On the Costs, Utilities and Simple Joys of Voting

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A WIDELY ACCEPTED "picture" equation of the voting calculus, originated by Downs[1] is

$$R = PB - C$$

where R is reward; B is the perceived differential in benefits offered the voter by the two parties; P is the probability that his vote will bring about the favored party's victory; and C represents the costs incurred in the voting decision.

The correspondence of the Downsian equation to the putative decisional calculus of the prospective voter has been tested with a variety of methods. The data used are typically drawn from national election surveys. No two studies have operationalized the terms of the equation in the same way. Nevertheless, the calculus, with various modifications, has been shown to have predictive utility.[2] Debate centers on the most appropriate definitions and

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[1] Anthony Downs, *An Economic Theory of Democracy* (New York: Harper and Row, 1957).

[2] William H. Riker and Peter C. Ordeshook, "A Theory of the Calculus of Voting," *American Political Science Review* 62 (March, 1968), 25-41; Norman Frolich, Joe A. Oppenheimer, Jeffrey Smith and Oran R. Young, "A Test of Downsian Voter Rationality: 1964 Presidential Voting," *APSR* 72 (March, 1978), 178-197; William R. Shaffer, *Computer Simulation of Voting Behavior* (New York: Oxford University Press, 1972).

relative importance of the formula's various terms. It is the contention of this paper that voting costs have been treated unrealistically and their importance relative to the other factors unduly discounted.

The P, B and C components for each individual are, of course, impossible to calculate with much precision. However, studies which take the Downsian equation literally perform mathematical operations which assume the components of the formula to be measured in the same numeraire.[3] The assumption of cardinality appears unsupportable. Simpler and less problematic empirical tests of Downs' argument merely gauge differences in turnout frequencies between sub-groups of respondents in different ordinal or dichotomous categories of the terms of the calculus. Such tests rely only on ordinal comparisons. They determine the percentage of comparisons in which, with the remaining components of the calculus controlled, an increase in one component leads to an increase in voter turnout. This is the approach used by Riker and Ordeshook and the one to be followed here.

In the cross-tabulation that constitutes their empirical test, Riker and Ordeshook ignore the cost term and concentrate on subjective probabilities and benefits perceived by the voter. They heed Downs' suggestion that factors other than short-term utility calculations may comprise the benefits of voting and add a fourth term, "D" (for "citizen duty"), to the equation. But whereas Downs treated civic motivation as a long-term investment (in regime maintenance), Riker and Ordeshook view the performance of the voting act as a consumption good whose discrete utility may offset a very small PB quantity. Thus $R = PB + D - C$ will usually be positive. The larger this positive quantity the "more likely" the individual is to vote. When this formulation was tested in three elections (1952, 1956, 1960), increases in levels of B and D clearly encouraged turnout. For B (utility differential), holding Probability and Duty constant, one hundred percent of cell to cell comparisons (18/18) supported the hypothesis. For D, 93 percent (28/30) of comparisons were positive although average cell to cell differences in turnout were larger for comparisons on D than B. Last in importance was P. Perceptions of a close election increased turnout,

[3] See, for example, John A. Ferejohn and Morris P. Fiorina, "The Paradox of Non-Voting: A Decision-Theoretic Analysis," *American Political Science Review* 68 (September, 1974), 525-536.

within B and D categories, in 83 percent (15/18) of comparisons but cell to cell differences were extremely small.

It is clear that the original Downsian equation cannot account for turnout levels since, objectively, the PB quantity must be minute (the probability that one's vote will break a tie is infinitessimally small in presidential races). Thus the equation will be positive only if (1) C is negligible; (2) subjective probability is grossly inflated—i.e., the individual presumes a realistic chance to break a tie;[4] or (3) some other term is added which is not discounted by probability.[5] Riker and Ordeshook have made all three modifications. Rather than independently establishing a quantity for C and subtracting it from PB + D as Downs' formula suggests, costs were considered to be constant in each category of D and were ignored. The authors speculate, however, that the cost of voting is a subjective estimation on the part of the voter that may actually be a negative function of the size of D (p. 37). This notion of voting costs bears little or no relationship to the costs of information gathering and processing emphasized by Downs; nor does it acknowledge the physical costs of registering and getting to the polls on a workday—costs measured in time, money, and opportunities foregone.

Ferejohn and Fiorina offer not a new empirical test but an alternative mathematical logic. They find the rationality assumption of the Downsian equation threatened by the inclusion of a term ("D") representing "psychic" or "cathartic" satisfactions imbibed in the voting booth. They prefer to modify the core of the equation, substituting for a utility maximizing strategy one that would minimize maximum "regret" if the unfavored party won. In devising matrices of outcomes for alternative voting strategies, Ferejohn and Fiorina assume a common numeraire and set costs = $\leq 1/2$ B.

[4] Riker and Ordeshook reject as unreasonable methods of calculating P which depend on the chance that the voter will cast the last necessary vote needed for his preferred candidate's victory. It is reasonable to assume, as they do, that most voters greatly over-estimate their impact on elections and that P for the individual voter is a function of his inflated subjective estimate of his chance to break a tie, which depends on the likelihood of a close election.

[5] To avoid discounting D it must be assumed either that "citizen duty" satisfactions are consumed on the spot or that, if D is a long term investment in democracy (as Downs saw it), then democracy is saved if only one person votes. The latter is not so far-fetched in view of the extremely small turnout in many American elections (in a recent federally-mandated health board election in Texas, two people voted. As luck would have it, there was a tie vote. The winner was selected in this case by coin toss).

Thus C is a relative, derivative quantity for each voter and plays no independent role in the voting calculus.

Two recent empirical tests of the Downsian equation also treat costs in a problematic way. Shaffer shares Downs' concern with information costs but operationalizes these in a strange way for his empirical analysis. The more mass media used by the respondent, the higher the costs incurred, according to Shaffer. Mass media consumption may, however, comprise a part of one's job or constitute a form of recreation. Newspaper and magazine reading may in fact be more indicative of the amount of leisure time and contextual preparation (education) for evaluating information that is possessed by an individual. It says nothing of the amount of free political information some voters (especially those with higher incomes and education) receive via occupational or social contacts. Of course Shaffer's focus also ignores the physical costs of registration and voting. This weakness may be the major reason for the problems incurred by his model in predicting turnout rates.[6]

Frolich et al criticize Shaffer's cost measure but fail to provide a more plausible operationalization. Instead, finding no survey questions suitable for voting cost measures, they experiment with various assumptions about the distribution of costs. These become mathematical functions within B - D categories and have no specific referents. The authors, using a research design similar to that of Shaffer, generate their best results by assuming a log-normal cost distribution when correlating "vote value" (a combination of discounted party differential and a long-run participation value) with turnout.

To demonstrate that voting costs are neither negligible nor a relative appendage of benefits, nor independent of the peculiar objective circumstances of each individual voter, we have employed a method similar to that of Riker and Ordeshook. A straightforward cross-tabulation makes possible observation of increases in voter turnout as one moves from one level of a variable to another, while controlling for the others. Riker and Ordeshook cross-tabulated voting percentages by P, B, and D; we add a variable C to the analysis. Our operationalizations of the first three terms are somewhat different. Riker and Ordeshook treated both P and B as

[6] *Op Cit.* Chapter five. Shaffer found the predictive accuracy of his model much improved by removing the cost measure altogether (114). Given the dubious operationalization, one is reluctant to grant Shaffer that, "Information costs are not relevant to voter decision-making" (139).

dichotomous variables whose values depend on whether the respondent predicted a close presidential race and whether he cared much about the outcome. D was trichotomized into high, medium, and low scores on a "citizen duty" scale. In our test, P is similarly related to perceived election closeness but the survey question used refers to predictions of a "big win" or close race in the respondent's home state. This operationalization assumes that the presidential race is the major reason for voting[7] and that the respondent understands the working of the electoral college.

For the B term we have employed a summated utility differential index comprised of four survey items. These items measure how much the respondent cares which party wins the presidency, the strength of his party affiliation ("strong" identification with a major party received a score of two; all other degrees, including independent and apolitical, zero); the degree of his interest in the campaign (trichotomized) and the difference in his feeling thermometer ratings of the two candidates scaled down (by dividing by 20) to a range of 0 to 4.84. Only one of these items (interest) was positively correlated (.24) with educational level. Correlations hovered around zero for the other three items with educational level (an SES surrogate validator). The average intercorrelation of the four items was only .25. Item—total index score correlations were .41, .27, .36, and .35, indicating that the "care" item carries somewhat more weight in the index than the other three. Scores on the B index ranged from 0 to 11 (the mean was 4.9). Scores were grouped as follows (percentages of respondents in each category are indicated): 0-3 = low (33 percent); 4-6 = medium (38 percent); 7-11 = high (29 percent).

In constructing the cost index the inclusion of information about access to means of transportation (car ownership) and prior registration would have been useful. Unfortunately the relevant survey questions were not asked on both forms of the questionnaire and to avoid a too-restricted sample size they were not used. The final additive cost index was composed of four equally weighted items:[8]

[7] Of course, this need not be the case. Especially in 1972, many Americans probably troubled themselves to go to the polls more on behalf of favored state and local candidates and referenda than presidential candidates. The choice-prolific federal electoral system in the U.S. undoubtedly depresses the predictive accuracy of Downs simple, one-election-oriented model.

[8] The Cost index is a simple, additive one. It may be that there are interactive effects among the four items that comprise it (for example the combination of low in-

rural-non-rural residence (on the assumption that getting to the polls is more difficult in rural areas where distances may be large, weather and roads greater obstacles); educational level (grade school, high school, or beyond); income ($\leq$5,999 family income = 2; $6-9,999 = 1; $10,000 or above = 0); and length of residence in the community (less than 6 months scored 2; all other, 0). The assumption here is that new residents have greater information costs (at least for intra-state elections) and the burden of new registration. The education and income items are surrogates for information, time, and monetary costs associated with registration and voting.[9] Cost index scores ranged from zero to eight (mean = 2.4) and were grouped as follows: 0-1 = low (35.6 percent); 2-3 = medium (36.7 percent); 4-8 = high (26.8 percent).

The Survey Research Center ceased to ask the questions comprising the "citizen duty" index after 1964. For the operationalization of the "D" term, the statement, "A person should not vote if he doesn't care how the election turns out" (agree-disagree), was used as an indication of citizenship value (or other psycho-social satisfactions) attached to the voting act itself.

Using the 1972 SRC election survey, the four variables were cross-tabulated with reported voting for 1734 respondents who could be ranked on all. Results are presented in Table 1.

In terms of the propensity to vote within groups defined by the intersection of the other variables, the evidence in the table confirms the paramount importance of utility differential in the voting calculus. Voting costs and the non-instrumental satisfactions of electoral participation run a close race for second place. The perceived closeness of the election appears not to matter very much.

Turnout increases steadily as one moves vertically from low to high utility differential within each sub-category of probability, duty, and cost. Of 36 relevant comparisons (low-medium,

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come and rural residence might impose a greater burden on the prospective voter than any other combination). However, in the absence of a compelling theoretical justification for using a multiplicative index, it was decided to employ the more parsimonious model and assume that costs were simply additive. If there is a resultant loss of information, the effect is to render this a conservative test of the proposition that voting costs are a major cause of low turnout.

[9] Obviously, it would be preferable to use specific information indicating the likely costs for each individual of getting to the polls and making a voting decision. Such information is difficult or impossible to obtain from current survey data. Thus these simplifying surrogates, while problematic, are necessary.

TABLE 1

A TEST OF THE VOTING CALCULUS[a]

Utility Differential (B)	Cost: Low; Duty: Low; Probability: low	Cost: Low; Duty: Low; Probability: high	Cost: Low; Duty: High; Probability: low	Cost: Low; Duty: High; Probability: high	Cost: Medium; Duty: Low; Probability: low	Cost: Medium; Duty: Low; Probability: high	Cost: Medium; Duty: High; Probability: low	Cost: Medium; Duty: High; Probability: high	Cost: High; Duty: Low; Probability: low	Cost: High; Duty: Low; Probability: high	Cost: High; Duty: High; Probability: low	Cost: High; Duty: High; Probability: high
Low	73.9	61.4	73.7	80	46.7	61.4	82.9	59.6	43.6	32.3	50	66
	(46)	(44)	(38)	(70)	(45)	(44)	(35)	(52)	(39)	(31)	(18)	(50)
Medium	75.4	81.3	87.5	89.7	75.	65.5	89.1	85.3	53.3	62.5	72.4	69.8
	(61)	(48)	(80)	(78)	(68)	(58)	(55)	(75)	(30)	(32)	(29)	(43)
High	87.5	93	93.8	97.5	73.8	76.2	79	91.9	70.	84.6	83.9	82.2
	(48)	(43)	(65)	(79)	(42)	(42)	(62)	(62)	(20)	(26)	(31)	(45)

[a] The numbers in the cells are percentages of respondents in that cell who reported that they voted in 1972. The numbers in parentheses are *N*'s.

medium-high, low-high), thirty-four (94 percent) are in the predicted direction. The highest percentage voting is found, as predicted, in the high B, high P, high D, low Cost cell. The lowest is off by only one cell (instead of occurring in the high cost, low D, low probability, low B sub-category, it is found in the cell with the high probability parameter). But probability-turnout here, as in the Riker and Ordeshook study, is the weakest of the four relationships. Only 11/18 (61 percent) comparisons are in the predicted direction. Cost is roughly equal in strength to Citizen Duty. In both cases, eighty-three percent of comparisons (30/36 and 15/18) are in the predicted direction.

For the utility differential variable the average percentage increase in turnout from cell to cell is 11.8. It is highest (16.1 percent) in the high Cost block. Somewhat larger cell to cell differences occur with each increment in Duty than is the case with Costs. The average percentage increase in D is 12.4 with the greatest increments (up to 16.3 percent) in the medium division. Cost differences, averaging 9.4, are almost equal when comparing low with medium and medium with high blocks. Probability differences average only 1.7 percent, with some large reversals. The latter finding offers further confirmation of the weak role played by probability estimates in the voting calculus. Perhaps there *is* a bit of the "minimax regretter" in all of us.

Conclusion

This limited empirical test of the voting calculus equation indicates that the utility differential perceived between candidates is the most important stimulant of voter turnout. The costs of voting and feelings of "citizen duty" are of lesser and not greatly unequal weight, judging by the percentages of comparisons of voter turnout that support each hypothesized relationship. The utility differential factor appears to play its most important role as a stimulus to voting for citizens with high voting costs.

These results do not contradict those of Riker and Ordeshook as to the relative importance of utility differential, citizen duty and anticipation of a close election. They do, however, bring out of undue obscurity the additional, independent significance of voting costs. In previous tests of the voting calculus such costs have either been ignored, assumed into measures of the other variables, or assigned in some arbitrary manner. Downs argued persuasively that costs are

important determinants of voting and that they vary greatly from voter to voter. Time is a major component of the cost of voting—the time necessary to acquire and assess information, to register, to get to the polls. Access to leisure time is not an equally distributed resource. Self-employed or non-working persons and adults without children (or affluent enough to bear easily the cost of baby-sitters) can more easily accomplish the prerequisites of voting.[10] The intellectual demands of obtaining and processing political information are greater for less well-educated persons who possess only limited contextual knowledge relevant to the electoral process. Reference groups may lower information costs and provide voting cues. But lower income persons belong to fewer politically relevant groups and are less likely than the affluent to receive political information from social peers with similar values.

Thus previous empirical tests of the Downsian rational voter model have ignored or obscured a factor that Downs considered crucial to the voting calculus. The findings reported here demonstrate that high predictive power can be obtained with a model of the calculus which incorporates an independent cost term. Furthermore, its operationalization is derived from the circumstances of the individual voter and not an assigned mathematical function.

When voting costs were ignored in previous attempts to predict voter turnout, unsupported assumptions had to be made about their distribution. These assumptions may not be valid for the particular election analyzed or, if they are, need not hold in subsequent elections. The relationship between costs and the other terms of the calculus may well vary from election to election. It is plausible, for example, that low-income voters (for whom costs are presumably greater) were as likely as the affluent to perceive high or low stakes in the 1964 presidential election. In 1972, however, low-income citizens were probably less committed to a particular outcome than high-income citizens, given the antagonisms aroused by the "left" candidate. Summing the *N*'s in Table 1, 27 percent of respondents in the high cost block had high utility differentials, compared with 34 percent in the low cost block. There is little or no difference on D and P, however. Fifty-eight percent of both low and high cost respondents registered high citizen duty and the two groups were

[10] A recent study using 1972 data points up the dampening effect on voter turnout in lower SES ranges produced by short and irregular registration hours. Steven J. Rosenstone and Raymond E. Wolfinger, "The Effect of Registration Laws on Voter Turnout," *American Political Science Review* 72 (March, 1978) 22-45.

about equally likely to predict (quite wrongly, as it turned out) close elections in their states.[11]

In the elections analyzed by Riker and Ordeshook, it is possible that costs were relatively constant across values of utility differential but positively correlated with citizen duty (contrary to the authors' assumption). That possibility would explain why utility differential shows about the same degree of predictive power in their test and this one, but the strength of citizen duty declines as a motivation to vote when the cost term is included.

Obviously voters do not methodically work their way through a PB - C + D equation in order to decide whether to go to the polls on Tuesday. But it is probable that the difficulty of obtaining and evaluating information about the candidates (or parties) deters many voters. For those who do have strong preferences, whether as a result of assessing issue positions or possessing ingrained party loyalties, multiple hurdles to registration and voting probably keep many at home on election day. The data presented here suggest that some notion of costs should be included in models of the voting decision and that the operationalization of this variable should bear a realistic relationship to the physical and psychological hurdles that confront prospective voters.

[11] The careful reader will perceive that in both this and the Riker and Ordeshook study the actual methodology is not true to the wording of the hypothesis. The Downsian equation is a proposition about the behavior of individuals. We shift from a stark statement like, "If PB-C + D>0, the individual votes," to phrases like, "...is more likely to vote." From the ambiguous quality "more likely" we move to a test which compares *groups* of individuals. Individual "more likeliness" is tested by comparing percentages of groups tied on one or more properties at incremental steps of another. The nature of voting as a dependent variable provokes such perverse methodological shifts. One either does or doesn't vote. From zero inclination up to some threshold, one abstains. From just over the threshold to rabid partisanship one can vote only—once. Still it would be truer to the hypothesis to compare individuals rather than groups. This comparison could be done by wording the hypothesis in the following way: "If individuals X and Y are tied on properties P, B and D and X has more C, then if there is a difference in behavior (i.e. they are not both voters or both non-voters), Y will vote and X will abstain." If this individualized test were run on the data in table 1, 66 percent of almost 29,000 paired comparisons would support the hypothesis about the importance of C. This conclusion is not so impressive, of course, as the 83 percent of cell (group) comparisons reported above for juxtaposition with the Riker and Ordeshook study. The individual paired comparison method has the virtue of corresponding more closely to the simple verbal claims (usually in the propositional form, "If more Q, then more R") with which so many empirical analyses begin but, alas, do not end. This criticism applies as much (or more) to regression—correlation methods as to the simpler cross-tabulations highlighted here. How, for example, can "percent of variance explained" be expressed in terms of individual behavior?