

Blank and Null Voting Paradox

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The Blank and Null Voting Paradox or the Blank and Null Support is a generalized suboptimal support of invalid votes and deliberate abstentions misrepresenting the results in a plurality runoff (two-round) election by choosing a pseudo-Condorcet loser candidate. Nepomuceno and Costa (2019) provided some evidence of this suboptimal support in the 2014 Brazilian national elections by constructing a pairwise comparison with 3,010 voting intention interviews conducted in 204 Brazilian cities. The authors suggested that the 2016 historical impeachment of the Brazilian president Dilma Rousseff can be associated with this weak legitimate representation.

This should not be confused with Fishburn and Brams (1983) no-show paradox, which states that the removal of a ballot, or the absence of a voter, might change the outcome of an election to a more preferable choice for that voter than if he or she decided to vote sincerely according to his/her preferences. In the Blank and Null Support, some results end up a worse outcome for the voter, and this outcome hardly could have been made by a strategic decision.

Voting Paradox

Group Decision

Political Behavior

Condorcet Criterion

Election Study

Social choice

Brazilian Politics

Decision Theory

Introduction

The consequence of social behavior for choosing an alternative aggregating the best individual preferences is a rich source of studies that have been explored in literature by means of assumptions and paradox for many decades. The paradoxes presented by Borda ^[1] and Condorcet date back to the eighteenth century, nevertheless many studies of electoral processes have come up with recent paradoxes of voting in modern democracies ^{[2][3][4]}. Invalid votes and abstention are treated in discussions about the rationality of individuals and strategic positions.

Nepomuceno and Costa ^[5] highlighted the importance of the suboptimal support of invalid votes and abstentions in the choice of the Brazilian president Dilma Rousseff and her impeachment. The behavior under compulsory election, i.e. the great number of intentionally blank votes, abstention, and spoiled voting, has special comparative implications to non-compulsory election countries with large spoiled ballots numbers. Since abstentions might not be accurately considered as an expression of protest voting in non-compulsory election democracies, a deliberately high number of blank and spoiled ballots might result in similar unpopular leaders' choice that the Brazilian 2014 majority runoff placed.

The Paradox Explained

Condorcet winner and loser criterion are the most widely discussed properties in the social choice literature, with some arguments it should be present in the ideal voting rule [6][7][8]. Nurmi [9] presented an example of plurality runoff procedure with a set of preferences of 200 voters expressed in 3 alternatives—A, B, and C—which can be extended to the case of majority runoff, provided the choice threshold surpass 50%, as showed in Table 1.

Table 1 – Representation of a simple majority runoff procedure under absolute majority rule.

Rank	90 voters (45.00%)	70 voters (35.00%)	40 voters (20.00%)
1°	A	B	C
2°	C	C	B
3°	B	A	A

The first row of the table represents the number of voters having the set of preferences discriminated in the rows below and their percentage of valid votes. Thereby, 90 voters prefer $A > C > B$, 70 $B > C > A$, and 40 $C > B > A$. This scenario proposes C as the Condorcet winner; since it defeats every other alternative in the pairwise comparison (C defeats A 110 to 90 and B by 130 to 70), and proposes alternative A as the Condorcet loser since it is defeated by every other alternative in the pairwise comparison (A is defeated by B according to the support of 110 to 90 voters and also defeated by C by the same amount). The procedure follows that A and B are the top-ranked alternatives with the largest number of voters in the first round, and since none of them have reached more than 50% of support, both stand for a second round, which results in the choice of B with the support from 110 voters to 90 from A.

The illustration presents the most important characteristic of two-round electoral systems. Although the two-round electoral procedures might not compliant with the Condorcet winner criterion, a Condorcet loser candidate cannot be chosen either. Let us consider the possibility of invalid votes and abstentions as an expression of preference by the electorate. Under this assumption, Table 1 could be modified as follows:

Table 2 - Representation of a simple majority runoff procedure under absolute majority rule with the possibility of abstention, blank votes and null votes.

Rank	90 voters (45.00%)	70 voters (35.00%)	40 voters (20.00%)
1°	A	B	C

2°	C	C	B/N
3°	B	A	B
4°	B/N	B/N	A

Where B/N is the choice to abstain from the election or invalidate a vote. Since nullifying a vote (or not vote at all) does not support the choice of an alternative itself, the resulting social choice should not be modified from the initial scenario of Table 1 where the possibility of not voting is not present. However, such a possibility has implications over the Condorcet criterion and Pareto optimal choice. The pseudo-criterion in the Condorcet properties is defined with the inclusion of invalid voting and abstentions. The pseudo-winner candidate is the alternative that beats each other alternative in the pairwise comparison and beats or is beaten by the deliberate abstentions and invalid votes. The pseudo-Condorcet loser candidate is the alternative that is beaten by each other alternative in the pairwise comparison and beats or is beaten by the support of the abstentions and invalid votes.

The set of preferences above represented in the second Table has the same Condorcet winner and pseudo-winner. Nevertheless, the B/N choice, when considered as an alternative by the electorate, represents the Condorcet loser in the new scenario, and A the pseudo-loser candidate. In the first round of this scenario, A and B are the best-ranked alternatives, and once again due to the non-achievement of the majority, both run for a second round, which results in the choice of A, the Condorcet loser in the pseudo-criterion, with the support of 90 from the 160 voters. This illustration provides the importance to consider the pseudo-Condorcet criterion in two-round relative majority procedures – invalid voting and abstentions divide the support of the remaining electorate providing suboptimal support to each remaining alternative in the second round. The social outcome of the election might not only result in an alternative that is not the Condorcet winner, but also the Condorcet loser candidate in the pseudo-criterion scenario having blank votes, spoiled ballots, null votes, or abstentions regarded as an expression of preference.

This paradox should not be confused with Fishburn and Brams [\[10\]](#) no-show paradox. In the Blank and Null Support, some election results end up a worse outcome for the voter, and this outcome hardly could have been made by a strategic decision [\[5\]](#).

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