Reference Dependence and Monetary Incentive

-Evidence from Major League Baseball-

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Abstract

- Empirical research that specifies the existance of reference point dependence observed in field setting:
  We pick up evidence of Major League Baseball (MLB)
- Players take some round numbers of the batting performance indexes as reference points, and adjust their effort level to meet the goals
- There are NOT observed any evidence for the monetary incentives that is paid to the players if they achieve these internal goals

Introduction

- Reference dependence is one of the two main charactaristics of the Tversky and Kahneman (1992)'s prospect theory: Individuals evaluate outcomes by the relative value to their internal benchmarks, or reference point, not by their absolute ones.
- Prospect theory enabled us to interpret some inconsistent empirical decision making with the traditional microeconomic theory, by applying additional assumptions.
- There are a lot of following researches that tests the reference dependence in field or laboratory settings.

Literature

Pope and Simonsohn (2011)

- presents three empirical evidences that verify the reference dependence, with the reference points "round numbers."
- One of them picked up Major League Baseball (MLB) players, about the observed attitude to their performance indexes.
- MLB position players manipulate their batting-average (AVG), in order to meet their internal goals: .300
- As a results, there is observed excess mass, or "bunching" around .300 of AVG.

Contribution

- Professional athletes receive monetary rewards according to the contracts they signed.
- Their contracts might include some incentivesed parts, which pay them additional bonus when their AVG reaches a certain cutoff point.
- If so, the observed behavior might be caused by the discontinuity of their profit function, not by the reference dependence.
- The contribution of our research is to examine this: examine if there exists any monetary incentives that make players make effort to the cutoff point.

Theoretical Frameworks

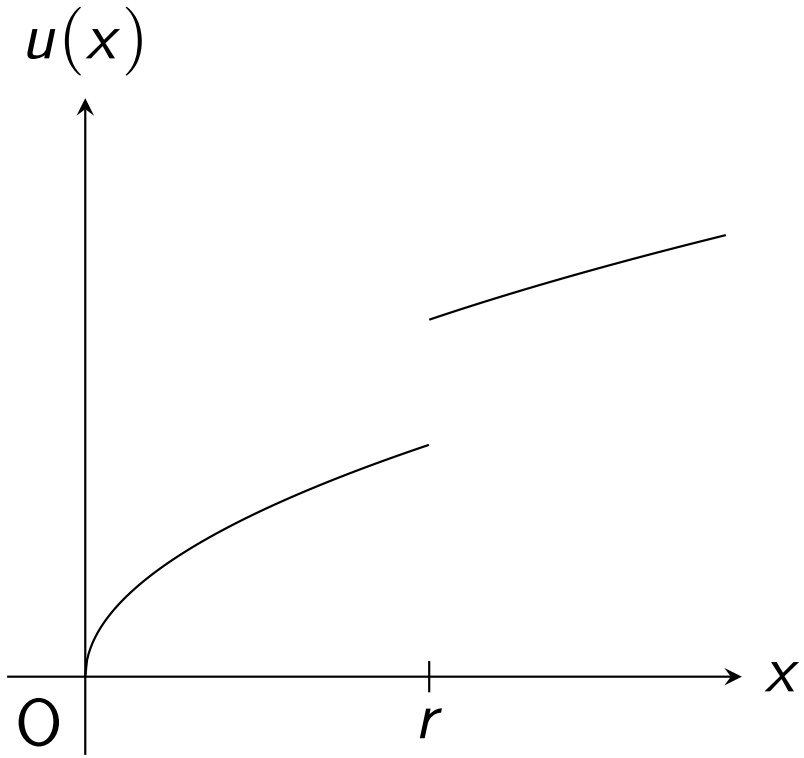

Figure: discontinuous utility function

- Following Allen et al. (2016) assume utility function $u(x)$ that jumps at the cutoff point, or the reference point.

  x stands for the performance index.

- This disconituity generates excess mass, or "bunching" around the possible reference point.

- We consider if this utility is derived by the descontinuous design of the monetary reward of the players.

Specification: Manipulation

- We exploit the McCrary's manipulation test, which is used in regression discontinuity design.
- Local-linear regression of undersmoothed histgram around the given cutoff point: .300 of AVG, 20 homeruns, ...
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Specification: Contract Design

- Discontinuity of the contract design is tested by RDD methodology:

$$w_{it} = \beta_0 X_{it} + \beta_1 \text{ABOVE}_{it}$$

- To check the robustness of our results, we also conduct the same local regression including the interaction term of X_{it} and ABOVE_{it}.

$$w_{it} = \beta_0 X_{it} + \beta_1 \text{ABOVE}_{it} + \beta_2 X_{it} \times \text{ABOVE}_{it}$$

Data

We obtain information about the players' stats (indexes) and annual salary.

- Stats Data
  - From *fangraphs*
  - Play stats from 1957 to 2018
  - We restrict the sample to the players with at least 200 plate-appearances

Results: Manipulation

Results: Contract Design

Summary

Considering Alternative Explanations

Conclusion

Reference


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