

# Welcome to Econ Theory!

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## How to Use Economic Theory

Are You Rational?

Theorems

What has Economics to say about Theology?

# The Marriage Problem

Problem: want to match single man and single woman in the area!  
A solution should be stable: which means it should be 1)  
**voluntary** and 2) there is no **blocking pair**

## Man-Proposing Deferred Acceptance

1. Each man creates a list that ranks all acceptable women
2. Each man proposes to the top woman on his list
3. Each woman compares the men who have proposed to her to the man she is currently holding (if any), and tentatively holds on to the one she likes most. She rejects the remaining men.
4. Each rejected man removes the rejecting woman from his list
5. If at least one man has been rejected at step 3, go to to step 2; otherwise, match each woman to the man she is currently holding

# The Marriage Problem

## Theorem

*In the marriage problem, a stable match always exists. In particular, the match selected by the man-proposing deferred acceptance algorithm is stable and is **man-optimal**.*

# Proof

It is voluntary: for man... for woman...

There is no blocking pair. Suppose there is. Then, there is a man that would have proposed to that woman before and she would have accepted.

# What can we learn about Economic Theory?

Blank

# Analysis

- ▶ Do people really follow that? (Ask data)
- ▶ Useful for very limited cases: matching apps maybe. Was your case different?
- ▶ In real life how would people behave? If differently, you need to be precise about the exact way of difference
- ▶ How robust is our setup? (Dynamic, number, power, information, change of tastes, income of new people, externalities of new people, uncertainty about a person's quality, change of person's quality, does it make sense for the designer? People would believe our algorithm? Is the preference defined only by the person we end up with?...)
- ▶ Is it predictive? Prescriptive?
- ▶ Is it useful?



# Map of Economics: where I am at

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## Airplane Problem



Should I fly?

# Definition

Rationality: “would you be ashamed if you review this decision in foresight?”

# Should I fly?

- ▶ Probability of dying
- ▶ Happiness of thriving

# Should I fly?

- ▶ Probability of dying
- ▶ Happiness of thriving
- ▶ How to make probabilities out of this?
- ▶ Bayesianism
- ▶ State space
- ▶ Independence
- ▶ Are all airplanes equal?

# Should I fly?

- ▶ Probability of dying
- ▶ Happiness of thriving
- ▶ How to make probabilities out of this?
- ▶ Bayesianism
- ▶ State space
- ▶ Independence
- ▶ Are all airplanes equal?
- ▶ Representative effect



# The tyranny of irrationality

**Framing effect** **Representative effect** **Anchoring** Mental  
Accounting Dynamical Inconsistency Nudges

# How to deal with it?

Awareness

Rationality  $\neq$  apathy

## What are the alternatives?

- ▶ Being rational (using economic theory)
- ▶ Relying on intuition

## Limits of Economic Theory

- ▶ Bounded arbitrage and nearly rational behavior:  
We establish the equivalence between a principle of almost absence of arbitrage opportunities and nearly rational decision-making. The implications of such principle are considered in the context of the aggregation of probabilistic opinions and of stochastic choice functions. In the former a bounded arbitrage principle and its equivalent form as an approximately Pareto condition are shown to bound the difference between the collective probabilistic assessment of a set of states and a linear aggregation rule on the individual assessments. In the latter we show that our general principle of limited arbitrage opportunities translates into a weakening of the McFadden–Richter axiom of stochastic rationality, and gives an upper bound for the minimum distance of a stochastic choice function to another in the class of random

## One Takeaway

**Decision Theory:** the best decision is given by assessing how much you value each outcome and how probable you believe they are

**Behavioral economics:** surprise! Humans are not good at Decision Theory

**Game Theory:** the individual optimal is not the collective optimal

**General Equilibrium:** free markets(and prices) makes everyone happy

**Industrial economics:** if you have market power, you can change the price

**Market Design:** clever mechanisms does save lives

# One Takeaway

**Macroeconomics:** few things are of control of the rule makers

**Econometrics:** your decision may be more far-reaching than you imagine

**Monetary Economics:** money does not affect everyone equally

**International Economics:** specialization is cool

**Public Sector Economics:** if your decision affect others, coordinating makes sense

# One Takeaway

**Corporate Finance:** some good deals do not happen because of distrust

**Asset pricing:** if the market is predictable, then it is not anymore

**Economic history:** black markets emerge when the market is done wrong



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# Theorems

- ▶ No Trade Theorem:
- ▶ Gibbard-Satterthwaite theorem
- ▶ Arrow's impossibility theorem
- ▶ Some Representation Theorem

## No Trade Theorem

In any voluntary trading process, if agents have rational expectations, then it is common knowledge among them that the equilibrium trade is feasible and individually rational. This condition is used to show that when risk-averse traders begin at a Pareto optimum (relative to their prior beliefs) and then receive private information (which disturbs the marginal conditions), they can never agree to any non-null trade. This result has implications for the nature of the information transferred among agents in any voluntary exchange. In particular, if trading occurs on competitive markets before and after agents receive private information, there always exists a fully revealing rational expectations equilibrium ex post, in which the change in relative prices (rather than the prices themselves) reveals a sufficient statistic for all agents' information. Moreover, even at equilibria that are less than fully revealing, the information conveyed by price changes "swamps" each trader's

# Arrow's Impossibility Theorem

**Pareto property:**  $x \succ_i y$  means  $x \succ y$

**Independence of Irrelevant Alternatives:** social ranking between  $x$  and  $y$  depend only on  $x$  and  $y$

**Dictatorial:** there is a guy that chooses all the ranking

## Theorem (Arrow's Impossibility Theorem)

*Suppose that the number of alternatives is at least three and that all preference profiles are admissible. Then, every social welfare function which satisfies the Pareto property and Independence of Irrelevant Alternatives is dictatorial.*

# Gibbard-Satterthwaite Theorem

Suppose that  $n \geq 2$  and  $|f(R^n)| \geq 3$ . Then, a social choice function is strategy-proof only if it is dictatorial.

## Covered Interest-Rate Parity

Two assumptions central to interest rate parity are capital mobility and perfect substitutability of domestic and foreign assets.

Interest rate parity rests on certain assumptions, the first being that capital is mobile - investors can readily exchange domestic assets for foreign assets. The second assumption is that assets have perfect substitutability, following from their similarities in riskiness and liquidity. Given capital mobility and perfect substitutability, investors would be expected to hold those assets offering greater returns, be they domestic or foreign assets.

However, both domestic and foreign assets are held by investors. Therefore, it must be true that no difference can exist between the returns on domestic assets and the returns on foreign assets.[2]

That is not to say that domestic investors and foreign investors will earn equivalent returns, but that a single investor on any given side would expect to earn equivalent returns from either investment

# vNM Theorem

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## Relations

- ▶ “In heaven, there is no Economics”
- ▶ Gilboa's Joshua meeting brother
- ▶ Bayesianism
- ▶ Pascal's Wager
- ▶ Divine Games

## My conclusion:

Not much. Economics is about being wise in the sense of this world. God commands us to something far superior.

In terms of morality  
In terms of risk acceptance  
In terms of rationality  
In terms of understanding the world  
Does love make sense?  
Cooperative Game Theory  
Should a man love money?  
Love x Money x God

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