

Economic Retrospection and the Calculus of Voting

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Abstract

Despite the plethora of studies demonstrating that economic perceptions affect *how* a person votes, relatively little is known about how economic perceptions affect *whether* individuals will vote. Using the calculus of voting as our starting point, we develop a simple, but novel, hypothesis regarding the influence of sociotropic evaluations on voter turnout. We argue that this relationship will be curvilinear, with particularly negative and particularly positive evaluations of the economy increasing the likelihood of voting. Using an instrumental variables approach with individual-level data from eight recent U.S. presidential elections, we find that economic evaluations affect the decision to vote in the curvilinear manner hypothesized, but—counter to existing theory—only when there is not an incumbent president seeking reelection.

Key Words: turnout, economic voting, sociotropic evaluations, elections, endogeneity

Beginning with Kramer's (1971) pioneering work, a voluminous literature has arisen demonstrating the influence of economics on electoral choice (e.g., Gomez and Wilson 2001; Lewis-Beck and Paldam 2000; Markus 1988). A broad consensus exists that self-reported retrospective evaluations of the national economy are a robust predictor of individuals' votes (Lewis-Beck and Paldam 2000). Voters tend to be "sociotropic" in their outlook, giving the economic performance of the nation more weight in their voting decisions than their personal financial situation (Kinder and Kiewiet 1981). When the national economy is perceived as having improved, voters are more likely to vote for an incumbent candidate or party. When a worsening economy is perceived, voters reject the incumbent.

Yet, despite the plethora of studies demonstrating that economic perceptions affect *how* a person votes, we know relatively little about how sociotropic evaluations affect *whether* an individual will vote. Our lack of knowledge regarding the connection between economic evaluations and voter turnout is unfortunate, given the possibility that the state of the economy could affect electoral outcomes and accountability in two ways: by altering vote choices and mobilizing voters. Indeed, these alternative routes of economic influence suggest a more nuanced view of electoral accountability, telling us not only whether voters pass judgment for economic variability but also which voters sit in judgment. Compounding the issue, the sparse literature on the effect of the economy on voter turnout is beset by theoretical disagreement over the mechanism by which the phenomena are related, contradictory hypotheses, and a failure to demonstrate empirically any consistent causal relationship. Some scholars show a positive relationship between economic perceptions and voter turnout, while others find a negative one, and still others no relationship at all.

In this paper, we examine the causal relationship between individual-level perceptions of the economy and the decision to turn out to vote. Using the calculus of voting (Downs 1957; Riker and Ordeshook 1968) as our starting point, we develop a simple, yet—to our knowledge—novel, hypothesis regarding the influence of sociotropic evaluations on voter turnout. We argue that this relationship will be curvilinear, with particularly negative and particularly positive evaluations of the economy increasing the likelihood of voting. To the extent that voters are retrospective and sociotropic, the utility of voting ought to be at its highest when the incumbent party or candidate is most deserving of reward or punishment, all else equal. There is less incentive for a potential retrospective voter to turn out on election day if that voter believes the economy is neither improving nor worsening.

Using individual-level data from the American National Elections Studies, we examine the effect of sociotropic evaluations on individuals' decisions to vote in eight recent U.S. presidential elections. Our interest in the role of economic perceptions on voting decisions raises concern, however, over the potentially endogenous nature of the relationship between the variables. Voters' perceptions of economic conditions are likely endogenous with voting (e.g., Evans and Anderson 2006; Wlezien, Franklin, and Twiggs 1997). Thus, we employ an instrumental variables approach in which we leverage objective county-level economic indicators as instruments for individuals' subjective evaluations of the national economy. We find that the decision to vote is affected by these evaluations in the curvilinear manner hypothesized, but, counter to existing theory and evidence, voters are mobilized only when there is *not* an incumbent seeking reelection. Sociotropic evaluations have no discernable *causal* effect on turnout decisions when there is an incumbent president on the ballot. This pattern of results is robust and comports with recent findings by Hansford and Gomez (2011) in their

assessment of retrospective voting amongst those who do turn out. It thus appears that retrospective considerations influence both the decision to vote and for whom to vote when neither presidential candidate is the incumbent. These results also join a growing chorus of scholars who have shown that endogeneity may significantly cloud the relationship between economic evaluations and voting behavior. We conclude the paper with a discussion of the importance of this result for our understanding of economic voting, voter turnout, and the calculus of voting.

Economic Variables and Voter Turnout

Existing studies of how economic conditions affect voter participation are framed mainly by the work of Rosenstone (1982), who articulates and tests three competing hypotheses: that economically-stressed citizens turn out to vote so as to voice their grievances (“mobilization”), that economically-stressed citizens do not vote because they are too preoccupied to pay attention to politics (“withdrawal”), and that voters see no appreciable link between economic conditions and their political participation (“no effect”). Rosenstone finds weak evidence in support of the withdrawal hypothesis, a result corroborated by others drawing on data from both the U.S. and abroad (Caldeira, Patterson, and Markko 1985; Pacek 1994). Other research, however, demonstrates mobilization in response to poor economic circumstances (Schlozman and Verba 1979), though mobilization may be conditional on contextual or psychological factors (Arceneaux 2003; Radcliff 1992). The empirical picture is further muddled when one considers the ample evidence in support of the third hypothesis predicting that economic considerations have no effect on turnout decisions (Arcelus and Meltzer 1975; Fiorina 1978).

The failure of this literature to converge upon a clear result is likely due to three issues. Many of the studies on economic considerations and voter turnout were published before the

literature on economic voting sorted out the economic variables that best explain vote choice. A consensus now exists that retrospective sociotropic evaluations of the national economy are the strongest economic predictor of vote choice (see Lewis-Beck and Stegmaier 2000). Scholars examining economic influences on turnout typically have tested the effect of personal (or egocentric) economic circumstances (e.g., employment status or subjective “pocketbook evaluations”) on the decision to vote (e.g., Arceneaux 2003; Fiorina 1978; Rosenstone 1982).¹ Thus the first problem evident in much of the literature on economic influences on turnout is a theoretical inconsistency between these turnout models and widely-accepted economic models of vote choice. To the extent that intended vote choice ought to influence an individual’s decision to vote in the first place, this theoretical disjuncture is problematic.

The second problem with testing the effect of personal economic circumstances on voter turnout is that it is difficult to disentangle the countervailing influences of this pocketbook variable. Some argue that negative pocketbook evaluations, for instance, should mobilize voters. Yet this is at theoretical odds with evidence showing that lower socioeconomic status lowers one’s ability to bear or minimize the costs of voting (e.g., Leighley and Nagler 1992; Wolfinger and Rosenstone 1980). The potential for these countervailing effects makes it difficult to interpret the meaning of the null findings often seen in existing models. Does a null finding represent an unwillingness of citizens to turn out and vote in order to punish incumbents who have made them less well-off? Or, are mobilizing effects difficult to observe because worsening personal financial conditions simultaneously make it less feasible for voters to meet the cost of voting?

¹ Killian, Schoen, and Dusso (2008) are an exception here, as they examine the interaction between pocketbook and sociotropic evaluations.

Third, many of these studies rely on respondents' self-reported evaluations of their personal economic situations (e.g., Arceneaux 2003; Fiorina 1978; Killian, Schoen, and Dusso 2008; Rosenstone 1982). Recent studies suggest that subjective evaluations of the national economy are endogenous to vote choice (e.g., Evans and Anderson 2006; Pickup and Evans 2013). It is quite plausible that these evaluations are also endogenous to the decision to vote and thus estimates of the effect of these evaluations may be biased. In sum, there is no consistent empirical or theoretical picture of how or whether economic conditions affect voter turnout. As noted by one author, "[t]he most striking aspect of the literature may be its inconsistency" (Radcliff 1992, 444).

Incorporating Economic Retrospection into the Calculus of Voting

The calculus of voting focuses on the utility of voting and is often relied upon when developing models of voter turnout (Downs 1957; Riker and Ordeshook 1968). Studies of voting behavior point to the importance of sociotropic economic evaluations in determining the candidate or party for whom a voter casts a ballot. Yet, remarkably, the research on economics and turnout has done little to connect these two theoretical paradigms. This is an unfortunate oversight, especially since the calculus of voting tells us a great deal about how individuals incorporate the costs and benefits (both instrumental and expressive) of voting into the decisions of voters.²

In its full form, the Downsian (1957) calculus of voting expresses a voter's decision rule for voting as $R = PB - C + D$, where R is the net rewards from voting (the voter turns out if $R > 0$ and abstains if $R \leq 0$), P is the probability that one's marginal contribution to the election is

² Numerous studies provide strong support for the notion that turnout is affected by variation in the costs and benefits of voting (e.g., Jackman 1987; Rosenstone and Wolfinger 1978).

decisive, B is the individual's instrumental benefits if participation is successful (e.g., the voter's preferred candidate wins), C is the cost of voting (informational, opportunity, etc.), and D , added by Riker and Ordeshook (1968), is the expressive benefit one receives from voting. As argued above, research on economics and turnout has not disentangled the potentially countervailing influences of *personal* economic circumstances, which could arguable play into the B , C , and D terms. We focus instead on examining how *sociotropic* economic retrospection enters the turnout calculus. This allows us to treat the C term as fixed, since it is unaffected by evaluations of the state of the national economy. It also has the benefit of tightly linking our turnout argument with the current understanding of how economics factors into the choice of for whom to vote. We will, however, control for indicators of an individual's personal economic circumstances when estimating our turnout model.

Starting with Downs (1957), B has been conceptualized as the instrumental benefits the voter receives from his/her preferred candidate vis-à-vis another. In spatial parlance, B increases with the difference between the ideological distance between the voter and the closer candidate and the distance between the voter and the farther candidate. This conception of the instrumental benefits of voting is thus dependent upon the ideological locations of the candidates. D , on the other hand, contains the expressive benefits of voting. As developed by Riker and Ordeshook, D is understood as the expressive benefits received from performing one's civic duty. This conception of expressive benefits is likely to be fairly constant for a given voter over time or over elections. Alternative conceptions of expressive benefits are more dynamic and reflect a broader stream of psychological benefits that flow from one's attachment to candidates and/or parties. Fiorina (1976), for example, links expressive benefits to the affirmation of party allegiance. More generally, Hamlin and Jennings (2011, 655) assert that "behavior is expressive

to the extent that it reflects, wholly or partly, underlying concerns that derive directly from the meaning or symbolic significance of actions or choices themselves, rather than their indirect consequences or consumption benefits.”³

We argue that retrospective economic evaluations may affect both B and D for a given eligible voter in a given election. For a retrospective voter, the instrumental benefit derived from voting depends on the performance of the incumbent president/party. If the retrospective voter believes the national economy is in a poor state, then there is likely to be a greater instrumental benefit associated with voting out the incumbent president/party. Conversely, if the retrospective voter believes the economy is doing very well, then there likely is an instrumental benefit to keeping the incumbent president/party in office. There is little retrospective benefit, however, to voting for or against the incumbent when the state of the national economy is perceived by the voter as not having changed. While the importance of the B term in the calculus of voting is diminished greatly by the miniscule objective probability (P) of the voter casting a decisive vote, individuals can greatly overestimate the marginal contribution of their votes (Darmofal 2010).

Assuming a voter’s subjective estimate of P is distinguishable from zero, utility-maximizers are more likely to vote as their instrumental benefits increase. We argue that B will increase as a voter views the economy as becoming increasingly good or bad, thus increasing the probability of voting. A view of the economy as neither improving nor worsening is unlikely to affect B . Thus, the retrospective contribution to B implies a non-linear, concave-upward relationship between a voter’s perception of the economy and their likelihood of voting.

³ For a detailed treatment of the concept of expressive benefits, see Brennan and Lomasky (1993). For a discussion of the electoral implications of expressive voting, see Brennan and Hamlin (1998).

Retrospective economic evaluations also could affect the D term—the expressive benefits of voting. Specifically, expressive benefits also could result from expressing one’s endorsement or rejection of the government’s economic performance. Importantly, a retrospective economic component of D for a given voter will vary from election to election, while other components of D should not fluctuate much. Unlike notions of civic responsibility, for instance, the retrospective component could help explain why a particular voter turns out for some elections but not others.

As with instrumental benefits, expressive benefits associated with economic performance will be greatest when a voter perceives that the economy is very strong or very weak. In the former case, voting for the incumbent candidate/party allows the opportunity to express an endorsement of positive status quo. In the latter, the act of voting allows for an expression of disapproval of the status quo. Yet, if the voter perceives that the economy has neither improved nor worsened under the incumbent, there is very little expressive benefit, in terms of economic retrospection, to voting either for or against the incumbent. Thus, the retrospective contribution to D also suggests a non-linear, concave-upward relationship between a voter’s perception of the state the economy and her likelihood of turning out to vote.

In sum, to the extent that retrospective sociotropic evaluations influence vote choice, they should also influence the initial decision to turn out. These evaluations contribute to both the instrumental and expressive benefits accrued in the voting calculus, and as either type of benefit increases an eligible voter should become more likely to vote. The solid curve in Figure 1 depicts a retrospective voter’s theorized utility of voting. We expect the relationship between retrospective evaluations and the probability of voting to be nonlinear, with perceptions of either a notably poor or notably strong economy increasing the likelihood of voting. This curvilinear

relationship dictates that the slope/effect of retrospective evaluations will depend on the value of retrospective evaluations under consideration. For poor evaluations, the slope of the effect of these evaluations will be negative; for good evaluations, the slope will be positive.⁴

[FIGURE 1 HERE]

The argument we make is simple; to the extent that vote choice is based on economic sociotropic retrospection, the decision to vote in the first place will be affected in a curvilinear manner by this form of retrospection. We expect that individuals who view recent economic performance as being particularly good or bad will be more likely to vote. However, we must consider a minor complication to our simple hypothesis. Considerable evidence suggests that retrospective voting may be most prevalent in elections with an incumbent candidate (Miller and Wattenberg 1985; Nadeau and Lewis-Beck 2001; Norpoth 2002). If this is indeed the case, then

⁴ One might consider whether retrospective contributions to the B and D terms of the calculus of voting are symmetrical, meaning that voters are equally affected by both positive and negative economic evaluations. Symmetry is a reasonable assumption for the retrospective component of the instrumental benefits (B), but it is plausible that there is an asymmetry to a retrospective voter's expressive benefits (D). Voters may accrue greater expressive benefits from blaming incumbents for poor economic performance than from crediting them for positive economic gains. This type of asymmetric utility function would then mean that particularly poor evaluations should lead to a greater probability of voting than particularly positive evaluations, all else equal. Unfortunately, we cannot satisfactorily explore this possibility with our data due to the relative scarcity of highly positive evaluations of the economy. There is not sufficient information in the data to identify properly (with our IV model) any differences in the effect of very positive and very negative economic evaluations on turnout.

the contribution of retrospective evaluations to the calculus of voting should likewise be stronger when there is an incumbent seeking reelection. Yet, as noted by Wlezien, Franklin, and Twiggs (1997, 8), “[t]o the extent that voters associate economic performance with the incumbent government...a government they liked (disliked) might be deemed to be performing well (poorly), irrespective of real economic conditions.” Indeed, recent work by Hansford and Gomez (2011; see also Evans and Pickup 2010) suggests that greater levels of economic voting when an incumbent is on the ballot may be a product of endogeneity bias—suggesting that voters cannot easily separate their evaluations of the economy from their feelings toward the incumbent. Indeed, they find that once endogeneity is accounted for economic voting for incumbent candidates is effectively absent. To account for these possibilities, we will allow for a conditioning effect for the presence of an incumbent candidate when we estimate our turnout models; we will also attempt to account for possible endogeneity.

Data and Methods

We utilize individual-level data from the Cumulative Data File of the American National Election Study to test our hypothesis regarding the effect of sociotropic evaluations on voter turnout.⁵ While these data contain survey information for elections dating back to 1948, 1980 was the first year in which the retrospective sociotropic question was asked. Our study thus

⁵ The 1948-2008 ANES Cumulative Data File was produced and distributed by Stanford University and the University of Michigan, 2010. These materials are based on work supported by the National Science Foundation under Grant Nos.: SBR-9707741, SBR-9317631, SES-9209410, SES-9009379, SES-8808361, SES-8341310, SES-8207580, and SOC77-08885. Any opinions, findings and conclusions or recommendations expressed in this paper are those of the authors and do not necessarily reflect the views of the ANES or its funding organizations.

includes data from the 1980 through 2008 U.S. presidential elections.⁶ Our dependent variable, *Turnout*, is coded 1 if the respondent reported voting and 0 if abstaining.

Our main independent variable is *Sociotropic Evaluation*, which the ANES measures on a five-point scale ranging from the respondent reporting that the national economy is now much worse (-2) to much better (2). We hypothesize that *Sociotropic Evaluation* will have a curvilinear effect on the probability of voting, and the simplest way to test this hypothesis is to include the square of this variable in our model. As explained above, we allow the effect of *Sociotropic Evaluation*² to vary according to whether there is an incumbent president seeking reelection. To do so, we interact *Sociotropic Evaluation*² with *Incumbent*, which equals one if the incumbent president is on the ballot. We therefore want to estimate the following model (Model 1.1):

$$\Pr(\text{Turnout}) = f\{b_1\text{Sociotropic Evaluation}^2 + b_2(\text{Sociotropic Evaluation}^2 \times \text{Incumbent}) + Xb + e\},$$

in which Xb are control variables and their coefficients and e is the error term.⁷ We expect b_1 to be positive (suggesting a one-tailed hypothesis test), which would indicate that high and low

⁶ The respondent's county of residence is required for the creation of our instrument of the respondent's sociotropic evaluation but is only publicly available through 1996. For more recent elections, we obtained **county codes** after filing an ANES Restricted Data Access Application.

⁷ We use a quadratic specification here primarily because in its full form it allows greater flexibility in terms of capturing the relationship between *Sociotropic Evaluation* and *Turnout* than by simply folding *Sociotropic Evaluation*. For example, the full quadratic specification allows for the possibility of a linear relationship (i.e., a non-zero coefficient for *Sociotropic Evaluation* and a coefficient of zero for *Sociotropic Evaluation*²), which we do not hypothesize

values of *Sociotropic Evaluation* increase the probability of voting. Given the debate in the economic voting literature (e.g., Evans and Pickup 2010; Hansford and Gomez 2011; Nadeau and Lewis-Beck 2001; Norpoth 2002), we are relatively agnostic about whether economic perceptions matter more or less when there is a reelection-seeking incumbent. We thus do not have a clear expectation about b_2 (suggesting a two-tailed test), though we believe it is important to allow the effect of *Sociotropic Evaluation* to be conditioned by the presence of an incumbent candidate.

In a typical interaction specification, the *Incumbent* variable would be included on its own as a “constitutive term” in this model—as well as in the model presented below (see Brambor, Clark, and Golder 2006). This would allow the researcher to determine the marginal effect of Incumbent when *Sociotropic Evaluation*²—and thus its interaction—is equal to zero. However, because we include election-year fixed effects, the *Incumbent* variable is effectively deconstructed as election-year dummies since *Incumbent* only varies between elections and not within them. Put differently, the fixed effects are a direct affine transformation of (indeed, perfectly correlated with) *Incumbent*. In our data, the constitutive term, *Incumbent*, is thus implicitly:

$$\begin{aligned} \textit{Incumbent} &= 0 \text{ if Year} = 1988, 2000, 2008 \\ &= 1 \text{ if Year} = 1980, 1984, 1992, 1996, 2004 \end{aligned}$$

but exists as a rival hypothesis in the literature. Nonetheless, we assessed whether our inferences remain the same if we use a folded version of *Sociotropic Evaluation* in our IV model. The results are very similar, as might be expected. The estimate for the folded variable is positive and significant while its interaction with *Incumbent* is negative and significant.

This specification affords us maximum flexibility, allowing us to specify the interaction term properly, while maintaining the ability to account for election-year specific effects.⁸

While the above specification is based on our theoretical expectations regarding the curvilinear nature of the relationship between *Sociotropic Evaluation* and turnout, we also estimate a second, more general model (Model 1.2):

$$\text{Pr}(\text{Turnout}) = f\{b_1\text{Sociotropic Evaluation} + b_2\text{Sociotropic Evaluation}^2 + b_3(\text{Sociotropic Evaluation} \times \text{Incumbent}) + b_4(\text{Sociotropic Evaluation}^2 \times \text{Incumbent}) + Xb + e\},$$

These parameters allow for greater flexibility in the functional form of the relationship between *Sociotropic Evaluation* and *Turnout*. While our theory suggests no explicit expectations regarding b_1 and b_3 , estimating these coefficients allows for alternative hypotheses inferred from the extant literature on economics and turnout. The mobilization hypothesis, for instance, suggests that b_1 will be negative (the worse the respondent's perception of the economy, the more likely they are to vote), while the withdrawal hypothesis implies that b_1 should be positive (the worse the respondent's perception of the economy, the less likely they are to vote). It is not clear that either of these alternative hypotheses have implications for b_3 . Consequently, we will employ two-tailed tests for b_1 and b_3 .

⁸ An alternative approach is to split the data by the two different types of election; those with an incumbent candidate and those without. We can then estimate separate models for each set of elections, thus removing the need for the *Incumbent* interaction term altogether. As reported in the Supplemental Information (see Table S7), the inferences resulting from this approach are the same as those obtained with the pooled models with the interaction terms.

In keeping with traditional models of turnout (e.g., Verba and Nie 1972; Rosenstone and Hansen 1993; Wolfinger and Rosenstone 1980), we include the following individual-level control variables in both models: *Female*, *Black*, *Latino*, *Asian*, *Age*, *Age²*, *Education*, *Income*, *Unemployed*, *Married*, *Union Member*, *Religiosity*, *Strength of Party ID*, and *Party Contact*.⁹ We also include *Registration Closing Date*, which is known to affect turnout (Highton 2004).¹⁰ And as noted, to control for all election-specific considerations we include election fixed effects.¹¹

⁹ *Female*, *Black*, *Latino*, *Asian*, *Unemployed*, *Married*, *Union Member*, and *Party Contact* are dummy variables. *Age* is measured in years. *Education* is a seven-category ordinal scale of the respondents' self-reported educational attainment. *Income* is a five-point ordinal scale indicating the respondent's family income percentile at the time of the survey, where the categories are 0-16, 17-33, 34-67, 68-95, and 96-100. Roughly 7.5% of the income percentile data were missing and thus imputed—details are available from the authors. *Religiosity* is a composite of three ANES variables (VCF0130, VCF0130a, and VCF0131) that measure respondents' church attendance. The three variables, which ANES used at different points in time, were collapsed into four temporally-consistent categories. *Strength of Party ID* is generated by folding the seven-point party ID scale so that larger values represent stronger partisan identification.

¹⁰ *Registration Closing Date* is measured as the number of days between the last day to register to vote and Election Day.

¹¹ The set of control variables excludes psychological correlates of turnout, such as trust in government and external efficacy, because they may be endogenous to *Sociotropic Evaluation*, making their inclusion in the first-stage model problematic. In addition, the inclusion of the ANES trust and external efficacy variables causes a loss of more than 1,000 observations.

The main issue we confront when estimating our model of turnout is that it is likely that *Sociotropic Evaluation* cannot be considered exogenous to political behavior such as voting (Evans and Anderson 2006). Partisanship affects how people assess the state of the economy (Duch, Palmer, and Anderson 2000), for example, and strong partisans are likely to both report extreme economic evaluations and to vote.¹² It may also be the case that particularly expressive people are simultaneously more likely to report strong opinions about the economy and engage in political activity. Either source of endogeneity might bias our results in the direction of providing false support for our central hypothesis. Alternatively, it is possible that *Sociotropic Evaluation* is contaminated by a respondent's personal economic circumstances and any apparent affect associated with *Sociotropic Evaluation* might be driven by this contamination. Regardless of the precise source of the bias, to the extent that endogeneity is present we cannot properly make causal inferences about the effect of *Sociotropic Evaluation* on the vote decision.

It is for this reason that many recent studies of economic voting seek to identify instruments for sociotropic evaluations (e.g., Evans and Anderson 2006; Evans and Pickup 2010; Hansford and Gomez 2011; Lewis-Beck, Nadeau, and Elias 2008; Lewis-Beck, Stubager, and Nadeau 2013). We follow in this recent tradition and address the issue of endogeneity by using an instrumental variables (IV) approach. We thus need instruments for *Sociotropic Evaluation* that are exogenous to turnout decisions and successfully predict these evaluations. Changes in

¹² One might argue that, instead of using an instrument, the effect of *Sociotropic Evaluation* can be modeled as being conditional on the partisanship of the potential voter. This would be a viable option if 1) partisanship was the only source of endogeneity here and 2) we could perfectly measure partisanship. Unfortunately, we believe it is highly unlikely that the data meet either of these assumptions, let alone both.

objective local economic conditions should satisfy both of these criteria. Specifically, we use Δ *County Income* and Δ *County Unemployment* as instruments for an individual's *Sociotropic Evaluation*. The first of these two instruments is measured as the change in the inflation-adjusted median income in the respondent's county of residence since the last presidential election (in \$1,000s). The second is measured as the change in the unemployment rate in the respondent's home county since the last presidential election.¹³

Objective local economic conditions are a highly attractive instrument for individuals' perceptions of national economic conditions.¹⁴ First, because these variables measure changes in

¹³ County-level unemployment data were provided by the Bureau of Labor Statistics (BLS). The BLS provides "official" civilian labor force data from 1990 to 2009 online at the U.S. Census Bureau's "USA Counties" website (<http://censtats.census.gov/usa/usa.shtml>). Data from 1976 to 1989 are deemed "unofficial" because they were estimated under an alternative methodological strategy. These data are available for purchase from the BLS. Our analyses show no discernible structural break in the estimates due to BLS's methodological changes. County-level per capita personal income data were provided by the Bureau of Economic Analysis (<http://www.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrdn=5>).

¹⁴ Kiewiet and Rivers (1984, 384-385) acknowledge both the prospect of endogeneity and the role of objective local conditions in forming individuals' perceptions of the national economy:

"We suspect that cross-sectional variation in perceptions of national economic trends arises from many sources. Some of it will be partisan rationalization, but some of it may reflect different sources of information available to voters. For example, in depressed areas voters may perceive national conditions to be worse than do voters in booming areas"

objective conditions, they are clearly exogenous to an individual's decision to vote. Indeed, it is impractical to think that an individual's decision to turn out during election t caused objective economic changes in the individual's county of residence during the preceding period. Second, objective information has been shown to be a useful instrument for subjective perceptions (e.g. Ansolabehere and Jones 2010). Unlike survey respondents' self-reported perceptions of the national economy, Δ County Income and Δ County Unemployment are not contaminated by the individual's partisanship, perceptions of personal economic circumstances, or any other individual-level factor that might also correlate with voting. Yet it makes theoretical sense for voters to use local, tangible, and accessible economic information to make inferences about the state of the national economy. Cognitive psychology, for instance, points to the importance of the "availability heuristic," which is a tendency for people to use readily available information to make inferences about distant phenomena (see Nisbett and Ross 1980, 18-23). Books and Prysby (1991, 146) also make this argument and claim that assessments of the national economy are influenced by perceptions of the local economy. Finally, local economic conditions are an attractive instrument because they vary considerably for any given presidential election, offering leverage for explaining the variation in individual-level assessments of the national economy for a particular election. Objective national economic conditions, which are fixed at any point in time, cannot explain this variation.

Our county-level economic variables also meet the so-called exclusion restriction (e.g., Angrist, Imbens, and Rubin 1996). For an IV model to estimate the causal effect of an endogenous variable on a dependent variable, the instruments for the endogenous variable must only affect the dependent variable *through* the endogenous variable. Thus, we must ask whether Δ County Income and Δ County Unemployment have a direct effect on an individual's turnout

decision. We think this is theoretically and empirically unlikely. There is little evidence of meaningful state- or county-level retrospection in presidential elections, and the limited evidence that exists does not demonstrate that votes are directly influenced by local conditions (e.g., Holbrook 1991; Eisenberg and Ketcham 2004). It seems more plausible that local conditions are observed by voters and used to help form their evaluation of the national economy (our assumption). Changes in a county's economy may affect an individual's decision to vote by changing the individual's economic resources, but this indirect effect is accounted for by controlling for the individual's income and employment status in our turnout model. It is conceivable that campaign intensity covaries with local economic conditions. Fortunately, we are able to include a control variable, *Party Contact*, which should help account for the effect campaign intensity and mobilization on turnout.

Researchers often rely on one instrument per endogenous variable, in which case the assumption that instruments are independent of the error term cannot be tested. Fortunately, we have more instruments than we do endogenous variables in our most fully-specified IV model (Model 1.2), which allows us to conduct an over-identification test to assess formally the validity of our instruments. The Sargan-Hansen test is based on a regression of the instruments on the residuals of the main or second stage model in which the null hypothesis is that all instruments are uncorrelated with the error, meaning that the instruments are valid and satisfy the exclusion restriction. For our model, the test statistic leads us to fail to reject this null ($p = .427$), thus supporting the validity of our instruments.

Do local economic conditions actually predict subjective evaluations of the national economy? To test this, we regress *Sociotropic Evaluation* on Δ County Income and Δ County Unemployment, as well as all of the control variables and fixed effects we ultimately include in

our model of *Turnout* (see Table S3 in the Supplemental Information). The results reveal that both Δ *County Income* and Δ *County Unemployment* are statistically significant predictors of *Sociotropic Evaluation*. While there is no bright line test for determining if a set of instruments have sufficient explanatory power, the t -statistics for Δ *County Income* and Δ *County Unemployment* are an impressive 4.3 and -6.5, respectively. Moreover, an F -test of their joint significance yields an F -statistic of 41.5, well above the econometric literature's admittedly rough rule of thumb ($F \geq 10$) for a set of excluded instruments to yield consistent estimates in the main equation (see Staiger and Stock 1997).

For the above reasons, Δ *County Income* and Δ *County Unemployment* are useful instruments for estimating the effect of *Sociotropic Evaluation* on *Turnout*. We use these instruments, and all of the control variables and fixed effects listed above, to predict *Sociotropic Evaluation*. To instrument for *Sociotropic Evaluation*², we follow Wooldridge (2002, 237) and use the square of these predicted values as an instrument in the first-stage models.¹⁵ We also include the interaction between these squared predicted values and *Incumbent* as an instrument in the first-stage models. Further details on all first-stage models for Model 1.1 and 1.2 are presented in the Supplemental Information.

Results

Table 1 presents four sets of results. Models 1.1 and 1.2 are the instrumental variables (IV) models, while Models 1.3 and 1.4 simply use the “raw” and likely endogenous version of *Sociotropic Evaluation*. The latter models are included for purposes of comparison. Though probit is a standard estimator when modeling a binary choice variable such as *Turnout*, two stage

¹⁵ We cannot simply include these squared predicted values in the main equation. Instead, they must be treated as an instrument in the first stage models (Wooldridge 2002, 236-237).

least squares is the preferred estimator when dealing with limited endogenous variables and a binary dependent variable (Angrist 2001; Angrist and Pischke 2009, 198).¹⁶ Accordingly, we use two-stage least squares to estimate our IV models. The second stage model can thus be considered a linear probability model. To allow for comparison, Models 1.3 and 1.4 are estimated with OLS.¹⁷ Both models include the host of control variables discussed above, but for the purposes of clarity and simplicity the estimates for these variables are not presented here.¹⁸

[TABLE 1 HERE]

The positive and statistically significant estimate for *Sociotropic Evaluation*² in Models 1.1 and 1.2 support our central claim.¹⁹ Individuals who view the state of the national economy in either strongly positive or strongly negative terms have an increased likelihood of voting. Particularly positive or negative evaluations of the economy increase the probability of turning out, presumably because of the greater benefits associated with either voting against the party of the incumbent president when the economy is bad or voting for the party of the incumbent

¹⁶ Examples of this approach include Miguel, Satyanath, and Sergenti (2004) and Ansolabehere and Jones (2010).

¹⁷ The Supplemental Information presents Models 1.3 and 1.4 estimated by probit instead of OLS (see Table S6).

¹⁸ The estimates for the control variables are presented in the Supplemental Information (Tables S4 and S5).

¹⁹ Given our clear theoretical expectation for the direction of the estimates for *Sociotropic Evaluation*² we employ one-tailed significance tests for this pair of estimates. For all other coefficient estimates, we use two-tailed tests.

president when the economy is strong. When the economy is perceived as having neither improved nor declined there is less incentive for the retrospective voter to turn out. The “naive” results of Model 1.3 and 1.4 would lead us to a very different conclusion—that *Sociotropic Evaluation* has no effect, linear or curvilinear, on turnout (e.g., Arcelus and Meltzer 1975; Fiorina 1978).

Interestingly, the estimate for *Sociotropic Evaluation*² × *Incumbent* is negative and statistically significant in Model 1.1, suggesting that when there is an incumbent president seeking reelection the positive, significant effect of *Sociotropic Evaluation*² is no longer present.²⁰ Though the estimate for this interaction term is not quite significant in Model 1.2 ($p = .08$, two-tailed test), it is negative and the full conditional coefficient for *Sociotropic Evaluation*² when there is an incumbent candidate is statistically insignificant. Thus, when a president is seeking reelection we find no evidence of a retrospective component to the calculus of voting. This suggests that other factors aside from economic perceptions motivate turnout decisions when the incumbent is on the ballot.

Is it surprising that there would be a retrospective component to the calculus of voting when a member of the president’s party, but not the president himself, is on the ballot? On the one hand, this is a provocative result given the studies suggesting that retrospective voting is strongest when the president seeks reelection (e.g., Miller and Wattenberg 1985; Nadeau and Lewis-Beck 2001; Norpoth 2002). On the other hand, a recent study that is attentive to causal

²⁰ In Model 1.1, for example, the conditional coefficient or effect for *Sociotropic Evaluation*² is .374 when there is not an incumbent candidate and -.005 when there is an incumbent candidate. The former conditional coefficient is statistically significant while the latter is not. See Brambor, Clark, and Golder (2006) for a discussion of conditional coefficients and standard errors.

identification only finds individual-level retrospective voting in elections when the president is not a candidate. Hansford and Gomez (2011) use an IV approach to reevaluate the sociotropic economic retrospections and individual vote choice and find that the endogeneity between the two variables is strongest when incumbent presidents are on the ballot. This suggests that what appears to be economic voting when incumbents are on the ballot is likely a biased response—one clouded by the individual’s affinity or malice toward the incumbent—rather than an untainted retrospective judgment. A study by Evans and Pickup (2010) also provides evidence for the lack of sociotropic voting when there is an incumbent on the ballot. Our result here regarding retrospection and turnout is consistent with these studies and demonstrates the importance of accounting for endogeneity in models that link individuals’ economic retrospections and their voting behavior.²¹

To further illustrate our empirical results, Figure 2 presents predicted probabilities of voting as generated by Model 1.2. For ease of comparison, we center these predicted probabilities at .5.²² Two sets of probabilities are plotted—one for when there is an incumbent and one for when there is not. The predicted probability of voting does not vary much at all based on *Sociotropic Evaluation* when there is an incumbent candidate. Yet when there is no incumbent, the probability of voting is highest when the economy is perceived as much better or

²¹ An analysis of the effect of objective national economic conditions over a longer time span yields results that are consistent with our IV models, providing reassurance that this somewhat counterintuitive result is not driven by the eight elections under analysis in our IV models. See the Supplemental Information for this alternative research design and results (Table S8).

²² This has no implication for the substantive effect sizes displayed, since these predictions are generated with a 2SLS model instead of a probit model.

much worse. Again, given the centering of the probabilities, attention should be paid to the shape of these relationships and not the specific probabilities.

[FIGURE 2 HERE]

There is an important caveat here. While our instruments for *Sociotropic Evaluation* have a good deal of explanatory power, the first stage of our IV model does not produce predicted values that correspond with extreme values of *Sociotropic Evaluation*. This is particularly the case for the positive end of this scale, which is not surprising given that very few respondents indicate that the economy is “much better” (only four percent over the eight elections analyzed—see the distribution of predicted values in the lower panel of Figure 2). The predicted probabilities for these extreme values of *Sociotropic Evaluation* should thus be treated with a great deal of caution, as if they were out-of-sample projections.

Interestingly, the IV results reveal there is no support for either of the main hypotheses found in the extant literature. Perceptions of the state of the economy do not exert a linear influence, either negative (i.e., the mobilization hypothesis) or positive (i.e., the withdrawal hypothesis), on the likelihood of voting. In fact, a researcher who includes solely the linear version of *Sociotropic Evaluation* in a model of vote choice would conclude that there is no relationship between these economic evaluations and turnout.

A Reduced-Form Model with More Elections

To probe the robustness of our IV results, we now alter our strategy and instead of using an IV model relying on instrument-predicted variation in the endogenous variable we estimate a single-stage reduced-form model. Δ County Income and Δ County Income² are included directly in the main model predicting turnout (along with their interactions with *Incumbent Candidate*). This reduced-form model does not require the sociotropic question, which allows us to add two

more presidential elections to our data; 1972 and 1976.²³ Due to data availability limitations, we cannot include Δ County Unemployment in this model.²⁴

This approach allows the exogenous changes in county income to substitute directly (i.e., proxy) for the individuals' subjective evaluations of the national economy while increasing the number of elections (and observations). It is important to note that this model specification is not contradictory to our claim that local economic conditions satisfy the exclusion restriction in our IV models. Δ County Income can serve as a proxy for subjective evaluations in this reduced form model while not having an independent effect on turnout. We estimate this reduced form model with both OLS and probit and present the results in Table 2 (Models 2.1 and 2.2, respectively).

[TABLE 2 HERE]

The results for these reduced form models of turnout in 10 elections are consistent with those of the IV models. The estimate for Δ County Income² is positive and statistically significant, indicating that local economic conditions that are particularly poor or particularly good, implying particularly poor or good subjective evaluations of the national economy, increase the likelihood of turning out to vote. The estimate for Δ County Income² \times Incumbent is negative and significant, revealing that the above effect goes away (changes direction, in fact)

²³ We cannot add elections before 1972 because we lack the requisite county-level data. For the 1972 election, we use three-year change in a county's median income because the Bureau of Economic Analysis' county-level data begin in 1969.

²⁴ The BLS county-level data date back to 1976, which limits our use of Δ County Unemployment to 1980 onward.

when there is a reelection-seeking incumbent. Thus, despite a shift in approach and the addition of two more elections we see the same general pattern of results as we did above.

Conclusion

While a long line of studies confirm the importance of the state of the economy in determining vote choice, there is far less consensus on how economic considerations might affect voter turnout. We develop a theory of economic retrospection and turnout by combining contributions of two distinct paradigms, the calculus of voting and retrospective voting, and argue that to the extent that economic retrospection affects vote choice it should also influence the voter's initial decision to turn out. For retrospective voters, there are both instrumental and expressive benefits to voting when they believe that the economy is either doing very well—and thus they benefit from rewarding the incumbent party or candidate—or very poorly—in which case they benefit from punishing the incumbent party/candidate. We therefore predict a U-shaped relationship between perceptions of the state of the economy and the likelihood of voting.

Using an instrumental variables approach to address potential endogeneity in subjective assessments of the economy, we find empirical support for our hypothesis when the election does not directly involve an incumbent president. The probability of someone turning out to vote increases if their evaluation of the economy is either particularly positive or particularly negative. When the president is seeking reelection, there is no relationship between sociotropic evaluations and the decision to vote.

The main implication of this analysis is that for a subset of presidential elections economic retrospective considerations may influence individuals' decisions to vote, instead of just affecting the type of votes they cast. Moreover, these economic considerations matter in a different way than previously thought. Instead of having a relatively linear positive or negative

effect, as implied by the traditional withdrawal and mobilization hypotheses, economic evaluations have a curvilinear effect on voter turnout, whereby both particularly positive or negative evaluations lead to a greater probability of voting all else equal.

The presence of a retrospective influence on turnout in elections without an incumbent candidate has another interesting implication for the venerable calculus of voting. To the degree that retrospective influence is operating through the *D* term, it is different from other contributions to this part of the calculus. The *D* term, which consists of the expressive benefits of voting, is typically thought of as varying systematically across voters, as some voters value democracy (Downs 1957) or feel that voting is a civic duty (Riker and Ordeshook 1968) more than others. Expressive benefits also vary with individuals' psychological attachments to candidates, parties, and policies (e.g., Brennan and Lomasky 1993), all of which may be affected by retrospective evaluation. Thus, an economic retrospective component to the *D* term should vary from election to election for a given voter, which then allows this key component of the calculus of voting to provide greater leverage in explaining within-voter variation in turnout.

Finally, the fact that retrospective considerations only influence the decision to vote when there is not an incumbent candidate on the ballot is intriguing, counterintuitive, and at odds with much of the literature on retrospective voting (e.g., Miller and Wattenberg 1985; Nadeau and Lewis-Beck 2001; Norpoth 2002). This result is, however, entirely consistent with what Hansford and Gomez (2011) find when they try to pin down the causal relationship between perceptions of the economy and vote choice. They find evidence of an exogenous retrospective effect on vote choice, but only when there is not an incumbent candidate. The consistency of this result across both the decision to vote and the decision of for whom to vote suggests that

economic retrospection, at least in terms of perceptions of the state of the economy, is only operating *exogenously* when neither candidate is the incumbent president.

Why would this be? It could be the case that sociotropic evaluations are particularly endogenous when the president is seeking reelection. In this situation, voters project their overall affinity for or evaluation of the president onto their assessments of the state of the economy. Voters may have a more hardened, more information-saturated (and biased) view of the president, but a more malleable impression of a candidate from the president's party. This overall level of affect for the president may then dominate the vote calculus, leaving little room for any exogenous component of sociotropic evaluations to matter. In the absence of an incumbent on the ballot, voters may find genuine sociotropic evaluations to be a more important information shortcut by which to structure their calculus of voting. These conjectures, of course, are largely speculative at this point, but we hope that they provoke further work on the topic of retrospective economic evaluation and voter turnout. A full determination of why the causal effects of retrospective evaluations vary based on whether a reelection-seeking president is on the ballot is beyond the scope of this (or, likely, any one) paper.

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Table 1 The Effect of Subjective Sociotropic Evaluations on the Decision to Vote, 1980-2008

Independent Variables	Model 1.1	Model 1.2	Model 1.3	Model 1.4
Sociotropic Evaluation	---	.067 (.095)	---	.005 (.006)
Sociotropic Evaluation × Incumbent	---	-.002 (.127)	---	.001 (.008)
Sociotropic Evaluation ²	.374* (.147)	.220* (.131)	-.005 (.004)	-.004 (.004)
Sociotropic Evaluation ² × Incumbent	-.379† (.143)	-.236 (.136)	.009 (.005)	.009 (.005)
Sociotropic Evaluations Instrumented?	Yes	Yes	No	No
Estimator	IV 2SLS	IV 2SLS	OLS	OLS
<i>F</i> -test, instruments for Sociotropic Evaluation	---	24.4*	---	---
<i>F</i> -test, instruments for Sociotropic Evaluation × Incumbent	---	25.9*	---	---
<i>F</i> -test, instruments for Sociotropic Evaluation ²	34.3*	12.9*	---	---
<i>F</i> -test, instruments for Sociotropic Evaluation ² × Incumbent	59.8*	21.3*	---	---
<i>N</i>	12,842	12,842	12,842	12,842
Wald test, all $b = 0$	1,957*	2,807*	---	---
<i>F</i> -test, all $b = 0$	---	---	150.2*	138.8*

Note: * $p \leq .05$ (one-tailed, for hypothesized relationships). † $p \leq .05$ (two-tailed, for estimates for which we have no hypothesis). Control variables included in the model are *Female*, *Black*, *Latino*, *Asian*, *Age*, *Age²*, *Education*, *Income*, *Unemployed*, *Married*, *Union Member*, *Religiosity*, *Strength of Party ID*, *Party Contact*, and *Registration Closing Date*. Estimates for these variables are included in the Supplemental Information (Tables S4 and S5). First-stage model results for Models 1.1 and 1.2 are presented Tables S1 and S2, respectively. Election fixed effects are also included, which absorb the direct effect of an *Incumbent* on the ballot.

Table 2 Reduced-Form Models of Turnout, 1972-2008

Independent Variables	Model 2.1	Model 2.2
Δ County Income	-.021 [†] (.008)	-.070 [†] (.031)
Δ County Income ²	(3.5×10^{-6}) [*] (1.2×10^{-6})	(1.3×10^{-5}) [*] (5.3×10^{-6})
Δ County Income \times Incumbent	.020 [†] (.009)	.066 (.037)
Δ County Income ² \times Incumbent	(-7.6×10^{-6}) [†] (2.8×10^{-6})	(-3.3×10^{-5}) [†] (1.1×10^{-5})
Estimator	OLS	Probit
<i>N</i>	15,929	15,929
<i>F</i> -test, all $b = 0$	155 [*]	---
LR test, all $b = 0$	---	3,834 [*]

Note: * $p \leq .05$ (one-tailed, for hypothesized relationships). † $p \leq .05$ (two-tailed, for estimates for which we have no hypothesis). Control variables included in the model are *Female*, *Black*, *Latino*, *Asian*, *Age*, *Age*², *Education*, *Income*, *Unemployed*, *Married*, *Union Member*, *Religiosity*, *Strength of Party ID*, *Party Contact*, and *Registration Closing Date*. Estimates for these variables are included in the Supplemental Information (Table S9). Election fixed effects are also included, which absorb the direct effect of an *Incumbent* on the ballot.

Fig. 1 The Sociotropic Retrospective Voter's Utility of Voting.

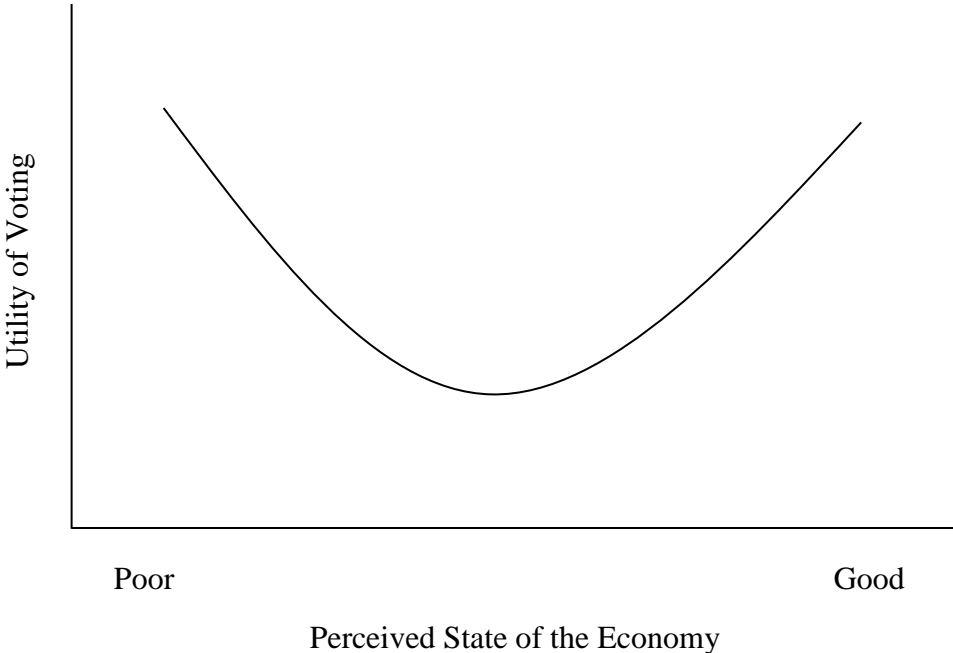
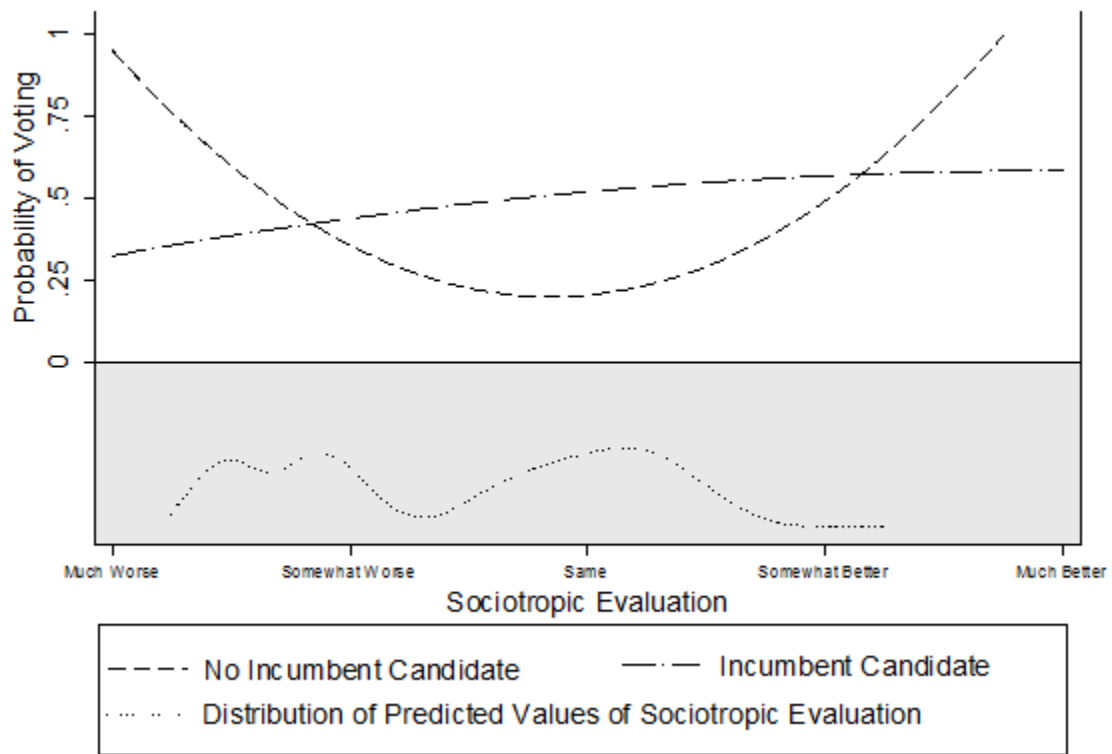


Fig. 2 Predicted Probability of Voting, Model 1.2



Note: The dotted line presents the distribution of predicted values of *Sociotropic Evaluation* (i.e., the instrumented values)