Microeconomics

Chapter 1: The Principles and Practice of Economics

Modified by Joseph Tao-yi Wang

Acemoglu Laibson List

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Chapter Outline

1.1. The Scope of Economics
1.2. Three Principles of Economics
1.3. The 1st Principle of Economics: Optimization
1.4. The 2nd Principle of Economics: Equilibrium
1.5. The 3rd Principle of Economics: Empiricism
1.6. Is Economics Good for You?

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Key Ideas

1. Economics is the study of people's choices.
2. The first principle of economics is that people try to optimize; they try to choose the best available option.
3. The second principle of economics is that economic systems tend to be in equilibrium, a situation in which nobody would benefit by changing his or her own behavior.

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Key Ideas

4. The third principle of economics is empiricism—analysis that uses data. Economists use data to test theories and to determine what is causing things to happen in the real world.

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Evidenced-Based Economics Example

Is Facebook free?

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What area of your life is NOT covered by economics?

1.1 The Scope of Economics

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The Scope of Economics

Economic Agent =
Any group/individual that makes choices, such as consumers, firms, parents, politicians, etc.

The Scope of Economics

What does it mean if something is scarce?

The Scope of Economics

Economics studies
how agents make choices
among scarce resources, and
how those choices affect society.

The Scope of Economics

How many pieces should each person have taken?

The Scope of Economics

▸ Positive Economics

  ▸ Some people took more than one and not everyone got a piece

▸ Normative economics

  ▸ Each student should just take one so that everyone gets a piece

The Scope of Economics

▸ Microeconomics
  ▸ The study of individuals, firms, government

▸ Macroeconomics
  ▸ The study of the whole economy

What Economics is Really About?

- Traditionally: Economics is the study of how society produces and distributes goods to satisfy the wants and needs of their members.
- My View: Economics is a study of institutions and human behavior (reactions to institutions)
  - I.e. 「上有政策，下有對策」
  - (Classical) market mechanism is just one example!
  - Other mechanisms: Auctions, match-making
  - Other institutions: governments, congress, national health insurance, families, social norms

People Respond to Incentives!

- Central Planning in Soviet Union:
  - "…if the plan merely calls for tonnages of output, there is every incentive to skimp on design or finish or quality, in order to concentrate on sheer weight."
    - The Economic Problem (1970), by Robert L. Heilbroner
- Interesting cartoon in Krokodil (Russian satirical magazine):

What is the essence of economics?

1.2 Three Principles of Economics

Three Principles of Economics

1. Optimization
   = making the best choice possible with given information
2. Equilibrium
   = when everyone is optimizing; no one would be better off with a different choice
3. Empiricism
   = using data to figure out answers to interesting questions

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First Principle of Economics: Optimization
Trade-offs and Budget Constraints

What is the optimal level of crime?

First Principle of Economics: Optimization
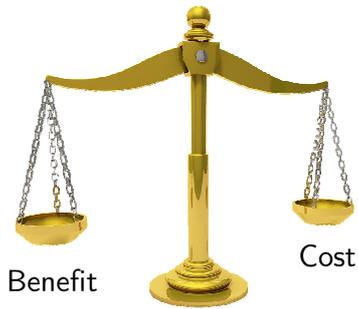## Opportunity Cost

Microeconomics

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- You want to buy a $20 book. If you drive 3 miles, you can buy it for $10.
- You want to buy a $1,000 computer. If you drive 3 miles, you can buy it for $990.

3

First Principle of Economics: Optimization
Cost-Benefit Analysis

Benefit   Cost

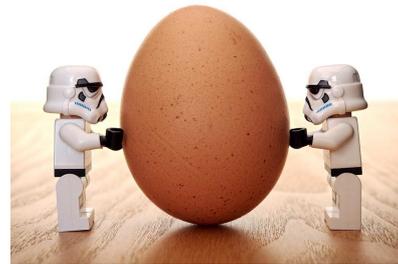### Evidenced-Based Economics Example

Is Facebook really free?

Second Principle of Economics: Equilibrium

Equilibrium
A situation in which
no one benefits by changing
his/her behavior

Second Principle of Economics: Equilibrium

What Does Equilibrium Really Mean?

Classroom Experiment 1: The LUPI Game

- Swedish Lottery in 2007
  - Lowest Unique Positive Integer (LUPI) Game
  - 最小唯一者勝的賽局
- Choose a positive integer from 1 to 100
- Win if choose the Lower but Unique number
- Prize?

Are We in the LUPI Game Equilibrium?
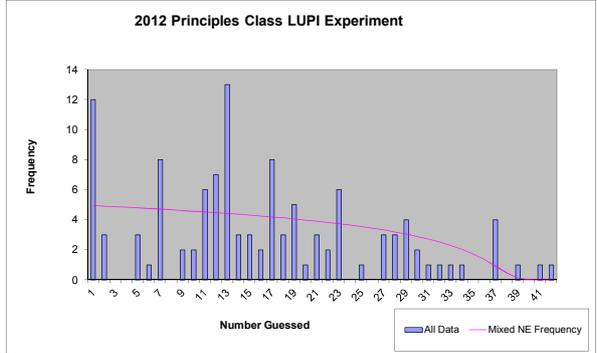
2012 Principles Class LUPI Experiment

Frequency

Number Guessed

All Data   Mixed NE Frequency

4

Second Principle of Economics: Equilibrium

Free Rider Problem Exists when an individual/group is able to enjoy the benefits of a situation without incurring the costs

Second Principle of Economics: Equilibrium
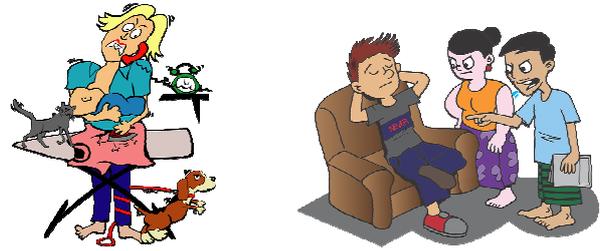
Which one is experiencing equilibrium?

Second Principle of Economics: Equilibrium

Is there an incentive for him to change his behavior?

Second Principle of Economics: Equilibrium

Is this an equilibrium?

Second Principle of Economics: Equilibrium

And you forgot this guy...

Third Principle of Economics: Empiricism

Crowded beaches and hot temperatures go together.

So if we want to make it cooler, keep people from going to the beach!

What are the costs and benefits of this course?

1.6 Is Economics Good for You?

Is Economics Good for You? Cost...

Costs of taking this class:
▸ Tuition
▸ Other Principles of Economics classes
▸ Other courses
▸ Sleep?
▸ Stress?

Is Economics Good for You? Benefits...

What Economics is Really About?

▸ Economics is a study of institutions and human behavior (reactions to institutions)
  ▸ 「上有政策，下有對策」
  ▸ (Classical) market mechanism is one example
▸ Other mechanisms: auctions, matching
▸ Other institutions: Governments, congress,
  ▸ Welfare systems, national health insurance,
  ▸ Families, social norms

Homework For ALL Chapter 1

▸ Watch "Ten Principles of Economics: A Translation" on YouTube & read its transcript
▸ ALL Chap.1, Problem 2, 5, 8
▸ Bonus Question (See next slide)
▸ Challenge Questions (from Past Midterms)
  ▸ Midterm 2008 - Multiple Choice Q2, Q14
  ▸ Midterm 2009 - Multiple Choice Q4
  ▸ Midterm 2010 - True/False Q1, Q5
  ▸ Midterm 2013 - True/False Q2

Bonus Question (ALL 1-7)

The costs of many environmental regulations can be calculated in dollars, but the benefits often are in terms of lives saved (mortality) or decreases in the incidence of a particular disease (morbidity).
  a. What does this imply about the cost-benefit analysis of environmental regulations?
  b. There is an old saying "You can't put a price on a human life." Do you agree or disagree? Explain.
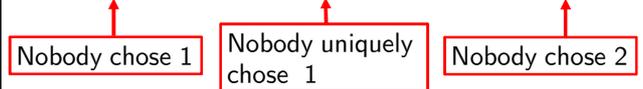
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Economic Lessons of The LUPI Game

1. A Set of Rules (= Institution)
   ‣ 一套遊戲規則:可以是明文規定或不成文的潛規則
2. Individuals Optimize
   ‣ 個人決策謀求最佳化，因為人們對誘因有反應！
3. You Need to React to Others Optimizing
   ‣ 其他人也在最佳化，所以你要因應。即使多數人循規蹈矩，制度設計者仍須考慮有人惡搞會怎樣？
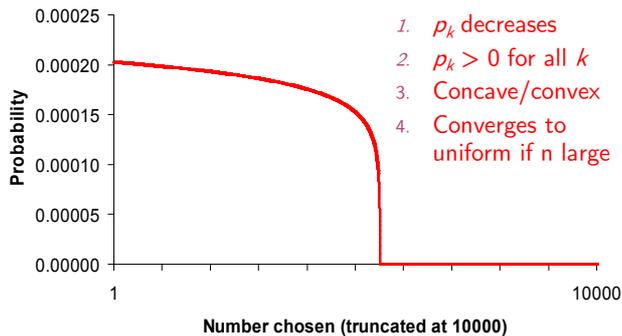4. What should the aggregate data look like?
   ‣ 整體結果長怎樣？理論的預測為何？

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Solving the LUPI Game Equilibrium

‣ Win by Choosing k if no other chooses k, and nobody "uniquely chooses 1 to (k - 1)"
‣ Assume Number of Players is Poisson(n)
‣ Mixed Strategy Equilibrium requires:
‣ Pr (win | choose 1) = Pr (win | choose 2) =...

$$e^{-np_1} = \left(1 - np_1 e^{-np_1}\right) \cdot e^{-np_2}$$

Nobody chose 1　　Nobody uniquely chose 1　　Nobody chose 2

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Unique Poisson-Nash Equilibruim (Mixed)

1. p_k decreases
2. $p_k > 0$ for all k
3. Concave/convex
4. Converges to uniform if n large

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Economic Lessons of The LUPI Game

5. Does empirical data match the theory?
   ‣ 實證資料是否支持你的預測？蒐集資料來看看「整個社會」的結果如何

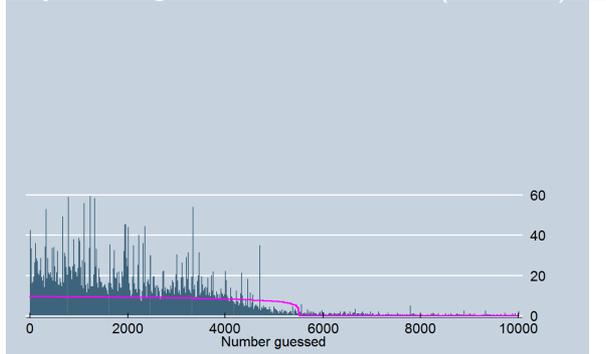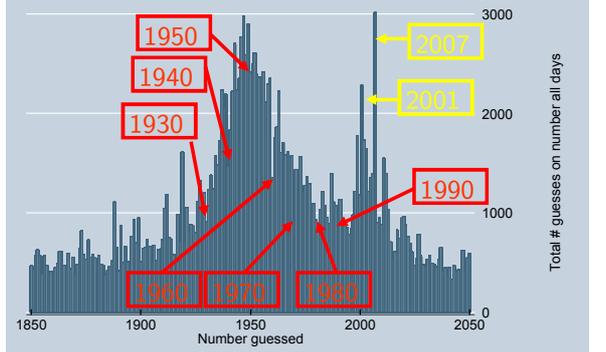2016/9/27　　　　What is Economics?　　　　Joseph Tao-yi Wang

Daily Average of Each Number (Week 1)

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Daily Average of Each Number (Week 3)
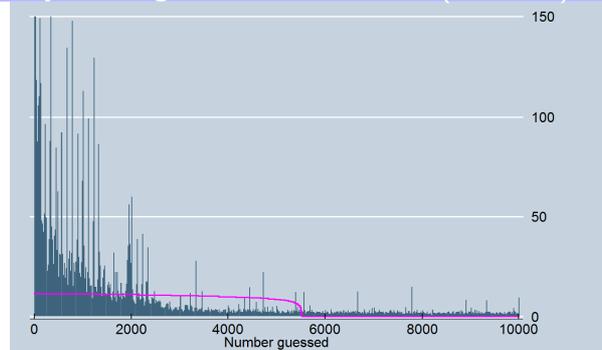
2016/9/27　　　　What is Economics?　　　　Joseph Tao-yi Wang
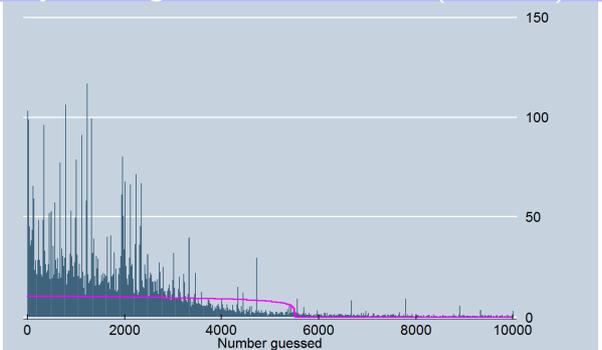
Daily Average of Each Number (Week 5)
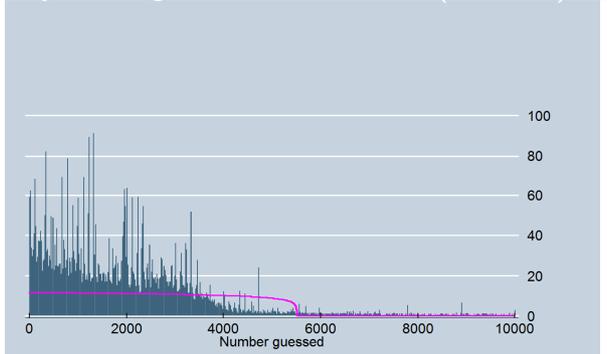
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Daily Average of Each Number (Week 7)

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Economic Lessons of The LUPI Game

5. Does empirical data match the theory?
   ‣ 實證資料是否支持你的預測？蒐集資料來看看「整個社會」的結果如何
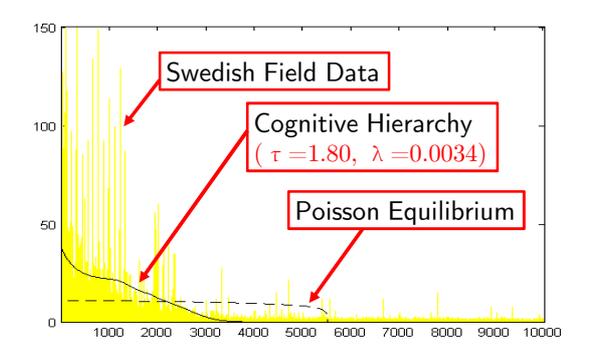6. Can individual differences be explained?
   ‣ (資料中)個別差異能否解釋？理論有改進空間嗎？

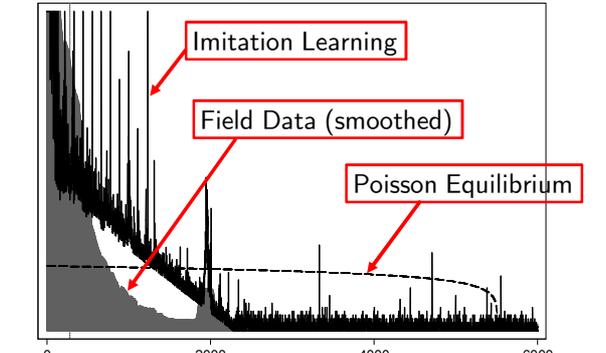2016/9/27 — What is Economics? — Joseph Tao-yi Wang

Choose Own Birth Year (and 2007)?

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Initial Frequencies: Field Data (Week 1)

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Imitation Learning vs. Field Data - Day 2

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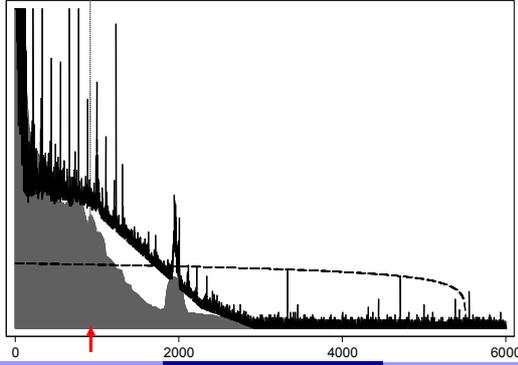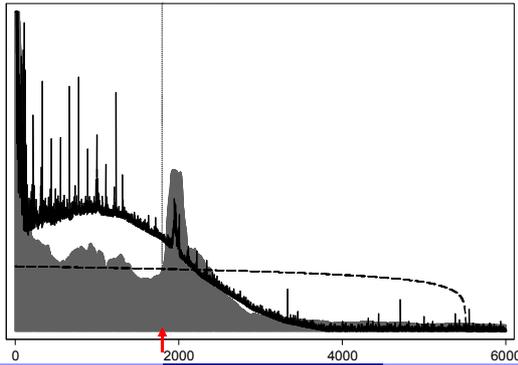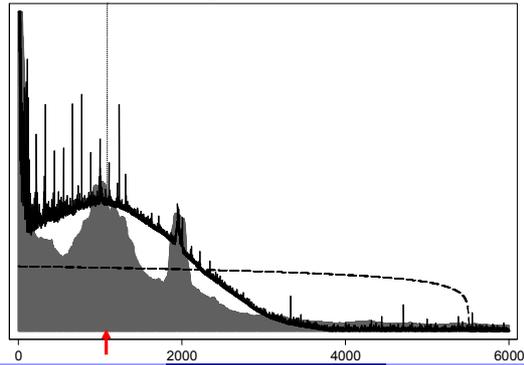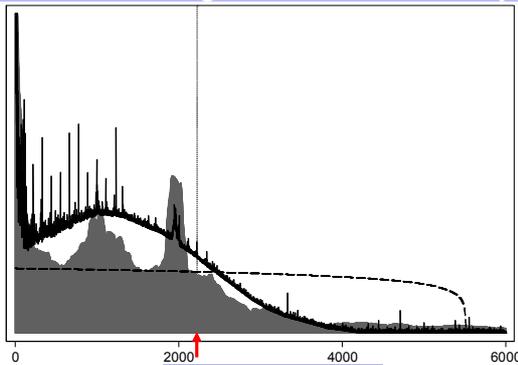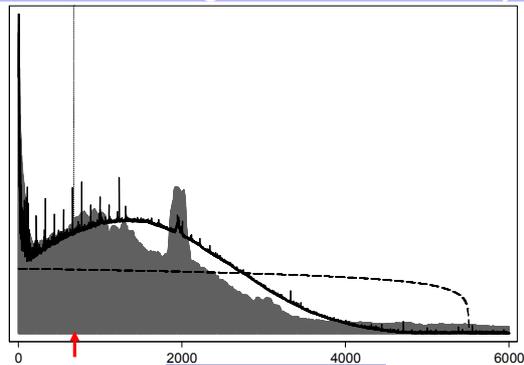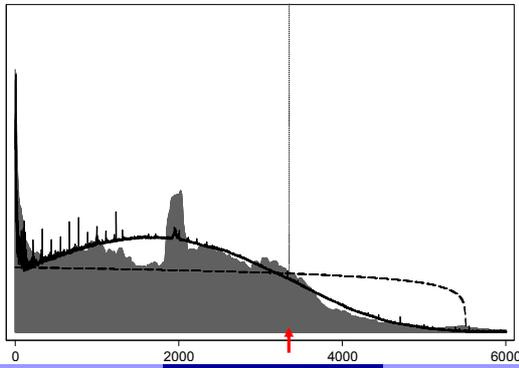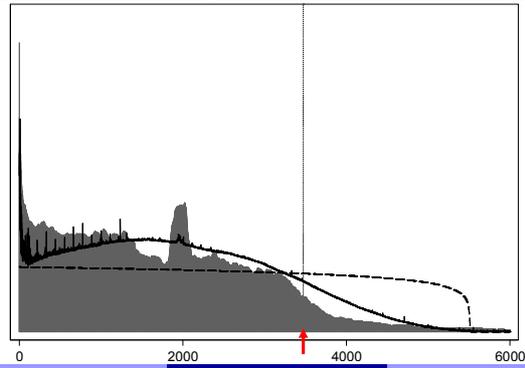
Imitation Learning vs. Field Data - Day 3

Imitation Learning vs. Field Data - Day 4

Imitation Learning vs. Field Data - Day 5

Imitation Learning vs. Field Data - Day 6

Imitation Learning vs. Field Data - Day 7

Imitation Learning vs. Field Data - Day 14

Imitation Learning vs. Field Data - Day 21

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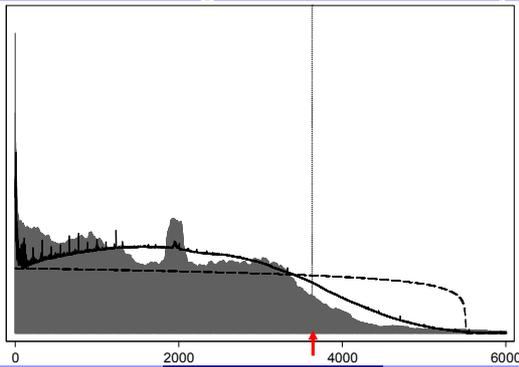## Imitation Learning vs. Field Data - Day 28

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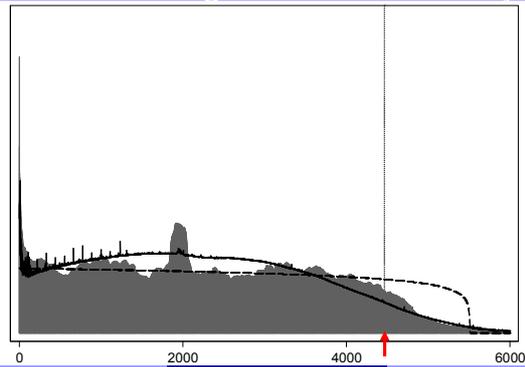
Imitation Learning vs. Field Data - Day 35

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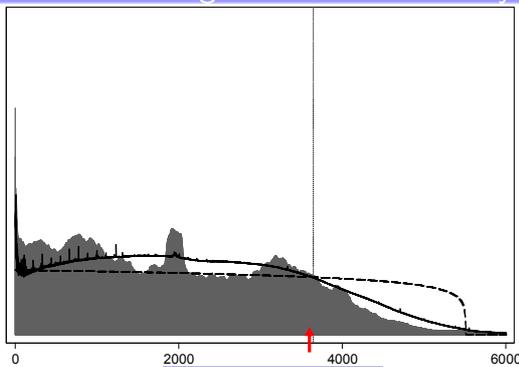
Imitation Learning vs. Field Data - Day 42

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Imitation Learning vs. Field Data - Day 49

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Economic Lessons of The LUPI Game

5. Does empirical data match the theory?
   - 實證資料是否支持你的預測？蒐集資料來看看「整個社會」的結果如何
6. Can individual differences be explained?
   - (資料中)個別差異能否解釋？理論有改進空間嗎？
7. How can the institution be improved?
   - 工程師問:制度(遊戲規則)有沒有可以改進的地方？
8. Where did this institution come from?
   - 這套制度是哪裡來的？現況的邏輯是什麼？

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