Political Economics
Voting - Part III[1]

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May 2007

[1] This script is based on the script by Marko Köthenbürger (shortened version).

1. Voter Turnout

- So far we have assumed that all individuals will participate in the election; thereby voting for the most preferred option irrespective of

  - the probability of being pivotal and

  - the costs associated with voting.

1.0 Paradox of Not Voting

- Taking both components into account, a rational voter i will participate in election e if $p_i^e B_i^e > C_i^e$ holds, where

  - p_i^e denotes the probability that voter $_i$'s vote is pivotal,

  - B_i^e is the benefit from implementing voter $_i$'s most preferred policy (relative to the opposing policy) and

  - C_i^e gives the cost of voting.

- Taking the stance that p_i^e is small, a rational voter will most likely abstain.

- The conclusion leads to a contradiction to what can be observed in the data.
  - Figures 4.1 and 4.2 show voter turnout in state elections in Germany which in contrast to the prediction is significant.
  - It is also correlated with socio-economic characteristics such as age; older people are more likely to vote relative to younger people.
- Downs (1957) names this contradiction the "Paradox of Not Voting".

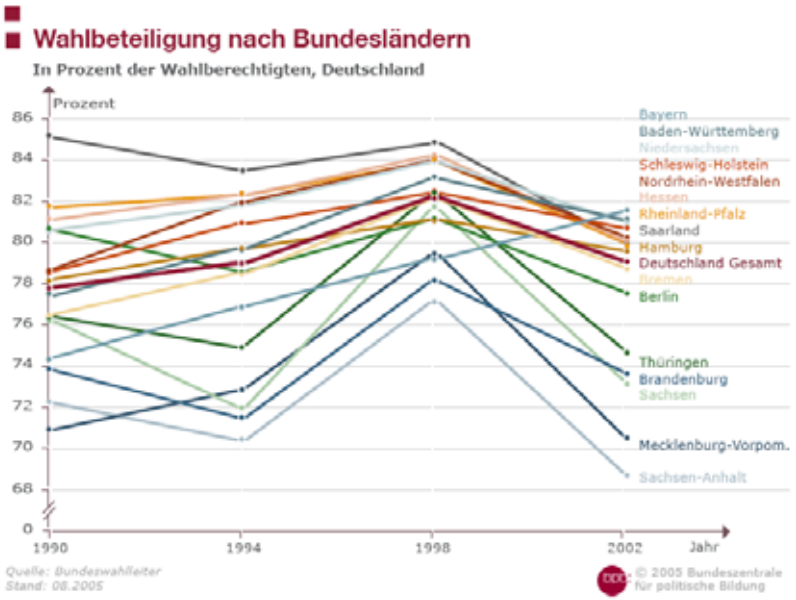

Figure 4.1: Turnout

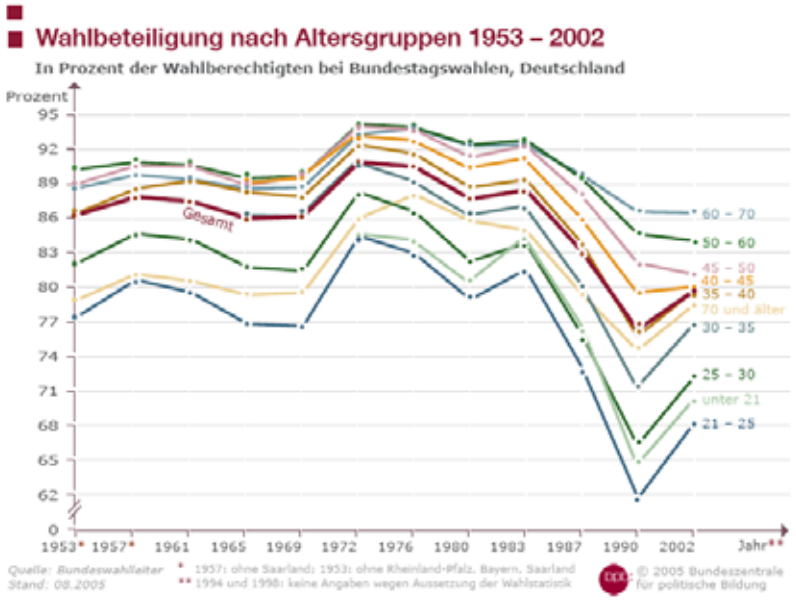

Figure 4.2: Turnout (age groups)

- One way to solve the paradox is to introduce a direct, consumption benefit of voting D_i^e which captures the benefit from being able to express one's opinion (different to the indirect benefit B_i^e)
- Independently of its microfoundation, this benefit is realized irrespective of whether the vote will influence the election outcome.
- This voting motive is called expressive voting in contrast to instrumental voting (voting as an instrument to implement the most preferred policy and thus to realize the benefit B_i^e).
- The explanatory power of the exogenously imposed benefit is rather limited as it yields no testable prediction. Thus, we are still left with the puzzle of explaining why people vote.

- The question has triggered a strand of literature which can be classified according to the component of the above presented reasoning which will be determined in a game-theoretic framework (rather than exogenously imposed).

  1. Pivotal voter models: they give a solid microfoundation of the probability of being pivotal p_i^e
  2. Ethical voting models: they endogenize the direct benefit component D_i^e
  3. Uncertain voter models: they endogenize the cost of voting C_i^e

1.1 Pivotal Voter Model

- Idea: probability of being pivotal may still be significant and thus the turnout may be positive.
- In particular, the model predicts that turnout is higher
  - the smaller the electorate, and
  - the more close the election outcome is.

- The subsequently presented formal reasoning is based on the review article by Merlo (2005). The complete model and derivation of the respective equations can be found in the article.

The assumption underlying the reasoning are:

A1 Assume there are two options on the table, `a` and `b`. This divides the electorate in two groups, either favoring `a` or `b`.

A2 Each individual knows his/her most preferred option, but can only infer that any other individual will favor `a` over `b` (or vice versa) with probability 0.5.

A3 The size of the electorate is `N` which is finite. Note, an infinite number of eligible voters would reduce p_i^e to 0

A4 The utility when the most preferred option wins is 1, while it is -1 when the other option wins.

A5 The cost of voting C_i^e is independently and uniformly distributed on the interval [0,1].

- The strategy to be chosen by each voter is the cut-off level C^*.All individuals with a cost below the level will participate in the election while the remaining individuals will abstain.

To characterize individual voting behavior, we proceed as follows:

- 1. We derive the probability that, for a given number of voters, individual i is pivotal.
  2. We determine the probability that s individuals indeed find it optimal to vote.
  3. Combining the two findings, we calculate the unconditional probability that individual i will be pivotal.
  4. Finally, we characterize the induced cut-off level C^*.

Empirical relevance ?

- The theory can in principle explain a positive turnout (when $C^* > 0$), but the questions is whether the predicted value conforms with values observed in the data.
- Coate et al. (2004) take the model to a test:
  - They use data on local referenda in the state of Texas.
  - In doing so, they divide the data set in referenda held in large and small jurisdicitons and estimate voting turnout for the subsample of small jurisdictions (for which the model is most suited).
  - The result is that turnout can be quite well predicted - see figure 4.3.
  - However, the model yields an upward bias in the predicted closeness of the election outcome as becomes evident in figure 4.4 (see script).

Figure 1: Figure 4.3: Predicted versus actual turnout

Eligible voters n	N. of obs.	Data	Pivotal-voter model
$n < 247$	48	0.62	0.65
$247 < n < 434$	48	0.55	0.51
$434 < n < 900$	48	0.43	0.40
All within-sample ($n < 900$)	144	0.54	0.52

Table 4: Average turnout as a percentage of eligible voters: model vs. data

1.2 Ethical Voter Model

- Idea: Elections typically divide the electorate in two groups (supporters and opposers) which triggers a kind of contest between the two groups.
  - Members of both groups may thus base their voting decision on what they consider best for promoting the success of their group; i.e. they want to do their part to help their group win.
  - They are inclined to follow a voting rule that, provided everybody adheres to it, maximizes the chance that the group wins.
  - Group solidarity may be due to a common ethnic identity or people feel similarly strongly about the political issues involved (e.g. abortion policy).

To formally illustrate this, we present a simple model based on Merlo (2005).

The assumptions are the same as for the pivotal voter model except of:

A2' The fraction of the population which supports option a is μ which is uniformly distributed on [0,1].

A3' There is a continuum of individuals. The size of the population is normalized at 1. This excludes pivotal individuals (no instrumental voting).

- The cut-off levels for group a and b are denoted by C_a^* and C_b^*. They are chosen such as to maximize the overall expected utility of the group members.
- For a given fraction of individuals in favor of a, group a wins if the number of supporters with a cost below C_a^* (being equal to C_a^*) times the fraction of supporters μ exceeds the corresponding value for the other group; i.e.

  $\mu C_a^* > (1-\mu) C_b^* \Longleftrightarrow \mu > C_b^*/(C_a^* + C_b^*)$ (1)
- After some intermediate steps (see Merlo, 2005), it follows that $C_a^* = C_b^* \simeq 0.71$.
- Here turnout is positive and might be significant. Note, the cost realizations are independent of the assignment to either group.

Evaluation:

- The theory relies on the assumption that each individual follows the voting rule which maximizes group welfare. The theory thus disregards free-riding behavior, which may be argued to be implausible.
- Besides evaluating the plausiblity of the model, another useful (and possibly more important) evaluation of the theory is to analyze the extent to which the theory can explain turnout observed in the data.
- Coate and Conlin (2004) use the same data set as for evaluating the pivotal voter model in Coate et al. (2004). They find a significant share of voter turnout to be explained by the model. However, there is a tendency to overpredict turnout with low actual turnout rates and vice versa.

1.3 Uncertain Voter Model

- Idea: The uncertain voter model assumes that the cost of voting is zero ($C_i^e = 0$), but that individuals have different information about the nature of the optimal option. The lack of perfect information may lead them to make mistakes which are costly from each voter's perspective. It is in this way that voting becomes costly.
- To shed some light on the economics of voter participation, we start with a simple example.

- Example 1: Assume there are two options on the table (a and b) and three individuals. In state a of the world all individuals prefer a to b. The state a occurs with probability $\mu = 0.9$. In state b of the world all voters prefer b to a.
- The benefit is 1 when the most preferred option wins and -1 otherwise.
- There is one who is perfectly informed about the true state of the world; a fact, which is known by the two uninformed individuals.
- In this situation the (perfect Bayesian-Nash) equilibrium involves that the informed individual will always vote, while the uninformed individuals will abstain.
  - Given that the uninformed individuals will abstain, it is optimal for informed individual to vote and to induce his most preferred outcome (assume that if nobody votes, either option is implemented with probability 0.5).
  - Given that the informed individual votes, an uninformed individual cannot induce a higher utility by voting.

When voting for a, he wouldn't change the outcome in state a, but would induce a tie in state b and, thereby, would produce the "wrong" outcome with probability 0.5.

Equivalenty, when voting for b, he wouldn't change the outcome in state b, but would induce a tie in state a (costly!).

Thus, abstention by uninformed individuals and voting by the informed individual is an equilibrium.

- The finding that all uninformed voters "delegate" the voting decision to the informed voter presupposes that the voters' preferences are aligned.
- Delegation does not incur a cost on the uninformed voters.
- Voting incentives might be different if there are voters around which would vote, but not for the option the uninformed citizens prefer. To see this more firmly, we modify the example as follows.

- Example 2: There is a fourth voter who has a partisan preference, i.e. he will get a positive benefit from option a in both states of the world and no benefit from option b. In this situation it becomes optimal that one uninformed individual votes for option b, while the other abstains. Both the partisan and the informed individual will vote as well. Why?
- The informed individual will induce a tie in both states of the world when abstaining, while guaranteeing the "correct" outcome with probability 1 when voting.
- When the uninformed voter opts for b, he will not change the election outcome in state a, but will induce a victory of b in state b. Differently, when the uninformed non-voter opts for a, then he will not change the outcome in state a, but will induce a tie relative to a victory for option b in state b (costly!!). Similary, when opting for b, he will induce a tie in state a (rather than a victory for option a) and no change in state b (also costly).
- The partisan individual can move the outcome in his most preferred direction in state a and is not influential in state b.

- The last example shows that uninformed, independent (i.e. non-partisan) individuals may vote and, if yes, they do so to neutralize the partisan bias. They may vote for option b, although it is less likely to be the "correct" voting decision ($\mu = 0.9$).
- The result extends to more general models; i.e. the higher the fraction of partisan voters (favoring option a),
  - the higher the fraction of independent individuals who vote, and
  - the more inclined are independent voters to opt for alternative b.

- What is the prediction for voter turnout?
- The pivotal and ethical voter model predict a higher turnout when the race becomes more close. Such a prediction may not arise in the current model. It may be just in the situation when (independent and uninformed) voters are privot that they will abstain. They rationally anticipate that they may decide the election in the "wrong" direction.
- The phenomenon is named Swing voter's curse (in analogy to the winner's curse in auctions) - see Feddersen and Pesendorfer (2004):

Empirical analysis:

- The model emphasizes the role of information for the decision to vote.
- This can rarely be observed in field data (unless there is a natural experiment where one group of voters is randomly chosen and gets more information about the alternatives under consideration).
- A different strategy is to resort to experimental analysis where the information of voters and the number of partisan voters can be more accurately controlled.
- In fact, Battaglini et al. (2005) conduct a laboratory experiment.
  - Therein, each lab session lasts 30 periods. After 10 periods the number of partisan voters, m, is changed and announced to the participants.
  - Follwing the change in m, the uninformed voters respond to the adjustment in the number of partisan voters.
  - In line with the theory, less individuals abstain and more vote for option b (not preferred by the partisan), the higher the number of partisans while the probability to vote for a remains at a low level.

References

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