Dynamic Inconsistency and Anticipated Aggregation

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Aggregation of Preferences

- The role of policy consists, precisely, in the maximization of the aggregated utility function subject to the constraint represented by the utility possibility set.
- Non-paternalism is a widely accepted principal for constructing aggregator function.
- Are individuals good judges of what is beneficial to themselves?

Preferences Distortion

- Are the preferences always a good guide to the individual's welfare?
- Recent investigation reveal systematic 'flaws' in decision making.
  - Temptation
  - Overconfidence
  - Inattention
- When preferences are distorted, one cannot rely on them to indicate what makes people better off.

Paternalism

Camerer, Issacharoff, Loewenstein, O'Donoghue and Rabin (2003); Thaler and Sunstein (2003, 2008)

- If policy makers can determine what is truly good for individuals, then they can devise policies that will lead people to make better choices.

But, the real question here is

- We need some grounds, independent of the distorted preferences agents express, to determine what is good for the agents.

An Example

- The schools observed that the percentage of obesity students increased since last year.
- The schools have reason to doubt that student' lunch choices are grounded in an accurate judgement of which dish is better for the student.
- The factors responsible for the disparity, temptation, distort preferences.

What can we do?

- Thaler and Sunstein place considerable weight on the agent's own retrospective judgement or ex post preferences.
- But, ex post preferences may also be exposed to some distorted factors.
- Hausman thinks that platitude can help. Therefore, we do not need to elicit preferences.

In this paper

I argue that when preferences are distorted,

- it makes sense to take steps to separate individuals' preferences of distortion and commitment;
- we should attempt only to measure commitment parts than preferences.

Specifically

- I consider one type of preference distortion, temptation preferences, which could be represented by Gul and Pensendorf's (GP) model.
- I provide a behavioral ground to separate the commitment from preferences.
- I suggest Pareto principle with respect to commitment and derive a utilitarian-like social aggregation function.

The Problem

Two-stage decision problem

- At stage 1, the society aggregates the entire individual preferences over menu and chooses a menu.
- The individuals choose a consumption out of the selected menu at stage 2.

Setup

- Let (Z, d) be a compact metric space. $\Delta = \Delta(Z)$, the set of all lotteries. The objects of our analysis are $\mathscr{A}$, the collection of subsets of Δ.
- Society is a set of individuals $\mathcal{I} = \{1, \ldots, I\}$. Individual $i \in \mathcal{I}$ has preference $\succsim_i \subset \mathscr{A} \times \mathscr{A}$, whereas society's preferences are denoted by $\succsim_0$.

GP Axioms

Axiom (Weak Order:)

$\succsim$ is complete and transitive.

Axiom (Continuity:)

The sets $\{B : B \succsim A\}$ and $\{B : A \succsim B\}$ are closed.

Axiom (Independence:)

If $A \succsim B$, then for all $\alpha \in (0,1)$, $\alpha A + (1-\alpha)C \succsim \alpha B + (1-\alpha)C$.

Axiom (Betweenness:)

If $A \succsim B$, then $A \succsim A \cup B \succsim B$.

GP Model

- There are continuous linear functions U, u, v such that

$$U(A) = \max_{x \in A} \{u(x) + v(x)\} - \max_{y \in A} v(y) \quad \text{for all } A \in \mathscr{A} \tag{1}$$

  and U represents $\succsim$.
- The preferences in second stage $\succsim^*$ is represented by

$$U^*(A) = \max_{x \in A} \{u(x) + v(x)\} \quad \text{for all } A \in \mathscr{A} \tag{2}$$

Example

Table : Utilities

	x	y	z
$u_1(\cdot), u_2(\cdot)$	$2, 2$	$0, 3$	$3, 0$
$v_1(\cdot), v_2(\cdot)$	$2, 2$	$2, 0$	$0, 2$

$$U_i(\{x\}) = 2 > 1 = U_i(\{y, z\}) \quad \text{for } i = 1, 2.$$

$$U_i^*(\{x\}) = 4 > 3 = U_i^*(\{y, z\}) \quad \text{for } i = 1, 2.$$

Purification

We would like to re-rank each menu based on individuals' commitment utility of their consumption in the second stage.

Definition

We say that x is *more tempting* than y if either

(i) $x \sim \{x, y\}$ or $y \succsim \{x, y\}$ whenever $x \nsim y$, or

(ii) for all $\alpha \in (0, 1)$ such that $z = \alpha x + (1 - \alpha)y$, $\{x, z\} \succsim \{y, z\}$ whenever $x \sim y$.

Proposition

An alternative x is more tempting than y if and only if $v(x) \geq v(y)$.

Anticipated Consumption

We say an alternative, write t^A, is the *most tempting* consumption in A if it is more tempting than any alternative in A.

Definition

We say an alternative, write x^A, is the *anticipated consumption* in A, if $\{x^A, t^A\} \succsim \{y, t^A\}$ for all $y \in A$ and if $x^A \succsim z$ whenever $\{x^A, t^A\} \sim \{z, t^A\}$.

Proposition

An alternative x^A is the anticipated consumption in A if and only if

$$u(x^A) = \max_{x \in A} u(x) \quad \textit{subject to } u(x)+v(x) \geq u(y)+v(y) \quad \textit{for all } y \in A.$$

Postulates

Individual Commitment Each individual preference $\succsim_i$ satisfies the Axioms 1-4.

Group Rationality The group preference $\succsim_0$ satisfies the Axioms 1-3.

Anticipation Pareto Principle For all $A, B \in \mathscr{A}$, if $x_i^A \succsim_i x_i^B$ for all $i \in \mathcal{I}$, then $A \succsim_0 B$.

Result

Theorem

Assume Individual Commitment and Group Rationality. Then Anticipation Pareto Principle is satisfied if and only if there exist $\alpha_i > 0$ *with* $\sum_{i=1}^{I} \alpha_i = 1$ *and a number* μ *such that for all* $A \in \mathscr{A}$,

$$U_0(A) = \sum_{i \in \mathcal{I}} \alpha_i u_i(x_i^A) + \mu. \tag{3}$$

Conclusion

- When preferences are undistorted, they are a good guide for social welfare analysis.
- When these conditions are not met, under a specific environment, I suggest a way to elicit individuals' commitment through their preferences and derive an aggregation function based on the commitment.
- The situation I consider is a 'clean' case. There are further complications for future studies.