Behavioral Economics

Lecture 11: Social Preferences

Alex Alekseev

Winter Semester 2024–25

Outline

1. Evidence for fairness concerns
2. Models of fairness and reciprocity
3. Differentiating among different models

Evidence for Fairness Concerns: From the Field

- Field evidence
  - Collective action (strikes, consumer protest, voting)
  - Tax compliance (people pay more than is optimal given they are rational and selfish)
  - Donations
- Questionnaire studies in labor market
  - Bewley (1995, 1997)

Evidence for Fairness Concerns: From Experiments

- Prime example: Ultimatum game
    - Responders: Reject low offers
    - Proposers: Frequently, offer a 50:50 split
- Ultimatum game with competition (Fischbacher, Fong, and Fehr, 2009)
    - 1 responder more
        - Mean accepted offers went down: 25.5% (from 42.7%)
    - 4 responders more
        - Mean accepted offers are even lower: 16%

Fairness or Selfishness?

- The standard model explains behavior in many games fairly well:
  - Double-auction markets, ultimatum games with proposer-responder competition, auctions, markets with Bertrand competition, repeated public good games ...
- But not in others:
  - Ultimatum game, trust game, public good games with punishment, gift-exchange game, prisoner's dilemma games,
- But even then, the standard model can explain some of the behavior in these games:
  - Proposers in ultimatum games, trustors in trust games, cooperation in public good games with punishment, firms in gift exchange games, etc.
- Maybe we just need to tweak the standard model a bit.

Understanding Fairness Concerns

- Predictive models of fair behavior: preference-based
- How predictive models can be used:
  - They formalize intuitive ideas and make them testable: Detect and distinguish between features.
  - Provide precise predictions for applications.
  - Therefore, models
    - should be applicable to any game.
    - should have a constant parameter set.

Fairness Concerns Could Come in Different Flavors

- Concern for fair (equal) **outcomes**
    - Relative to a reference standard
- Concern for intentions: **reciprocity**
    - Positive reciprocity: Rewarding kind behavior
    - Negative reciprocity: Punish unkind behavior
    - Even at a cost

Modelling Fairness: Outcomes and/or Reciprocity

- **Inequity aversion**
  - Fehr and Schmidt (1999) (FS)
  - Bolton and Ockenfels (2000) (BO)
- **Quasi-maximin preferences:**
  - Charness and Rabin (2002) (CR)
- **Reciprocity**
  - Rabin (1993)
  - Dufwenberg and Kirchsteiger (2004) (DK)
  - Falk and Fischbacher (2006) (FF)

- **Altruism:** Andreoni (1989), Cox, Friedman, and Gjerstad (2004)
- **Spitefulness:** Levine (1998)
- **Social emotions and guilt aversion:** Bowles and Gintis (2000), Charness and Dufwenberg (2004)

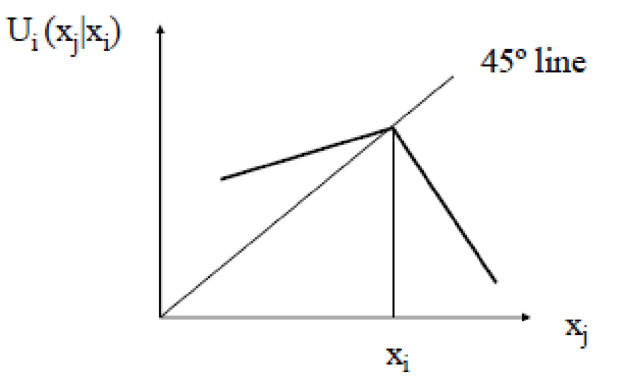
Outcome-Based Models

- Utility depends on own and others' payoffs: $U_i = U_i(x_i, x_{-i})$
- How does U_i depend on x_{-i}?
  - BO: Share of own payoff, i.e., $\frac{x_i}{\sum x_j}$
  - FS: All differences, i.e., $x_i - x_j$

Fehr and Schmidt (1999): Two-Player-Case

$$U_i = x_i - \alpha_i \cdot max(x_j - x_i, 0) - \beta_i \cdot max(x_i - x_j, 0) \quad (1)$$

- $\alpha_i =$ individual parameter of negative inequity aversion.
- $\beta_i =$ individual parameter of positive inequity aversion.
- For selfish subjects, both parameters are equal to 0.
- Assumptions: $\alpha_i \geq \beta_i \geq 0$, $\beta_i < 1$
  - Negative inequality aversion is more important than positive.
  - Nobody destroys money to reduce positive inequality.



- *i* prefers that *j*'s income is equal to hers. *i*'s utility declines in their income difference, more so if *i* herself is worse off.

Ultimatum Game: Inequity-Averse Responder

- Responder B prefers high payoff to himself, and equality between himself and the proposer A.

- **Choice:**
  - Reject: $(x_A, x_B) = (0, 0)$
  - Accept: $(x_A, x_B) = ((1 - s)X, sX)$
- **Offered share** $s = 0.5$**:**
  - **Accept** yields same income difference as **reject**.
  - **Accept** yields more income than **reject**.
  - **Offer is accepted.**
- **Offered share** $s > 0.5$**:**
  - **Accept**: higher (positive) income difference than reject.
  - **Accept** yields more income.
  - Assumption $\beta_i < 1$: One will never throw away income to avoid advantageous inequality.
  - **Offer is accepted.**

Inequity-Averse Responder

- **Offered share $s < 0.5$:**
  - **Accept**: higher (negative) income difference than **reject**.
  - **Accept** yields more income.
  - No upper boundary on α_i: We may throw away income to avoid **disadvantageous** inequality.
  - $U_B = x_B - \alpha_B \cdot max(x_A - x_B, 0) - \beta_B \cdot max(x_B - x_A, 0)$
  - $U_B(accept) = sX - \alpha_B \left[(1 - s) X - sX\right]$
  - $U_B(reject) = 0$

- **Reject** is preferred if

$$X \left[s - \alpha_B (1 - 2s)\right] < 0 \Leftrightarrow s < \frac{\alpha_B}{1 + 2\alpha_B} \qquad (2)$$

- Note: X does not matter!

Example:

- $\alpha_B = 2$, $\beta_B = 0.4$
- Offer from proposer A: $s = 0.2$
- $U_B = x_B - \alpha_B \cdot max(x_A - x_B, 0) - \beta_B \cdot max(x_B - x_A, 0)$
- $U_B(accept) =$
  $= 0.2X - 2 \cdot max(0.8X - 0.2X, 0) - 0.4 \cdot max(0.2X - 0.8X, 0)$
  $= 0.2X - 2 \cdot 0.6X$
  $= -X$
- $U_B(reject) = 0$
- B will reject, regardless of the size of the "pie" to be shared.

Inequity-Averse Proposer

- Prefers high payoff to himself (A) **and** equality between himself and the responder (B).

- **Offered share $s = 0.5$:**
  - If accepted: Yields max. equality, but less than max. income

- **Offered share $s > 0.5$:**
  - If accepted: Yields less income than $s = 0.5$, **and** less equality
  - Both self-interested and inequality-averse responders will accept $s = 0.5$
  - **Proposer will never offer** $s > 0.5$

Inequity-Averse Proposer

- **Offered share $s < 0.5$:**
  - **If accepted**: Lower s, higher income, but less equality
  - What is more important?
  - A's utility when $s \leq 0.5$, given that B accepts:
    $U_A = x_A - \alpha_A \cdot max(x_B - x_A, 0) - \beta_A \cdot max(x_A - x_B, 0)$
    $= (1 - s)X - \beta_A [(1 - s) X - sX]$
    $= X [s (2\beta_A - 1) - \beta_A + 1]$
  - This is increasing in s whenever $\beta_A > 0.5$
  - If acceptance were not a concern (dictator game), A would offer $s = 0$ if $\beta_A < 0.5$, $s = 0.5$ if $\beta_A > 0.5$, and be indifferent between any offer $s \in [0, 0.5]$ if $\beta_A = 0.5$.

What is the Equilibrium Prediction?

- A must take into account: Will B accept?
- Assume inequity-averse preferences (common knowledge): $\alpha_A = \alpha_B = 2$ and $\beta_A = \beta_B = 0.4$
- As $\beta_A < 0.5$, A would prefer to keep all of X himself, despite his inequity aversion.
- However, B will reject if

$$s < \frac{\alpha_B}{1 + 2\alpha_B} = \frac{2}{5} = 0.4 \tag{3}$$

- Knowing this, A will offer $s = 0.4$.
- B will accept the offer.

Now: Self-Interested Proposer, Inequity-Averse Responder

- Let $\alpha_A = 0, \beta_A = 0, \alpha_B = 2, \beta_B = 0.4$,
  - Common knowledge
- Responder will reject if $s < 0.4$
  - Threat is credible, due to B's inequity aversion
- Knowing this, Proposer will offer 0.4
- No difference between the behavior of self-interested and inequity-averse proposers!

Now: What if Proposer Does Not Know Responder's Type?

- A must consider the probability that B is inequity-averse.
- If possible (in the lab, it is usually not!), a self-interested B would pretend being inequity-averse.
- In some situations, the existence of inequity-averse types makes self-interested types behave as if they were inequity-averse too.

Competition and Fairness Concerns

- Responder or proposer competition in the UG:
    - Observed outcomes usually very inequitable
    - 1 person reaps (almost) all gains, others get (almost) nothing.
- Double auction markets:
    - Observed outcomes usually conform nicely to the self-interest model
- Do such results contradict the assumption that (at least some) players are inequity-averse?

Proposer Competition

- You're selling a house with market value X. If it's not sold, your gain is 0 (you're moving, no rental market).
- For any interested buyers, its value is X.
- Sales process:
  1. Potential buyers i give sealed offers $s_i X$
  2. You either reject all offers (no sale), or you accept the highest offer. If there is a tie, actual buyer is picked randomly among highest offers.
  3. Trade takes place according to the accepted offer (if any).
  4. If sale took place, your payoff is $s_h X$ (h is the buyer). Buyer's gain is $(1 - s_h)X$. No sale: All get payoff 0.

Proposer Competition

- If only 1 potential buyer: Standard ultimatum game.
    - Buyer: Proposer. Seller: Responder. (Sequence!)
- Assume:
    - 10 potential buyers.
    - Your $\beta_B < 0.5$, so you will pick the highest offer.

Proposer Competition

- Self-interest prediction:
  - Several proposers offer $s = 1$, which is accepted
  - When there are several potential buyers who all value the house at X, you will get X.
- Assume: Every player is inequity-averse
  - If buyer i's offers is rejected, he will experience unfavourable inequity: His payoff=0, someone else's > 0
  - If his offer is accepted, there will be inequity anyway, but his income will increase, and the inequity can be turned to his advantage
  - The only (subgame perfect) Nash equilibrium is that at least two proposers offer $s = 1$, of which one is accepted.

Why Doesn't Inequity-Aversion Affect the Outcome in the Presence of Proposer Competition?

- "No single player can enforce an equitable outcome. Given that there will be inequality anyway, each proposer has a strong incentive to outbid his competitors in order to turn part of the inequality to his advantage and to increase his own monetary payoff." (Fehr and Schmidt 1999, p.834)
- No buyer can secure less disadvantageous inequality between himself and the monopolist (you) by offering you a relatively low share.
- If he tries, you can just pick someone else's offer.
- Thus, inequity-aversion becomes irrelevant in the face of proposer-competition.

n-Person Inequity-Aversion

$$U_i = x_i - \frac{\alpha_i}{n-1} \sum max(x_j - x_i, 0) - \frac{\beta_i}{n-1} \sum max(x_i - x_j, 0) \quad (4)$$

- Normalizes inequity-aversion by the number of others (otherwise every new player k would decrease i's utility unless $x_k = x_i$)
- Self-oriented: compares himself to everyone else, but does not care about inequality between others

What Models of Inequity-Aversion can Explain

- Ultimatum game: rejection of low offers and proposers making high offers
- Trust game: trust and trustworthy behavior
- Gift exchange game: high wages and high effort
- Public goods games: low contributions without punishment and high contributions with punishment
- Ultimatum game with competition (and other markets): Subjects "accept" more inequity, so standard prediction prevails. (see also: Dufwenberg, Martin, et al. "Other-regarding preferences in general equilibrium." Review of Economic Studies (2011): 613-639.)

These models are surprisingly accurate across many games using similar set of parameters!

Criticisms of the Fehr-Schmidt Model

- Linearity
  - Dictator games: Dictator A will give either 0 (if $\beta_A < 0.5$) or 0.5 (if $\beta_A > 0.5$)
  - Possible modification of model: Utility concave in inequity
- What is the reference group?
  - Lab: All subjects in experiment? Opponent(s)?
  - Outside lab...?
- Evidence from micro data
  - Engelmann and Strobel (2004, 2006)
- Can the same set of parameter values explain findings across games?
  - Avner Shaked (2005): The Rhetoric of Inequity Aversion, University of Bonn.

What is the Reference Group?

- **Comparing FS and BO**
  - What is the right reference agent for income comparisons?
  - FS: compares to each other individual in the group
  - BO: compares to the average other individual in the group