1.1 — The Tools of Microeconomics

ECON 306 • Microeconomic Analysis • Fall 2020

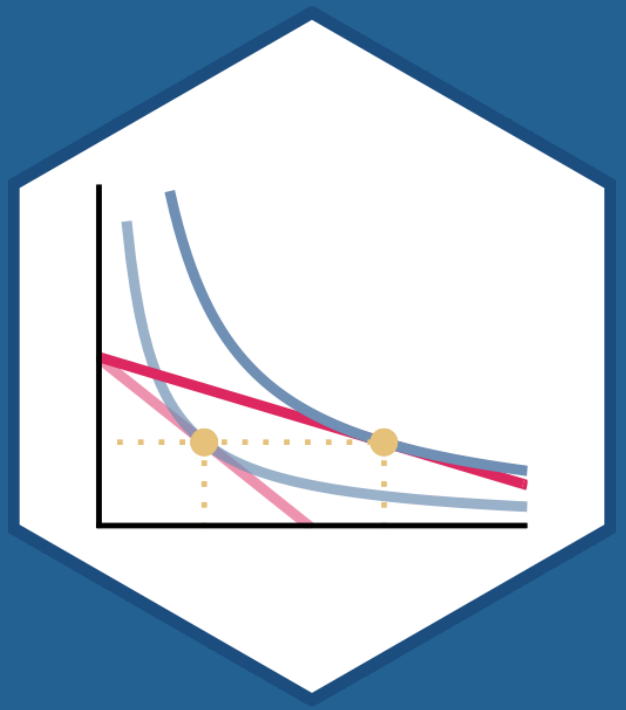
Ryan Safner

Assistant Professor of Economics

safner@hood.edu

ryansafner/microF20

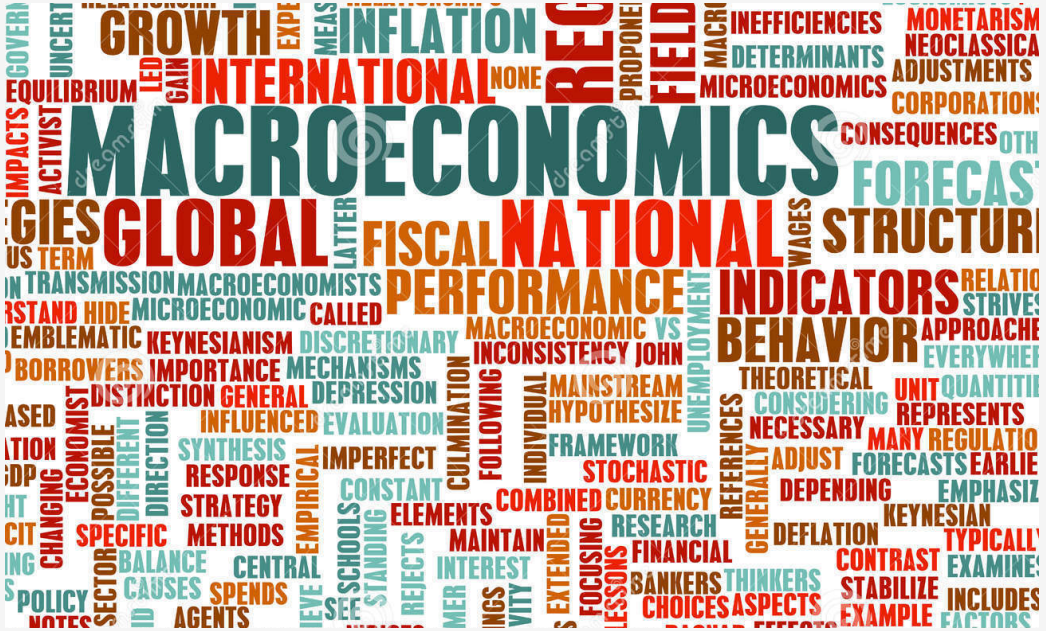
microF20.classes.ryansafner.com



Micro-economics

Micro- vs. Macro-economics

- What is “an economy?”
- Where do aggregates (“GDP”, “unemployment”, & “inflation”) come from?
- **Micro**: [modelling] **Choices** and **consequences**
- **Macro**: [modelling] **Systemic interaction** of choosers & **emergent behavior**



Where You Are Now

- **Basic concepts** of markets, individuals (consumers & firms), economies:
  - ECON 205: Principles of Macroeconomics
  - ECON 206: Principles of Microeconomics
- **Modelling** markets, individuals (consumers & firms), economies
  - ECON 306: Microeconomic Analysis
  - ECON 305: Macroeconomic Analysis[1]

[1] Required for ECON majors only. Calculus I is required.

Economists Speak a Foreign Language...

- Terms you “know” from ordinary life mean **very different things** to economists:

> Cost, efficiency, welfare, competition, marginal, equilibrium, profit, public good, discrimination, elasticity

- Using these words’ “ordinary” meanings will lead to wrong economic conclusions!

- You will need to **“relearn”** the economic meanings of these words

...But You Can Learn It

- You'll need to master a new vocabulary:

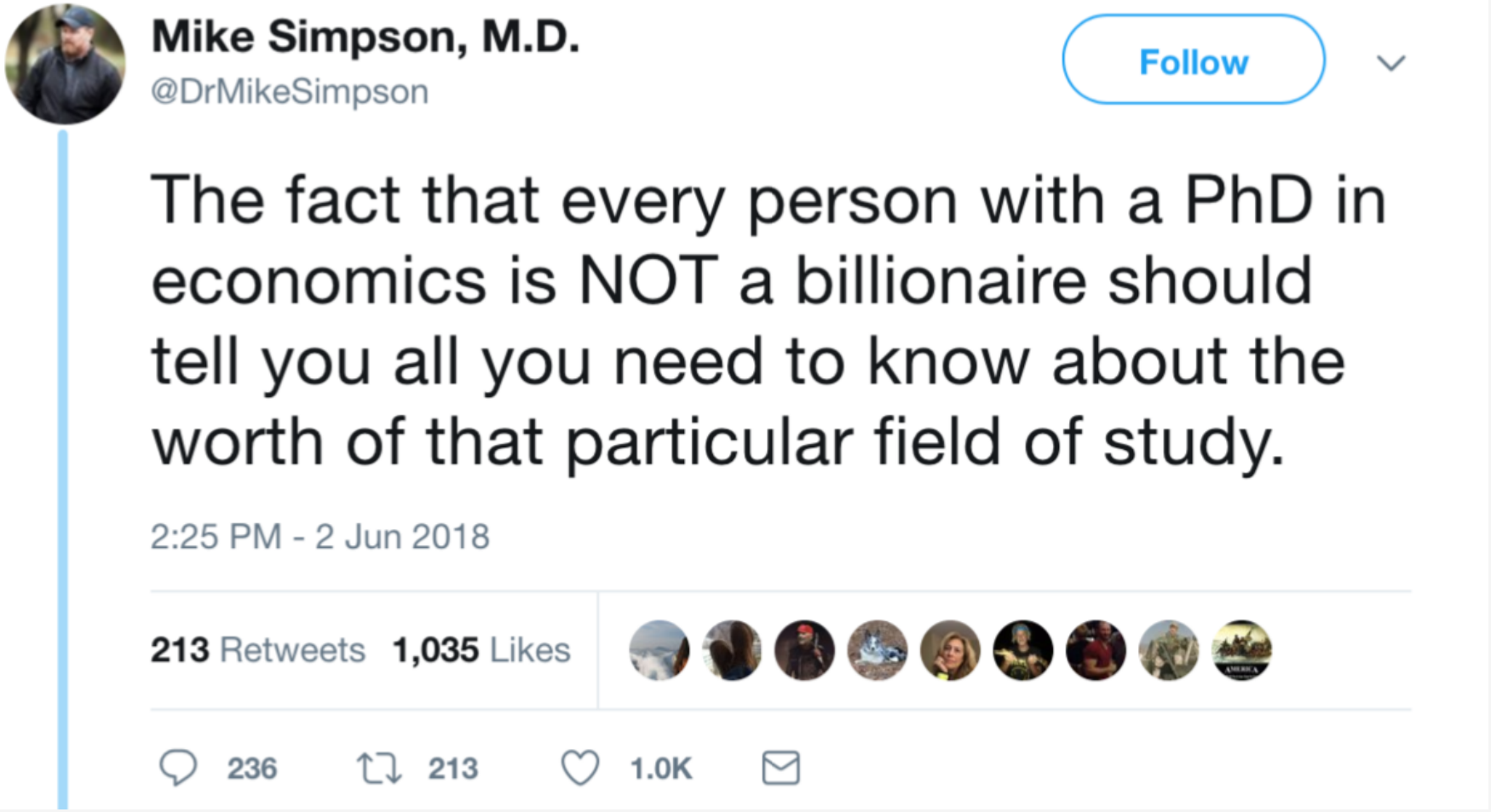
  > externality, marginal rate of substitution, marginal cost, consumer surplus, allocative efficiency

- Avoid excessive jargon, but these concepts are useful to explain reality!

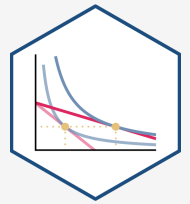
...But You Can Learn It

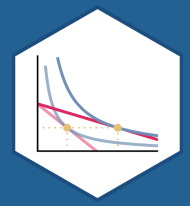
- Everyone thinks they are *already* an economist and can speak this foreign language
- Be humble!
- Economics is *often* common sense, but reached via deep analytical thinking

Economics ≠ Business or $$$



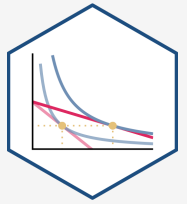
Economics ≠ Business or $$$





The Tools of Microeconomics

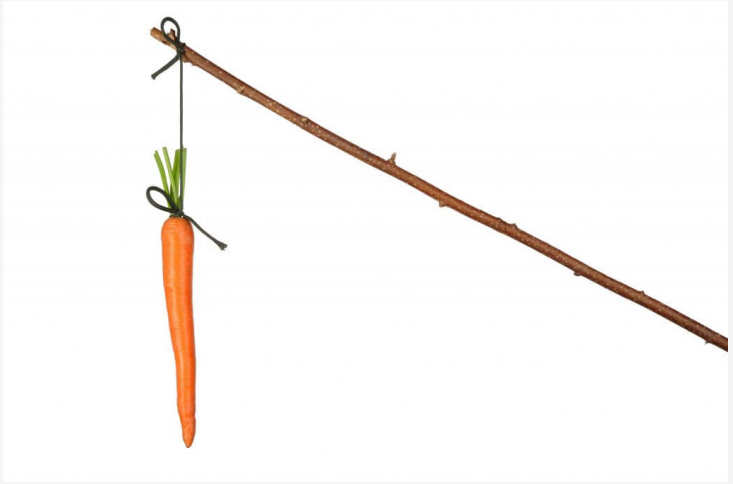
Economics as a *Way of Thinking*



- Economics is a **way of thinking** based on a few core ideas:

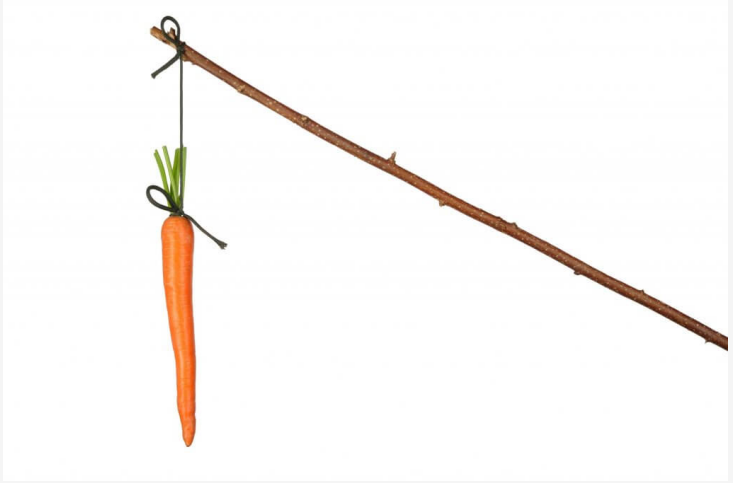
Economics as a *Way of Thinking*

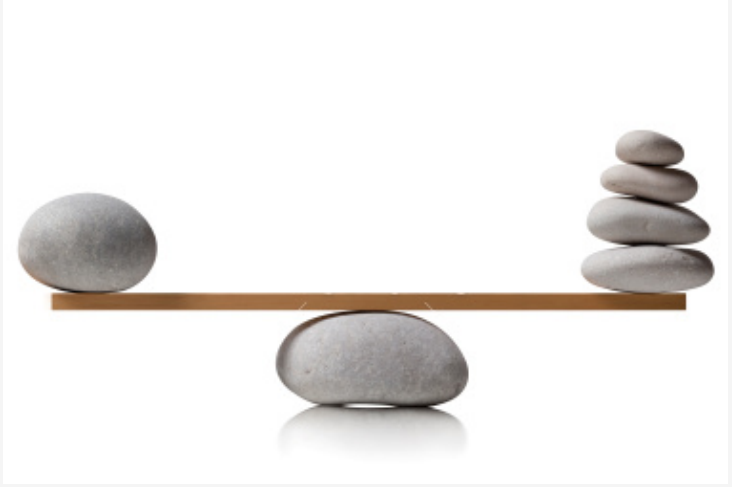
- Economics is a **way of thinking** based on a few core ideas:
- **People respond to incentives**
  - Money, punishment, taxes and subsidies, risk of injury, reputation, profits, sex, effort, morals

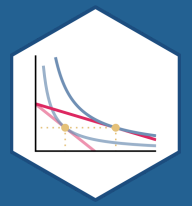


Economics as a *Way of Thinking*

- Economics is a **way of thinking** based on a few core ideas:
- **People respond to incentives**
  - Money, punishment, taxes and subsidies, risk of injury, reputation, profits, sex, effort, morals
- **Environments adjust until they are in equilibrium**
  - People adjust their choices until optimal, given others' actions





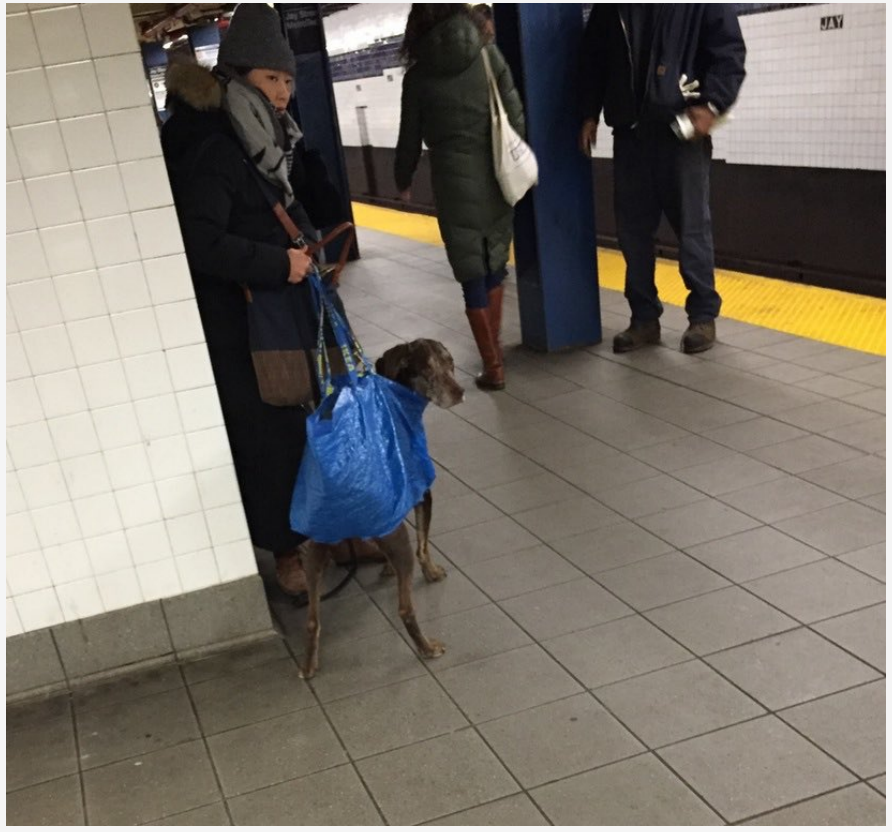


Incentives

Incentives Example: Subway I

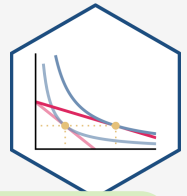
The NYC Subway bans dogs unless they can be [“enclosed in a container”]

Incentives Example: Subway II



Pictures Source

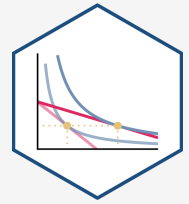
Incentives Example: Rat Bounty



Some governments pay bounties to reduce pest populations such as rats.

Example: Suppose the government were to pay $250 for every rat tail turned in.

Incentives: Even Dolphins Understand I



Animal behaviour

Why dolphins are deep thinkers

The more we study dolphins, the brighter they turn out to be, writes **Anuschka de Rohan**

Anuschka de Rohan

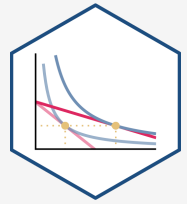
Wed 2 Jul '03 21.25 EDT

20,181

The brain of an adult bottlenose dolphin is about 25% heavier than the average human adult's brain. Photograph: Stephen Frink/Getty Images

July 2 2003, "Why Dolphins are Deep Thinkers", *The Guardian*

Incentives: Even Dolphins Understand II

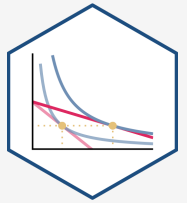


At the Institute for Marine Mammal Studies in Mississippi, Kelly the dolphin has built up quite a reputation. All the dolphins at the institute are trained to hold onto any litter that falls into their pools until they see a trainer, when they can trade the litter for fish. In this way, the dolphins help to keep their pools clean.

Kelly has taken this task one step further. When people drop paper into the water she hides it under a rock at the bottom of the pool. The next time a trainer passes, she goes down to the rock and tears off a piece of paper to give to the trainer. After a fish reward, she goes back down, tears off another piece of paper, gets another fish, and so on. This behaviour is interesting because it shows that Kelly has a sense of the future and delays gratification. She has realised that a big piece of paper gets the same reward as a small piece and so delivers only small pieces to keep the extra food coming. She has, in effect, trained the humans.

July 2 2003, "Why Dolphins are Deep Thinkers", *The Guardian*

Takeaways About Incentives I



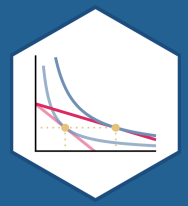
- People respond to (changes in) incentives
- People have goals they seek to attain
- Removing one alternative ≠ people *stop* persuing their goals
- People will seek (less preferred) alternative methods to attain goals
- **Unintended consequences**!

Takeaways About Incentives II

Peter Fortune
@PeterTFortune

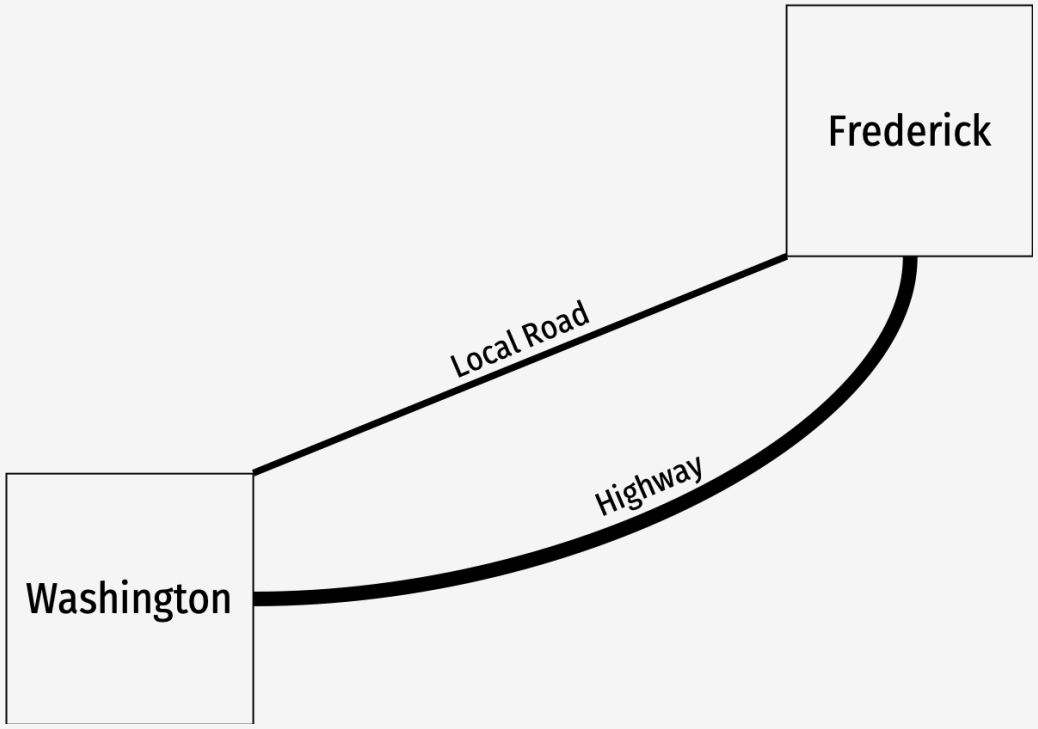
Whenever I am working on policy decisions I think of this image... 🚴

2:54 PM · Aug 7, 2019



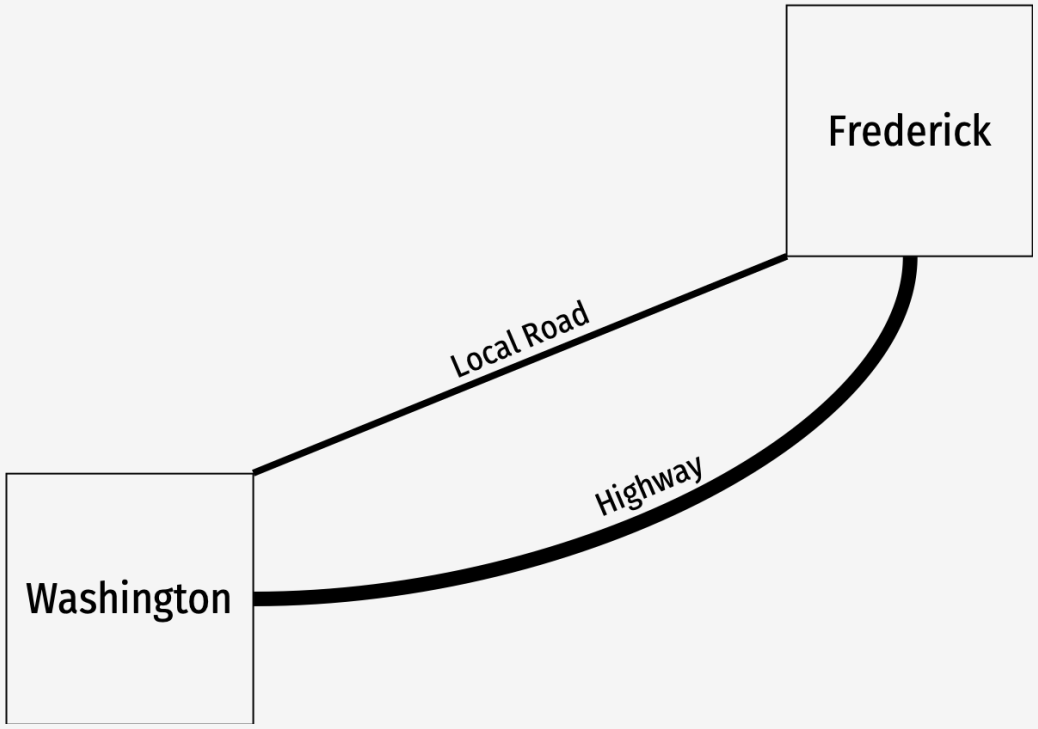
Equilibrium

Equilibrium Example I



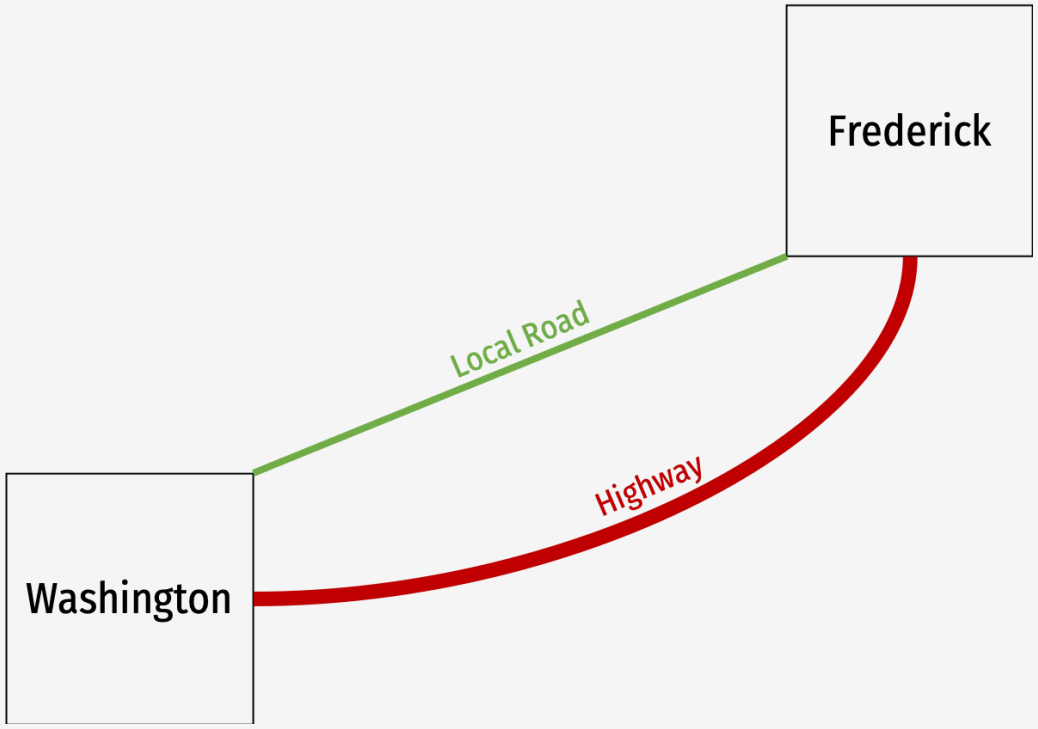
- Suppose 2 roads connect Frederick and Washington
- 100 cars commute
- Local road travel time: 30 min + 1 min/car
- Highway travel time: 1 hour (always)

Equilibrium Example I



- Suppose 2 roads connect Frederick and Washington
- 100 cars commute
- Local road travel time: 30 min + 1 min/car
- Highway travel time: 1 hour (always)
- Assume people **optimize**: choose road to **minimize travel time** between cities

Equilibrium Example II

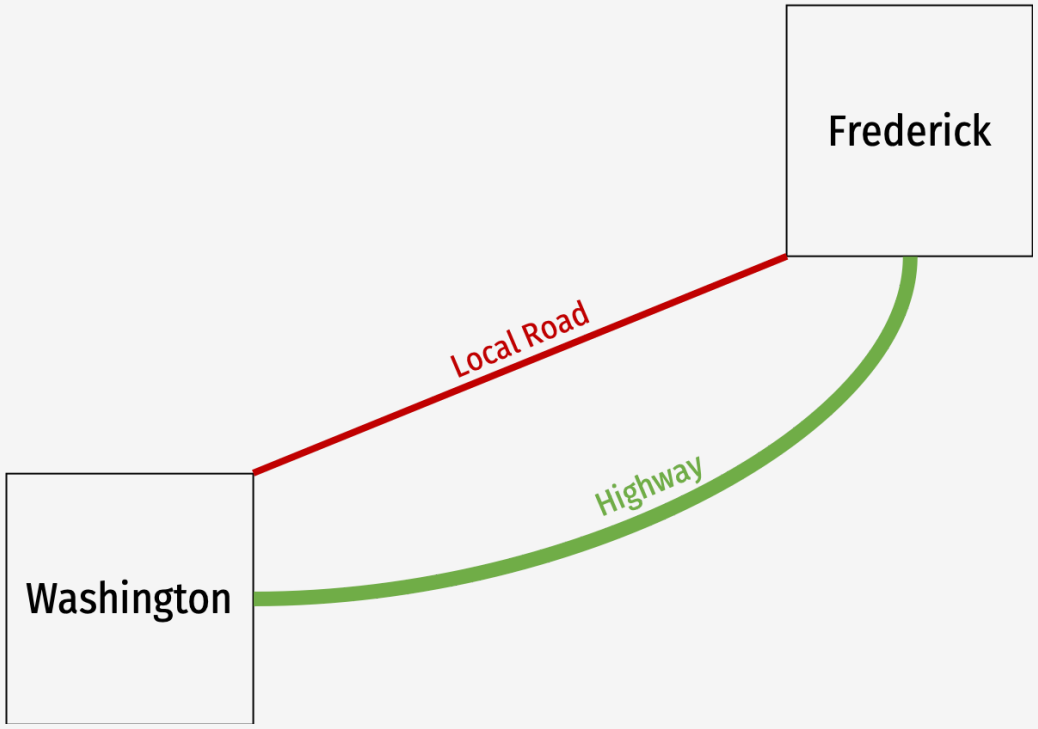


- Suppose 2 roads connect Frederick and Washington
- 100 cars commute
- Local road travel time: 30 min + 1 min/car
- Highway travel time: 1 hour (always)

Scenario I: There are **less than 30 cars** on the local road

- What will people do?

Equilibrium Example III

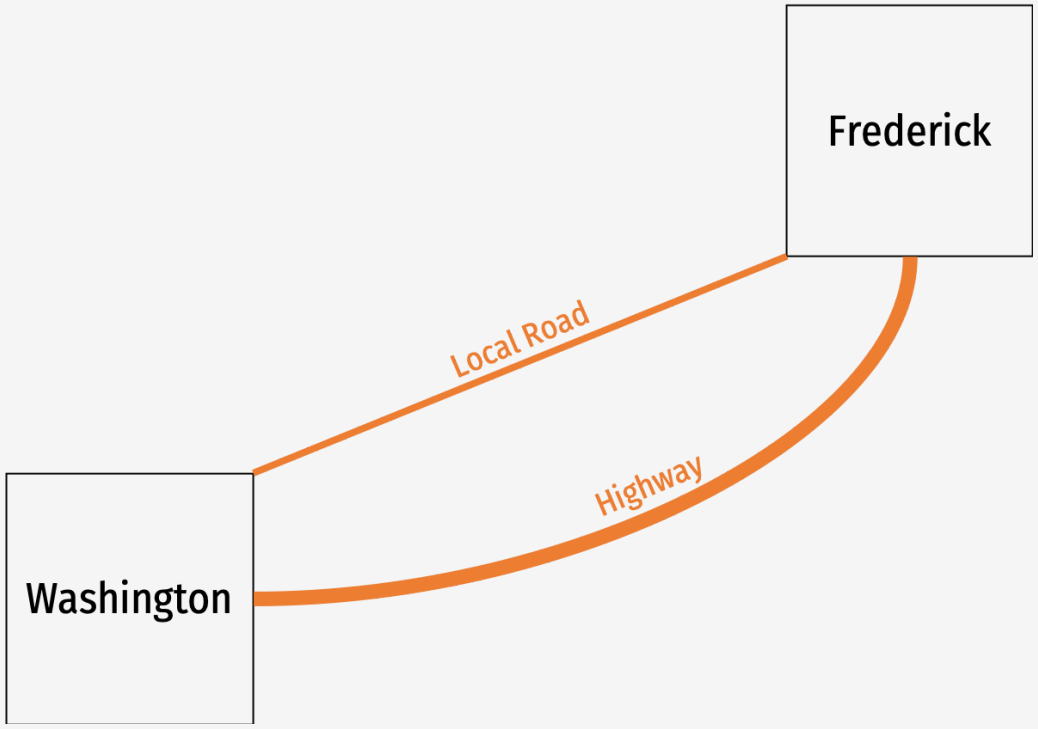


- Suppose 2 roads connect Frederick and Washington
- 100 cars commute
- Local road travel time: 30 min + 1 min/car
- Highway travel time: 1 hour (always)

Scenario II: There are **more than 30 cars** on the local road

- What will people do?

Equilibrium Example IV

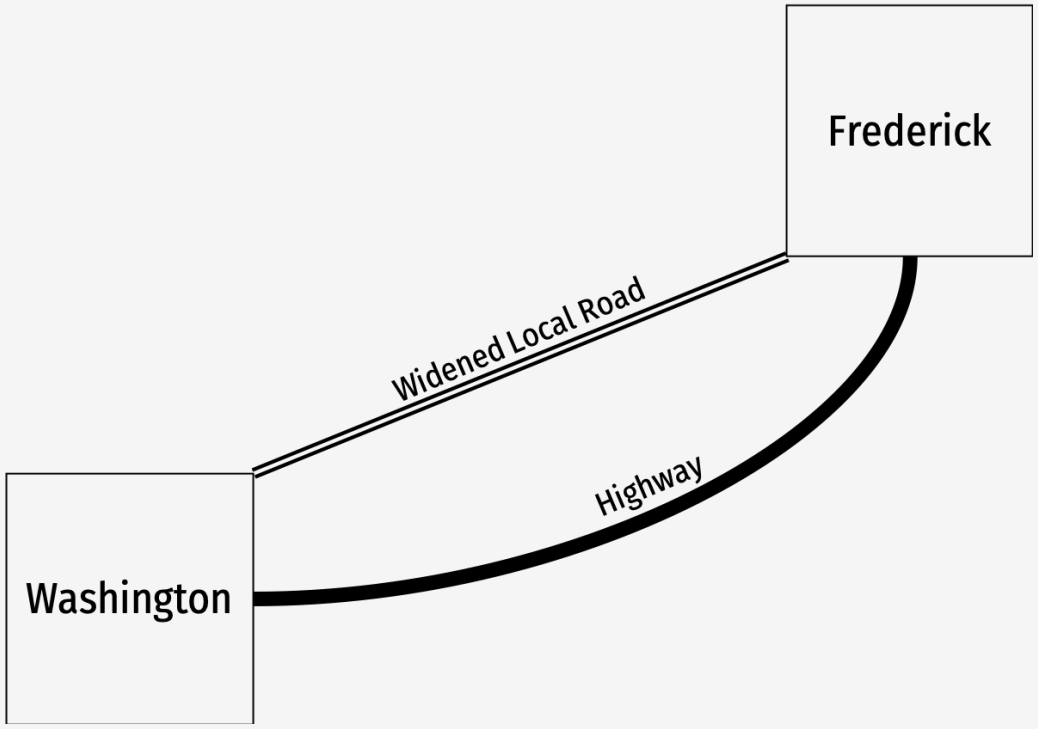


- Suppose 2 roads connect Frederick and Washington
- 100 cars commute
- Local road travel time: 30 min + 1 min/car
- Highway travel time: 1 hour (always)

Equilibrium: How many cars are on each road?

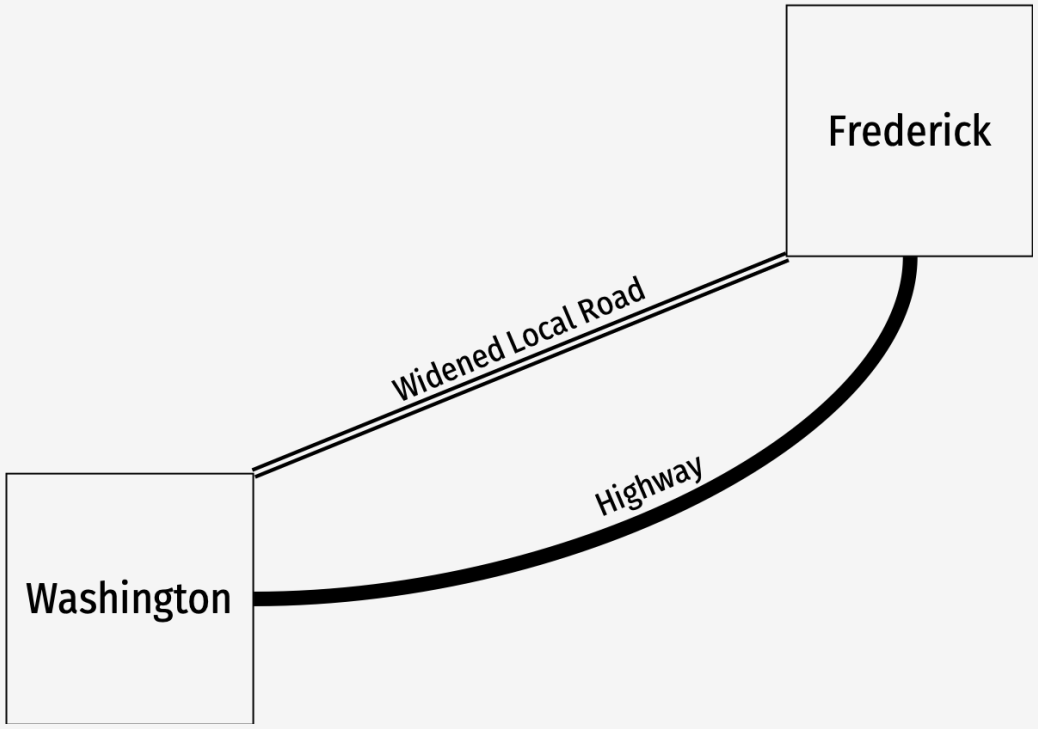
- Why?

Equilibrium Example V



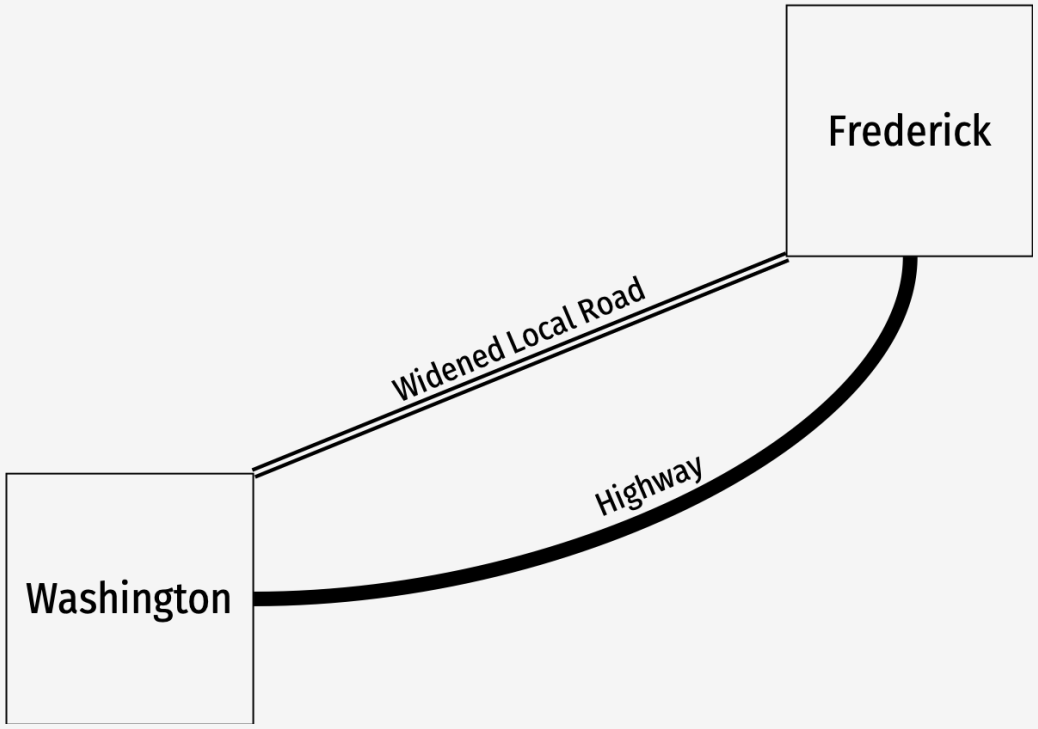
- Suppose the State *doubles the capacity* of the local road
- Local road travel time: **30 min + 0.5 min/car**
- Highway travel time: 1 hour (always)

Equilibrium Example V



- Suppose the State *doubles the capacity* of the local road
- Local road travel time: **30 min + 0.5 min/car**
- Highway travel time: 1 hour (always)
- Will this reduce travel time?
- Yes! says the State:
  - 30 cars use the local road, takes 1 hour
  - With wider road it takes 45 min!

Equilibrium Example V



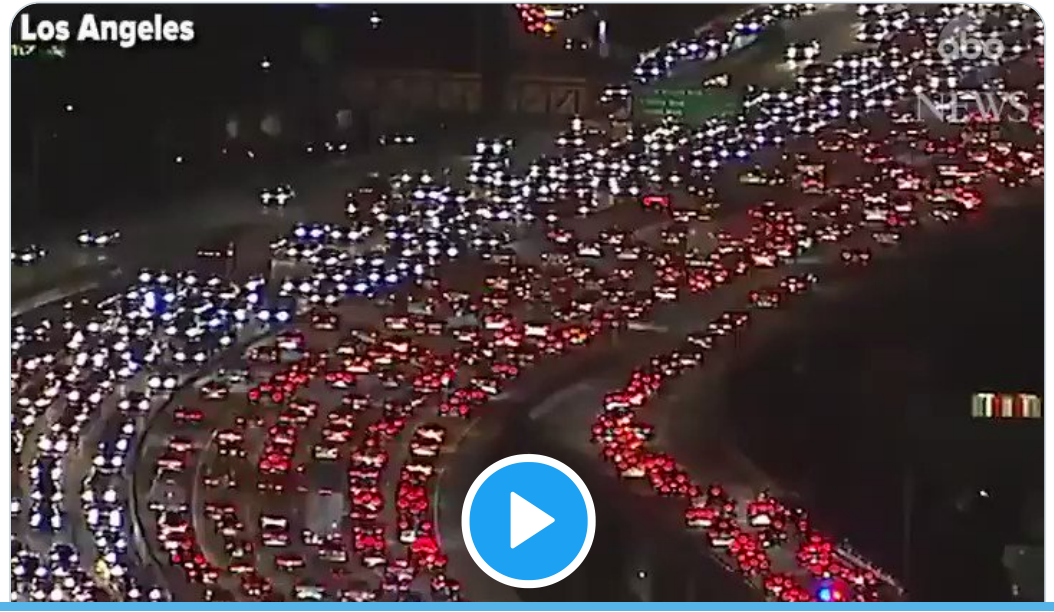
- Suppose the State *doubles the capacity* of the local road
- Local road travel time: **30 min + 0.5 min/car**
- Highway travel time: 1 hour (always)
- Will this reduce travel time?
- Yes! says the State:
  - 30 cars use the local road, takes 1 hour
  - With wider road it takes 45 min!
- **Is this an equilibrium?**

In the Long Run...(& Repeating the Same Mistake)

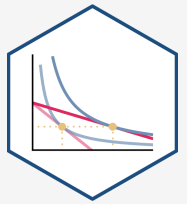
Urban Planning & Mobility
@urbanthoughts11

1970: One more lane will fix it.
1980: One more lane will fix it.
1990: One more lane will fix it.
2000: One more lane will fix it.
2010: One more lane will fix it.
2020: ?

via @avelezig



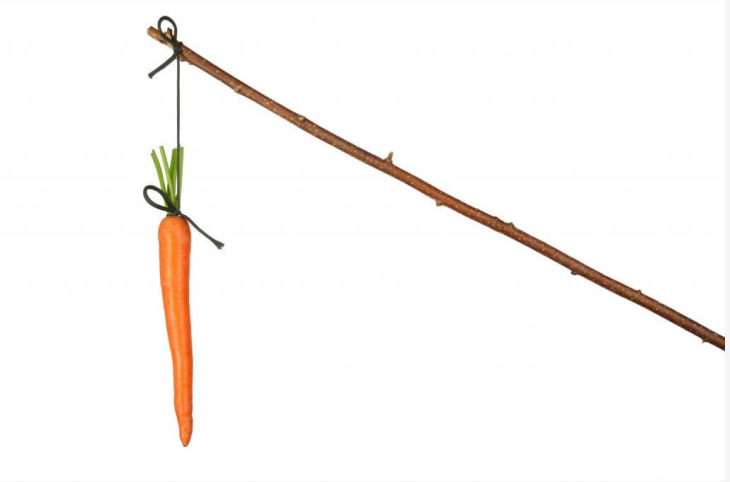
Comparative Statics

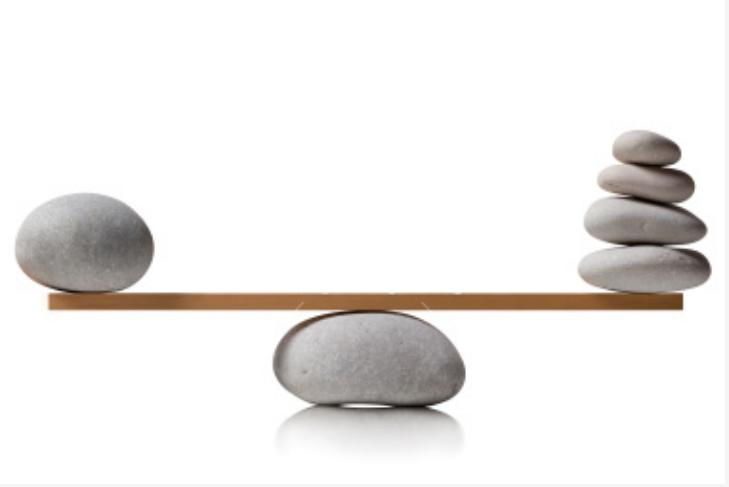


- **Comparative statics**: examining changes in equilibria cased by an external change (in incentives, constraints, etc.)

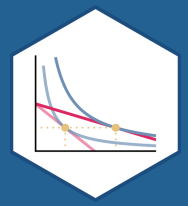
Optimization and Equilibrium

- If people can **learn** and **change** their behavior, they will always **switch** to a higher-valued option
- If there are no alternatives that are better, people are at an **optimum**
- If everyone is at an optimum, the system is in **equilibrium**



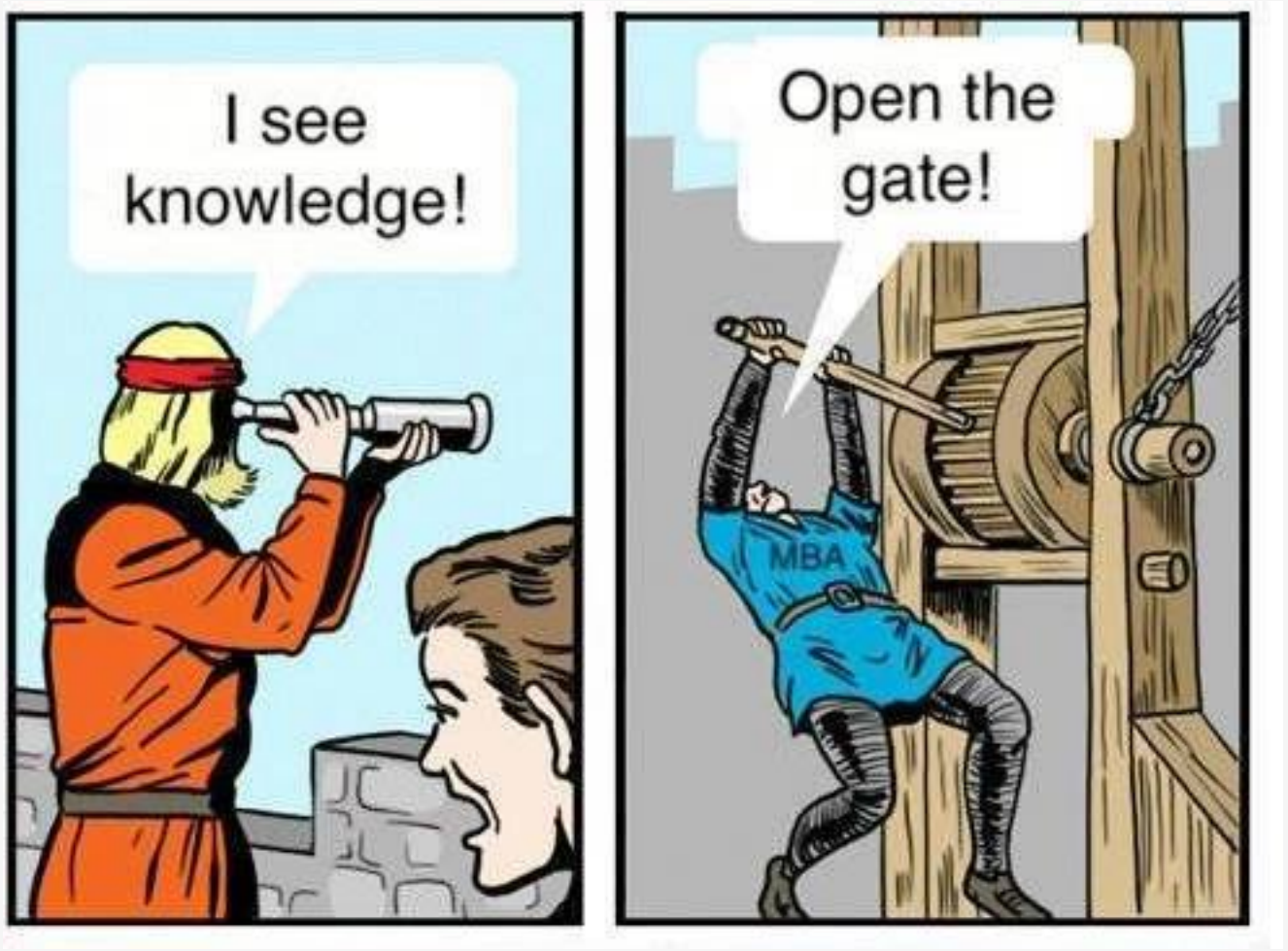


Economics Is Broader Than You Think

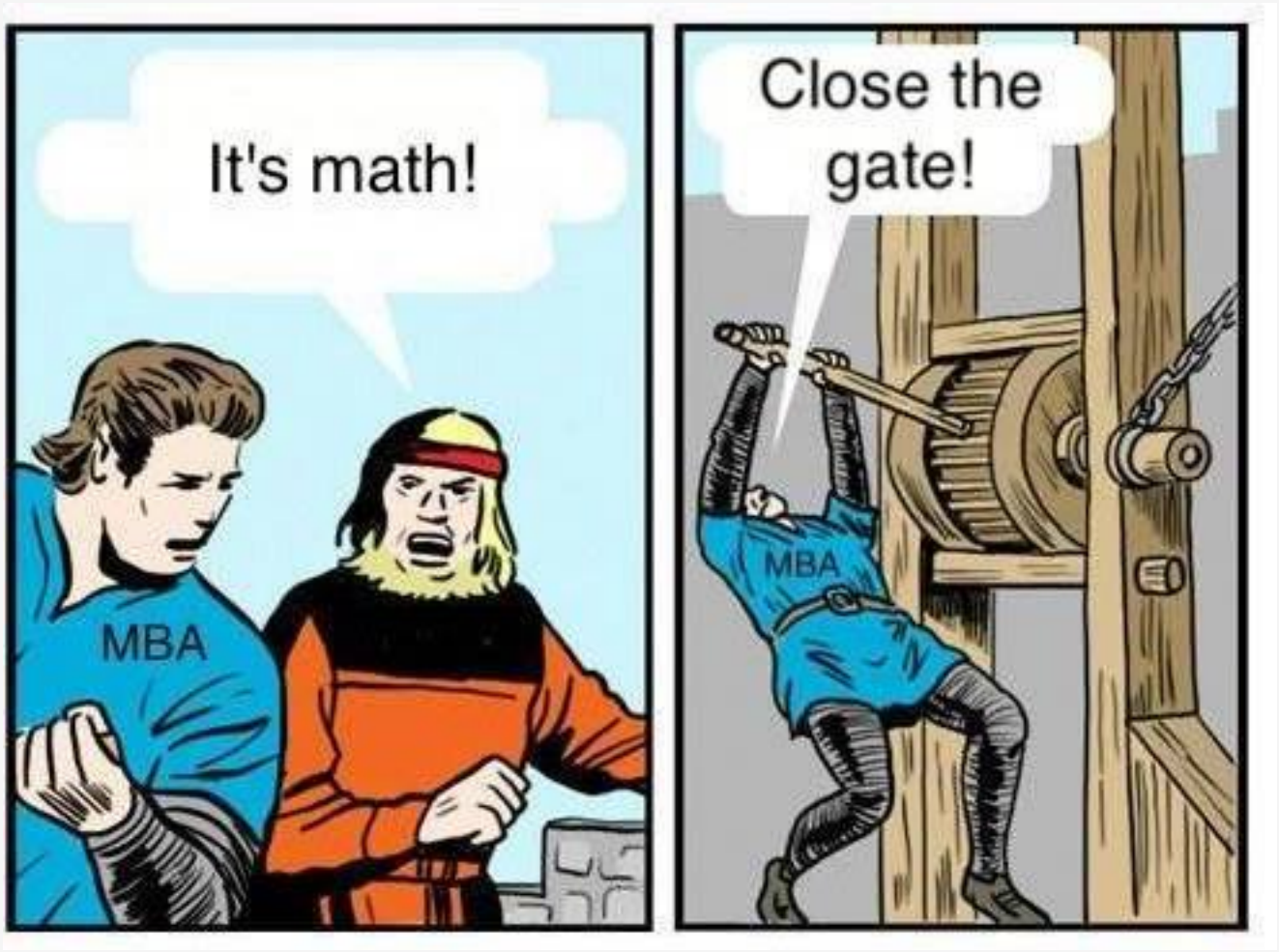


Real Talk: The Math

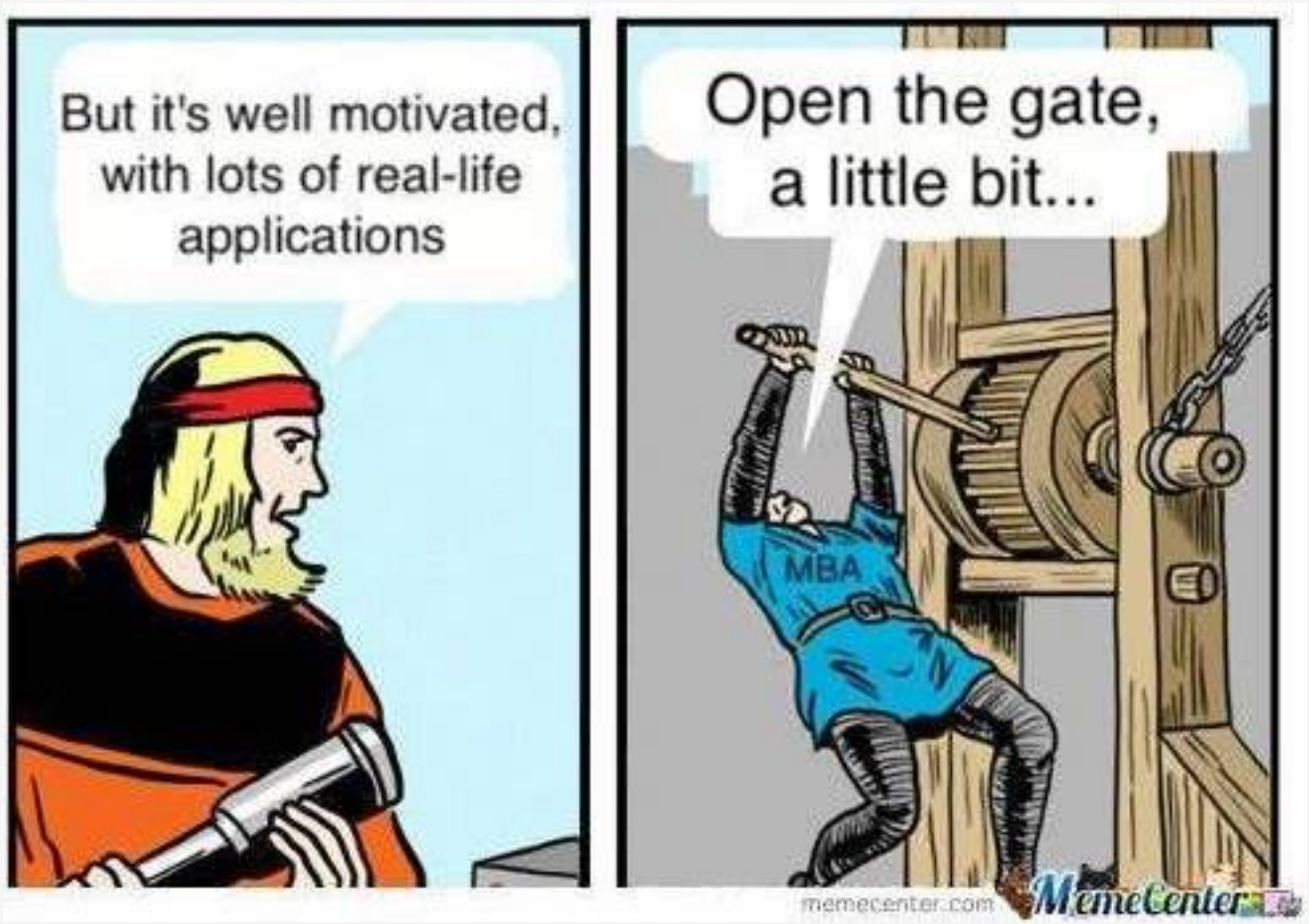
Real Talk



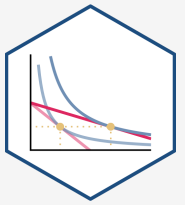
Real Talk

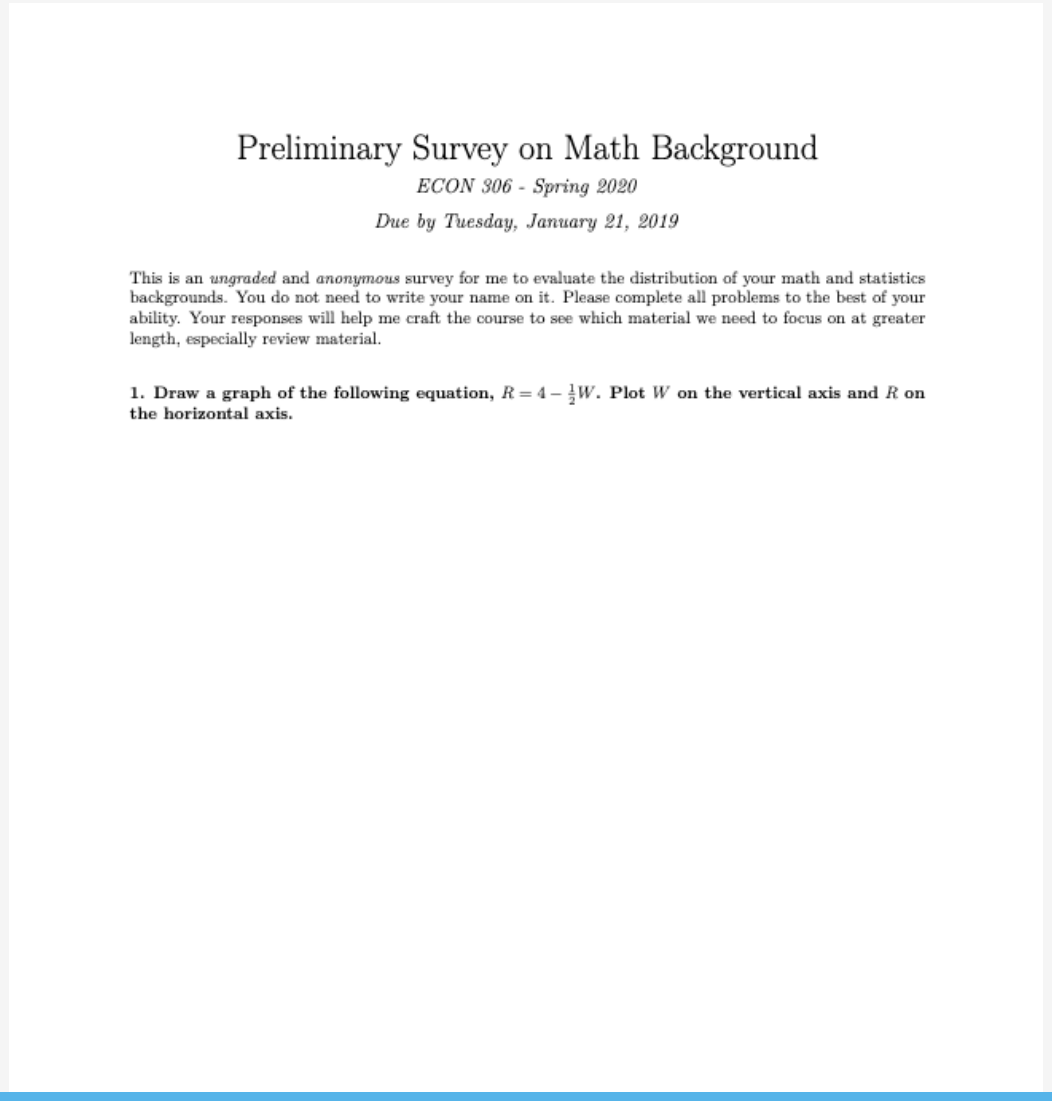


Real Talk


But it's well motivated, with lots of real-life applications
Open the gate, a little bit...
MBA
memecenter.com
MemeCenter

Real Talk





Preliminary Survey on Math Background

ECON 306 - Spring 2020

Due by Tuesday, January 21, 2019

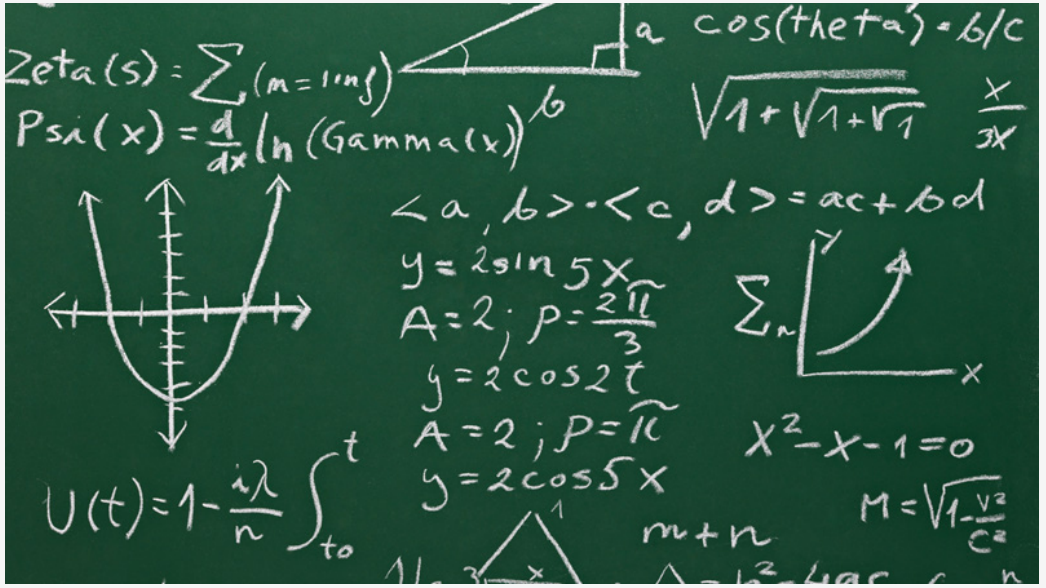
This is an *ungraded* and *anonymous* survey for me to evaluate the distribution of your math and statistics backgrounds. You do not need to write your name on it. Please complete all problems to the best of your ability. Your responses will help me craft the course to see which material we need to focus on at greater length, especially review material.

1. Draw a graph of the following equation, $R = 4 - \frac{1}{2}W$. Plot W on the vertical axis and R on the horizontal axis.

- Complete the **preliminary math survey**
- Help me help you with the math!

Why We Model I

- Economists often “speak” in models that explain and predict human behavior
- The pure language of models is mathematics
  - things that are universally true, deducible from axioms, can easily spot errors
  - often equations and graphs
  - this is what scares students most about economics

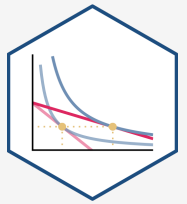


Why We Model II

- Economists use conceptual models: fictional constructions to logically examine consequences
- Very different from other sciences
  - No social experiments
  - Purposive, strategic human beings
  - Introspective understanding

> "All models lie. The art is telling useful lies." - George Box

The Two Major Models of Economics as a "Science"



Optimization

- Agents have **objectives** they value
- Agents face **constraints**
- Make **tradeoffs** to maximize objectives within constraints

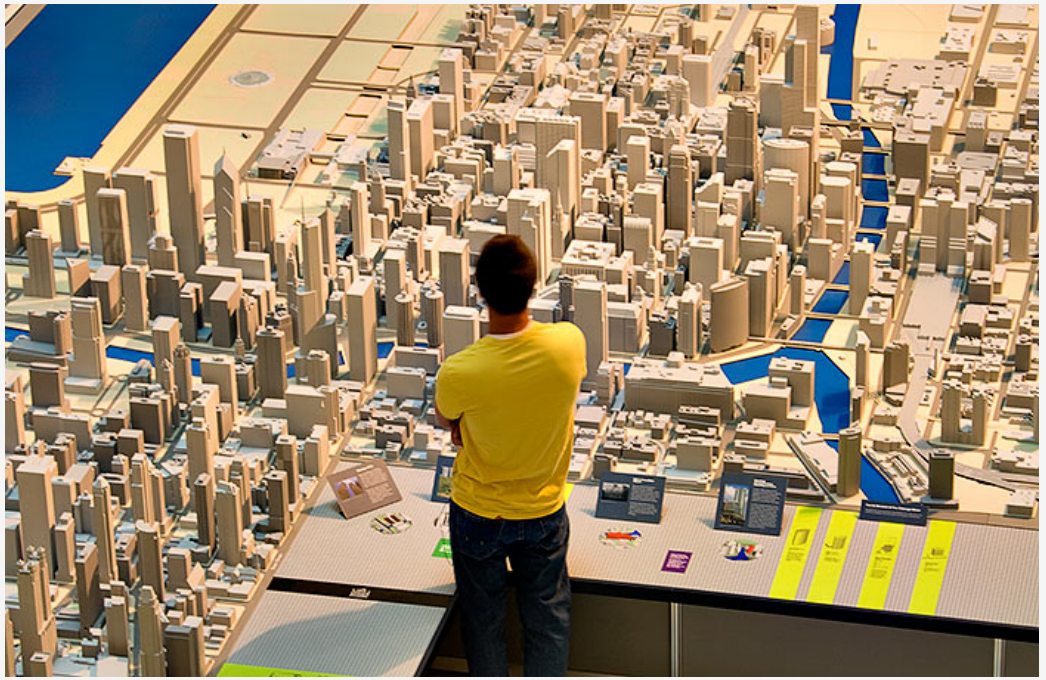
Equilibrium

- Agents **compete** with others over **scarce** resources
- Agents **adjust** behaviors based on prices
- **Stable outcomes** when adjustments stop

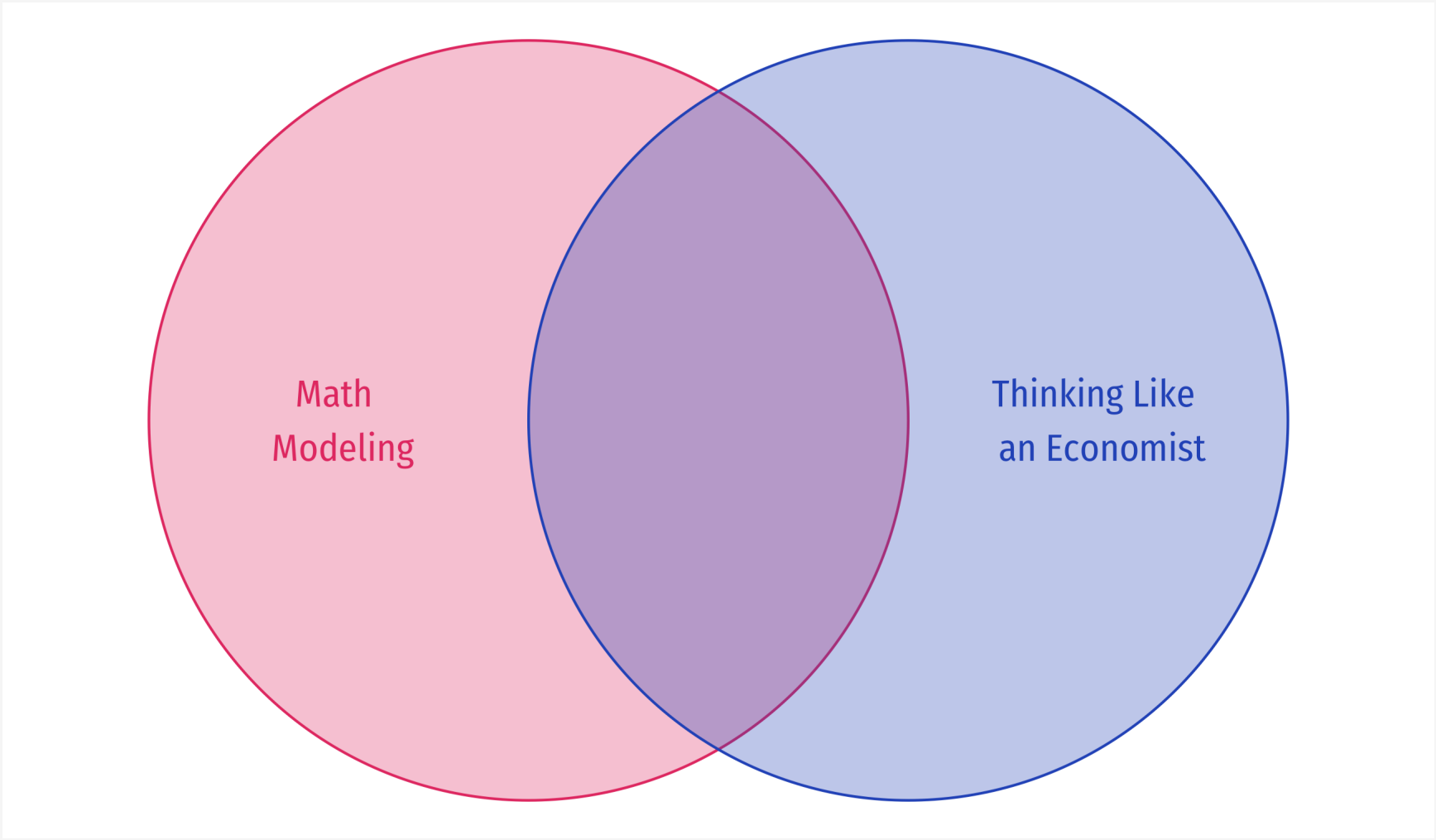
Remember: All Models are Wrong!

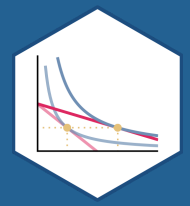
Caution: Don't conflate models with reality!

- Models help us *understand* reality.
- A good economist is always aware of:
  - "*ceterus paribus*"
  - "...and then what?"
  - "...compared to what?"



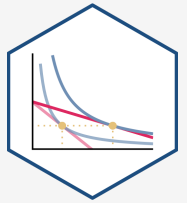
Economics Uses, but Is Not Limited to, Math





About This Course

Learning Goals



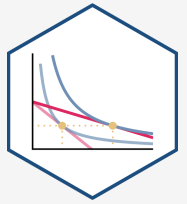
By the end of this course, you will:

1. apply the models of microeconomics (constrained optimization and equilibrium) towards explaining real world behavior of individuals, firms, and governments

2. explore the effects of economic and political processes on market performance (competition, market prices, profits and losses, property rights, entrepreneurship, market power, market failures, public policy, government failures)

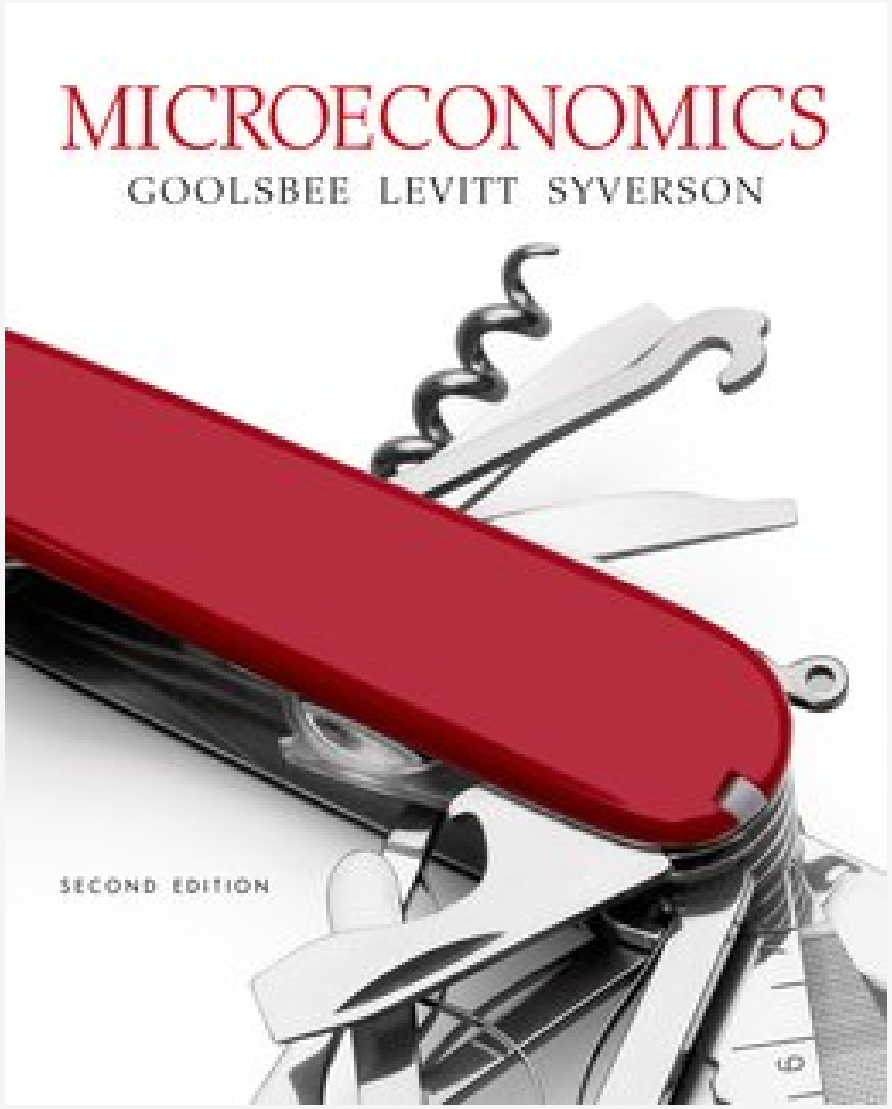
3. apply the economic way of thinking to real world issues in writing

Assignments

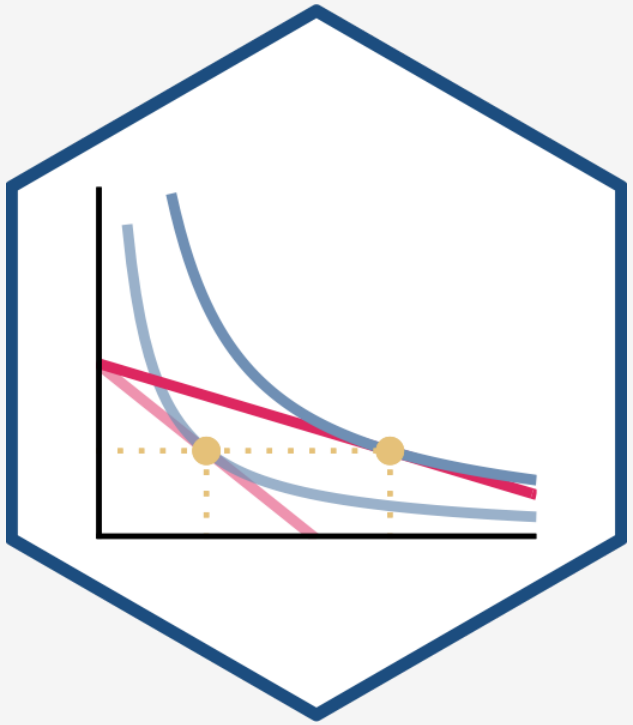


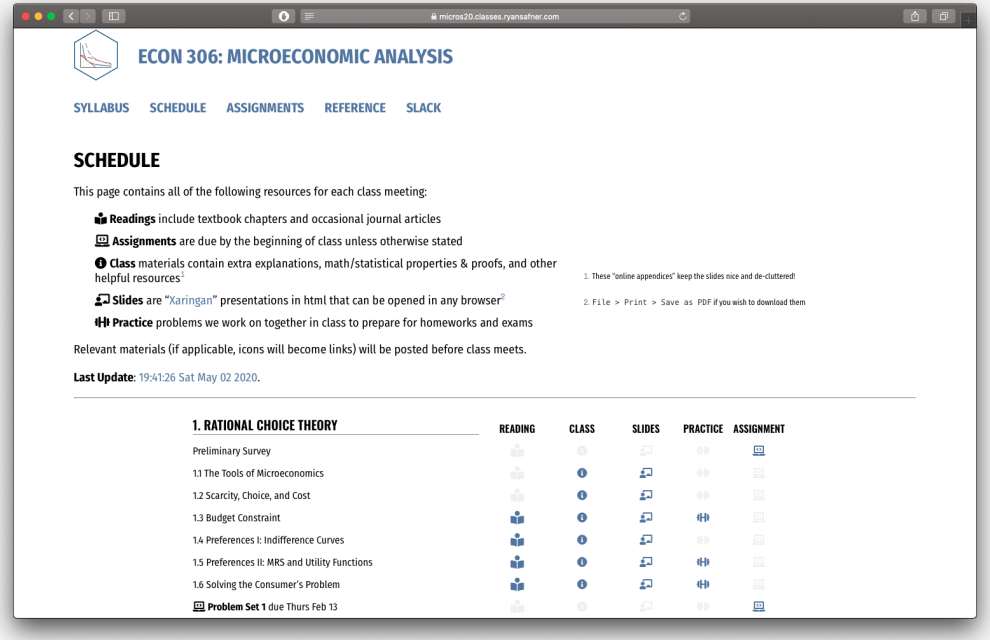
	Assignment	Percent
1	Opinion-Editorial	20%
n	Homeworks (Average)	20%
3	Exams	20% each

Your “Textbook”



Course Website

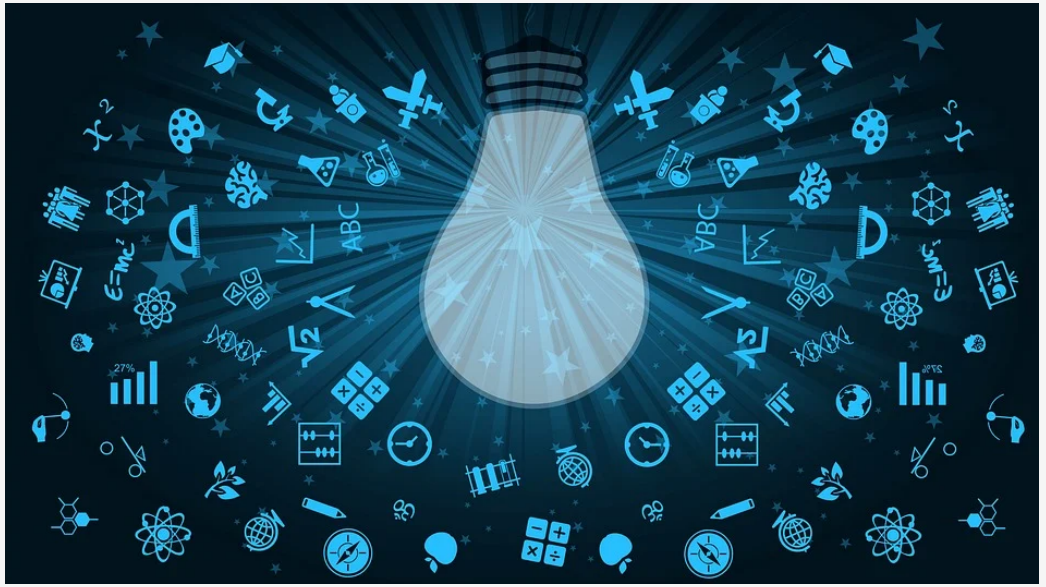




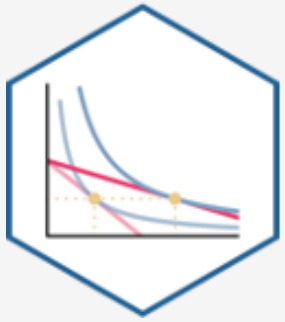
microF20.classes.ryansafner.com

Tips for Success, Or: How to College

- Take notes. On paper. Really.
- Read the readings.
- Ask questions, come to office hours. Don't struggle in silence, you are not alone!
- You are learning how to learn
- See the reference page for more



Roadmap for the Semester



Microeconomic Analysis

Individual Choice Theory
- Budget Constraint
- Preferences
- Utility Maximization
- Demand Curves

Production
- Firms & Technology
- Cost Minimization
- Profit Maximization
- Supply Curves

Market Equilibrium
- Supply & Demand
- Government Policy
- Externalities
- Entrepreneurship

Industrial Organization
- Competition
- Market Power
- Antitrust
- Factor Markets

Imperfect Competition
- Game Theory
- Oligopoly
- Nash equilibrium
- Cartels