

The Impact of Social Conditioning (Internal Motivation) on the Probability of Voting

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This paper extends the well known rational interest voting (rational voter) model to include a composite measure to capture the residual effects of internal, sociological motives not previously accounted for in empirical studies of general election voting. These motives are referred to here as “social conditioning” or “internal motivation” and may to at least some extent reflect a sense of duty or sense of civic duty to vote, as well as a simple “habit” of voting. Estimations using CPS data from the 1984 Presidential elections suggest that previously unmeasured internal motives, which we capture in a variable called “Social Conditioning,” may exert a powerful influence on individual voting behavior. J.E.L Classification: D-72

1. Purpose of and Justification for This Study

The purpose of this study is to develop and test a probability model of *individual* voting behavior under the assumption that, while all potential voters are affected at the margin by the expected costs and benefits of voting, some potential voters will have higher voting probabilities that are independent of such considerations. Some voters are likely to be independently motivated by internal factors that may be the result of “social conditioning.” According to Tollison and Willett (1973), unless social conditioning is accounted for, empirical voting models will not be completely specified, and estimates of turnout on individual voting probabilities will be biased. Specifically, Tollison and Willett (1973, p. 61) argue that

Where social conditioning has affected individuals’ response patterns in a significant manner, for instance, by instilling in individuals a sense of duty to vote, then to be useful, explanatory models must take this into account, even if this comes at the cost of the disciplinary pureness of the resultant model.

To date, very little empirical work has attempted to measure how social conditioning might influence general election voting behavior. One exception is the recent study by

Matsusaka and Palda (1999). Although the primary focus of the Matsusaka and Palda (1999) study is the relative lack of explanatory power for empirical voting models, the effect of internal, unobserved factors on voting is briefly analyzed. A basic assumption of Matsusaka and Palda (1999) is that individuals who voted in a previous election have a higher probability of voting in a current election. Underlying this assumption is a corollary, namely, that consecutive-election voters are motivated by socially conditioned internal factors that are not controlled for in standard Downsian rational interest models. To correct this shortcoming, the Matsusaka and Palda (1999) model includes a dummy variable, whose value =1 if the respondent voted in the immediately previous election and = 0 otherwise. The variable is always very significant, suggesting that consecutive-election voters are different from those who are not consecutive-election voters.

The present study seeks to extend and refine the procedures introduced by Matsusaka and Palda (1999). We demonstrate that, while the exact processes cannot be easily identified, social conditioning appears to systematically affect voting among the respondents in our data sample. These results support the Tollison and Willett (1973) view that unless social conditioning is accounted for, flawed estimates of voter turnout and of individual voting probabilities will be the likely result.

Section 2 of this study provides a brief survey of the related empirical literature and establishes the basis for the variables used in our empirical analysis. Data limitations prevent incorporation of all previously used variables, but the most consistently statistically significant influences are accounted for. In section 3, we modify the rational voter model to include social conditioning. In section 4, we create a measure for social conditioning/internal motivations and incorporate this variable into a regression using the overall sample of those who were potential

voters in 1984. In this section, we stratify the data and demonstrate that white males who voted in the 1980 Presidential election had a much higher probability of voting in 1984 than those who did not vote in 1980. This is partly due to differences in mean values and in coefficient estimates between the two subgroups. Using the decomposition technique developed by Oaxaca (1973) and Blinder (1973) for use in wage and income discrimination studies, we isolate those portions of the total probability differential that are attributable to mean and coefficient differences. After this adjustment, a substantial probability differential remains, and we attribute this to differing social conditioning and differing internal voting motivations between those who did and did not vote in 1980. A summary of the results and their implications are presented in section 5.

2. A Review of Empirical Studies of Voting Behavior

As Tullock (2006, p. 41) observes, since the modern introduction of rational interest voting modes, i.e., the rational voter model (Downs, 1957; Black, 1958; Buchanan and Tullock, 1962, Tullock, 1967), general election voting has been extensively modeled and tested using a wide variety of variables, methodologies, and data. The common assumption among these studies is that politicians and constituents maximize a political utility function, which incorporates both the expected costs and expected benefits of voting. Empirical results are rather mixed, but the Downsian rational interest theory of voting is largely supported.

Early studies focused on the marginal effects of closeness, income, age, race, gender, concurrent elections (such as in the Senate or House of Representatives) and other factors on the probability that an individual will or will not vote or that average voter turnout will increase or decrease. Examples of important works include the study of individual voting by Ashenfelter

and Kelly (1975), cross-section studies of turnout by Tollison and Willett (1973) and Silberman and Durden (1975), and the excellent survey paper by Carroll Foster (1984), which summarizes the literature on empirical voting models up to that point.

More recent work has tried to bring the empirical analysis up to date (Durden and Gaynor, 1989) and to extend or refine the model. Refinements and extensions include new analyses of: (1) the effect of closeness on voter turnout (Kirchgassner and Meyer Zu Himmern, 1997; Grofman and Griffin, 1998; Cebula, 2001), with all three studies suggesting that closeness is more influential than previously indicated; (2) determination of how weather influences turnout, with Knack (1994) finding little or no influence and no particular “bad weather benefit” to Republicans; (3) the impact of motor voting laws, where Knack (1995), Knack and White (1998), and Franklin and Grier (1997), find strong evidence that states with such laws experience larger turnout in both voting and registration; (4) the historical impact of voting restrictions, with Heckelman (1995), finding that poll taxes and secret balloting were very effective in preventing targeted groups from voting; (5) reducing information costs, where Matsusaka (1995) presents an information-based theory which successfully incorporates the standard determinants from the Downs (1957) rational interest model. Matsusaka (1995) finds that if information shows the candidate to be what the voter thinks he (she) *should* be, then voter turnout increases. (6) In a later paper, Matsusaka and Palda (1999) demonstrate that empirical voting models generally have low explanatory power and suggest that better results may require the identification of additional cost and benefit variables; and (7) Copeland and Laband (2002) and Cebula (2004) find evidence of “expressive voting,” voting that allows voters to express their emotions on one or more issues or candidates.

3. Incorporation of the Effects of Social Conditioning on the Internal Motivation to Vote

Some years ago, Riker and Ordeshook (1968) argued that, since perceived marginal costs are high and expected marginal benefits relatively small, purely consumption and/or investment based economic motives will not sufficiently explain the act of voting. Distributed among a voting population, then, there must be a socially conditioned sense of duty or responsibility to vote or not vote (Tollison and Willett, 1973). A form of socially conditioned enhanced voting proclivity may exist, and it be more strongly felt by some potential voters than others. These internal, unobserved influences presumably affect individual voting choices in a way that is independent of the rational voter model as it typically interpreted.

The rational interest view (rational voter model) suggests that an individual will make the voting decision after evaluating a cost-benefit ratio such as:

$$P(\mathbf{EB})/C, \tag{1}$$

where P is the probability that one's vote will determine an election outcome, \mathbf{EB} is a vector of expected consumption and investment benefits to be forthcoming if the voter's candidate wins, and C is the opportunity cost of voting, which may be interpreted to include lost time and/or direct expenditure (gasoline, cab fare, lost wages). But this specification is clearly insufficient because the probability that one's vote will influence an outcome is extremely small even in very close elections. Moreover, any thinking voter will know this to be true.

We suggest that a more realistic expression of the cost-benefit ratio is

$$(P(\mathbf{EB})+\mathbf{IB})/C, \tag{2}$$

where \mathbf{IB} represents the *internal benefits* one obtains from the very act of voting. The magnitude of \mathbf{IB} is not dependent upon the success or failure of the voter's candidate, but is determined, for each potential voter, by the level of socially conditioned internal motivation for

that individual. Given that $(P(EB)+IB)/C$ provides a reasonable expression of the voting cost-benefit ratio, if IB is sufficiently large, *ceteris paribus*, then $P(EB)$ can be inconsequential and one will still vote and, alternatively, if IB is small, one will abstain from voting.

The underlying assumption in this reasoning is that if internal voting motivations differ, then potential voters can be stratified into two classes. The first class includes those who appear to have a strong inclination to vote, with instrumental and observable consumption-based factors held constant, and the second class includes those who appear not to possess this characteristic. Estimation results from each of the sub-samples may then be used to compute voting probabilities to determine whether there are significant differences. If there are, then further analysis can be performed to determine what portion of the total probability of voting differentials¹ may be attributed to differences in variable means, variable coefficients, and internal voting motivations. Given the existence of differences in internal motivations to vote, models which do not account for these motivations and the resulting internal benefits, will produce biased voting probabilities (Tollison and Willet, 1973) and arguably low levels of explanatory power (Matusaka and Palda, 1999).

In the next section of this study, we provide the empirical findings. In this analysis, we stratify the data, perform empirical analyses, and use the results to determine whether two classes of potential voters in fact *do* exist. If so, then the probability of voting between the two classes will differ and (using the Oaxaca-Blinder decomposition technique mentioned earlier) this differential can be separated into a portion due to mean differences and a portion due to differences among coefficient estimates. We expect that the decomposition procedure will leave a portion of the probability differential unexplained and that this difference is due to internal

¹. The procedure used is a variation of the technique developed in economics by Oaxaca (1973) and others.

voting motivations. Given that this is a reasonable assumption, we then create a measure for internal motivations and test this variable in a regression that employs the full data set.

4. Creation of the Social Conditioning/Internal Motivations Variable and Estimates

4a. Introduction

The nature of the social conditioning/internal motivations variable created for use in *full* sample regressions warrants some explanation. The Matsusaka and Palda (1999) study attempted to account for social conditioning (which they label “citizen duty”) by using a dummy variable with a value =1 if the respondent voted in the previous election and a value = 0 otherwise. The variable is always highly significant but, because the same or similar influences will have affected voting at the margin in both elections, this technique may produce inaccurate results (Kau and Rubin, 1979; Hird, 1993; Burkey and Durden, 1998).

The latter three studies faced a problem very similar to the one faced here. Each of the these works is concerned with accounting for differences in Congressional voting patterns among legislators, which were not captured by standard measures such as campaign contributions and constituent characteristics. Specifically, they require a measure of a given legislator’s “own ideology,” which can then be incorporated into models for estimating the determinants of Congressional voting on particular types of special interest legislation. To properly measure a Congressperson’s own ideology, they required an ideology variable that has been purged of general constituent and special interest influences. To create this variable, ratings from such ideology-based organizations as the Americans for Democratic Action and the League of Conservation Voters were regressed on a set of independent variables that were designed to capture the marginal effects of external influences on how a legislator is rated by the

various ideology-based groups. Given that external influences have been controlled for, residuals from these equations are assumed to measure the affect of a legislator's own internal ideological leanings. For example, suppose that a legislator's expected score by the League of Conservation Voters is low, but the actual score is relatively high. Then the corresponding residual will also be high and this condition is taken to be evidence of an internally held "own" ideological leaning. The internal ideology variables thusly created turned out to be highly useful in empirical regressions for all three studies, improving estimation and suggesting that legislator preferences *can* be isolated and approximated.

Creation of the legislators' own ideology variable is admittedly imperfect and subject to the criticism that what the variable actually measures cannot be known with certainty. What the previous studies did may be considered valid, however, because the existence of an ideological leaning on certain issues seems reasonable and because their use of the manufactured "own ideology" variable improved the specification of their models. The variable created and used here to measure the effects of internal motivations is subject to similar concerns but also may be valid for similar reasons. Specifically, it seems quite reasonable to believe that there is a class of voters that is motivated not only by perceived costs and benefits but also by internal, socially conditioned factors which have been recognized but never adequately accounted for in estimating models. As will be shown, use of the internal motivation variable created here is consistently significant and correctly signed and appears to improve model specification.

The procedure used in the Kau and Rubin (1979), Hird (1993) and Burkey and Durden (1998) studies provides a blueprint for constructing the measure of social conditioning/internal voting motivations to be used here. To adjust for heteroscedasticity that is present in a binary model a weighted OLS regression equation is estimated, with $Voted\ in\ 1980 = 1$ if the

respondent voted in 1980 and = 0 otherwise as the dependent variable (Ramanathan , 1993).

Independent variables are the same as those used in the stratified-data regressions, and are South, West, SMSA, Married, North Central, High School education, College 3 years, College 4 years or more, Government employment, home ownership (Home Owner) Income, Age and Unemployed. The residuals from the weighted regression are a measure of social conditioning.

The effects of independent variables on the probability of voting should be generally the same between the 1980 and 1984 presidential elections. For example if education increases, the effect is expected to be positive with respect to both. However, one potential drawback is that individuals in the sample will not have maintained exactly the same socioeconomic characteristics. Some respondents may have more education, higher income, become married or divorced, retired, and so forth. These problems cannot be entirely eliminated but, since the 1980-84 time period is relatively short, the probability of substantial bias would seem modest. We have attempted to lessen biases by restricting the data set to those individuals who are aged 25-65 in 1984 (21-61 in 1980). The sample thus includes for both years only primarily non-retired persons and persons with a 4 year college education potential.

4b. Formal Analysis

In this section, in Tables 2a, 2b, 3a and 3b, we present the results of four models. All four estimations are based on a sample of white males² who were potential voters in the 1984 presidential election, and are taken from the 1984 March supplement to the Current Population Survey (CPS). The explanatory variables adopted (see Table 1 for definitions of the explanatory

² Race and gender comparisons are avoided to save space and focus on the measurement of self-interest and sociological motivations.

variables) are similar to those employed in a great many other studies and have been justified in a range of published works (see the literature listed in the References of this study).

Table 2a is a weighted regression using the full sample and with the value of the dependent variable = 1 if the respondent voted in 1980 and = 0 otherwise. Although the OLS equation is robust with most of the independent variables significant, the adjusted r-square of .175 suggests that voting in 1980 is influenced by something other than the usual cost-benefit and sociological factors. This provides the residual values for what we call the “social conditioning” variable (explained earlier) and is the means by which, following Kau and Rubin (1979), Hird (1993), and Burkey and Durden (1998), we attempt to capture the effect of unmeasured internal influences on individual voting behavior. Table 2b is a regression of the full sample that includes the social conditioning variable. The dependent variable is dichotomous with a value = 1 if the respondent voted in 1984 a value = 0 otherwise. To obtain the results shown in Tables 3a and 3b, data are stratified into two sub-samples of white males who were potential voters in 1984. The first sub-sample (results shown in Table 3a) consists of white males who did not vote in 1980 and the second consists of those who did vote in 1980. This allows us to compare relative influences of socioeconomic conditions on the two groups to see whether they seem different and if so, attempt to measure the nature and extent of those differences in terms of relative probabilities of voting

Based on the Downsian (1957) rational interest model, our expectation is that the probability of voting in 1984 will be affected (at the margins) by perceived costs and benefits for all variations of the empirical model and that this will be demonstrated via the four regressions summarized. Further, our purpose is to provide evidence that strongly suggests that there is a measurable difference in the probability of voting in 1984 for those who are known to have

voted in 1980. This higher voting probability derives, we believe, at least partly, from socially conditioned, internally felt motivations.

We now discuss generally the results of regressions, focusing on the reliability of the social conditioning variable, differences in marginal influences of socioeconomic conditions between those who are consecutive voters and those who are not, and on measurement of the differences in the probability of voting between consecutive and non-consecutive voters.

There are no surprises (relative to other studies) in Tables 2a and 2b with respect to the influences of the most important commonly used independent variables. In both estimations, very high significance levels are associated with being a married homeowner and with increases in age, education and income levels. Government employment, residence in the north central region and home ownership very significantly increase the probability of voting, while unemployment, residence in the south and SMSA location all have negative effects.

The variable of primary interest here is the social condition/internal motivation variable. Table 2b shows this to be positive, as expected, and far beyond the 1% significance level. The variable has the highest t-value of all, 35.2. This result suggests, as hypothesized, that social conditioning is a very strong motivator for voting. Given this, it is clear that models are incomplete if they do not control for internal, “expressive” motives, that is motives such as social conditioning that not directly associated with costs and benefits as normally considered.

To determine whether means are statistically different between sub-samples (those who did not vote in 1980 compared to those who did), we conducted z-tests for the means. These results are provided in Tables 3a and 3b. The z tests suggest that respondents who voted in 1980 are more likely to live in non- south regions, to be married and own their own homes, and to have considerably more education, as compared with those who did not vote in 1980. They are

also on average older and more affluent. We now compute probabilities for each equation, with the expectation that there will be a significant difference between them. We then use the Oaxaca-Blinder decomposition technique to see how much of that differential is due to means, how much is due to coefficient differences and whether an unexplained portion remains which might be attributable to internal motivations not accounted for by costs and benefits as perceived by respondents and as proxied by the specified set of independent variables.

The computation of probabilities is accomplished using the following equation:

$$P_i = 1 / (1 + e^{-(b_0 + b_1X_1 + \dots + b_nX_k)}) \quad (3)$$

In equation (3), b_0 is the intercept, b_1, \dots, b_n are the coefficients, and x_1, \dots, x_n is the vector of independent variables. The respective voting probabilities are .693 for those who voted in 1980 and .306 for those who did not vote in 1980, a differential of .387. To determine the portion of this differential that is due to differences in coefficients, one addresses the following question: how much would the probability of voting in 1984 increase if the coefficients from the “did not vote in 1980” equation were replaced with coefficients from the “did vote in 1980” equation, other things (means) equal? The answer is that the probability estimate would increase from .306 to .353, so that the portion that is due to coefficient differences is given by $.353 - .306 = .047$.

To determine the portion that is due to differences in means, one asks: how much would the probability of voting in 1984 increase if the means from the “did not vote in 1980” equation were replaced with means from the “did vote in 1980 equation,” other things (coefficients) equal? The answer here is that the probability estimate would increase from .306 to .541, so that the portion that is due to means differentials is given by $.541 - .306 = .235$. Together, coefficient

and mean differences account for $.047 + .235 = .282$, or about 73% ($=.282/.387$), of the total probability differential, leaving an unexplained residual of .105 or 27% ($=.105/.387$).

These results imply that if the two subgroups were, in the aggregate, exactly alike with respect both to average characteristics and responses to marginal changes in explanatory variables, those who *did not vote in 1980* would have a mean voting probability of .588 while those who *did vote in 1980* would have a mean voting probability of .693. It seems logical and reasonable to then infer that the latter group is subject to socially conditioned internal motivations to vote and that this proclivity is demonstrated via consecutive-election voting. If so, then models that include consecutive and non-consecutive voters but do not account for socially conditioned internal voting motivations will produce seriously biased voting probability estimates.

5. Summary and Conclusions

This paper extends the well-known rational interest (rational voter) voting model to include a composite measure to capture the residual effects of internal, sociological motives not previously accounted for in empirical studies of general election voting. These motives are referred to here as “social conditioning” or “internal motivation” and may to at least some extent reflect a sense of duty or sense of civic duty to vote, as well as a simple “habit” of voting. Estimations using CPS data from the 1984 Presidential elections suggest that previously unmeasured internal motives, which we capture in a variable called “Social Conditioning,” seems to exert a powerful influence on individual voting behavior. When the data are stratified into sub-samples of those who exhibit the social conditioning motive by voting in the 1980 election (internal motivation) and those who do not vote in the 1980 election, the mean voting

probability for the former is .693 and for the latter is .306. Of this differential, .047 is due to differences in coefficients, and .235 is due to differences in variable means (where $.047 + .235 = .282$ or 73% of the entire differential). The balance of the differential is .105 (i.e., 27% of the entire differential), which reflects the impact of social conditioning (internal motivation). These results suggest that if social conditioning/habit persistence is not properly accounted for, then the probability of voting among those who *do* exhibit this characteristic will be *understated* and the probability of voting will be *overstated* among for those who do *not* exhibit social conditioning.

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Table 1: Independent Variables

1. Age: Categorical age groupings used in regressions: 25-31=1; 32-38=2; 39-45=3; 46-52=4; 53-59=5; 60-65=6.
2. Income: a categorical variable for family income levels: 1-14.
3. Education: Dummies=1, =0 otherwise for High School, College 1-3 years, College 4+ years.
4. Married: Dummy = 1, = 0 otherwise.
5. Own Home: Dummy = 1, = 0 otherwise, a measure of wealth.
6. Unemployed: Dummy = 1, = 0 otherwise.
7. Government: Dummy =1 if employed by government, = 0 otherwise.
8. SMSA: Dummy = 1 if residing in an SMSA, = 0 otherwise.
9. Region: Dummies: South=1, =0 otherwise; West=1, = 0 otherwise; North Central=1, =0 otherwise; reference=Northeast.
10. Social Conditioning: residuals from the weighted Voted in the 1980 regression equation, a measure of "social conditioning," i.e., internal motivation or habit persistence in voting

Table 2a: Determinants of Voting in the 1980 Presidential Elections Using a Weighted OLS Regression, with Dependent Variable = 1 if the Respondent Voted in 1980, =0 Otherwise			Table 2b: Determinants of Voting in the 1984 Presidential Elections Using Logit, with Dependent Variable =1 if the Respondent Voted in 1984, =0 Otherwise		
Variable	Coefficient	t-value	Variable	Coefficient	t-value
South	-.0911	-2.22	South	-.2171	-4.38
West	.0036	.08	West	.0134	.26
SMSA	-.1418	-4.68	SMSA	-.0596	-1.64
Married	.3442	8.98	Married	.2999	6.86
North Central	.2446	5.78	North Central	.2333	4.62
High School	.7412	15.22	High School	.8750	15.90
College 3	1.3249	21.03	College 3	1.5516	22.49
College 4	1.9586	27.40	College 4+	2.3287	29.16
Government	.5139	10.10	Government	.6660	10.91
Own Home	.4506	12.01	Own Home	.7788	14.71
Income	.0675	13.78	Income	.0715	12.31
Age	.3502	26.71	Age	.3384	21.99
Unemployed	-.1518	-2.20	Unemployed	-.3010	-3.54
Social Cond.	-	-	Social Cond.	.6646	35.20
Intercept	-2.5864	-14.93	Intercept	-2.9066	-16.28
N= 12374? Adjusted R-square=.175			df = 11564: % of Observations of the Dependent Variable Correctly Classified is 79.0%		

Table 3a: Logit Regression of the Sub-sample of White Males Who Did Not Vote in 1980: Dependent Variable = 1 if Respondent Voted in 1984, =0 Otherwise

Variable	Coefficient	t-value	Mean	SD	Z-test
South	-.08469	-1.15661	.28	.45	-3.80
West	.12030	1.52279	.24	.43	2.56
SMSA	.02925	.54952	.54	.50	-1.11
Married	.04005	.67809	.64	.48	5.93
North Central	.10283	1.32680	.23	.42	2.59
High School	.43080	3.81615	.35	.48	-8.45
College 3	.92549	5.50568	.20	.40	2.72
College 4+	1.60252	7.61245	.17	.38	22.28
Government	.29889	3.17339	.12	.32	16.88
Own Home	.19905	3.31576	.59	.49	9.28
Income	.03475	3.54626	6.03	3.85	12.90
Age	.04743	2.63652	3.73	1.62	9.54
Unemployed	-.05536	-.49209	.10	.31	-6.11
Intercept	-2.21419	-5.73043			

df=4698; % of Observations of the Dependent Variable Correctly Classified is 70.1%.

Table 3b: Logit Analysis of the Sub-sample of White Males Who voted in 1980: Dependent Variable = 1 if Respondent Voted in 1984, =0 Otherwise

Variable	Coefficient	t-value	Mean	SD	Z-test
South	-.25369	-2.86596	.25	.43	-3.80
West	-.05471	-.59320	.26	.44	2.56
SMSA	-.00599	-.09331	.53	.50	-1.11
Married	.27536	3.12229	.69	.46	5.93
North Central	.19281	2.14925	.25	.43	2.59
High School	.66913	6.10844	.28	.45	-8.46
College 3	1.04896	7.99868	.22	.41	2.72
College 4	1.56209	10.89546	.35	.48	22.28
Government	.61751	6.35099	.24	.42	16.88
Own Home	1.07387	9.17035	.67	.47	9.28
Income	.04909	4.78766	7.20	3.80	12.90
Age	.30601	10.76677	4.18	1.69	9.54
Unemployed	-.51616	-2.78906	.07	.26	-6.11
Intercept	-2.77478	-6.04209			

df=7661; % of Observations of the Dependent Variable Correctly Classified is 76.1%.