

# *A Framework for Teaching the Rational Voter Model in Public Choice Courses*

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## Abstract

This study provides a simple interpretation and extension of the Rational Voter Model (RVM), which enables students in Public Choice classes to easily understand its application in a real-world context. In doing so, the presentation identifies key *aggregate*-level economic and non-economic determinants of the expected benefits from voting and further provides empirical findings for the period 1960-2000, data indicate that the voter participation rate has been directly/positively related to strong public approval *or* strong public disapproval of the incumbent President. This study also finds that the voter participation rate has been positively impacted by the opportunity to vote in Presidential elections, the Vietnam War, a “too slowly” growing real GDP, and “excessive” inflation. In addition, it is shown that the voter participation rate has been negatively impacted by the public’s general dissatisfaction with government.

## I. Introduction

Understanding the Rational Voter Model (RVM) is a cornerstone of a successful Public Choice course. Since the time Downs [1957] first introduced the RVM, there have followed numerous and varied studies to test and better understand the RVM or variants thereof in a variety of “real world” or “experimental” contexts (e.g., Riker and Ordeshook [1968], Brazel and Silberberg [1973], Ashenfelter and Kelly [1975], Wolfinger and Rosenstone [1980], Aldrich and Simon [1986], Cox and Munger [1989], Green and Shapiro [1994], Green and Shapiro [1994], Verba, Schlozman, and Brady [1995], Lapp [1999], Greene and Nikolaw [1999], Knack [1999], Putnam [2000], Copeland and LaBand [2002], Barreto, Seguran and Woods [2004], Cebula [2004], Borgers [2004], and Feddersen [2004]).

The student must be made aware of the complexity of voting and the ways in which consumer-voters “express” their votes. The complexity of traditional, i.e., ballot-box, voting behavior is perhaps best exemplified in the work by Buchanan and Tullock [1962]. Very recently, Copeland and LaBand [2002], and in a limited sense, Barreto, Segura, and Woods [2004] and Cebula [2004], have empirically investigated a theory of “expressive voting,” voting that fundamentally represents the *expression* of the voters’ *emotions* on one or more issues. To some extent, Copeland and Laband [2002] represent an effort to identify non-traditional and/or non-demographic variables that may explain voting behavior.

Concern over low voter participation rates in the U.S. is frequently expressed in the economics literature, the political science literature, the press, and elsewhere. As observed by Putnam [2000, p. 31], “With the singular exception of voting, American rates of political participation compare favorably with those in other democracies...” Putnam [2000, p. 31] proceeds to observe that “We are reminded each election year that fewer voters show up at the polls in America than in most other democracies...” Putnam [2000, p. 32] further observes that poor voter turnout exists “...despite the fact that the most commonly cited barrier to voting [“burdensome registration requirements’] has been substantially lowered.”

Clearly, since election outcomes can have very profound implications for societal and government resource allocations, the underlying “free-rider” problem in the voting/not voting decision process may generate a huge social/economic cost. The size of government outlays generally and the specific directions in which public expenditures are directed influence the well being of the society as a whole in both the short run and the long run. So, “What determines voter participation, or the lack of it, in the U.S.?” Once there is a better understanding of the

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answer(s) to this question, perhaps there will also be a better answer to the question “How can the voter participation rate in the U.S. be increased?” These are fundamental issues to the Public Choice student.

With the students provided this background, this study seeks to facilitate the students’ understanding of the voting process in general and the RVM in particular. First, within the RVM framework, it seeks to identify key aggregate-level economic and non-economic determinants of the expected benefits from voting and the *theoretical* impact thereof on the aggregate voter participation rate in the U.S. The study seeks to achieve this objective in a framework that is broader and hopefully more useful than most previous (usually micro-level) treatments of voter turnout. The focus in this study is on the perspective that the decision as to whether or not to vote may involve “Rational, self-interested individuals [who]...engage in behavior that is not motivated directly [simply] by a benefit-cost calculation...” (Copeland and LaBand [2002, p. 351]) involving the probability of whether their individual votes will determine an election outcome.

In particular, it is argued in this framework that a factor such as the public’s strong approval *or* strong disapproval of the incumbent President *per se*, may positively affect voter turnout. Indeed, it is argued in this study that this factor, along with such other factors as the excitement of the Presidential nomination, campaigning, and election process, an unpopular/controversial, protracted war such as the Vietnam War, the public’s *general* dissatisfaction with government, and the performance of the U.S. economy may combine to significantly affect voter turnout and hence the election of public officials whose decisions largely determine the allocation of public funds to the myriad forms of public outlay options that exist.

Alternatively stated, this study seeks to identify, within the RVM framework, the key determinants of the *aggregate* voter participation rate over time in a fashion that includes macro-level, time series variables that can potentially be viewed as affecting the *expected benefits from voting* by eligible voters as a whole. As another example, included in this study is a dissatisfaction index (DIS). The dissatisfaction index is constructed as an equally weighted average of three normalized indices reflecting responses to the University of Michigan’s Institute for Social Research (ISR) surveys concerning whether government officials can be trusted, whether they are dishonest, and whether government employees waste tax dollars. Values for this index lie within a range of -1.5, which corresponds to least dissatisfied, to +1.5, which corresponds to most dissatisfied. Arguably, the voter dissatisfaction index effectively allows for a measurement of voter attitudes toward government *in general*; therefore, it is hypothesized in this study for the “rational voter” that the greater the public’s *general* dissatisfaction with government, the greater the degree to which the public questions the expected gross benefits (value) of voting.

## II. The Empirical Framework: Expected Benefits from Voting

Paralleling in principle the basic RVM, although expressed in more general terms, the student is introduced to the idea that the probability that a given eligible voter will actually vote,  $PROBV$ , is positively related to the *expected* gross benefits (EGB) associated with voting, *ceteris paribus*, and negatively related to the *expected* gross costs (EGC) associated with voting, *ceteris paribus*. Thus, it follows that:

$$PROBV = f(EGB, EGC), f_{EGB} > 0, f_{EGC} < 0 \quad (1)$$

In interpreting EGB, this study argues that this concept requires a very broad, i.e., a very inclusive and encompassing, interpretation. For example, in *most* major elections, the marginal probability that one vote will make the difference is approximately zero. Nevertheless, certain circumstances or factors can potentially *increase* the expected benefits from voting. For example, when there is an issue (be it economic or non-economic in nature) or a candidate for elected office that an eligible voter feels particularly strongly about, voting may provide *subjective benefits* to the would-be voter because it can serve as an *emotional* release or outlet. That release may consist of expressing either approval or disapproval regarding the particular issue or candidate. Alternatively, certain circumstances can potentially *decrease* the expected benefits from voting. For instance, if a circumstance makes one feel disenfranchised from the government, e.g., if a would-be eligible voter *feels* that elected officials often act with limited or no genuine regard for voters’ wishes, the would-be voter *feels* a reduced expected benefit from voting and therefore shies away from making the effort to vote. Accordingly, this study explores, while remaining true in principle to the RVM, the perspective that the decision to vote or not vote can be impacted by a host of subjective, but nonetheless powerful, circumstances.

The formal analysis begins with the following question: “Does the voter participation rate increase when voters either *strongly approve* or *strongly disapprove* of the perceived job performance of the incumbent President?” To begin, it is observed that the public’s approval rating of the U.S. President has for decades been measured scientifically, adopting sound and comparable polling methodologies. The present study, due to certain data limitations explained below, covers the period 1960-2000. Over this 41 year period, the mean public approval rating

of the incumbent President was 48.13 out of a possible 100.0, with a standard deviation of 8.78. It is hypothesized in this study that the public has a greater incentive to vote when eligible voters are *especially pleased or especially displeased* in their perception of the incumbent President's job performance. To measure whether the public is *especially pleased or displeased* with the President, the binary variable PRESAPP/DIS is introduced. The variable PRESAPP/DIS = 1 during those years when the President's average public approval rating is *either very low*, defined in this study as the average Presidential approval rating *minus* at least one standard deviation (i.e., an approval rating of roughly 39 or less), *or very high*, defined here as the mean Presidential approval rating *plus* at least one standard deviation (i.e., an approval rating of roughly 57 or more). Thus, it is hypothesized that voting when one either strongly approves *or* strongly disapproves of the President provides a subjective benefit because the act of voting has facilitated the expression of strong *feelings*. Whereas an approval rating that is very high or very low (as defined in this study) is expected to *increase* voter participation, *ceteris paribus*, naturally an approval rating exceeding 39 but less than 57 is expected to be associated with greater voter apathy/indifference and hence a lower voter turnout, *ceteris paribus*.

Presidential elections seemingly offer an opportunity for individual eligible voters to vote for a very powerful and important policymaker (the President) in conjunction with voting for myriad other candidates for public office, as well as a potential host of referenda. Thus, during Presidential election years (as opposed to non-Presidential election years), a given trip to the voting booth provides at effectively zero marginal cost an increased expected gross benefit, the added opportunity/benefit of voting for a Presidential candidate, and hence it provides an increased incentive to vote. Moreover, the prospect of voting in such an important election also tends to invoke a high degree of *emotional* enthusiasm typically missing in most other election years (Copeland and Laband [2002]). Such enthusiasm can be generated by a variety of circumstances, including such considerations as: the large number of and diverse character of the Presidential primaries and the drama attendant thereto; the national party nominating conventions, complete with speculation over prospective Vice Presidential running mates; and controversial issues that arise during Presidential primaries and election campaigns (e.g., "right-to-life" proponents versus those advocating "choice" and abortion rights, campaign finance reform, and terrorism). Furthermore, the psychological rewards/benefits of fulfilling one's "civic duty" by voting may be even more pronounced during a Presidential election year. Consequently, it is hypothesized that the voter participation rate is increased by the expected benefits associated with a broad assortment of quantifiable and emotional issues generally associated with Presidential election years *per se, ceteris paribus*.

The U.S. military involvement in the Vietnam War clearly can be regarded as having generated intense emotional responses among the electorate. The controversy and emotions surrounding the Vietnam War were in part reflected in the following: numerous anti-war demonstrations (including flag burning and anti-draft demonstrations), disruptions of national political party conventions where Presidential candidates were being nominated, intense and almost constant "hawk" versus "dove" debates, and daily media coverage of POWs, MIAs, casualties, and wounded, amidst the chaos that came to symbolize the Vietnam War. Arguably, then, the Vietnam War created intense *emotional* responses, including an intensified effort to disengage from the Vietnam War by electing "new" candidates to key political offices. Indeed, the Nixon election victory over President Johnson in 1968 *might* even be interpreted in part as an emotional expression on behalf of just such a *change*. It is hypothesized here that the Vietnam War (VIETNAM) elicited interest levels and emotional reactions that raised voter interest and participation, *ceteris paribus*: voter participation would be expected to yield a benefit by providing a vehicle for *expressing one's feelings* on this major public issue.

As suggested above, it is hypothesized here that greater public *general* dissatisfaction (DIS) with government, as described in the Introduction, acts to discourage voting by eliciting a negative *emotional* response on the part of voters. More specifically, if would-be voters *feel* discouraged by their government because of negative perceptions as to whether government officials can be trusted to fulfill their responsibilities, whether they are dishonest, and whether government officials waste tax dollars, they very likely may react by adopting a negative attitude toward voting, presumably resulting from lower expected gross benefits from voting, so that voter participation would tend to decline, *ceteris paribus*.

Naturally, *economic issues* are likely to play a role in the expected benefits of voting and voter participation. Students of Public Choice presumably should be especially interested in this issue. Accordingly, it is also hypothesized in this study that the more poorly the economy is performing, e.g., the more slowly the economy is expanding (in real terms), the more interest the public (eligible voters) may have in the outcome of a major election. If indeed the economy is growing "too slowly," the public may vote so as to express a wish for change at some level(s) of government because of fear of the unemployment prospects associated with slow real GDP growth. Consequently, it is expected that if real GDP grows too slowly, the greater may be the expected potential benefits from voting (so as to precipitate change in order to implement more effective economic policies and/or to at least

“express displeasure” with the economy’s weak performance) and hence the greater the voter participation rate, *ceteris paribus*. In this study, any year in which the real GDP grows at an annual rate of less than two percent is treated as a year when real GDP is growing too slowly to prevent increases in the unemployment rate. In such years, the voter participation rate is expected to be higher, *ceteris paribus*.

Of course, the impact of economic issues could transcend merely the performance of real GDP. Inflation, especially if excessive, could also be of interest for voters. Inflation reduces the purchasing power of nominal income and unless nominal wages/salaries grow more rapidly than inflation, higher inflation reduces *real* income. Over the study period, nominal wages/salaries in the U.S. rose at an average annual rate of nearly five percent. Consequently, it is hypothesized here that when the inflation rate *exceeds five percent* annually, many eligible voters are more likely to vote in the hope of electing politicians who will pursue policies conducive to lower inflation, *ceteris paribus*.

### III. Empirical Model

Based upon the framework provided above, the empirical investigation of the determinants of the aggregate voter participation rate involves estimating the following:

$$VPR_t = a_0 + a_1 \text{PRESAPP/DIS}_t + a_2 \text{PRESDUM}_t + a_3 \text{VIETNAM}_t + a_4 \text{DIS}_t + a_5 \text{SLOWGR}_{t-1} + a_6 \text{INFLDUM}_{t-1} + u \quad (2)$$

where:

$VPR_t$  = the aggregate voter participation rate in the U.S. in year  $t$ , expressed as a percent;  $a_0$  = constant term;

$\text{PRESAPP/DIS}_t$  = a binary variable to measure strong public approval *or* strong public disapproval of the President in year  $t$ :  $\text{PRESAPP/DIS}_t = 1$  for those years in which the public’s average approval rating of the President was either very low (39 or less out of a possible 100.0) *or* very high (57 or more on the same scale) and  $\text{PRESAPP/DIS}_t = 0$  otherwise<sup>3</sup>;

$\text{PRESDUM}_t$  = binary variable for Presidential election years:  $\text{PRESDUM}_t = 1$  during Presidential election years and  $\text{PRESDUM}_t = 0$  otherwise;

$\text{VIETNAM}_t$  = a binary variable for the years during which the U.S. was militarily involved in the Vietnam War, such that  $\text{VIETNAM}_t = 1$  for those years and  $\text{VIETNAM}_t = 0$  otherwise;

$\text{DIS}_t$  = the level of the public’s dissatisfaction with government over year  $t$ , as measured by the dissatisfaction index, ranging from  $-1.5$  for least dissatisfied to  $+1.5$  for most dissatisfied;

$\text{SLOWGR}_{t-1}$  = a binary variable reflecting the annual percentage growth rate of real GDP in year  $t-1$ :  $\text{SLOWGR}_{t-1} = 1$  when the percentage growth rate of real GDP is less than two percent in year  $t-1$  and  $\text{SLOWGR}_{t-1} = 0$  when the annual percentage growth rate of real GDP is two percent or more in year  $t-1$ ;

<sup>4</sup> $\text{INFLDUM}_{t-1}$  = a binary variable indicating when the inflation rate of the CPI in year  $t-1$  exceeded five percent annually:  $\text{INFLDUM}_{t-1} = 1$  during such years and  $\text{INFLDUM}_{t-1} = 0$  otherwise;

$u$  = stochastic error term.

The study period runs from 1960 through 2000. The study period begins in 1960 because of data unavailability for the  $\text{DIS}_t^5$  variable prior to 1960. The  $VPR_t^6$  is measured only for even-numbered years. This is because even-

<sup>3</sup> The data for the Presidential approval rating were obtained from:

<http://www.geocities.com/americanpresidencynet/approval.htm>

<sup>4</sup> The data used to construct the binary variables  $\text{INFLDUM}$  and  $\text{SLOWGR}$  were obtained from the Council of Economic Advisors [2003, Tables B-64, B-3]

<sup>5</sup> The variable  $\text{DIS}$  is represented by the “dissatisfaction index,” obtained from the ISR at the University of Michigan: <http://www.isr.usmich.edu>

numbered years are when all members of the U.S. House of Representatives and one-third of the U.S. Senate are elected and, on alternate even-numbered years (“leap years”) when the President also is elected. The odd-numbered years typically do not correspond to the election of large numbers of “significant” officials.

The P-P (Phillips-Peron) unit root test reveals that the series for variable  $DIS_t$  is stationary only in first differences. Hence, in the estimation provided below, this variable is expressed in first differences. Given that  $VPR_t$  is contemporaneous with the dissatisfaction index,  $DIS_t$ , the possibility of simultaneity bias exists. To account for this possibility, the model in equation (2) was estimated using an instrumental variables (IV) technique, with the instrument being the two-year lag of the maximum marginal federal personal income tax rate,  $MAX_{t-2}$ .<sup>7</sup> On economic grounds, the choice of instrument was based on the finding in Cebula, Koch, and Paul (1998, p. 497) that “...the public’s dissatisfaction with government...was an increasing function of the federal personal income tax rate.” On technical grounds, the choice of instrument was based on the finding that  $DIS_t$  and  $MAX_{t-2}$  are highly correlated, whereas the two-period lagged instrument is not contemporaneous with the error terms in the system.

#### IV. Empirical Findings

Estimating equation (2) by IV, using the White (1980) heteroskedasticity correction, yields:

$$\begin{aligned}
 VPR_t = & 12.57 + 42.64 \text{ PRESAPP}/DIS_t + 11.15 \text{ PRESUM}_t + 6.1 \text{ VIETNAM}_t - 367.2 zDIS_t \\
 & \quad \quad \quad (+4.29) \quad \quad \quad (+7.78) \quad \quad \quad (+4.07) \quad \quad \quad (-3.81) \\
 & + 1.08 \text{ SLOWGR}_{t-1} + 5.57 \text{ INFLDUM}_{t-1} \\
 & \quad \quad \quad (+3.59) \quad \quad \quad (+3.48) \\
 \text{DW} = & 1.78, \text{ Rho} = 0.10 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad (3)
 \end{aligned}$$

(where: terms in parentheses are t-values and z is the first differences operator.)

In equation (3), the estimated coefficients on all six of the explanatory variables exhibit the expected signs and are statistically significant at the one percent level. The D-W and Rho statistics imply the absence of serial correlation problems. Thus, the student need not be concerned about spurious results.

The estimated coefficient on the PRESAPP/DIS variable is positive and significant at the one percent level. This finding suggests, as hypothesized in this study, that when the public strongly approves *or* strongly disapproves of the job performance of the incumbent President, they turn out in greater numbers than otherwise would be the case either to express that strong approval *or* that strong disapproval. Venting such *feelings* may generate increased benefits from voting.

The estimated coefficient on the PRESUM variable is positive and significant at the one percent level. This confirms the hypothesis that during Presidential election years voter participation rates increase because the outcome(s) of the election is (are) perceived as more important, so that the expected potential benefits from voting are enhanced while presumably reflecting emotions ranging from simple enthusiasm, perhaps almost reminiscent of “cheerleading” (Copeland and Laband [2002], Barreto, Segura, and Woods [2004], Cebula [2004]) on the one hand to emotional responses (involving arguably greater substance) to candidate positions, the candidates themselves, or party platforms on sensitive issues such as abortion, the environment, and affirmative action. Thus, possibly for multiple reasons, voting in Presidential election years may increase the expected value/benefit of voting.

The coefficient on the VIETNAM variable is positive, as expected, and significant at the one percent level. This finding is perhaps suggestive of a strong emotional pull by the “War” issue of voters to the polling booths, perhaps in the hope of creating a change in U.S. policy regarding military involvement in Vietnam, i.e., the possibility of ending U.S. involvement in the Vietnam War may have increased the expected benefit/value of voting. Thus, the documented unpopularity of and controversy over the Vietnam War appears to have led to increasing voter participation.

The coefficient on the variable DIS is negative, as expected, and significant at the one percent level, presumably suggesting that the more dissatisfied the voting-eligible population is in general with government and perceived government officials’ trustworthiness, honesty/dishonesty, and use of tax revenues, the more discouraged from participation in the voting process they become. This suggests a form of disappointment and a negative emotional

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<sup>6</sup> The VPR data were obtained from: [www.infoplease.com](http://www.infoplease.com)

<sup>7</sup> The  $MAX_{t-2}$  data were obtained from: [www.taxfoundation.org/prtopincometable.html](http://www.taxfoundation.org/prtopincometable.html)

reaction to even “bothering” to vote. Arguably, the DIS variable reflects disillusionment with government and a corresponding diminished expected gross benefit from voting.

The coefficient on the SLOWGR variable is positive and significant at the one percent level. This result suggests strongly that when the growth rate of real GDP is relatively slow (i.e., less than two percent per annum), eligible voters to some extent envision greater stakes (greater expected gross benefits) in acting to help ensure the election of politicians whose economic policies may more effectively stimulate economic growth and therefore job growth and employment security and/or use votes to *express displeasure* over slow real GDP growth.

Finally, the coefficient on the INFLDUM variable is positive and significant at the one percent level. This finding implies that when the annual inflation rate of the CPI exceeds five percent, eligible voters express their displeasure and concerns by more extensively exercising their right to vote. This increased voter turnout could serve either as a means to elect politicians who will pursue policies that more effectively contain inflation and/or as a means to *express* their displeasure over the economy’s poor inflation record.

## V. Conclusion

This study has endeavored to introduce the student of Public Choice to a broad and easily understood representation of the Rational Voter Model (RVM). It has also sought to identify for the student key aggregate-level determinants of the expected benefits from voting and hence key aggregate voter participation rate determinants in the U.S. Implicitly, it has also sought to improve the Public Choice student’s understanding of why the U.S. has often experienced low rates of voter participation.

In the empirical analysis, using aggregate time series covering the period 1960-2000, this study has obtained several significant results. First, the voter participation rate tends to be higher when the public either *strongly approves or strongly disapproves* of the job the President is perceived as doing while in office. Second, the opportunity to vote in a Presidential election appears to induce a greater voter turnout. Third, the greater the public’s dissatisfaction with government, i.e., (1) the greater the degree to which the public doubts that government officials can be trusted, (2) the more the public feels government officials are dishonest, and (3) the greater the extent to which the public feels that government employees waste tax dollars, the lower the voter participation rate. Fourth, the Vietnam War had a positive and significant impact on voter participation. This issue *may* have galvanized an otherwise potentially somewhat free-riding, somewhat apathetic public into a voter coalition with a greater propensity to vote in order to promote a specific agenda. This particular finding *may* be capable of being generalized into a rule of thumb by which it is possible to conjecture that any *protracted, unpopular war* might act to elicit greater voter turnout. Clearly, this factor could potentially imply marginally important election developments in the U.S. in terms of the War in Iraq. Finally, on the purely *economics* front, a slower growing real GDP, i.e., a performance of less than two percent annual growth, or an annual inflation rate that exceeds five percent, tends to raise the voter participation, perhaps because, respectively, such a slowly growing economy is perceived as posing a threat of rising unemployment and such a high inflation rate jeopardizes living standards.

In conclusion, the Rational Voter Model (RVM) and the issue of voter turnout can be quite easily understood when cast within the framework of the U.S. as an aggregate.

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