned that the expected value of being pivotal is likely to be negligible in general elections, introduce a positive term, *D*, into the voter's calculus. The term might be thought of as the cost of not voting or the benefit from fulfillment of civic duty through vote participation or even the cost of social pressure imposed on those who fail to cast a ballot. This motivation is independent of the effect of a vote on the election outcome (i.e., captures expressive rather than instrumental voting motivation). Aldrich (1993) notes that both the *D* term introduced by Riker and Ordeshook and the *C* term introduced by Downs are small relative to their variation. As *PB* is zero for all practical purposes, Aldrich takes *V* as equal to *D* – *C*. In this formulation, the larger of the two right hand side variables for an individual determines whether or not the individual participates in a vote. Aldrich explains that closeness affects turnout not because of instrumental voting but because candidates and their political organizations have greater incentive to influence the voter's calculus in close elections. In other words, while the supply of votes may be expressive, the demand for votes by candidates and their organizations (or the political elite) is most certainly instrumental, and these elites are able to motivate participation by altering the *D* and *C* terms. Extending a model proposed by Peltzman (1976) and refined by Lott (1986, 1987), Karahan, Coats and Shughart (2006, 2009) present evidence to support the view of Aldrich that candidate or leader motivation provide key incentives to voters.

Abstentions occur in legislative bodies, especially as elections approach. Rothenberg and Sanders (2000a) find little support for a Downsian theory of vote casting for the U.S. House of Representatives in the 104th Congress. Yet, in comparison to the Senate, the House is a large legislative body (435 members). Further, the U.S. House of Representatives in the 104th Congress featured 26 more Republicans than Democrats such that closeness was not a general theme of that legislative body. Lastly, with all House members potentially facing a challenge, there is little variation from legislator to legislator in the decision between legislating and campaigning. The 110th Senate is both smaller and closer in party representation than the 104th House, making the former body an intriguing alternative setting in which to explore the explanatory power of the Downsian model.

In this paper, we extend the literature on legislative shirking as surveyed in Bender and Lott (1996). This literature distinguishes between two types of shirking by legislators, "ideological shirking," which involves pursuit of one's own ideological preferences in conflict with their constituents, and "participatory shirking," which involves participating in fewer roll call votes. Shirking is largely mitigated by the constituency monitoring and the legislator's incentive to get re-elected, this incentive disappears in the legislator's last session, when she plans on retirement. While Lott (1987 and 1990) suggests that sorting of legislators among districts removes last-period ideological shirking, he and others (see, e.g., Rothenberg and Sanders 2000b or Tien 2001 for additional evidence) find support for last-period participatory shirking by those retiring or who think they will not return to office. Among other factors, we consider the decision to shirk as a function of a legislator's degree of job security (i.e., margin of victory in last election bid). Those who lack job security but wish to be re-elected may not be able to afford a low, or even average, attendance rate.

Downs in the Senate

As with ordinary estimates of voter participation based on Downs, we begin by examining the effect of closeness of vote. One should bear in mind that many Senate votes require super-majorities of 60 percent, and veto overrides require two-thirds majority. As a result, if either the Downs or Aldrich view of closeness holds, the smaller the difference between the actual and required majorities, the greater should be the levels of participation. Also of consequence to a senator's voting benefit is the importance of the measure upon which a vote is based. The importance of a vote to a senator is unobservable. However, certain votes are likely to carry more general importance, such as those used to score a senator's ideology by the Americans for Democratic Action (ADA) or the American Conservative Union (ACU). Across the set of regressions, we use two distinct binary variables to capture whether a particular vote represents an ADA or ACU vote.

Within the empirical model to follow, we also examine the effect of a senator's campaign activities for re-election or for higher office upon his or her participation in Senate floor votes. A real opportunity cost of casting a vote in the Senate is that of foregone re-election campaigning. Similarly, an active candidate for president is expected to have a relatively high cost of casting a Senate vote. To measure the cost of campaigning, we incorporate a binary variable to indicate whether the Senator faces re-election to the Senate and a distinct binary variable to indicate whether the Senator is a presidential or vice-presidential candidate at the time of the vote.i In the analysis, we consider serious candidates for president (or vice president) to be Joseph Biden, Hillary Clinton, John McCain and Barack Obama. Given a higher opportunity cost of casting a Senate vote, lower rates of voting are expected among those actively campaigning for Senate re-election or election to higher office. Among senators facing re-election, this effect is expected to be stronger for those who narrowly won their last Senate election. Thus, closeness of the Senate vote, issue salience, and campaign-related opportunity costs are all expected to influence a senator's vote participation decision. Additionally, the nearer a Senate vote is to the next election day, the more costly the vote is expected to be from the perspective of a senator facing re-election.

Our two closeness variables, closeness of the observed Senate vote and closeness of a senator's last Senate race, affect different parts of the Downsian equation. The first variable affects the benefit of participating in a Senate vote, whereas the second variable affects the opportunity cost of participating in a Senate vote. Certainly, Senate leaders play an important role in coercing senators to the floor to cast a vote. Even if closeness is found to affect voting participation in the Senate, we cannot distinguish between an indirect effect of closeness via political elites (such as the Senate leadership in our case) of the sort discussed by Aldrich (1993) and the direct effect of closeness of the sort discussed by Downs (1957). The closer was a senator's previous election race, the less expected political capital she has heading into a re-election bid. As Election Day nears, therefore, we expect a senator facing re-election who endured a close race in her previous election to possess a particularly high opportunity cost of Senate floor voting. In the literature, closeness is usually measured by an inverse indicator—the margin of victory.1 Often, the vote margin in these measure of closeness are measured as a proportion of the registered voters, though Gary Cox (1988) has suggested the use of the raw vote difference or margin as the margin of victory divided by registered voters is spuriously correlated with turnout. Barzel and Silberberg (1973) and Silberman and Durden used winner vote to total vote as their measures of closeness. Francois and Fauvelle-Aymar (2006) discuss several closeness variables used in the literature, including the proportional vote margin (p. 474-75). Instead, for our two closeness variables, we take an inverse function of the margin of victory in a vote or Senate race. The Senate leadership also schedules Senate votes and can either schedule votes nearer to or further from Election Day, as well as nearer to or further from midweek (Tuesday through Thursday). We expect votes scheduled during the midweek to be more important than those scheduled for the weekend, though some important votes may be slated for the weekend. Senators also face different costs of travelling home. Senators from states very near Washington, D.C. may be able to travel to their home states and still return for Senate votes. Those who live farther away may be more likely to travel to their respective home states and miss a few votes before returning. Those who live very far away (e.g., Alaska or Hawaii) may not even bother to return home on a frequent basis. Thus, we might expect distance from Washington, D.C. to affect the likelihood of a Senator's vote participation in a non-linear and non-monotonic fashion.

Next, we model each Senator's voting participation behavior as a function of his or her age. Senators who are slightly above the average age are expected to have a higher rate of voter participation, as they are more likely to have survived previous bids for re-election. Thus, age is expected to control somewhat for legislator quality. However, after a point, a Senator is expected to develop limiting health problems and participate in fewer votes (e.g., Edward Kennedy in the years prior to his recent death). We use the age of a Senator and its square to control for these potential effects of age on Senate voting.

Finally, we introduce a binary variable, *LASTPERIOD*, to control for well-known last-period participatory shirking, as mentioned above in the work of Lott (1987, 1990), Rothenberg and Sanders (2000b), and Tien (2001), where a value of 1 is assigned to retiring senators and a value of 0 to those not retiring. These retiring Senators were John Warner, VA; Chuck Hagel, NE; Larry Craig, ID; Pete Domenici, NM; Wayne Allard, CO. In addition, we use the same binary retirement variable for the indicted Ted Stevens who was found guilty a few days before he lost his re-election bid.ii

The Data and the Model

To test the Downsian-Aldrich theory of participation in Senate votes, data are drawn from the 215 votes in the Senate of the 2nd session of the 110th Congress (U.S. Senate Roll Call Votes, 2008), during which time 30 senators vied for re-election.iii As a senator's decision between casting a vote and not casting a vote is a binary decision, we employ a series of maximum-likelihood logistic regression models (with STATA as our statistical software) to estimate the effects of various causal factors on the probability of a senator voting or abstaining. Model 2 tests the hypothesis that closeness in voting matters. Models 3 and 4 feature either senator fixed effects or vote-day fixed effects with standard errors that are robust against senator on vote-day cluster correlation. Fixed effects account for dependence of the error terms that may arise from underlying dependence between legislative votes. For example, senator fixed effects account for the fact that we do not directly observe some characteristics of a senator, such as how conscientious or dutiful he or she is. Vote-day fixed effects are likely to account for unobserved aspects of the importance of a set of votes. Further, vote-day fixed effects and senator on vote-day cluster correlation robust standard errors, used separately, are each expected to account for dependence in participation likelihood across votes of the same day. For example, a senator's decision to attend the first vote on a given day influences her decision to attend the second vote on that day. To participate in the first vote, she has already overcome the cost of reaching the Senate floor on that day. Consider the following latent variable model:

$$V_{it}^{*} = \alpha + \beta_c C_{it} + \beta_x X_{it} + \beta_s S_{it} + \beta_z Z_{it} + \varepsilon_{it} \qquad (2)$$

Where i indexes voter observations and c, x, s, and z index the regressors that comprise the vectors X, S, and Z respectively. Vit* is the latent propensity of the decision whether to cast a vote or not; however, Vit* is not observed. Instead, we observe Vit, a voting variable, which is a binary indicator of whether a senator decides to cast a vote or not and is equal to one if Vit* > 0 and is equal to zero if Vit* ≤ 0. Cit is a variable included to capture the closeness of a vote. Cit is the closeness of the vote in the Senate relative to the required majority (1/2, 3/5, or 2/3). Xit is a vector that contains a set of additional controls believed to help explain a senator's decision whether to vote or not. It includes SENCAND, PRESCAND, DISTANCE, DISTANCE SQUARED, AGE, AGE SQUARED, DAYSTILELECT, WEEKEND, WEEKEND*DISTANCE. Sit is a vector of geographic location indicator variables representative of each of the fifty states in the United States. Zit is a vector of vote day indicator variables. These geographic and year fixed effects allow us to eliminate any unobserved geographic or year voting day specific heterogeneity that might impact the estimate of βc. Furthermore, assuming ε ~ N(0,1), the logit model which we estimate is given by:

$$Prob(Vote_{it} = 1) = ln(\frac{p}{1-p}) = \Phi\ (\alpha\ + \beta_c C_{it} + \beta_x X_{it} + \beta_s S_{it} + \beta_z Z_{it} + \varepsilon_{it})\ (3)$$

where Φ is the cumulative distribution function of the standard normal distribution.

Measures

CLOSENESS, as mentioned above, is a direct measure of closeness or an inverse measure of vote margin. It is measured as the reciprocal of [1 + |(yea votes/100)-(required majority)|], where the required majority is .5 for most votes, but .6 for cloture votes and .66 to overturn a veto. Francois and Fauvelle-Aymar (2006) discuss several closeness variables used in the literature, including the proportional vote margin (p. 474-75).

ACU is a binary variable with the value of 1 if the vote is a scored vote by the American Conservative Union (*ACU*) and a 0 if it is not a scored vote. *ADA* is a binary variable with the value of 1 if the vote is a scored vote by the Americans for Democratic Action and a 0 if it is not a scored vote. *SENCAND* is a binary variable with value 1 if senator faces re-election in 2008 and 0 otherwise. *PRESCAND* is a binary variable with value 1 if senator is a contender for President or Vice President in 2008 (Biden, Clinton, McCain, and Obama). *SENRACECL* is 1/(100*senator's vote proportion in last election).[iv] *DISTANCE* is the road mileage from the senator's state capital to Washington, D.C.[v] *AGE* is the senator's age which serves as a proxy for health and perhaps quality. *WEEKEND* is a binary variable which takes the value 1 if the vote is held from Friday to Monday and 0 otherwise. *DAYSTILELECT* is the number of days between the vote in the Senate and the next election so that the variable for votes taken after November 4th, election day, are "reloaded" with 730 days. Senator fixed effects and vote day fixed effects are also included in Model 3 while ε, the error term, is potentially corrected for senator on vote day cluster correlation. The squared terms of the *DISTANCE* and *AGE* variables are used to account for the likely non-monotonic relationship between age and voting and distance and voting.

We use a binary variable, *LASTPERIOD*, for the retirements of Senators John Warner, VA; Chuck Hagel, NE; Larry Craig, ID; Pete Domenici, NM; Wayne Allard, CO; and Ted Stevens,

The variables above are summarized in Table 1 below.

Table 1: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
VOTED	21498	.943	.231	0	1
CLOSENESS	21498	.707	.128	.4	.995
ACU	21498	.116	.321	0	1
ADA	21498	.093	.290	0	1
SENRACECL	21498	.017	.002	.010	.020
SENCAND	21498	.300	.458	0	1
PRESCAND	21498	.030	.170	0	1
DISTANCE†	21498	1.176	.931	.034	3.761
AGE	21498	63.532	9.939	44	91
WEEKEND	21498	.144	.351	0	1
DAYSTILELECT	21498	188.403	83.572	34	714
LASTPERIOD	21498	.0600056	.2375027	0	1

Note - † Distance reported in thousands of miles.

Table 1 shows that the session abstention rate for all Senators is about 5.7 percent. Further, the mean age of a Senator is about 63.5 years, a number that is pulled upward by the presence of a few Senators who were above eighty and ninety years old at the time.

Results

The first two specifications seek to determine which, if any, vote types are important to vote participation. The results of our Logit estimations for the first two specifications are featured in Table 2 above. The results below are all for a two-tailed p value and the standard normal z-test.

Table 2 - Logit Regression: Does Closeness Predict Voter Turnout?

	VOTED	
	(Logit)	(Logit RE)
CLOSENESS	.74***	1.0***
	(.004)	(.001)
ACU	.22**	.29**
	(.039)	(.019)
ADA	-.04	-.06
	(.704)	(.635)
PRESCAND	-1.85***	-.16
	(.000)	(.978)
SENCAND	.41***	.28
	(.000)	(.391)
SENRACECL	.18***	-.12
	(.000)	(.877)
*SENRACECL*SENCAND*	-.56***	-.12
	(.000)	(.597)
DISTANCE †	-.42***	.016
	(.000)	(.839)
DISTANCE^2 *†*	.0001***	.00003
	(.000)	(.243)
AGE	.19***	.20
	(.000)	(.198)
AGE^2	-.002***	-.002
	(.000)	(.001)
LASTTERM	-.25*	-.75
	(.08)	(.274)
WEEKEND	-1.06***	-1.41***
	(.000)	(.000)
DAYSTILELECT	.001***	.002***
	(.001)	(.000)
F-Test for Age & Distance	43.1***	1.47
F-Test for SENRACECL & SENRACECL*SENCAND	24***	0.41
R^2	.08	.08

Note - P-values reported in parenthesis with White's correction for heteroskedasticity. N=21,498. †*DISTANCE* and *DISTANCE*^{2} are reported in thousands of miles. *P<.10; **p<.05; ***p<.01

The first two model specifications, offer strong support for the contention that Senators conform either to the Downs or Aldrich view of voter participation. The coefficient on the variable CLOSENESS is positive and significant within the .01 level over each specification (p-values = .004 and .001). Logit regressions are non-linear. As such, interpreting marginal effects requires analyzing the coefficient from regressions at different probabilities. Table 4 reports the marginal effects estimation from Logit regressions at the average probability of voting (p=.943). The marginal effects of *Closeness* can be analyzed under an undivided and divided Senate.vi If there are either 99 yay or nay votes, the marginal effect from voting is a .004 percentage point increase in voting. Conversely, if the Senate is divided evenly, the marginal effect from casting one more vote is a .04 percentage point increase in voting, which is a result 10 times larger in magnitude. As was previously suggested, the 2008 Senate, in which Democrats enjoyed a mere one-vote margin in a legislative body of only 100 individuals, appears to offer an ideal laboratory in which to examine the Downs-Aldrich contention that closer votes increase the probability of voting.

Our statistical model is not capable of distinguishing between the Downs and Aldrich mechanisms by which closeness impacts participation. Not only does closeness affect voting behavior in the Senate, but the importance of the vote, as measured by the vote's inclusion in American Conservative Union scoring, increases the probability of a Senator casting his or her vote.vii The coefficient on the variable *ACU* is positive and significant well within the .05 level (p-values = .039 and .019). The same effect is not observed for the *ADA* measure of vote importance. These slightly different magnitudes seem to imply that issues deemed important by the *ACU* are more likely to arouse a closeness vote.

We also find that senators running for the presidency are far less likely to cast their votes in the Senate, with the strong negative effect of the *PRESCAND* binary variable in column 1. A presidential candidate is statistically less likely to vote. The marginal effects suggest than presidential candidates are nine percent less likely to vote than candidates who are not running for president at the average vote, p=.943. These presidential candidates include John McCain, Barack Obama, and Hillary Clinton. This result is expected due to the fact that presidential candidates face a large opportunity cost of voting; any time they spend in congress voting is time they could have spent campaigning for the presidency. However, this result is not robust to the inclusion of senator random effects in column 2.

The *SENCAND* variable has a similar finding. It is positive and significant at the .01 level (p-value = .001) in column 1, but it is not robust to the inclusion of senator random effects in column 2. The marginal effects in Table 4 show that a senator seeking re-election is more likely to cast a vote by two percentage points at the average, p=.943. The most logical explanation is that candidates running for senator have their voting records tracked scrupulously. Abstentions from voting are very costly to their track record. Thus, there is some slight evidence that Senators appear to have a better voting participation record in re-election years. It further appears that the best way to campaign for one's present Senate job is to have a high rate of participation in that job (i.e., resume building). Unlike the case of Presidential candidates, Senate candidates are known to the constituency they seek to serve. On the other hand, presidential and vice-presidential candidates are attempting to drastically shift constituency and therefore choose to engage in a time-intensive, introductory campaign. We will dissect these candidacy variables in specifications to follow to observe before election season and election season effects.

SENRACECL is positive and significant well within the .01 level (p-value < .0001) in column 1, but it too is not robust to the inclusion of Senator random effects in column 2. Therefore, there is again some slight evidence that Senators with low levels of expected job security (i.e., whose previous Senate race was very close) are more likely to participate in a given Senate floor vote. This suggests that senators with job security face a moral hazard issue in their voting participation rates and are more likely to shirk on their Senate voting duties. As in the case of the *SENCAND* variable, we examine *SENRACECL* more closely in subsequent regressions. There is some degree of evidence for a non-linear relationship between *VOTE* and *DISTANCE*.

The coefficient on the variable *DISTANCE* is negative and statistically significant at the .01 level (p-values = .000 in column 1) while the coefficient on the variable $DISTANCE^2$ is positive and significant well within the .01 level (p-values = .000). We will find these two variables to achieve strong significance, while maintaining the same signs, in the fixed effects models to follow. However, these variables exhibit the same story as before; these findings for *DISTANCE* and $DISTANCE^2$ are not robust to the inclusion of senator random effects. There is some evidence for a Goldilocks effect of *DISTANCE*, in which those Senators with a home state that is not too close and not too far abstain from more votes due to time spent in home state. Those who live near D.C. miss fewer votes presumably because they face a low time cost of travelling to their home state and back. Those who live far from D.C. (i.e., in Alaska or Hawaii) presumably find it difficult to travel home at all and therefore miss fewer votes on account of such travels. Every 1000 miles traveled to vote decreases the odds of voting by one percentage point. The farthest anyone has to travel to vote is from Alaska and Hawaii to Washington D.C. The summary statistics show that the mean distance one travels to vote is 1,176 miles while the maximum distance is 3,761 miles which would suggest that senators from Alaska and Hawaii are a little less than two percent less likely to vote than a senator in Louisiana, which is about the mean distance from Washington D.C. *DISTANCE* and $DISTANCE^2$ are reported in thousands.

The significantly positive coefficient on *AGE* (p-values = .000 in column 1) and the significantly negative coefficient on AGE^2 (p-values = .000 in column 1) suggest that age relates to legislator quality (i.e., the presence of possible adverse selection issues among the cross section of legislators). That is to say, being an older Senator typically implies having not been weeded out of the Senatorial population on the basis of work habits. However, after a certain age, even the most well-intentioned Senator is more likely to develop limiting health problems and participate in fewer votes (e.g., Edward Kennedy in the years prior to his recent death). A senator right around the mean age of 63 is the most likely age to cast a vote. Ceteris paribus, they are about 92 percent likely to vote. From there, the probability of casting a vote declines in both directions; a senator age 80 and also age 40 are both about 83 percent likely to cast a vote. The oldest senator in the 110th Senate was Senator Robert Byrd, who, at 91 in 2008, was only 68 percent likely to vote, ceteris paribus. Yet once again, *AGE* and AGE^2 are not robust to the inclusion of senator random effects. An F-test was employed to test the joint significance between *AGE* and *DISTANCE* and the results are that the two variables are strongly significant with a chi-square of 43.1 (P-value=<0.0001).

LASTTERM appears to explain at least a portion of the variation of voting. Senators who are in their last term are statistically less likely to vote as this coefficient is marginally significant (P-value=<.10). Analyzing marginal effects suggest that senators in their last term are 1.3 percentage points less likely to vote than senators who are not in their last term. Rothenberg and Sanders (2000b) found that abstention, in their data, increased by 11 percentage points due to retiring legislators, while we find a much smaller effect. Still, considering the small probability of abstention, a 1.3 percentage point increase is substantial.

Lastly, weekend votes raise a Senator's probability of abstention (p-value <.0001 in columns 1 and 2), and a given senator is apparently more likely to abstain as Election Day (measured by *DAYSTILELECT*) draws near (p-values = .001, .000). Analyzing the marginal effects for *WEEKEND* in Table 4 The latter result suggests that there is an increasing opportunity cost of participating in Senate floor votes as

Election Day draws near. Marginal effects from Table 4 suggest that when an election is six months away, a candidate will vote with a 96 percent probability of casting a vote, ceteris paribus. However, when an election is only one month away, a candidate is only expected to vote with a probability of 16 percent. These results confirm that a candidate faces significant increases in opportunity costs as an election date approaches.

These latter variables further suggest that senators consider opportunity costs when deciding whether to participate in Senate floor votes. One interesting aspect about the results for weekend votes and the number of days until the Election Day are that unlike the majority of the previous controls, these two variables are indeed robust to the inclusion of senator random effects in column 2.

Tests of collinearity show that the majority of variable pairs feature a correlation of .0002 or less in absolute value terms. Further, no variable pair features strong or even moderately strong collinearity. The interaction term between *SENRACECL* and *SENCAND* is used to ascertain whether job security affects voting record differently in times of re-election. The coefficient on the variable *SENRACECL* is again significantly positive, but the coefficient on *SENRACECL*SENCAND* is significantly negative. Thus, those Senators who do not enjoy job security participate at a higher rate when they do not face re-election. However, the magnitudes of the coefficients indicate that such Senators participate at a lower rate when facing re-election. These results suggest that Senators without job security engage in resume building, relative to their peers, in the first five years of office and subsequently engage in heavy campaigning in re-election years. Factors such as job security and opportunity cost of foregone campaigning influence the voting decisions of Senators. An F-test was employed to test the joint significance between *SENRACECL* and *SENRACECL*SENCAND* and the results are that the two variables are strongly significant with a chi-square of 24 (P-value<0.0001).

Table 3 employs Senator fixed effects alongside various characteristics of a vote in column 1, and column 2 employs vote day fixed effects alongside various characteristics of a Senator.

Table 3: Logit Regressions with Vote Day and Senator Fixed Effects

	Voted	
	Senator FE	Vote Day FE
CLOSENESS	.982***	-
	(.001)	
ACU	.271**	-
	(.021)	
WEEKEND	-1.422***	-
	(.000)	
DAYSTILELECT	.002***	-
	(.000)	
SENCAND	-	.418***
		(.000)
PRESCAND	-	-1.753***
		(.000)
SENRACECL	-	100.767***
		(.000)
DISTANCE †	-	-.4***
		(.003)
DISTANCE^2*†*	-	.0001***
		(.000)
AGE	-	.209***
		(.000)
AGE^2	-	-.002***
		(.000)
LAST TERM	-	-.24**
		(.04)
Pseudo R-squared	.315	.140
Wald Chi-squared	2850.90***	1310.84***
	(.000)	(.000)

Note – N=21,498. † *DISTANCE* and *DISTANCE*^{2} are denoted in thousands of miles. P- values are given in parenthesis. *P<.10;**P<.05;***P<.01.

The explanatory power and overall significance of the fixed effects models is much greater, as suggested by the Pseudo-R2 value and Chi2 test, respectively. We conclude from these results that controlling for vote day and Senator is important in explaining the likelihood of a senator participating in a given floor vote. However, within the fixed effects models, the same general story is concluded from the data. The variables closeness, *ACU*, *DAYSTILELECT* and weekend maintain sign and significance in column 1. Further, the variables *SENCAND*, *PRESCAND*, *SENRACECL*, *DISTANCE*, *DISTANCE2*, *AGE*, and AGE2 maintain sign and significance in column 2. The variables *DISTANCE* and *DISTANCE2* move from marginally significant to highly statistically significant (p-value<.01) in the fixed effect models.

The marginal effects used to describe the impact of the regressors on voting are the product of the coefficient estimates from Table 2 and p*(1-p). They are reported for the average level of voting, p-.943. Marginal effects, of course, would be maximized when p=.5. Estimates are provided below.

Table 4 - Marginal Effects Estimation From Logit Regression

VOTED	Mean (p=.943)
CLOSENESS	0.04
ACU	0.012
ADA	-0.002
SENRACECL	0.01
SENCAND	0.022
*SENRACECL*SENCAND*	-0.03
PRESCAND	-0.1
DISTANCE	-0.023
$DISTANCE^2$	.00001
AGE	0.1
AGE^2	-.0001
WEEKEND	-0.057
DAYS UNTIL ELECTION	.0001
LAST TERM	-0.013

Note - Marginal effects are found by multiplying coefficient estimates from Table 2 by p*(1-p).

Conclusions

Senators are found to respond to the closeness of a vote in much the same way that Downs and Aldrich predict. Logistic regression models with senator fixed effects, vote day fixed effects, senator random effects, and cluster correlation robust error terms are employed to test the response of individual senators to factors hypothesized to affect the calculus of voting. Further, senator vote participation is influenced by such factors as age, distance from home state to Washington D.C., ideological importance of vote, days until election, job security of the senator, whether the senator faces re-election, and whether the senator is running for the presidency or vice presidency. Our finding that expected closeness of vote reduces the rate of vote abstention differs from the main finding of Rothenberg and Sanders (2000a). Given the differences of the respective legislative bodies that are examined, these results do not necessarily contradict one another. The Senate is a relatively small legislative body, in which the likelihood of being pivotal is much greater for a given party mix. The 110th Senate in particular was almost evenly divided between major parties—a fact that further increases the likelihood of an individual vote being pivotal. In summary, we find evidence consistent with a Downsian explanation of senate voting and abstention, whether the link between closeness and vote participation is due to the individual decisions of senators or to pressure from Senate leadership.

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[i] Note that we do not consider the Presidential candidate abstention in 2008 some sort of hypothesis, but rather, a fact to control for statistically, and perhaps to measure.

[ii] Results do not change when Stevens is included or excluded.

[iii] Retirements made this number slightly less than the expected one-third of the Senate.

[iv] Barrasso (R-WY) was up for re-election in 2008, but had never stood for election to the Senate before, as he was appointed by the Governor of Wyoming upon the death of the previous office holder. In this case, his actual vote margin in 2008 was used.

[v] Hawaii's road miles from DC to Honolulu are, for all practical purposes, infinite. We use the mileage to Juneau to proxy Honolulu's distance, as either of these is too far for driving.

[vi] Marginal effects for *Closeness* are calculated by (dProb/dCloseness) *(dCloseness /dyea or dnay)

[vii] We also tried the votes used for scoring Congressmen and Senators by the Americans for Democratic Action (*ADA*) and those noted as key votes by Congressional Quarterly, but these variables, while having the expected sign, were quite insignificant. The *ACU* coefficient , while reported here, is the result of admitted "variable shopping." However, it is not a surprising result that the Senate Leadership is able to get senators to the floor for more important votes.