Online Appendix to "Securing the Base: Electoral Competition under Variable Turnout"

A.1 – Characterization of Equilibria under Variable Turnout

In this appendix, I demonstrate that in my framework, (i) abstention due to alienation can cause divergent equilibria even when the ideology distribution is unimodal, and (ii) abstention due to indifference can lead to divergent equilibria. I will demonstrate this by constructing two examples.

In this general framework, equilibria for vote-maximizing candidates often fail to exist. This is of little practical consequence since equilibria for policy-motivated candidates exist. I assume that candidates care about both policy and about holding office. Note that allowing for policy-motivated candidates alone is not sufficient to generate divergent equilibria here because neither candidate has a non-policy advantage.

For the purpose of constructing examples of divergent equilibrium, I can allow v and z to be independent and the probability of voting to be independent of the non-policy factors. Let $f_v(v) = \frac{1}{6}1\{-3 \le v \le 3\}$ be the density of voter ideal points (i.e. ideology is uniformly distributed over [-3,3]) and $f_z(z) = \phi(z)$ be the density of non-policy factors.

In the first example, I allow for abstention due to alienation and set,

$$p(v, z_D, z_R; y_D, y_R) = \begin{cases} \frac{1}{4}, & v \in [-1,1] \\ \min\{1 - \min\{|y_D - v|, |y_R - v|\}, 0\}, & otherwise \end{cases}$$

This example has moderate voters who are not sensitive to candidate positioning in their turnout behavior. Turnout among voters at either extreme are sensitive to candidate positioning and they tend to abstain owing to alienation. I computed the unique equilibrium to be [-2,2],[1] which is a divergent equilibrium with the Democratic candidate positioning to the left of the Republican candidate.

In the second example,

[1] Characterizing equilibria analytically is complicated in such models, so to save the reader pages of algebra, I computed these equilibria numerically. By plotting the vote-margins of each candidate as a function of position of both candidates, I ensure that I capture all equilibria.

$$p(v; y_D, y_R, z_D, z_R) = \begin{cases} \frac{1}{2}, & v \geq 0 \\ \min\{\frac{1}{2} \| y_D - v | - | y_R - v \|, 1\}, & \textit{otherwise} \end{cases}$$

In this case, right-wing voters are insensitive to candidate positioning in their turnout decisions, while left-wing voters abstain due to indifference. The unique equilibrium has the candidates located at [-1.2,.2], which is once again an example of a divergent equilibrium.

A.2 – Weighting the Observations

Perhaps the most significant problem with the ANES data is that turnout is self-reported. Turnout among ANES respondents who participated in the post-election survey and answered the turnout question ranged from 74% to 81%. There are a number of possible reasons for the discrepancy between turnout in the sample and actual turnout- (a) the ANES post-election survey may be over-sampling voters relative to non-voters, (b) the respondents may lie or incorrectly recall voting, and (c) the act of participating in a political survey may motivate the respondent to vote (the 'instrumentation' problem).

The first concern is the least problematic since it can be corrected for using simple weighting. The second concern is potentially more troublesome. Katz (2001) reports that between 8% and 13% of respondents who claim to have voted did not in fact vote. Fortunately, the ANES provides validated voter turnout for the 1980, 1984, and 1988 surveys. My own calculations indicate that over-sampling of voters is the most important cause of the discrepancy between sample turnout and actual turnout.[2] Because of this, I use simple weights when drawing inferences, and use the validated turnout data for the years in which it is available.[3] The instrumentation problem potentially may bias inferences about the population, but since the magnitude of this effect is unknown, it cannot be corrected for. Nonetheless, Burden (2001) argues that the instrumentation effect is small.

It is important to ensure that voting behavior in the sample accurately reflects voting behavior in the population. The ANES over-samples voters relative to non-voters, and there is the potential that the ANES also over-samples Democratic voters over Republicans voters, or vice-

[2] In particular, a higher proportion of non-voters drop out of the post-election survey and the vast majority of respondents coded as missing values for self-reported turnout did not vote.

[3] As a robustness check, I replicated the results using the self-reported turnout data for 1980, 1984, and 1988, and found no differences in my substantial conclusions. Thus, using self-reported turnout should not be a problem in the other years I study.

versa. To correct for both potential problems, I use simple weighting.[4] For each observation in the sample, I construct a weight w_n such that

(i) The fraction of voters voting for any of the two (or three) major candidates in the sample equals the corresponding fraction in the population, estimated by dividing the number of votes for the two (or three) major candidates by the size of the voting-age population.

(ii) The fraction of voters voting for each of the two (or three) major candidates equals the fraction of voters voting for those candidates in the population.

(iii) Respondents displaying the same voting behavior have equal weights.

All quantities of interest are computed using these weights (e.g. the median voter's position reported is the weighted-median in the sample).

The weighting scheme has a substantial effect on voter turnout since (as I argued earlier) the ANES over-samples voters significantly. Contrarily, the ANES produces an accurate sample of the candidate vote shares. In most years, the candidates' vote shares in the sample were within one percentage point of their actual vote shares, and thus weighting has little effect here. Even when the ANES sample is only off by a fraction of a percentage point, weighting the observations makes interpreting the results easier.

A.3 – The Utility Formulation of Variable Turnout

In my paper, I employ the policy formulation of abstention due to alienation and indifference, which is used in the empirical work of Zipp (1985), Thurner and Eymann (2000), and Plane and Gershtenson (2004). An alternative specification is,

$$p(v, z_D, z_R, y_D, y_R)$$
$$= \Phi\left(\alpha + \beta Max\{u(y_D - v, z_D), u(y_R - v, z_R)\} + \gamma\left|u(y_D - v, z_D) - u(y_R - v, z_R)\right|\right)$$

This specification is referred to as the utility formulation of abstention due to alienation and indifference, and is used in the empirical work of Adams et al. (2005, 2006). My approach will focus on the policy formulation because it corresponds more closely to the arguments made by

[4] Note that I use weighting only in making inferences about the population, and not in the estimation procedure.

adherents of the Securing the Base strategy, but I consider the utility formulation as a robustness check.

I re-specify the turnout equation as follows,[5]

$$t_n = \delta' X_n + \beta_2 Max\{u_{n,D}, u_{n,R}\} + \gamma \mid u_{n,D} - u_{n,R} \mid + \varepsilon_n^V$$

Computing the choice probabilities, once again, involves integrating rectangles of the normal distribution. This means that we can again apply the GHK method to compute the likelihood function. The results are similar to what we found for the policy-based theory. Indifference is statistically significant in 1984, 1988, 2000, and 2004. In 1976, alienation is borderline insignificant (recall that it was borderline significant under the policy-based specification). In addition, I used Vuong's (1989) likelihood ratio test for non-nested models to see if one of the two models could be rejected. In all the years considered, the policy formulation could not be rejected in favor of the utility formulation (nor could the utility formulation be rejected in favor of the policy formulation).

A.4 – Full Estimation Results

In Tables 9 through 12, I present the full estimation results for the models estimated in the paper. In general, partisans, the old, and the rich are more likely to vote, and southerners are less likely to vote. The results for voter turnout correspond closely with Wolfinger and Rosenstone's (1980) study of turnout in the 1972 election, as well the more recent work on voter turnout (Lacy and Burden, 1999, 2001).

Party identification has the expected effect on voting behavior, with registered Democrats more likely to vote for the Democratic candidate and registered Republicans more likely to vote for the Republican candidate. Policy distance has a negative and highly significant effect in all the elections considered. Blacks are much less likely to vote for third party candidates, such as John Anderson and Ross Perot. The rest of the demographic variables do not have effects that are stable across elections.

One way to measure the fit of the model is to determine the fraction of outcomes that are correctly predicted by the model. These results are presented in Tables 1 and 2. The model correctly predicts the voter's turnout decision between 68.6% and 80.6% of the time. The voter's choice of candidate is correctly predicted between 81.9% and 91.0% of the time in the two

[5] I preformed this check only for the two-candidate elections.

candidate elections and between 71.2% and 83.2% of the time in the three candidate elections. This indicates that the model's fit is in line with other work in this area.[6]

A.5 - Additional References

[1] Burden, B. (2001). "Voter Turnout and the National Election Studies". *Political Analysis* 8 389:398.

[2] Katz, J. (2000). "Correcting For Survey Misreports Using Auxiliary Information". Working paper.

[3] Vuong, Quang H. (1989). "Likelihood Ratio Tests for Model Selection and Non-nested Hypotheses". *Econometrica* 57:307-335.

[6] Wolfinger and Rosenstone (1980) report correct predictions rates of 72.9% and 71.4% for two probit regressions they run for the 1972 election. Lacy and Burden (1999) correctly predict both turnout and candidate choice 50.6% of the time for the 1992 presidential election.

Table 9 – Turnout Equation (Two Candidate Elections)

	1972	1976	1984	1988	2000	2004
Constant	0.611** (0.148)	0.614* (0.246)	0.459* (0.210)	0.276 (0.235)	0.086 (0.184)	-0.003 (0.207)
Alienation	-0.086 (0.057)	-0.195** (0.054)	0.017 (0.042)	0.030 (0.056)	-0.028 (0.051)	0.016 (0.070)
Indifference	0.112** (0.033)	0.028 (0.039)	0.094** (0.026)	0.121** (0.034)	0.122** (0.031)	0.126** (0.042)
Female	0.004 (0.082)	0.025 (0.095)	0.063 (0.076)	0.069 (0.084)	0.128 (0.093)	0.104 (0.106)
Black	-0.117 (0.156)	0.212 (0.174)	-0.045 (0.128)	-0.018 (0.134)	0.119 (0.174)	0.129 (0.175)
South	-0.182* (0.090)	-0.182 (0.107)	-0.203* (0.084)	-0.352** (0.090)	-0.132 (0.096)	-0.260* (0.115)
Democratic Party Reg.	0.649** (0.153)	0.900** (0.108)	0.265** (0.090)	0.227* (0.100)	0.490** (0.111)	0.192 (0.130)
Republican Party Reg.	0.732** (0.127)	1.036** (0.135)	0.259** (0.097)	0.477** (0.104)	0.427** (0.119)	0.554** (0.132)
Age: <35	-	-	-	-	-	-
Age: 35-49	0.160 (0.103)	0.552** (0.128)	0.327** (0.094)	0.419** (0.102)	0.211 (0.117)	-0.119 (0.134)
Age: 50-64	0.208 (0.112)	0.481** (0.124)	0.546** (0.112)	0.763** (0.118)	0.436** (0.135)	0.192 (0.139)
Age: >=65	0.289 (0.151)	0.572** (0.164)	0.433** (0.125)	0.749** (0.131)	0.616** (0.152)	0.304 (0.178)
Degree: Graduate	-	-	-	-	-	-
Degree: Bachelor's	0.242 0.125)	0.059 (0.248)	0.146 (0.198)	-0.167 (0.218)	0.396** (0.121)	0.212 (0.137)
Degree: None	0.527* (0.237)	-0.266 (0.227)	-0.410* (0.173)	-0.696** (0.199)	0.360* (0.159)	0.356* (0.175)
Income: Quartile 1	-0.453** (0.136)	-0.770** (0.164)	-0.534** (0.125)	-0.551** (0.136)	-0.613** (0.147)	-0.353* (0.166)
Income: Quartile 2	-0.344** (0.126)	-0.332* (0.140)	-0.415** (0.109)	-0.351** (0.127)	-0.256 (0.131)	-0.009 (0.155)
Income: Quartile 3	-0.039 (0.115)	-0.184 (0.130)	-0.161 (0.107)	-0.137 (0.113)	-0.048 (0.139)	0.250 (0.146)
Income: Quartile 4	-	-	-	-	-	-
% Correctly Classified:						
Turnout	78.8%	80.1%	73.9%	68.6%	77.6%	76.3%
Candidate Choice	83.1%	81.9%	84.8%	85.0%	88.0%	91.0%
Both	65.6%	67.5%	64.2%	61.9%	69.6%	69.9%
N	1348	1098	1341	1101	1044	751

Table 10 – Turnout Equation (Three Candidate Elections)

	1980		1992		1996	
Constant	0.086	(0.284)	0.418**	(0.144)	-0.009	(0.179)
Alienation (Major Party Candidates)	-0.149	(0.104)	-0.012	(0.081)	-0.016	(0.109)
Alienation (All Candidates)	-0.133	(0.119)	0.025	(0.090)	-0.103	(0.113)
Indifference	0.115*	(0.050)	0.200**	(0.038)	0.159**	(0.037)
Female	-0.106	(0.121)	0.041	(0.083)	-0.013	(0.091)
Black	-0.121	(0.245)	0.162	(0.140)	-0.050	(0.152)
South	-0.043	(0.129)	-0.498**	(0.116)	0.027	(0.094)
Democratic Party Reg.	0.717**	(0.140)	0.294*	(0.114)	0.367**	(0.105)
Republican Party Reg.	0.985**	(0.159)	0.169	(0.133)	0.459**	(0.118)
Age: <35	-		-		-	
Age: 35-49	0.274	(0.150)	0.149	(0.100)	0.354*	(0.112)
Age: 50-64	0.393*	(0.165)	0.540**	(0.135)	0.313*	(0.129)
Age: >=65	0.536*	(0.219)	0.550**	(0.135)	0.845**	(0.139)
Degree: Graduate	-		-		-	
Degree: Bachelor's	0.557*	(0.262)	0.478**	(0.138)	0.392**	(0.127)
Degree: None	-0.230	(0.221)	0.575**	(0.158)	0.542**	(0.165)
Income: Quartile 1	-0.255	(0.214)	-0.761**	(0.135)	-0.665**	(0.145)
Income: Quartile 2	0.122	(0.165)	-0.421**	(0.121)	-0.299*	(0.135)
Income: Quartile 3	0.148	(0.158)	-0.082	(0.124)	0.013	(0.134)
Income: Quartile 4	-		-		-	
% Correctly Classified:						
Turnout	76.4%		80.6%		76.3%	
Candidate Choice	74.4%		71.2%		83.2%	
Both	61.6%		58.5%		65.1%	
N	607		1362		1073	

Table 11 – Candidate Choice Equation (2 Candidates)

	1972		1976		1984		1988		2000		2004	
Constant	-0.130	(0.167)	-0.754**	(0.230)	-0.266	(0.220)	0.020	(0.339)	-0.070	(0.326)	-0.249	(0.399)
Policy Distance	-0.425**	(0.034)	-0.447**	(0.041)	-0.209**	(0.018)	-0.395**	(0.039)	-0.327**	(0.033)	-0.412**	(0.049)
Female	0.069	(0.098)	-0.063	(0.117)	0.027	(0.115)	-0.079	(0.137)	0.053	(0.134)	-0.220	(0.168)
Black	1.526**	(0.244)	0.699*	(0.333)	0.749**	(0.270)	1.193**	(0.364)	0.866*	(0.357)	1.396**	(0.400)
South	-0.113	(0.117)	0.069	(0.185)	-0.364**	(0.138)	-0.273	(0.172)	-0.278	(0.145)	-0.259	(0.201)
Democratic Party Reg.	-0.731**	(0.176)	0.316*	(0.132)	1.051**	(0.127)	0.900**	(0.172)	1.285**	(0.217)	0.952**	(0.216)
Republican Party Reg.	0.151	(0.138)	-0.547**	(0.177)	-1.036**	(0.183)	-0.935**	(0.181)	-1.225**	(0.171)	-1.013**	(0.297)
Age: <35	-		-		-		-		-		-	
Age: 35-49	-0.135	(0.119)	0.283	(0.168)	-0.017	(0.144)	0.021	(0.210)	0.011	(0.187)	0.024	(0.235)
Age: 50-64	-0.143	(0.137)	0.608**	(0.183)	0.144	(0.162)	0.020	(0.237)	0.251	(0.210)	0.336	(0.230)
Age: >=65	0.040	(0.188)	0.250	(0.236)	-0.009	(0.192)	-0.055	(0.239)	-0.049	(0.228)	0.394	(0.302)
Degree: Graduate	-		-		-		-		-		-	
Degree: Bachelor's	-0.026	(0.144)	-0.062	(0.212)	-0.128	(0.215)	-0.279	(0.283)	0.356*	(0.177)	0.013	(0.235)
Degree: None	0.359	(0.209)	0.142	(0.187)	-0.332	(0.193)	0.074	(0.261)	0.178	(0.227)	0.020	(0.281)
Income: Quartile 1	-0.022	(0.174)	0.453*	(0.217)	0.464*	(0.209)	-0.051	(0.259)	0.416	(0.230)	0.246	(0.341)
Income: Quartile 2	0.048	(0.146)	0.448*	(0.181)	0.326*	(0.160)	0.452*	(0.206)	-0.038	(0.188)	0.002	(0.253)
Income: Quartile 3	0.029	(0.124)	0.207	(0.134)	-0.061	(0.147)	0.361*	(0.172)	0.350	(0.181)	0.131	(0.237)
Income: Quartile 4	-		-				-		-		-	
σ_{VD}	-0.465*	(0.190)	0.420**	(0.156)	-0.060	(0.163)	-0.292	(0.222)	-0.430	(0.316)	0.150	(0.557)
N	1348		1098		1341		1101		1044		751	

Table 12 – Candidate Choice Equation (3 Candidates)

	1980				1992				1996			
	Democrat		*Republican*		*Democrat*		*Republican*		*Democrat*		*Republican*	
Constant	-0.121	(0.346)	0.282	(0.276)	-0.086	(0.161)	0.051	(0.148)	0.695**	(0.225)	0.557**	(0.216)
Policy Distance	-0.372**	(0.066)			-0.233**	(0.040)			-0.180**	(0.042)		
Female	0.149	(0.176)	-0.009	(0.137)	0.353**	(0.094)	0.394**	(0.090)	0.196	(0.132)	0.109	(0.124)
Black	1.456**	(0.495)	-[7]		1.289**	(0.249)	0.891**	(0.254)	1.282**	(0.398)	0.592	(0.436)
South	0.050	(0.208)	0.157	(0.158)	0.441*	(0.181)	0.355*	(0.169)	-0.123	(0.136)	-0.095	(0.127)
Democratic Party Reg.	0.538**	(0.198)	0.124	(0.166)	0.226	(0.130)	-0.130	(0.147)	0.569**	(0.178)	0.234	(0.190)
Republican Party Reg.	-0.354	(0.319)	0.537*	(0.220)	-0.540**	(0.158)	-0.178	(0.120)	0.259	(0.183)	0.514**	(0.165)
Age: <35	-		-		-		-		-		-	
Age: 35-49	-0.087	(0.220)	-0.019	(0.176)	0.137	(0.120)	0.082	(0.111)	-0.009	(0.166)	0.019	(0.156)
Age: 50-64	0.289	(0.243)	0.109	(0.191)	0.233	(0.149)	0.105	(0.132)	0.518*	(0.249)	0.552*	(0.245)
Age: >=65	1.037**	(0.351)	1.257**	(0.324)	0.282	(0.164)	0.264	(0.154)	0.423	(0.225)	0.449*	(0.219)
Degree: Graduate	-		-		-		-		-		-	
Degree: Bachelor's	-0.511	(0.293)	-0.008	(0.224)	0.279*	(0.135)	0.306*	(0.126)	0.285	(0.183)	0.291	(0.169)
Degree: None	-0.289	(0.268)	-0.055	(0.204)	0.467**	(0.144)	0.424**	(0.136)	0.334	(0.240)	0.419	(0.235)
Income: Quartile 1	0.150	(0.343)	0.255	(0.313)	0.713**	(0.178)	0.373*	(0.168)	-0.104	(0.216)	-0.194	(0.203)
Income: Quartile 2	0.409	(0.235)	0.134	(0.176)	0.294*	(0.133)	0.096	(0.120)	-0.163	(0.200)	-0.183	(0.188)
Income: Quartile 3	0.409	(0.215)	0.257	(0.175)	0.204	(0.117)	0.168	(0.106)	0.083	(0.183)	0.078	(0.170)
Income: Quartile 4	-		-		-		-		-		-	
σ_{VD}	0.249	(0.233)			-0.273	(0.200)			-0.307	(0.183)		
σ_{VR}	-0.066	(0.175)			-0.249	(0.174)			-0.214	(0.177)		
σ_{R}	0.408**	(0.157)			0.707**	(0.144)			0.671**	(0.111)		
σ_{DR}	0.238	(0.173)			0.763**	(0.072)			0.766**	(0.071)		
N	607				1362				1073			

[7] In 1980, too few black respondents voted for Ronald Reagan to estimate this coefficient.