Bargaining and Social Preferences

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Bargaining

- Bilateral bargaining is pervasive in both markets and non-market interactions (such as legal and political disputes), and in both developing and developed economies.
- Experimental research has conducted studies on both unstructured bargaining and structured bargaining.
- In the structured bargaining setting, the timing and sequence of decisions are limited in a way that permits the calculation of Nash equilibria and highlights the conflicts of interests.
- In this lecture we overview some important experiments and their findings.
Social Preferences

- Social preferences refer to the concern that people have for each other’s well-being, such as altruism, fairness and reciprocity.
- The classical approach in economics assumes that an individual is self-interest. Or it suspects that any social preference other than self-interest may be fragile.
  - G. Stigler (1981), "When self-interest and ethical values with wide verbal allegiance are in conflict, much of the time, most the time in fact, self-interest theory ... will win."
- We will start with a two-player game, known as ultimatum bargaining, that highlights an extreme conflict between selfish, strategic behavior and notions of fairness.
There are two players (the proposer and the responder) who want to divide £100 between themselves.

The proposer makes a take-it-or-leave offer that must be accepted or rejected by the responder.

If the responder accepts the offer, each would receive as specified in the offer. Otherwise, both would have nothing.
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- Nash equilibrium is subject to the issue of whether the responder’s strategy is “credible”:
  - Suppose that the responder’s strategy is rejecting any offer which gives him less than $50. When the responder turns out to face the proposer’s offer giving him $45, is it “reasonable” for him to reject this?
  - This issue of credibility can be dealt with the notion of Subgame Perfect Nash Equilibrium (SPNE). A SPNE is a NE whose strategies are a NE in each subgame. The unique SPNE is the proposer makes an offer \((100 - \varepsilon, \varepsilon)\) and the responder accepts any offer \(\varepsilon\) (or \(\varepsilon = 0\)).
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A typical finding in many lab experiments is shown below (Hoffman, McCabe, and Smith (1996)): responders reject offer less than 20% of the total money around half of the time and, anticipating this, proposers often offer between 30% and 50%.
Several anthropologists (see Jean Ensminger (2002)) conducted the same games in many different areas:
Market Integration and Fairness

Ultimatum game
Player One offers to Player Two

Percentage of stake offered to Player Two

50%

0%

Hunter-gatherers
Subsistence farmers
Nomadic herders
Cash-crop farmers
Industrial society

Market Integration
Distinguishing from Altruistic Preferences to Strategic Considerations

- In the ultimatum bargaining game, the generous offers by the proposer could come out because he is fair-minded or because he is afraid of having low offers rejected (or both).
- These two explanations can be easily separated in a Dictator Game, which removes the responder’s ability to reject offers.
- If the proposer offer positive amounts in the dictator game, he is not maximizing only his own payoffs but cares about the other’s payoff.
- A modified version of dictator game can reveal an individual’s preference regarding others, through choices.
A Modified Dictator Game

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![Diagram showing the modified dictator game](image)
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Selfish Preference

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Utilitarian Preference (or Perfect Substitute Preference)

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However, the ultimatum game, by its all-or-nothing nature, makes it difficult to discern what kind of preferences may be generating choices.
A Convex Ultimatum Game

- Suppose there is a fixed amount of money, $M$.
- The proposer first specifies the proportion of each money, $a \in [0, 1]$, that will go to the responder.
- Then the responder determines how much money to divide, $m \in [0, M]$.
- The payoff functions for the proposer, $\pi_p$, and the responder, $\pi_r$, are

  $$\pi_p = (1 - a) \times m,$$
  $$\pi_r = a \times m.$$

- If $m$ can be only either 0 or $M$, then the game reverts to the standard ultimatum game.
A Graphical Representation of Convex Ultimatum Game

Proposer’s Offer

Final outcome

π_r

π_p
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  - Both players will settle in a particular relative payoff. The responder will never shrink the allocation proposed by the proposer in equilibrium.

- There will be a difference between the two games when responder’s preference is nonmonotonic in both players payoffs and indifference curves are nonlinear.
Figure 1. Standard and Convex Ultimatum Games
Best Reply Functions: Ultimatum vs. Convex Games

- Responder’s Payoff vs. Proposer’s Payoff diagram
- Best Reply Functions
  - Ultimatum Game
  - Convex Game

- Responder’s Indifference Curves
- Optimal Offer in Convex
- Optimal Offer in Ultimatum Game
<table>
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<th>B. …then I choose to divide this many dollars (circle one for each Dividing Rule):</th>
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<td>a</td>
<td>Divider gets 99¢ and Designator gets 1¢</td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12</td>
</tr>
<tr>
<td>b</td>
<td>Divider gets 90¢ and Designator gets 10¢</td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12</td>
</tr>
<tr>
<td>c</td>
<td>Divider gets 80¢ and Designator gets 20¢</td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12</td>
</tr>
<tr>
<td>d</td>
<td>Divider gets 70¢ and Designator gets 30¢</td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12</td>
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<td>e</td>
<td>Divider gets 60¢ and Designator gets 40¢</td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12</td>
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<tr>
<td>f</td>
<td>Divider gets 50¢ and Designator gets 50¢</td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12</td>
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<td>g</td>
<td>Divider gets 40¢ and Designator gets 60¢</td>
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<td>k</td>
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Inequality-Averse Preferences (Andreoni et. al)

a. One-Sided Inequality Averse

b. Two-Sided Inequality Averse
Classroom Experiment

- Session name: ___
The game you just participated in is called the Trust Game whose experiment was first reported by Berg, Dickhaut, and McCabe (1995).

There are two players (the first mover and the second mover). The first mover who is given $10 decides how much (if any) of this money to pass to the second mover, say $X$.

Money that is passed is multiplied by a factor 3 (or 6), $3X$, before it is given to the second mover, who in turn decides how much to return to the first person, $Y$.

The payoff for the first mover is $(10 - X) + Y$. The payoff for the second mover is $3X - Y$. 


Trust Game II

- If both individuals are selfish and rational, then the Subgame Perfection argument leads to the conclusion that the first mover passes nothing to the second mover (why?).

- The action of passing money initially would signal that the first mover “trusts“ the second mover to reciprocate his behavior.

- Trust is risky because the first mover will regret having entrusted if he does not get much back.

- In this sense, *the amount passed to the second mover* measures *trust*. *The amount returned* measures *trustworthiness*. 
Experimental Findings

- Berg, Dickhaut, and McCabe ran this experiment with 32 pairs of participants in a single round interaction.
Discussion

- Since the act of passing money in the trust game is risky, it might be that people who pass large amounts might simply be more willing to take a risk. (Karlin, 2005)

- How can one design an experiment if he/she wants to isolate pure trust from risk-taking behavior?