Intermediate Microeconomics

An Introduction

Mark Dean – Fall 2009 – Brown University

What is Economics?

- “A social science that studies the production, distribution and consumption of goods and services”?
- “The study of the allocation of scarce resources”?

Economics is Defined by its Tools

- People respond to incentives
  - Wages
  - Punishment
  - Taxes and Benefits
  - Risk of Infection or injury
  - Profits
  - Sex
  - Effort
- Environments adjust until they are in equilibrium
  - Prices
  - Strategies

The Importance of Incentives and Equilibrium

- Incentives are important
- Equilibrium is important

Incentives are Important

- Policy
  - Reduce rat population by paying people for rat pelts
- Effect
  - Industrious locals set up rat farms

A Rat Farm

Incentives are Important

- Policy
  - Funding for fire departments based on the number of call outs to fires
- Effect
  - Stopped fire departments installing smoke alarms

Incentives are Important

- 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

Incentives are Important

- Policy
  - Encouraging people to by health/car/house insurance
- Effect
  - Reduce efforts made by people to stay healthy/not crash/protect their home

Incentives are Important

- 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

The Importance of Incentives and Equilibrium

- Incentives are important
- Equilibrium is important

Equilibrium is also Important

Rotherham
(Pop: 200)

Sheffield

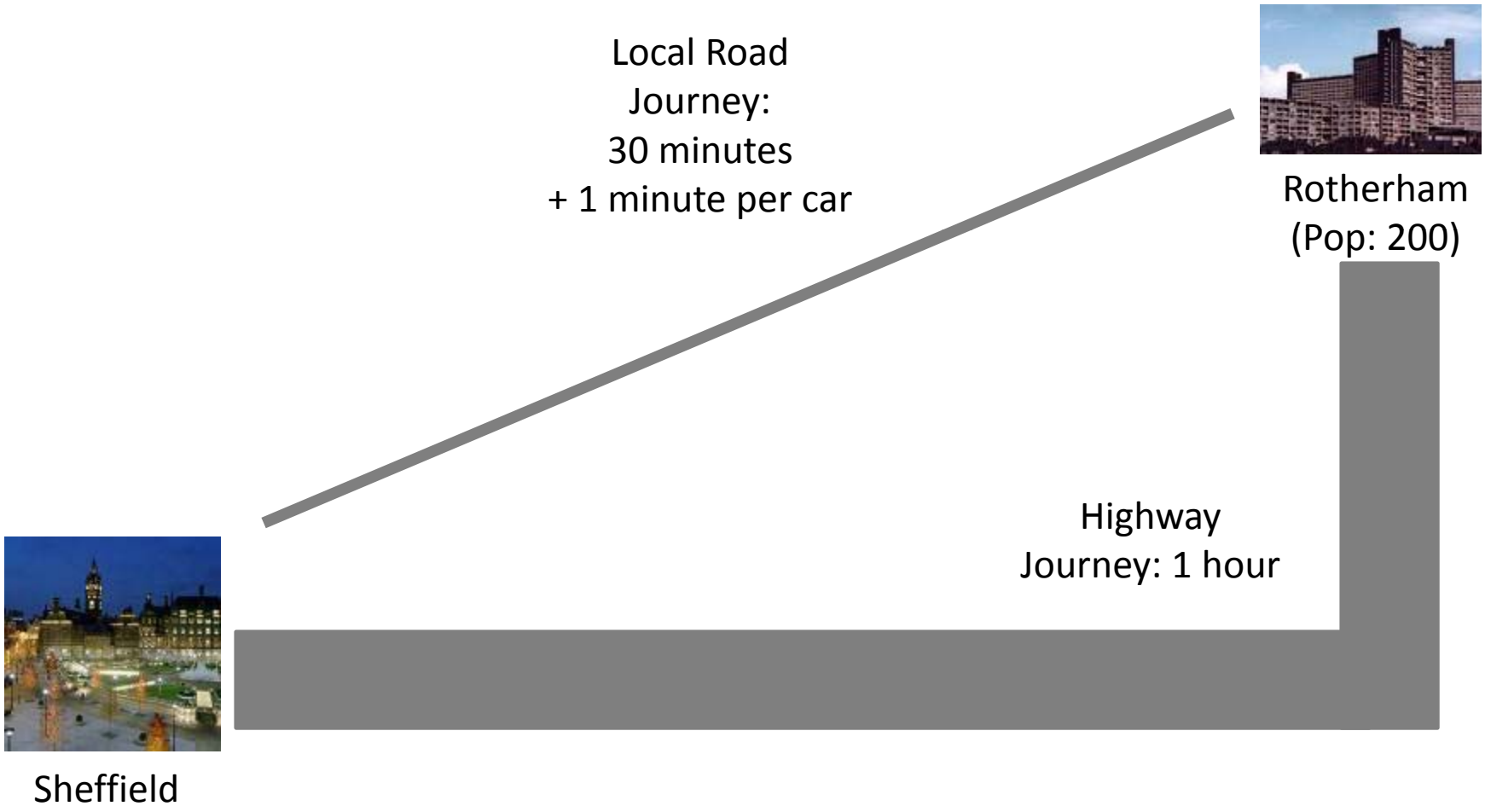
Equilibrium is also Important

Rotherham
(Pop: 200)

Highway
Journey: 1 hour

Sheffield

Equilibrium is also Important



Which Route to Take?

- Say less than 30 cars are currently taking the local
  - Travel time is 30mins + 1 x number of cars < 1hr
  - Everyone wants to take the local road

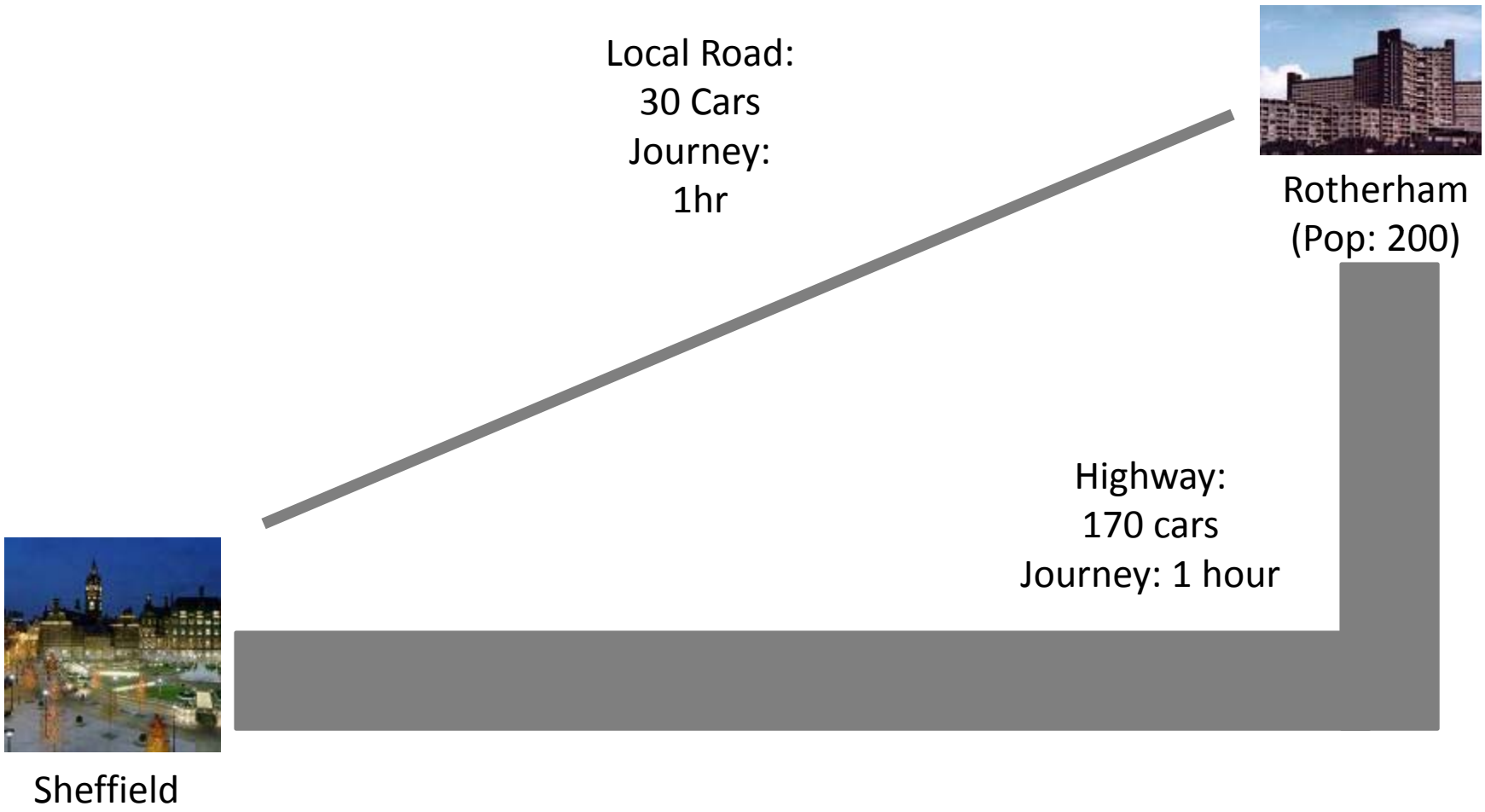
Which Route to Take?

- Say more than 30 cars are currently taking the local
  - Travel time is 30mins + 1 x number of cars > 1hr
  - Everyone wants to take the highway

Which Route to Take?

- Say exactly 30 cars are currently taking the local
  - Travel time is 30mins + 1 x number of cars = 1hr
  - Everyone indifferent between taking the highway
- This is an Equilibrium: Given what everyone else is doing, no one has incentive to change their plans

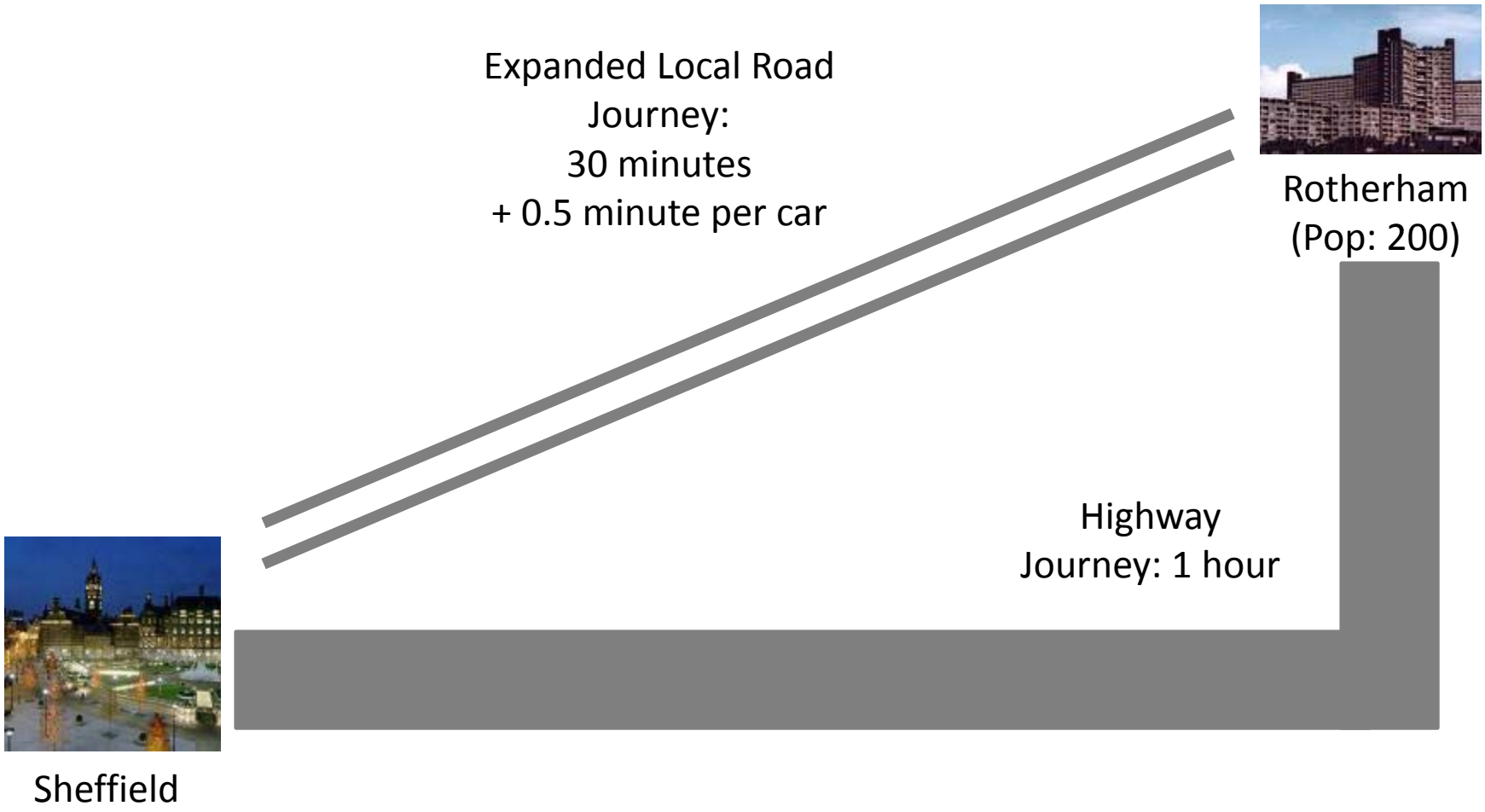
Equilibrium



Expanding the Local Road

- Rotherham City Council has a plan to double the capacity of the local road

Expanding the Local Road



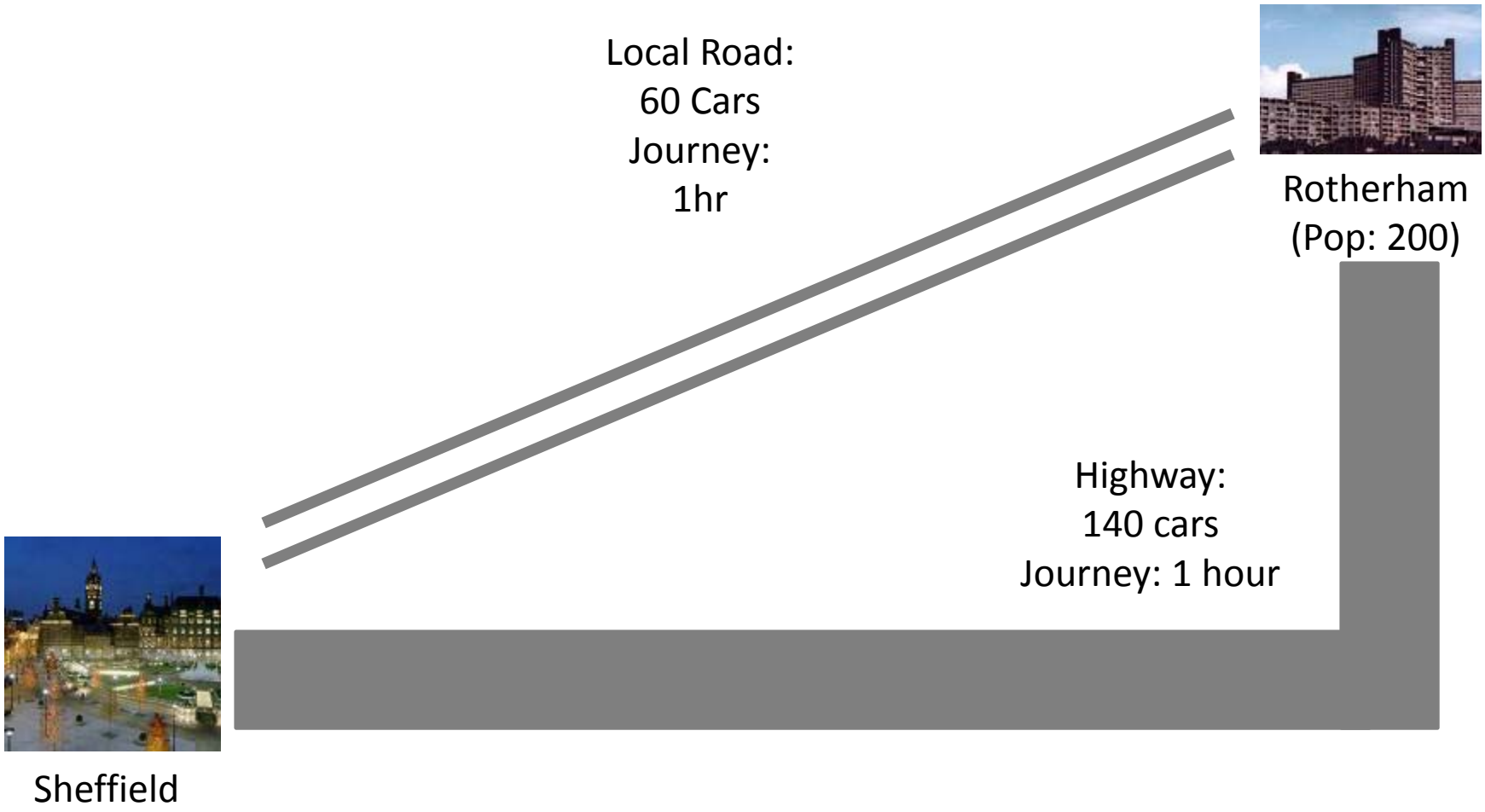
Expanding the Local Road

- Will this reduce journey time?
- Yes, say Rotherham city council
  - 30 people use the local road
  - It currently takes them 1 hour
  - Under the new road, it will only take them 45 minutes
- Conclusion: Rotherham city council are idiots

Expanding the Local Road

- Imagine that Rotherham City Council were right
  - People taking the highway would want to change their plan and take the local road
  - This is not an Equilibrium
- Will lead people to switch from the highway to the local road
  - When will this process stop?
  - When journey times are the same on the highway and the local road

Equilibrium II



The Tools of The Economist

- In this course, you will learn the tools that economists use to analyze the effect of incentives in the framework of equilibrium analysis
  - Incentives
    - Optimization

Optimization

- Assume that agents behave as if maximizing a well specified mathematical function
  - Utility function for individuals
  - Profit function firms
- These agents are constrained in what they can choose
  - Budget constraints for individuals
  - Technological constraints for firms
- We use the mathematical tools of constrained optimization to understand how people respond to incentives

The Tools of The Economist

- In this course, you will learn the tools that economists use to analyze the effect of incentives in the framework of equilibrium analysis
  - Incentives
    - Optimization
  - Equilibrium
    - Market Equilibrium
    - Game theory

Market Equilibrium

- Market equilibrium considers the case in which agents (firms and individuals) are ‘small’
- These agents buy, sell and produce goods which they trade at market prices
- No agent is big enough to influence these prices, so they take them as given
- Market equilibrium assumes prices adjust to the equalize supply and demand
  - Amount that people want to sell equals the amount that people want to buy

Game Theory

- In many case, the assumption that agents are ‘small’ is a bad one
- The actions of agent A may directly affect those of agent B
  - E.g. ‘Oligopoly’ – Price that Apple set for Macs will directly affect PC manufactures
- Agent B may react to the actions of agent A, which may in turn will affect agent A
  - PC manufacturers will respond to changes in Mac prices which will in turn affect demand for Macs
- Agent A needs to take this into account when they decide what to do
- This is the arena of Game Theory: the study of strategic interaction

The Tyranny of Economics

- In the past, these tools were used to analyze 'traditional' economic topics:
  - Prices and quantities (esp of agriculture)
  - Money
  - Stocks, bonds and exchange rates
  - Etc.
- Now used to study an enormous range of different questions

Economics c. 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

Economics 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

Limits of Economics

- Is economics “fundamentally flawed”?
  - Failure to predict market crash
  - Interventions in Russia and Argentina didn’t go so well
  - Seen as ‘cold hearted’, and inherently favoring the rich
- Many criticisms aimed at the assumption that people are rational agents that maximize a well-specified utility function
  - People have well defined utility functions?
  - The always choose the best option?
  - People are selfish?

“All models are lies: The art is telling useful lies”

- Economists rely on simplified models of the environment
- In many cases, these simplified models are fantastically useful
- But they have their limits
- IT IS IMPORTANT TO REMEMBER THIS!

Economics has very few ‘universal truths’

- This course will not allow you to conclude
  - “Markets are good things”
  - “A minimum wage creates unemployment”
  - “Healthcare should/should not be provided by the government”
- But it will give you the tools to join the debate
- Normative conclusions, in particular should be examined critically
  - Normative economics: what people should do
  - Positive economics: what people do do

Syllabus

- *Consumer Theory*
  - The budget set
  - Preferences and indifference curves
  - Utility functions
  - Optimal choice
  - Demand Functions, comparative statics and the Slutsky Equation
  - Consumer Surplus

Syllabus

- *Market equilibrium and efficiency in an exchange economy*
  - Definition of equilibrium
  - The Edgeworth box
  - Walras law
  - How is equilibrium reached?
  - Pareto Equilibrium
  - 1st Fundamental Welfare Theorem
  - 2nd Fundamental Welfare Theorem
  - Problems with the welfare theorems
  - Property rights and Coase theorem

Syllabus

- *Producer Theory – Perfect Competition*
  - Technology
  - Profit Maximization and Cost Minimization
  - Firm Supply
  - Equilibrium in a production economy
  - Welfare theorems in a production economy

Syllabus

- *Monopoly*
  - The monopolist's problem
  - Monopoly behavior
  - Cost of monopolies

Syllabus

- *Game Theory*
  - The concept of a game
  - Nash equilibrium
  - Subgame perfect Nash equilibrium
  - Applications of Game Theory

Syllabus

- *Choice Under Uncertainty*
  - Choices between gambles
  - Expected utility theory
  - Risk aversion

Syllabus

- *Asymmetric Information*
  - The market for lemons
  - Adverse selection
  - Moral hazard

Syllabus

- *Behavioral Economics*
  - Do people choose the ‘best option’
  - Do people maximize expected utility
  - Other-regarding preferences
  - The effect on economic analysis