

Noncompensatory Rules, Voting, and Welfare

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Talk Outline

- Noncompensatory rules in behavioral models of decision making
- Relevance to voting
- Choice-preference consistency violations
- Inter-menu consistency/transitivity violations
- Generalization to a comprehensive set of relevant variables
- Electoral competition model
- Result for 2 binary issues
- Mixed compensatory/non-compensatory electorates
- Empirical connections

Noncompensatory Rules (Johnson & Meyer, 1984)

A decision rule is noncompensatory if the prospect it chooses is (at least sometimes) insensitive to variables that could change the utility of the prospect.

Examples:

- *Satisficing*. Choose the first alternative that passes some threshold, independent of whether other alternatives would yield higher utility. (Simon, 1955)
- *Elimination by Aspects (EBA)*. Step through dimensions along which options differ, from most to least important, eliminating those that do not pass a preset threshold on each dimension until only one alternative remains. (Tversky, 1972)
- *Lexical Choice Rule*. Compare alternatives along an ordered set of dimensions, “with the choice between any alternatives being made on the first dimension on which they differ. (Wissel, 1973)
- *Priority Heuristic*. Application of LCR to standard gambles. (Brandstatter, Gigerenzer, & Hertwig, 2006)

Claimed to be adaptive because environments are often noncompensatory (e.g. Gigerenzer & Selten, 2001)

Relevance to Voting and Aggregation

What are the collective consequences if voters use noncompensatory rules to decide for whom to vote? Do they make us “collectively” smart?

How would electoral competition models be affected?

Do voters use noncompensatory rules on a large scale?

How does the concept of noncompensatory versus compensatory decision rules relate to social choice and aggregation?

- Compensatory social choice rules: Borda count, Total utility
- Noncompensatory SCRs: Majority and plurality rule, Runoff rules

Choice-Preference Consistency for Social Choice

- *(Weak) Majoritarian Consistency (MC*)*. If X and Y are parties, and X is chosen over Y by a majority in an election, then Y's issue positions should not all be preferred to X's by a majority of voters.
- *Individual Consistency (IC)*. If a voter chooses party X over party Y, then that voter should not prefer Y's platform over X's.
- *Group Consistency (GC)*. If X is chosen over Y in an election, then the voters should not collectively prefer Y's platform over X's.

Noncompensatory Rule Voters Can Violate MC* Under Majority Rule

Consider the following *lexicographic priority profile* for issues A and T and positions + (favor) and – (oppose)

| Voter 1 | Voter 2 | Voter 3 |
|---------|---------|---------|
| A- | T- | A+ |
| T+ | A+ | T+ |

Two parties:

L: A+T+

R: A-T-

Majority prefers A+ to A-, and T+ to T-

But majority rule elects party R

Violates weak majoritarian consistency (MC*)

But Compensatory Voting Rules Can Also Violate MC*

Consider the following proportional utility profile defined for each voter's utilities:

| States | Voter 1 | Voter 2 | Voter 3 |
|--------|---------|---------|---------|
| A+T+ | 3 | 3 | 10 |
| A+T- | 0 | 10 | 7 |
| A-T+ | 10 | 0 | 3 |
| A-T- | 7 | 7 | 0 |

Can construct assuming additive, compensatory utilities:

| Positions | Voter 1 | Voter 2 | Voter 3 |
|-----------|---------|---------|---------|
| A+ | 0 | 3 | 7 |
| T+ | 3 | 0 | 3 |
| A- | 7 | 0 | 0 |
| T- | 0 | 7 | 0 |

Majority prefers A+ to A- and T+ to T-, but elects party R (A-T-) over party L (A+T+).

Other Types of Choice-Preference Consistency

Individual Consistency: Any rule that deviates from individual utility can violate IC

Group Consistency: Any rule that deviates from total utility can violate GC

Example: Majority rule violates GC in the above utility profile ($u(A-T-)=14$, but $u(A+T+)=16$). Majority rule is noncompensatory . But IC is not violated: Each voter who chooses according to their utilities prefers the platform for which they vote.

Lexicographic choice violates IC if compensatory individual utility chooses differently from the Lexicographic rule.

Generalizing the Compensatory- Noncompensatory Distinction

Define an “availability set” as the set of variables that serve as inputs to a decision rule in a given choice situation. \

A rule is noncompensatory w.r.t. a set of variables if it discards information in the set.

Define the “relevant set” as the set of all the variables that could affect the utility of a prospect.

All rules that determine choices using an availability set that is a proper subset of the relevant set are noncompensatory w.r.t. the relevant set.

Thus even rules that are compensatory w.r.t. an availability set may be NC w.r.t. the relevant set, defining comprehensive welfare. => All rules are NC in practice.

Inter-Menu Consistency and Transitivity

Consider again the priority profile:

| Voter 1 | Voter 2 | Voter 3 |
|---------|---------|---------|
| A- | T- | A+ |
| T+ | A+ | T+ |

All platforms on A and T are in a cycle under majority rule:

A+T+ is defeated by A-T-

A+T- is defeated by A+T+

A-T+ is defeated by A+T- and A+T+

A-T- is defeated by A-T+ and A+T-

Hence lexicographic voting can lead to and account for intransitive cycles across different pairs of party platforms.

A Model of Electoral Competition

Assume

- Two parties: A (first mover) and B
- Two issues A and T, and valences + and -
- A static priority profile P for N voters
- Platform specifies valence on each issue
- If platforms are identical, the party most recently adopting the platform loses

Dynamic game:

- First election: Party A chooses a platform, and party B chooses a platform in response – winner chosen by majority rule
- All subsequent elections: Incumbent party retains same platform, but opposition party may change platforms
- Party identity constraint: A party may not change its position on all issues in one election.

Result for Two Binary Issues and N Voters

All priority profiles fit within exactly two equivalence classes, either:

- Stable – one platform (e.g. A+T+) defeats all others (Black-Downs equiv.)

Example:

| Voter 1 | Voter 2 | Voter 3 |
|---------|---------|---------|
| A+ | A+ | A- |
| T+ | T- | T+ |

or

- Even – choosing any Nash strategy results in neither party winning more elections in the long run than the other

Example:

| Voter 1 | Voter 2 | Voter 3 |
|---------|---------|---------|
| A- | T- | A+ |
| T+ | A+ | T+ |

Mixed Compensatory/Noncompensatory Voting Rule Electorates and Parties

Percentage of lexicographic choice rule voters only needs to be enough to swing election.

A Downsian party that chooses the majority position on every issue in an even class priority profile election will lose to a strategic party that bases its platform on lexicographic voters

Empirical Connections

Lexicographic rules do very well in competition with compensatory models (e.g. weighted and unweighted summation) in predicting human choice data (Gigerenzer & Selten, 2001, Brandstatter et al. 2006).

For elections, data are observational, but a few studies have been done supporting widespread use of LCRs and NCRs (Dutter, 1981; Williams et al. 1976; Bronner & De Hoog, 1981)

Models such as retrospective voting (e.g. Key, 1966) and Downsian models appear to have broken down in explaining voter behavior in the U.S.: Democrats hold majority views on more issues and performed well economically in the 1990s, but they have been losing elections.

Lex voting may explain platform cycling.

Grover Norquist on U.S. Republican Party Strategy (December 2005)

“When you look at the modern center-right coalition, it’s a group of people who stand around a circle and put their foot in on one issue:

- Taxes: Don’t raise my taxes.
- Property rights.
- Gun owners. Don’t take my Second Amendment rights.
- Home schoolers – let me educate my kid.
- All the various communities of faith – evangelical Protestants, conservative Catholics, Orthodox Jews, Muslims, Mormons. People for whom the most important thing is practicing their faith and raising their kids.

The reason the center-right coalition holds together, the Reagan voters, the George W. Bush voters, is that everybody is around that circle, and on the issue that matters to them,

the issue they vote on, they want the government to leave them alone. That's why everyone can cheerfully work together.

...

I'm on the board of the NRA. Some people who vote on the gun issue have what I consider the oddest views on trade with China. But politically I don't care whether they're for free trade with China, because they vote on the gun issue. And people who want to be left alone to practice their faith, if you ask them would you be for restrictions on gays or other things, they may say yes. They don't vote on that issue. ...

Karl Rove and President Bush, as governor, understood the nature of the modern Republican Party.... Pat Buchanan [who ran against Bush] – he said “I've polled the Republican Party: 70 percent want fewer immigrants. I polled the Republican Party: 70 percent want less trade with China. He forgot to ask a second question: Do you vote on that issue?

