ECON 3113 Microeconomic Theory I
Lecture 1: Economic Modelling

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What is Economics About?

- Fields in economics:
  - Microeconomics
  - Macroeconomics
  - Econometrics
  - Subfields/Subdisciplines according to JEL Classification System
    - A - General Economics and Teaching
    - B - History of Economic Thought, Methodology, & Heterodox Approaches
    - C - Mathematical and Quantitative Methods
    - D - Microeconomics
    - E - Macroeconomics and Monetary Economics
    - F - International Economics
    - G - Financial Economics
    - H - Public Economics
    - I - Health, Education, and Welfare
    - J - Labor and Demographic Economics
    - K - Law and Economics
    - L - Industrial Organization
    - M-Z - Business, History, Growth and Development, Environmental Economics, Urban Economics, etc...

What Is Microeconomics About?

- Microeconomics studies how individuals make decisions in different contexts, and their consequences to the organization and society.
- ECON 3113 (Microeconomic Theory I)
  - "Theory of the consumer" / Demand theory
  - Utility/preference maximization
  - Information asymmetry
- ECON 3133 (Microeconomic Theory II)
  - Theory of the firm
  - Profit maximization
  - Market competition

What is ECON 3113 About?

- Basic model of individual decision-making
  - Relation between preference, utility and choice
- Demand theory
  - Utility maximization
  - Indifference curve diagram
- Social choice
  - Preference aggregation?
- Risk and information
  - decision-making under uncertainty
- Information asymmetry
  - Adverse selection, signaling, moral hazard, screening, etc.

Economics vs Sociology

- Harvard economist James Duesenberry once said, "*I used to tell my students that the difference between economics and sociology is very simple. Economics is all about how people make choices. Sociology is all about why they don't have any choices to make.*"
- Economics: Individualism
- Sociology: Determinism

How Do We Do Economics?

1. Identify interesting phenomena and important questions by observing the real world
   - big questions: societal well-being, fighting poverty, etc
   - counter-intuitive observations: pro-abortion policies lower crime rate?

2. Build theoretical models
   - simplified version of the phenomena/settings we are interested in
   - consist of assumptions that help abstract away from insignificant complications of the reality
   - other things being equal, we prefer simple and realistic assumptions

How Do We Do Economics?

3. Derive predictions of the theoretical models
    - logical deduction, often with math

4. Test the models' predictions
    - controlled policy experiments
    - econometric analyses of data from natural experiments

What Are Economists Interested In?

In 1911:

- *Agricultural Credit in the United States* by E. W. Kemmerer
- *Will the Present Upward Trend of World Prices Continue?* by Irvin Fisher
- *The Report of the Tariff Board on Cotton Manufacturers* by Melvin T. Copeland
- *The Report of the Tariff Board on Wool and Woolens* by F.W. Taussig
- *Marketing of Agricultural Lands in Minnesota and North Dakota* by John Lee Coulter
- *Profit on National Bank Notes* by Spurgeon Bell

What Are Economists Interested In?

Now:

- *The Impact of Legalized Abortion on Crime* by John Donohue and Steven Levitt
- *Corruption, Norms, and Legal Enforcement: Evidence from UN Diplomatic Parking Tickets* by Ray Fisman and Edward Mipguel
- *Racial Preferences in Dating: Evidence from a Speed Dating Experiment* by Ray Fisman, Sheena Iyengar, Emir Kamenica and Itamar Simonsen
- *A Theory of Rational Addiction* by Gary Becker and Kevin Murphy
- *Professionals (soccer players) Play MinMax* by Ignacio Palacios-Huerta
- *The Endowment Effect in Capuchin Monkeys* by Keith Chen, Venkat Lakshminarayanan and Laurie Santos

- People respond to **incentives**.
- Environments evolve until they are in **equilibrium**.

Ingredient 1: Incentives

- In deciding what to do, people consider how well their actions help pursuing their objective, after assessing the constraints and the environment.

    - Consumers maximize utility given their affordability and prices.
    - Workers maximize income given their cost of effort and the labour contract.
    - Firms maximize profit given the environments in the input and product markets.
    - Students maximize their grades given their effort cost in studying and the grading policy.
    - Young ladies/gentlemen maximize the desirability of their partner given the "dating market environment".
    - Criminals maximize their expected payoff given the legal system and enforcement.

- People's behaviors are expected to respond to changes in the constraints and environments.

Example of Incentives

- Policy: Paying people for rat pelts in order to reduce rat population.

Example of Incentives

- Effect: Industrious locals set up rat farms.

- Policy: Paying fossil hunters per piece of bone they find while fossil hunting.

- Effect: Fossil hunters smash bones they find into lots of small pieces.

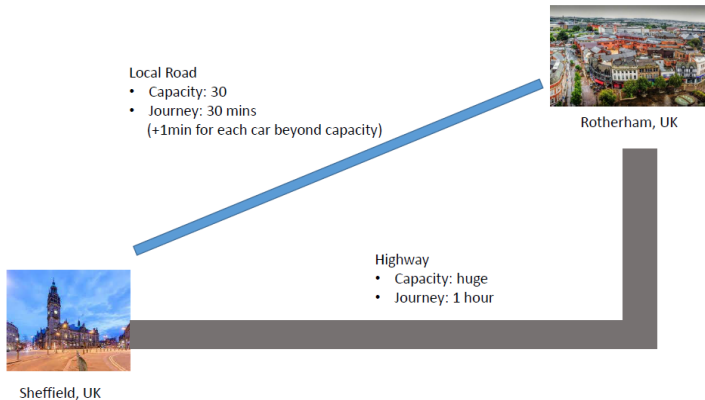- Policy: Introduce laws that make it hard for firms to sack workers in order to reduce unemployment.

- Effect: Stops firms from hiring workers and so increases unemployment.

Ingredient 2: Equilibrium

- Environment adjusts until it reaches an equilibrium – a state of affairs in which no individual is willing to unilaterally change his/her behaviors.
  - e.g., prices, strategies

Example of Equilibrium

Local Road
- Capacity: 30
- Journey: 30 mins
  (+1min for each car beyond capacity)

Rotherham, UK

Highway
- Capacity: huge
- Journey: 1 hour

Sheffield, UK

Example of Equilibrium

- Initially, less than 30 cars uses the local road.
- Travel time of the local road is 30 minutes $<$ 1 hour, so everyone wants to take the local road.
- What if everyone indeed take the local road?
- Then the travel time of the local road is 30 minutes $+$ no. of cars $>$ 1 hours, so everyone wants to switch to the highway.

- This leaves us with the only possibility: exactly 60 cars use the local road.
- Travel time of local road = 1 hour = travel time of highway.
- Everyone is indifferent, so no one wants to switch.
- This is an equilibrium: given what others are doing, no one has an incentive to change his/her own plan.

Example of Equilibrium

- Rotherham City Council plans to **double** the capacity of the local road.
- Will this reduce journey time?
- Yes, says the Rotherham City Council:
    - 30 people are currently using the local road.
    - Currently their journeys take an hour
    - Travel time becomes 45 minutes after the road expansion.

- Imagine the city council's description becomes reality.
- Current highway users will switch to local road — their description is **not an equilibrium**!
- When will the process of switching stop?
- Exactly when the travel time of the local road and highway are equal.
- Conclusion: Rotherham City Council are idiots.

Derivation of Model Predictions

- Economists rely on rigorous mathematics in deriving their model predictions.
- Economists often speak in the language of mathematics, not because we like being difficult, but rather because

1. it is often fantastically useful in obtaining insights;
2. it makes ideas clear and precise;
3. it allows us to make predictions we could not make using intuition alone.

- Math to be used in this course:
  - Calculus
  - Algebra
  - Logic/proofs

Predictions

- Models are useful only if they offer testable predictions.
- A prediction is a statement about how **exogenous variables** affect **endogenous variables.**
  - Exogenous variables: variables that the model takes it as given (inputs)
  - Endogenous variables: variables that the model can say something about (outputs)

Economics as a Positive Science

- Positive analysis: objective description and prediction of real-world economic events
- Normative analysis: recommendation of what should be done
    - Lack of consensus on the choice of criteria
- Science vs Engineering

- "*All models are lies: the art is telling useful lies.*"
- Economics studies human-beings' interactions, which can be very complicated.
- To make progress, economists rely on simplified models of the environment.
- In many cases, these simplified models are very useful.
- But it is important to remember they have their limits and applicability.

Caveats

- Economics has very few "universal truths", and none of these are:
  - "Markets are good things";
  - "Minimum wage and unemployment benefits create unemployment";
  - "Healthcare should/should not be provided by the government."
- These are complicated questions, with complicated answers.
- But economics will give you the tools to think about and analyze these questions, and develop informed opinions.