

## Experimental Economics

### Market Institutions & Human Behaviour

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## Experimental Economics

### What?

- Observes economic decision making under controlled conditions
- Incorporates psychological and social aspects of human behaviour
- Puts real people back into economics...

## Experimental Economics

### Why?

- Develop economic theory
- Test and compare economic institutions
- Inform policy design

## Experimental Economics

### How?

- Controlled environment
- Real participants, real incentives
- Statistical analysis

### Simulated economic environment

- You use “units” to produce income
- You have a production function, specifying how much income you can produce with each unit

This creates a controlled, simplified, context-free economic environment

### Incentives

- Participants paid real money, based on the amount of income they generate in the experiment
- Trading is real

## Markets 101

- Markets can efficiently allocate scarce resources
- Markets provide an incentive for traders to reveal information about their costs and values
- The invisible hand of the market aggregates this information, expressing it through the price, and guides resources to their highest value users

- Much of the theory of markets assumes they contain a large number of fully rational agents with complete information
- There are not a large number of you
- You did not have complete information
- Are you perfectly rational?

Can a market really work?

What do these experiments show us?

- Markets work
- Institutions matter – significant differences in performance

## Experimental Results

- Efficient outcomes can be reached even with a very small number of traders, provided there is competition
- Asset markets → price bubbles
- Strategic (mis)behaviour and market manipulation can occur!

## Institutions Matter

Market institutions

- The rules that specify how a market is implemented and how agents interact with each other - particularly the nature and timing of messages between agents
- Experiments test and compare effect of institutions on market performance

## Institutions Matter

Double auction institution

- Extremely high efficiency
- Reaches equilibrium more rapidly than alternative
- Capable of rapidly adjusting to shocks both within and between periods
- Transaction costs can be relatively high

## Institutions Matter

Over-the-counter institution

- Overall efficiency relatively high
- Would involve high transaction costs
- Profitable trades may be missed
- May be more or less confidential
- Opportunities for price discrimination

## Institutions Matter

Posted offer institution

- Overall efficiency high
- Takes time to reach equilibrium
- Prices usually sit above equilibrium
- Takes time to respond to changes between periods
- Cannot respond to changes within trading periods

## Institutions Matter

So which is best? It depends!

- Posted offer has low transaction costs, but sacrifices some efficiency
- Over the counter is rather haphazard
- Double auction highly efficient, and can rapidly incorporate new information; but may require specialist traders

## Institutions Matter

So which is best? It depends!

- Posted offer works best for repeated, low value transactions where values are well known, eg grocery shopping
- Double auction works best for larger transactions where information about values and costs is widely dispersed

## Role of Experiments

Test how alternative market institutions perform under different circumstances.

For example:

- Introduce demand or supply shocks
- Incorporate varying levels of risk or uncertainty
- Incorporate varying levels of transaction costs

## Behavioural Anomalies

'Anomalies'

- Psychological
- Social

*Homo sapiens* vs *Homo economicus*

## Psychological Factors

### Risk aversion

- Certain outcomes often preferred to more valuable uncertain outcome

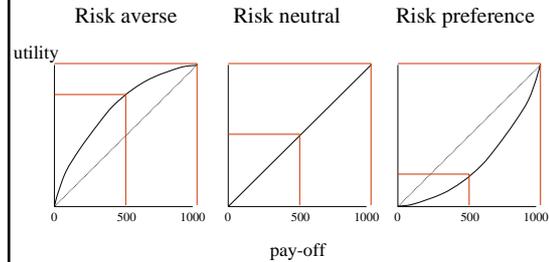
Which is preferred:—

- \$500 or a 50% chance of \$1000?
- \$450 or a 50% chance of \$1000?

Expected monetary value  $\neq$  Expected utility

## Expected Utility

\$500 vs a 50% chance of \$1000



## Expected Utility

Measuring risk aversion

	A	B
1	10% \$2.00; 90% \$1.60	10% \$3.85; 90% \$0.10
2	20% \$2.00; 80% \$1.60	20% \$3.85; 80% \$0.10
3	30% \$2.00; 70% \$1.60	30% \$3.85; 70% \$0.10
4	40% \$2.00; 60% \$1.60	40% \$3.85; 60% \$0.10
5	50% \$2.00; 50% \$1.60	50% \$3.85; 50% \$0.10
6	60% \$2.00; 40% \$1.60	60% \$3.85; 40% \$0.10
7	70% \$2.00; 30% \$1.60	70% \$3.85; 30% \$0.10
8	80% \$2.00; 20% \$1.60	80% \$3.85; 20% \$0.10
9	90% \$2.00; 10% \$1.60	90% \$3.85; 10% \$0.10

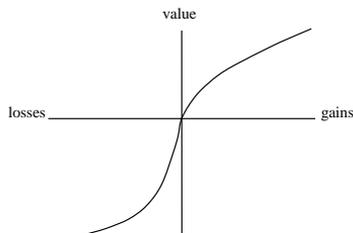
## Psychological Factors

### Loss aversion

- Losses weigh more heavily than gains
- Framing determines whether an outcome is perceived as a loss or a gain

## Psychological Factors

### Prospect theory



## Psychological Factors

### Prospect theory

- Reference point crucial
- Risk aversion for gains, risk seeking for losses
- Certainties and small probabilities overweighted

## Psychological Factors

### Status quo bias

- Potential losses have greater impact than potential gains
- Status quo is reference point
- Therefore bias to remain with status quo, even if potentially better options are available

## Psychological Factors

### Endowment effect

- People value goods they have more than goods they don't have
- Greatly reduces trade
- Overcome by experienced traders

## Psychological Factors

### Behavioural economics/finance

- Explains puzzling investment behaviour
- Affects market performance, especially, but not exclusively, where inexperienced traders are involved
- Initial endowments and reference points crucial
- Mechanisms may be needed to overcome these biases

## Social Factors

### Money isn't everything!

- Personal and social motivations also important
- Give rise to complex patterns of behaviour

## Social Factors

### Dictator game

- You are given \$10
- You may give some, all or none to an anonymous partner
- How much do you give?

## Social Factors

### Ultimatum game

- You are given \$10
- You may give some, all or none to an anonymous partner
- If your anonymous partner rejects your offer, you both get nothing

## Social Factors

### Ultimatum game

- "Unfair" offers rejected, costly to both parties
- Parallels with many financial decisions
- Perceptions of fairness crucial

## Social Factors

### Gift exchange game

- A offers "gift" to B, and indicates desired response
- If B rejects, both earn nothing
- If B accepts, selects response
- A is paid the response multiplied by ten, minus the cost of the gift
- B earns the gift minus the cost of the response

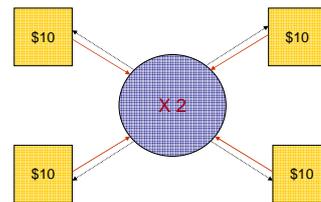
A's income depends on how much B invests in response

## Social Factors

### Gift exchange game

- Parallels with labour market
- Reciprocity crucial
- Positive actions get positive actions
- Perceived negative actions elicit negative responses

## Public Goods Game



## Public Goods Game

### Voluntary contributions:

- Homo economicus \$0
- Social optimum \$10
- Homo sapiens \$4-6

## Public Goods Game

Contributions decline over time

Institutions have a major effect on contributions

Contributions promoted and maintained by:

- Communication
- Sanctioning mechanisms

## Social Factors

“Intrinsic” motivations important

- Many people make voluntary contributions to public goods
- Many are conditional cooperators – will only contribute provided others also do
- Communication and sanctioning systems can maintain cooperation

## Social Factors

Crowding out

- Formal institutions can “crowd out” intrinsic motivations
- Introducing financial incentives can in some cases lead to a reduction in contributions
- Depends on existing motivations

## Psychological & Social Factors

*Homo sapiens* differs from *Homo economicus*

- Human responses to institutions and incentives often deviate from expectations
- Therefore markets and other economic policies may not perform as models predict

## Psychological & Social Factors

*Homo sapiens* differs from *Homo economicus*

- However many of these deviations are measurable and predictable
- Experimental economics can reveal these anomalies, providing general guidance on policy design as well as testing specific institutions