3.3 — Social Functions of Market Prices

ECON 306 • Microeconomic Analysis • Spring 2021
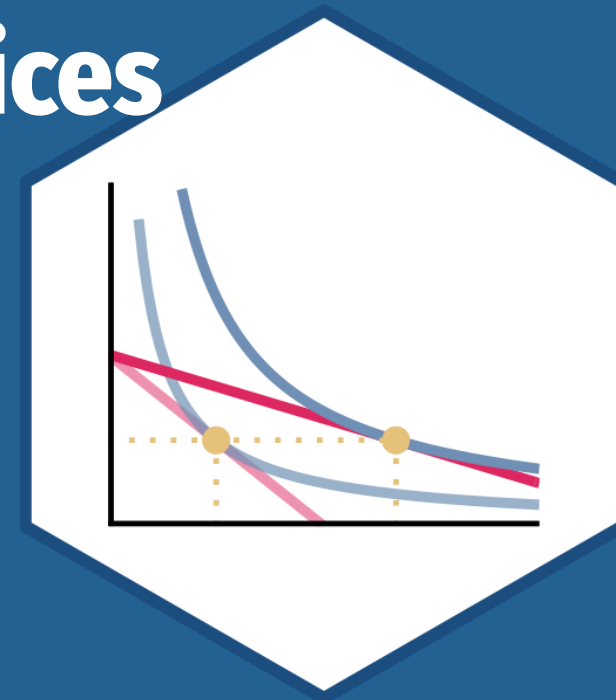
Ryan Safner

Assistant Professor of Economics
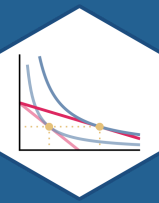
✈ safner@hood.edu

⊙ ryansafner/microS21

🌐 microS21.classes.ryansafner.com

Outline

The Model is Not the Reality I

- This course is about economic modeling and formal theory

- Applications in ECON electives
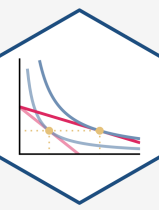
- Models help us *understand* reality, but they *are not* reality!

  - Don't mistake the map for the territory itself

  > *"All models are wrong. Some are useful"* - George Box

The Model is Not the Reality II

- Our models so far have given us interesting results:

    - Markets reach equilibrium
    - Economic profits are zero in the long run in competitive markets

- Both are **fictional**

- But the models **still** show us useful insights about how a market economy works

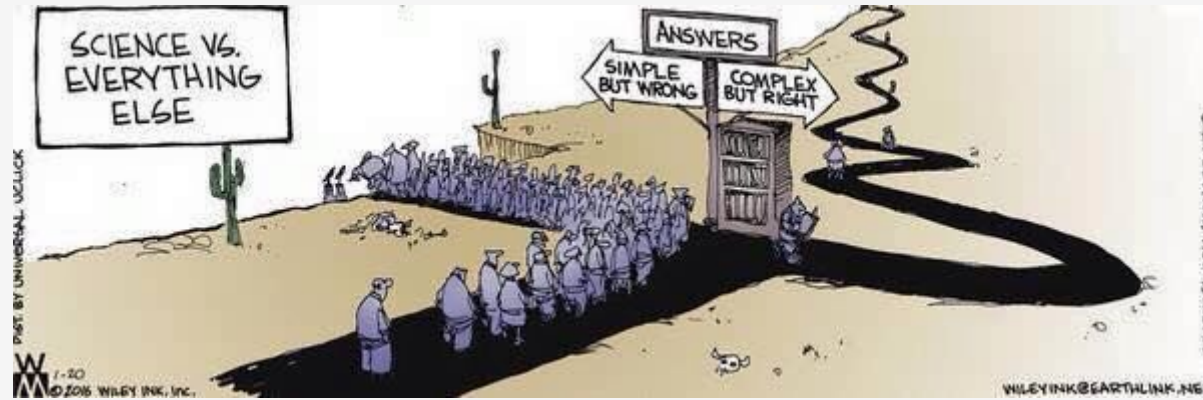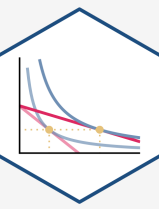- Some readings in today's readings page to help you understand
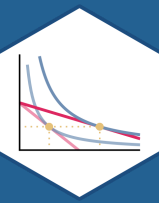
The Model is Not the Reality III
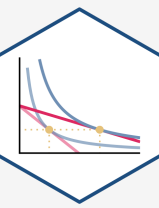
Source: SMBC

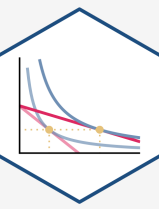"Shame on the three of you who enjoyed this joke"

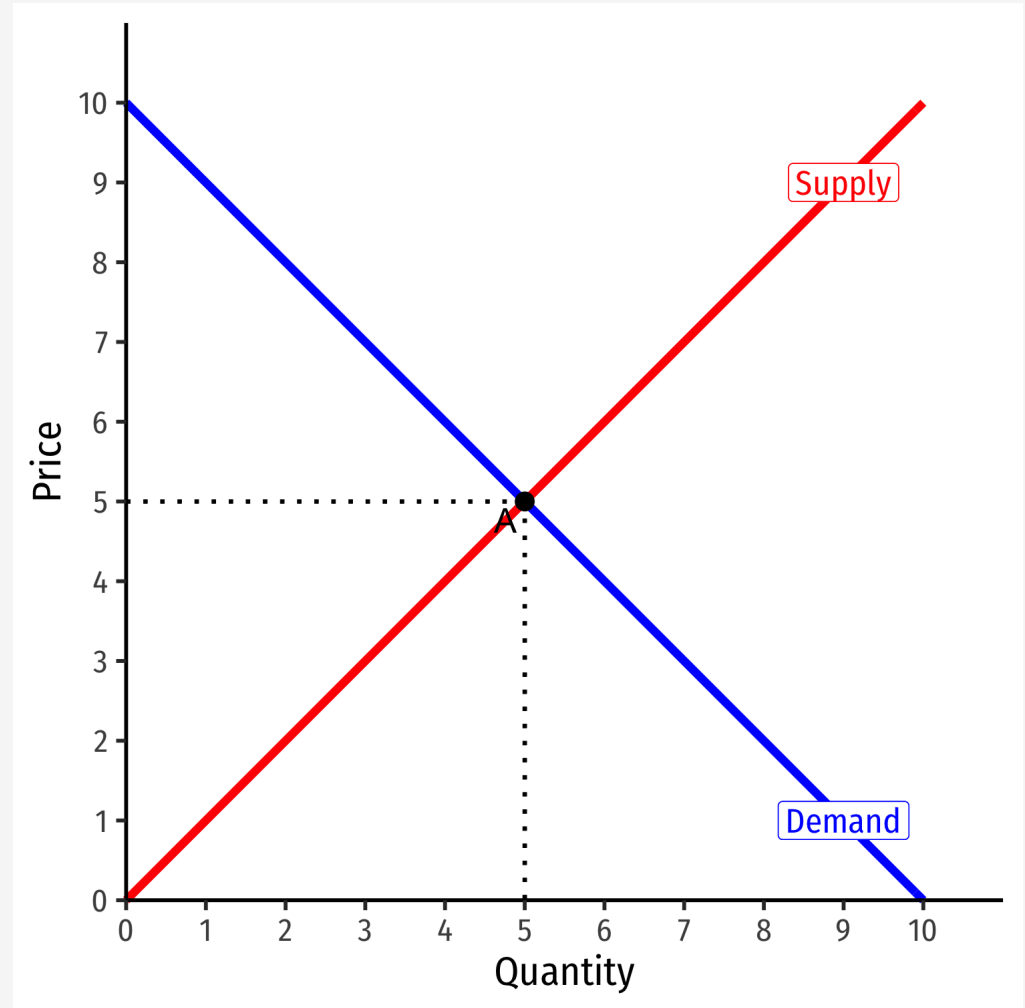# The Model is Not the Reality III

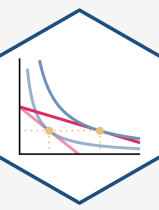# Why Markets Tend to Equilibrate, Redux

The Law of One Price I

- **Law of One Price**: *all* units of the *same* good exchanged on the market will tend to have the same market price (the market-clearing price, p^*)

The Law of One Price II

- Consider if there are *multiple* different prices for *same* good:

- **Arbitrage** opportunities: optimizing individuals recognize **profit opportunity**:

  - Buy at low price, resell at high price!
  - There are possible gains from trade or gains from innovation to be had

- **Entrepreneurship**: recognizing profit opportunities and entering a market as a seller to try to capture gains from trade/innovation

Arbitrage and Entrepreneurship I
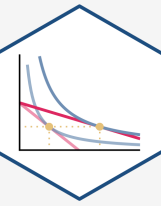
Arbitrage and Entrepreneurship II
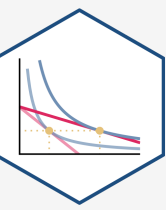
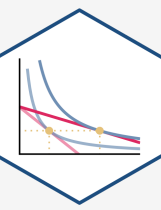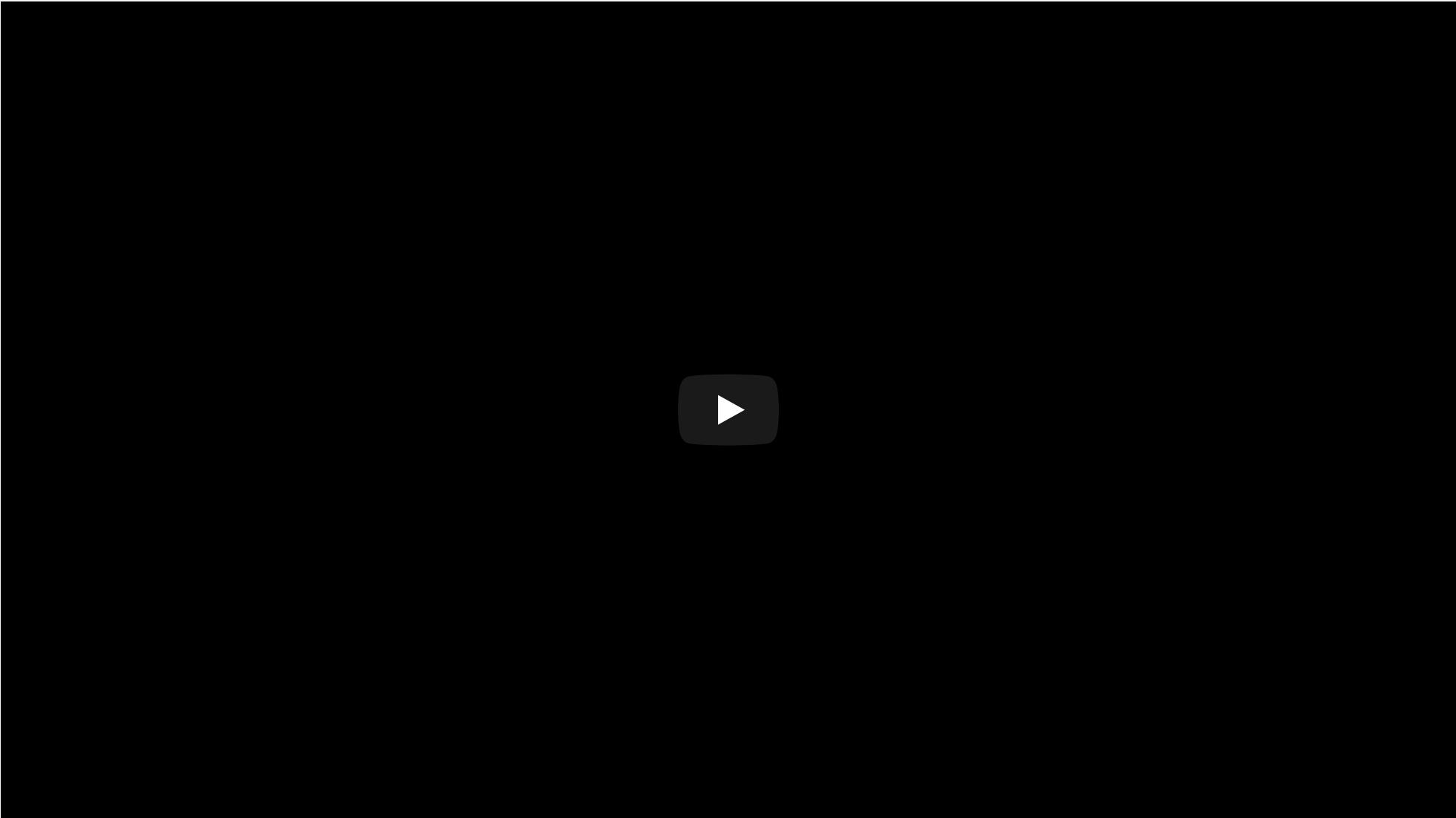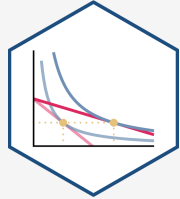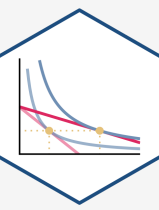# Arbitrage and Entrepreneurship III

Uncertainty vs. Risk

Uncertainty vs. Risk

- **"Known knowns"**: perfect information

- **"Known unknowns"**: risk

  - We know the probability distribution of states that *could* happen
  - We just don't know *which* state will be realized
  - We can estimate probabilities, maximize expected value, minimize variance, etc.

Uncertainty vs. Risk
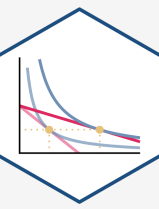
- **"Unknown unknowns"**: uncertainty
  - We don't even know the probability distribution of states that *could* happen
  - *No model to optimize* in a world of uncertainty!

The Role of Entrepreneurial Judgment
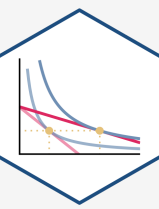
- Under true **uncertainty**, it's not that we can't assign probabilities to each outcome; we do not even have the knowledge necessary to list all possible outcomes!

- Requires **entrepreneurial judgment** to *both*:

  1. estimate possible actions *and*
  2. estimate the likelihood of their success

- **Entrepreneur** is central player, earns pure profits (a residual) for *bearing uncertainty*

Entrepreneurial Judgment
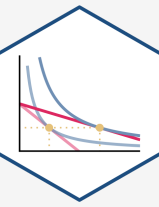
"If I had asked people what they wanted, they would have said **faster horses**." - Henry Ford

Henry Ford

1863-1947

Entrepreneurial Judgment
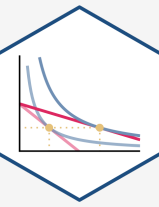
"It's really hard to design products by focus groups. A lot of times, **people don't know what they want until you show it to them.**" - Steve Jobs

Uncertainty and Entrepreneurship
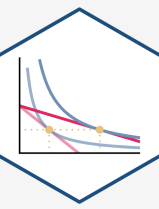
Mark Zuckerberg

1984-

"Why were we the ones to build [Facebook]? We were just students. We had way fewer resources than big companies. If they had focused on this problem, they could have done it. The only answer I can think of is: **we just cared more**. **While some doubted** that connecting the world was actually important, **we were building**. While others doubted that this would be sustainable, **we were forming lasting connections**."
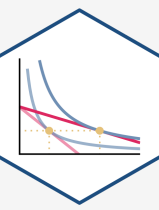
How Markets Get to Equilibrium I

TOTAL EARNINGS: $ 1243   **POSSIBLE EARNINGS:** $ 1410   **EFFICIENCY** 88.16%
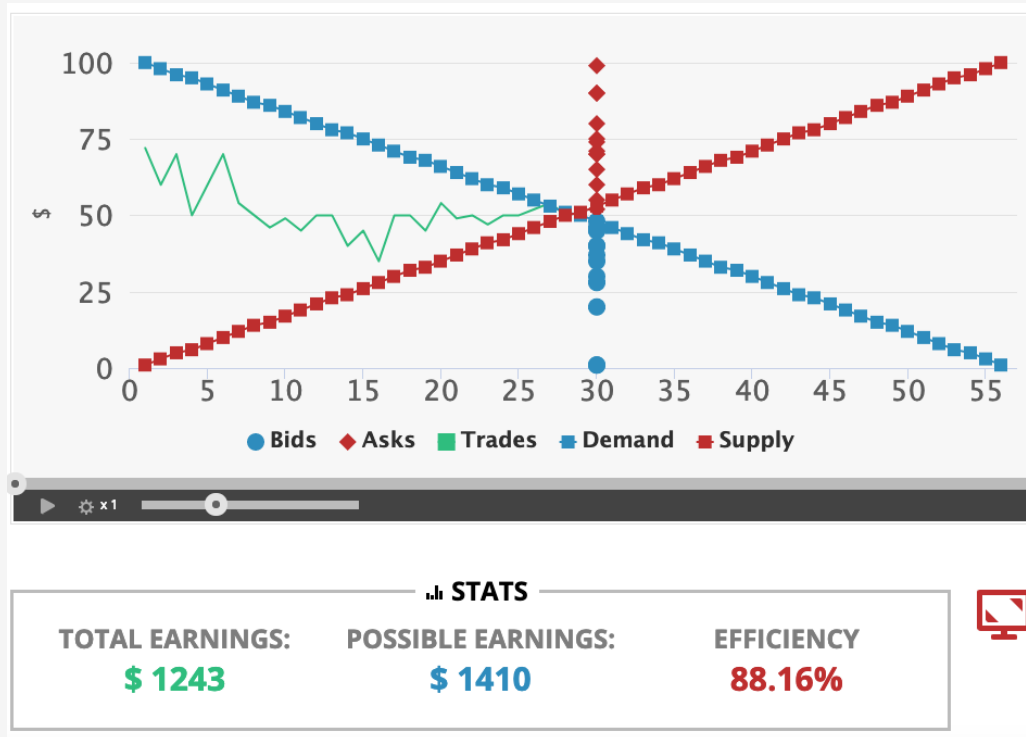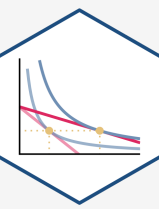
- **Nobody knows "the right price" for things**

- Each buyer and seller only know **their own** reservation prices

- Buyers and sellers adjust their bids/asks

- Markets do not *start* competitive, but *become* competitive!

- New entrepreneurs enter to try to capture gains from trade/innovation

- As these gains are exhausted, prices converge to equilibrium
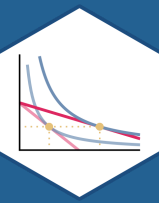
How Markets Get to Equilibrium II
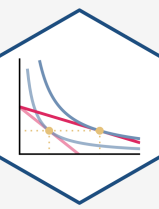
- Errors and imperfect information $\implies$ multiple prices

  - $\implies$ arbitrage opportunities $\implies$ entrepreneurship
  - $\implies$ correcting mistakes $\implies$ people update their behavior & expectations

- Markets are **discovery processes** that *discover* the right prices, the optimal uses of resources, and cheapest production methods, none of which can be known in advance!

How Markets Get to Equilibrium III

- Economy as a cat-and-mouse game between:

  - **Mouse**: preferences, technologies, alternative uses of resources
  - **Cat**: market prices, least-cost technologies

- Cat always chasing mouse

  - Mouse *always* moving
  - Any time cat hasn't caught mouse: profit opportunities

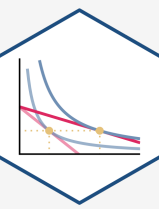- **IF** mouse *froze*, market would rest at equilibrium

The Social Functions of Market Prices
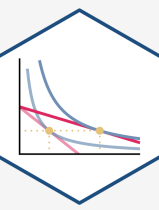
Prices are Signals I
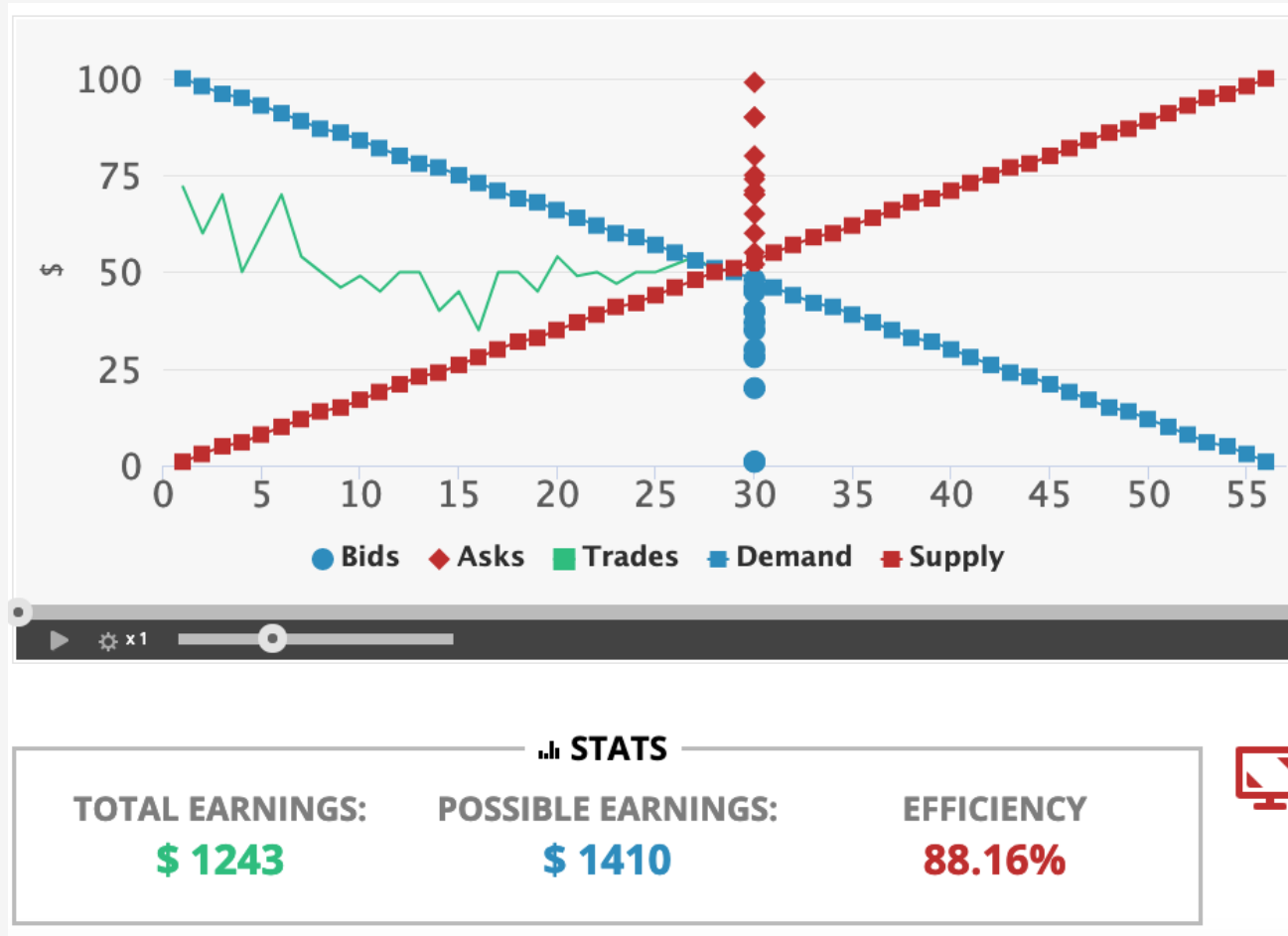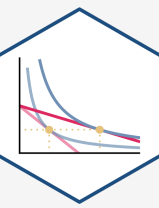
Prices are Signals II

- **Markets are social *processes* that generate information via prices**

- **Prices are never "given"**, prices **emerge** dynamically from negotiation and market decisions of entrepreneurs and consumers

- **Competition**: is a **discovery process** which *discovers* what consumer preferences are and what technologies are lowest cost, and how to allocate resources accordingly
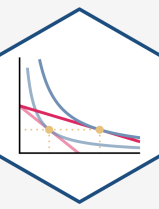
The Social Functions of Prices I

A relatively high price:

- **Conveys information**: good is relatively scarce

- **Creates incentives for**:

  - **Buyers**: conserve use of this good, seek substitutes
  - **Sellers**: produce more of this good
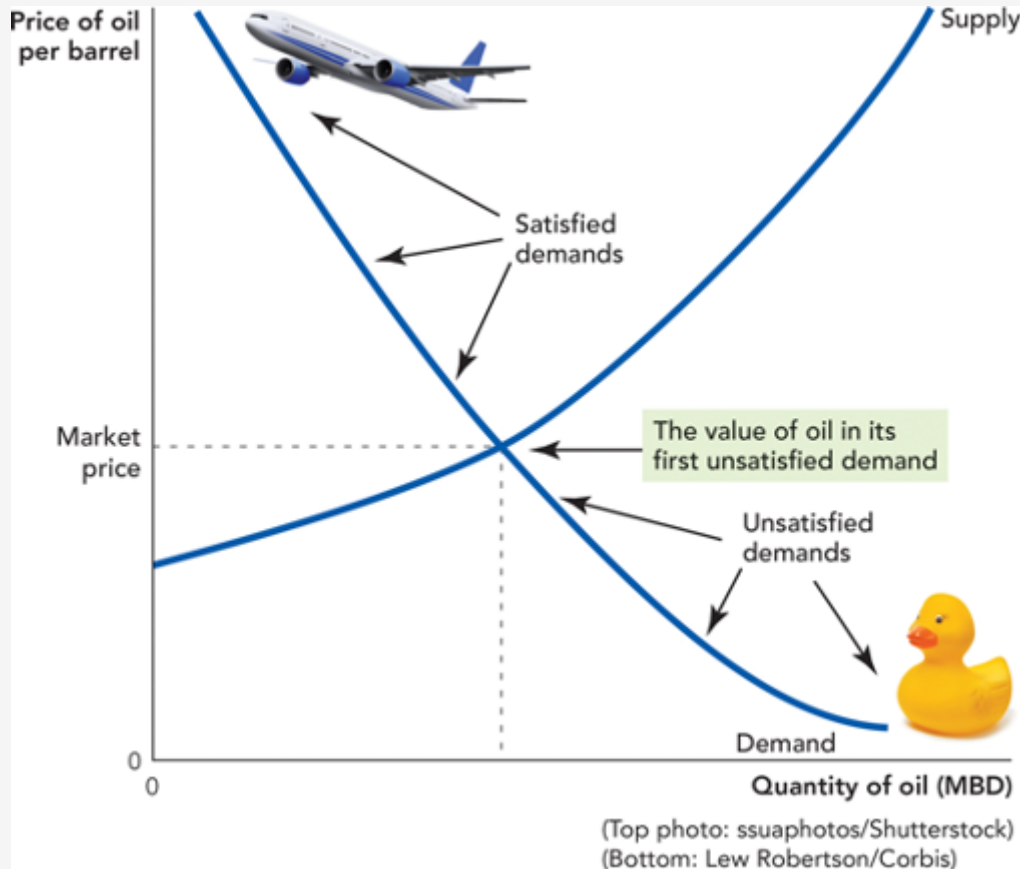 - **Entrepreneurs**: find substitutes and innovations to satisfy this unmet need
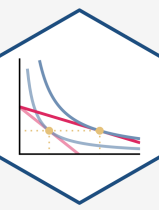
The Social Functions of Prices II
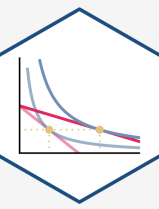
A relatively low price

- **Conveys information**: good is relatively abundant

- **Creates incentives for**:

  - **Buyers**: substitute away from expensive goods towards this good
  - **Sellers**: Produce less of this good, talents better served elsewhere
  - **Entrepreneurs**: talents better served elsewhere: find more severe unmet needs

The Social Functions of Prices III

Price of oil per barrel — Supply

Satisfied demands

Market price

The value of oil in its first unsatisfied demand

Unsatisfied demands

Demand

Quantity of oil (MBD)

(Top photo: ssuaphotos/Shutterstock)
(Bottom: Lew Robertson/Corbis)

- **Prices tell us how to allocate scarce resources among competing uses**

- Think of diminishing marginal utility:

  - allocate scarce good to highest-valued use first
  - as supply becomes more plentiful (price falls), can allocate more units of the good to lower-valued uses (higher-valued uses already satisfied)
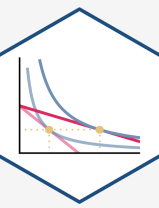
Knowledge, "Speculation," and Prices

- Suppose (oil) producers believe there is going to be a shortage (of oil) in a year
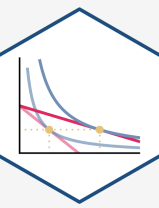
Market Today

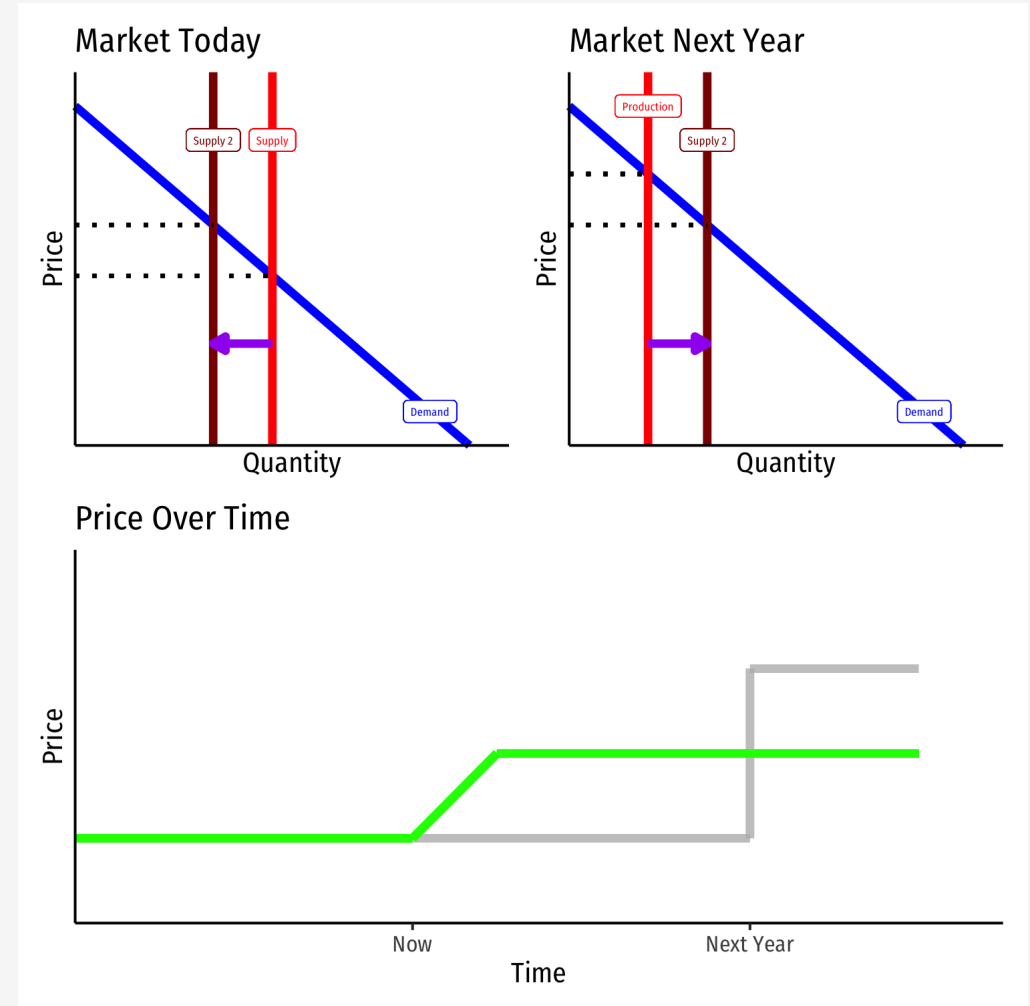Market Next Year
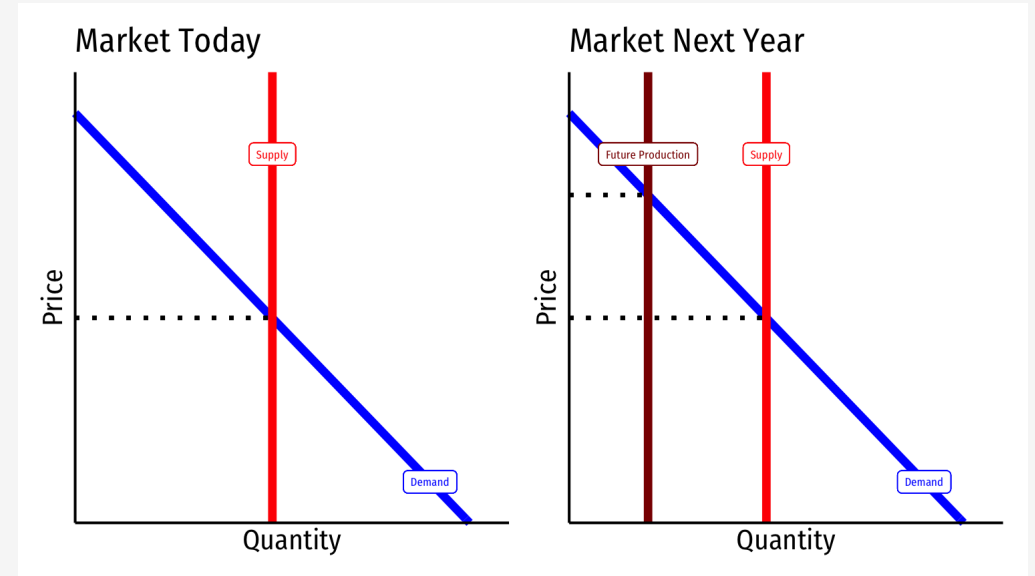
Knowledge, "Speculation," and Prices

- Suppose (oil) producers believe there is going to be a shortage (of oil) in a year

- Suppose they do nothing

- In the future, a sudden spike in price

  - Demand is inelastic to sudden changes, consumers can't adjust on the fly
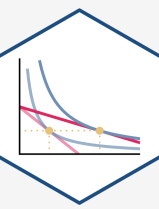 - A lot of lost economic surplus (shaded)

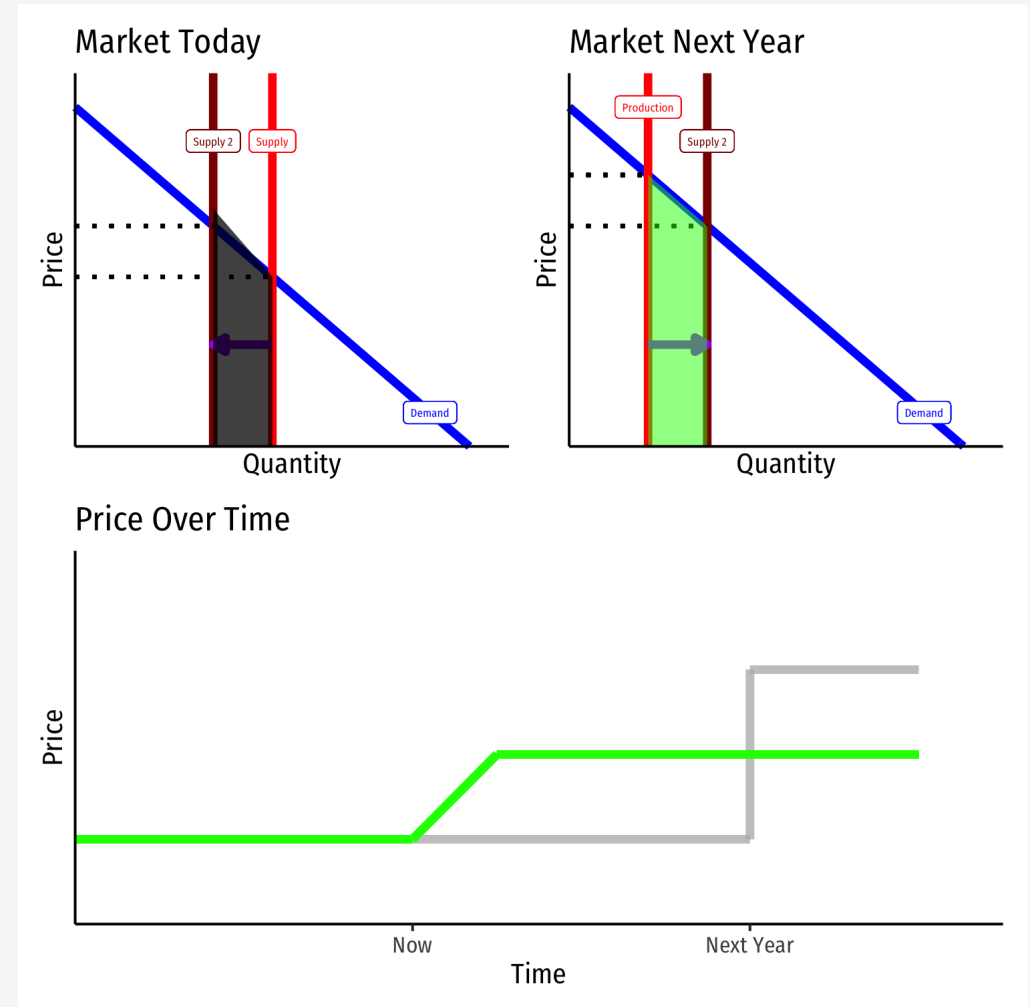# Knowledge, "Speculation," and Prices

- Suppose (oil) producers believe there is going to be a shortage (of oil) in a year

- Suppose instead they **speculate**, and try to profit from the future price change

  - TODAY: put some inventory **into storage** (take off market)
 - FUTURE: when price is higher, sell more **from inventories**

Knowledge, "Speculation," and Prices

- Suppose (oil) producers believe there is going to be a shortage (of oil) in a year

- Suppose instead they **speculate**, and try to profit from the future price change

  - TODAY: put some inventory **into storage** (take off market)
  - FUTURE: when price is higher, sell more **from inventories**

- **Price-smoothing** over time

  - Small loss in the present (gray shaded), larger gain in the future (green shaded)
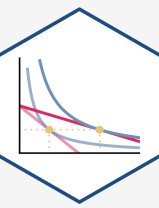 - Allows consumers to adjust their plans more over time (more elastic demand)

Knowledge, "Speculation," and Prices
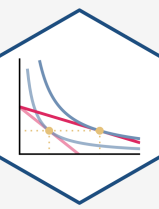
- **Futures markets**: where people buy/sell claims on *future* goods at specified prices
  - e.g. "10 barrels of oil at $30/barrel, delivered on November 2021"
  - allows producers to minimize their exposure to major price swings
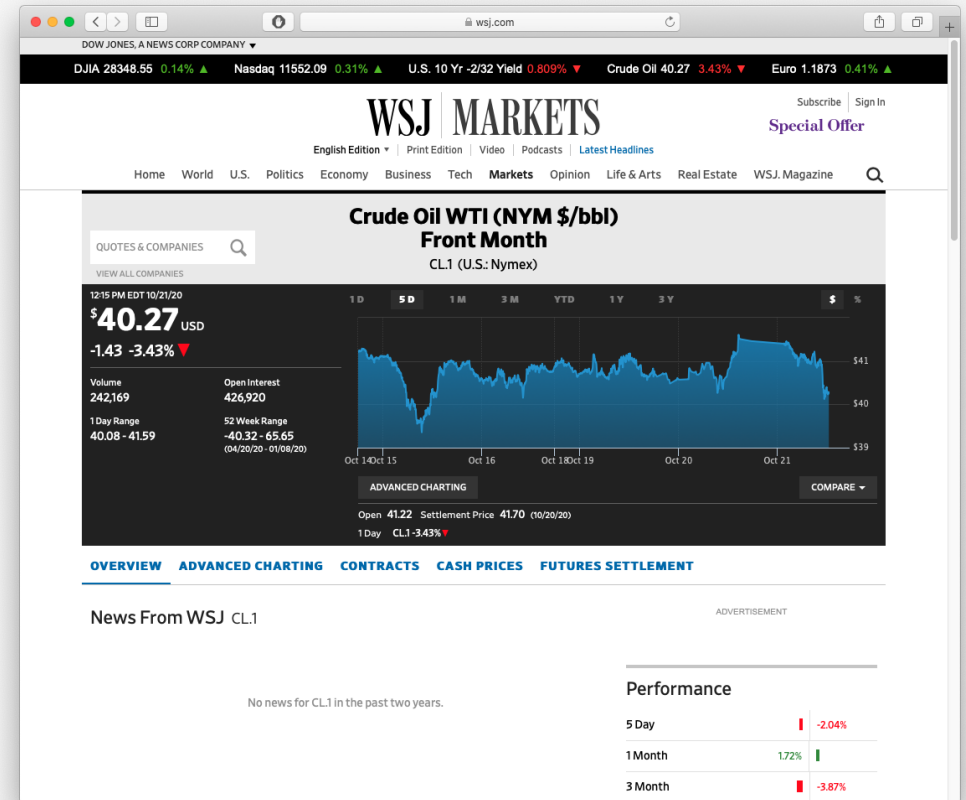
Knowledge, "Speculation," and Prices

NPR | WAMU 88.5
AMERICAN UNIVERSITY RADIO

SIGN IN · NPR SHOP · ♥ DONATE NOW

WAMU 88.5 On Air Now

NEWS · ✈ ARTS & LIFE · ♪ MUSIC · 🎧 SHOWS & PODCASTS · 🔍 SEARCH

► HOURLY NEWS · ► LISTEN LIVE · ► PLAYLIST

BUSINESS

U.S. Oil Prices Fall Below Zero For The First Time In History

April 21, 2020 · 5:02 AM ET
Heard on Morning Edition

CAMILA DOMONOSKE

► 3-Minute Listen   + PLAYLIST

Oil prices went into negative territory on Monday. That means traders were paying money to get people to accept oil in May. It's a sign of just how imbalanced the global oil markets are.

🔲 Transcript

NOEL KING, HOST:

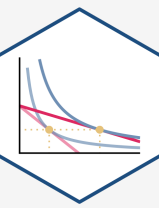Yesterday, U.S. oil prices did something wild - they went negative. That means

Knowledge, "Speculation," and Prices

- **Prediction markets**: where people buy/sell claims on *verifiable* future outcomes at specified prices

  - Hope to profit on information you believe to be true
  - Provides incentives for people to reveal private information for public benefit

- If you want to know what somebody truly believes, leverage the power of prices and **make a bet**
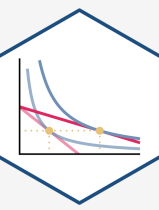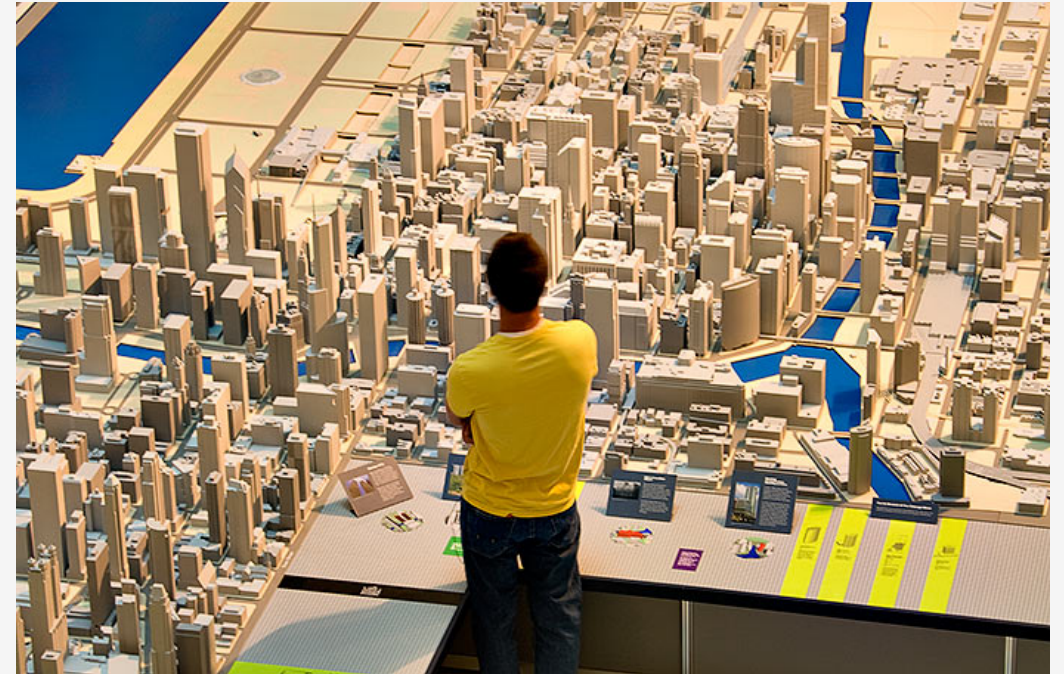
Knowledge, "Speculation," and Prices
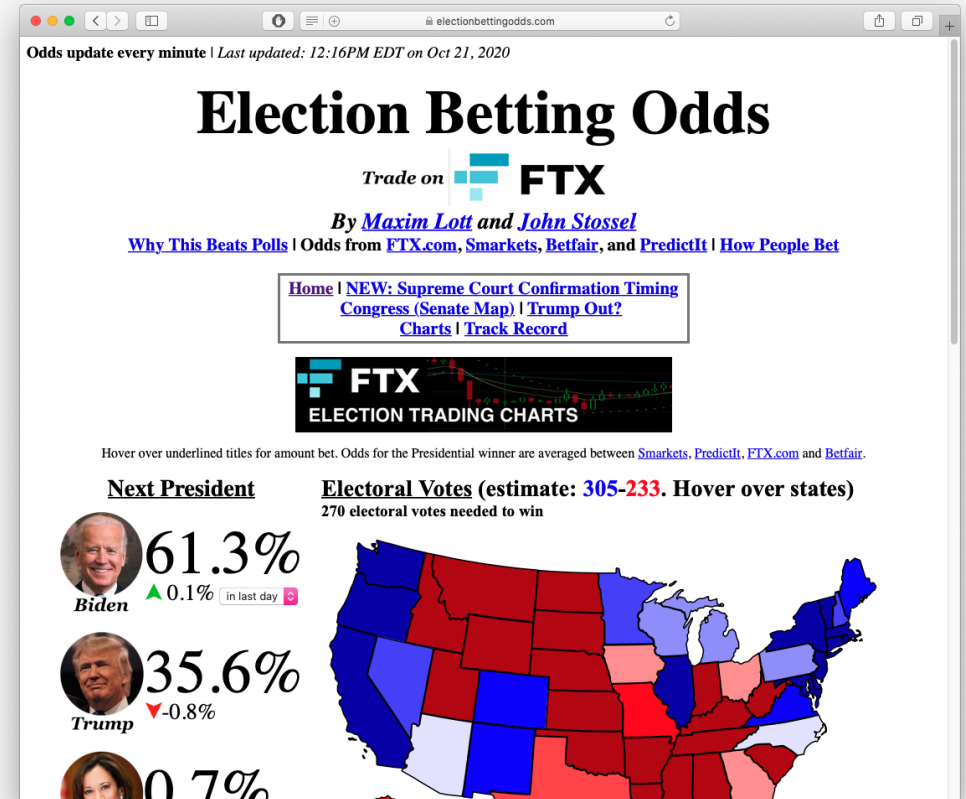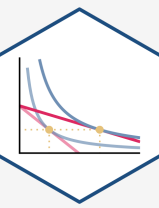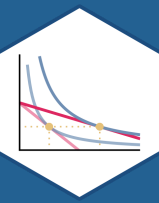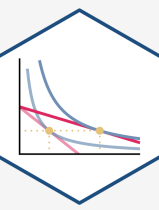
Uncertainty and Profits

Uncertainty, Tacit Information, and Profit I

- **Economic theory**: in a perfectly competitive market, in the long run, economic profit $\rightarrow$ to zero

- **Real world**: there *are* often economic profits

- Our blackboard models assume perfect information

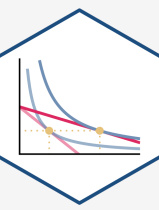- In reality we have to deal with **uncertainty**

Uncertainty, Tacit Information, and Profit II

- Imperfect information: mispricing and multiple prices → arbitrage/profit opportunities

  - Some people recognize opportunities ($20 bills) that others do not see

- **In a world of certainty, there would be no profit**

  - The model world of perfect competition is a fictional world of certainty
 - The real world, *because* it's uncertain, *has* profit opportunities!

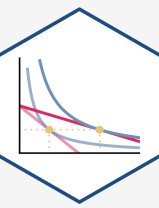# Uncertainty, Tacit Information, and Profit III

- Firms don't actually *maximize* profits, just a convenient assumption

  - In a world of uncertainty (unlike mere risk), there's no way to *maximize* anything!

- Real world is not merely a constrained maximization problem!

- Better to think in **evolutionary** terms

  - Firms that *best* adapt to market circumstances will earn profit and merely *survive*
  - Whether by skill and talent or just dumb luck!

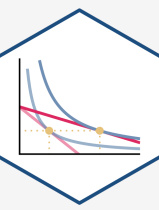# Uncertainty, Tacit Information, and Profit IV
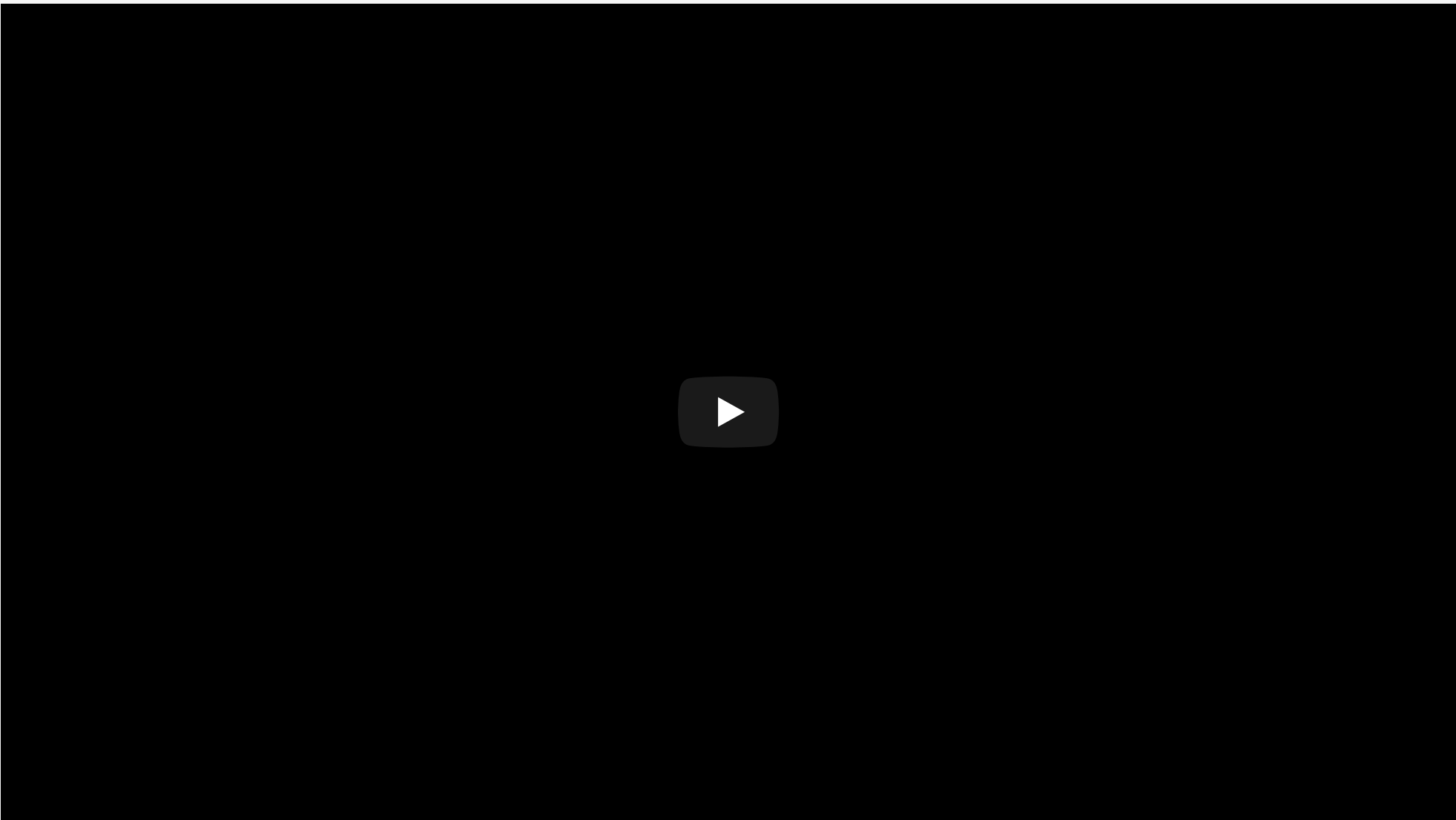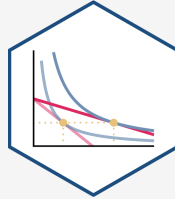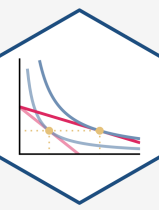
Reminder: Profits and Entrepreneurship

- In markets, production faces **profit-test**:

  - **Is consumer's willingness to pay $>$ opportunity cost of inputs?**

- Profits are an indication that **value is being created for society**

- Losses are an indication that **value is being destroyed for society**

- Survival for sellers in markets *requires* firms continually create value and earn profits or die

Why We Need Prices, Profits, and Losses I
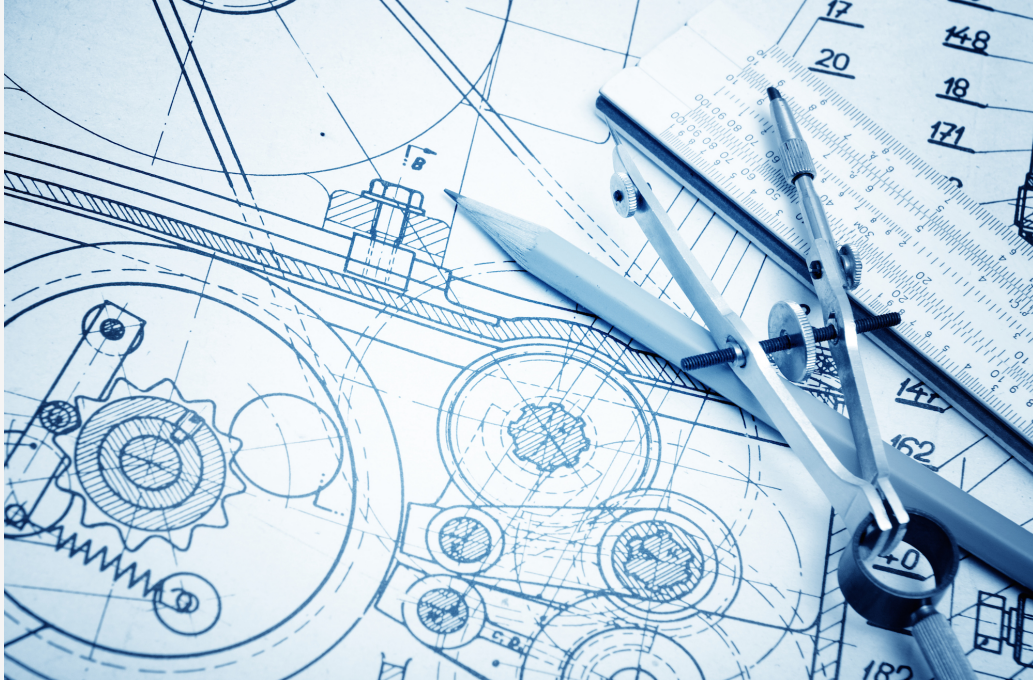
- People often confuse the **economic problem** with a **technological problem**

- **Technological problem**: how to allocate scarce resources to accomplish a particular goal

  - e.g. buy the right combination of goods to maximize utility
  - e.g. buy the right combination of inputs and produce output to maximize profits
  - given stable prices, preferences, and technologies, **a computer can solve this problem**

Why We Need Prices, Profits, and Losses II
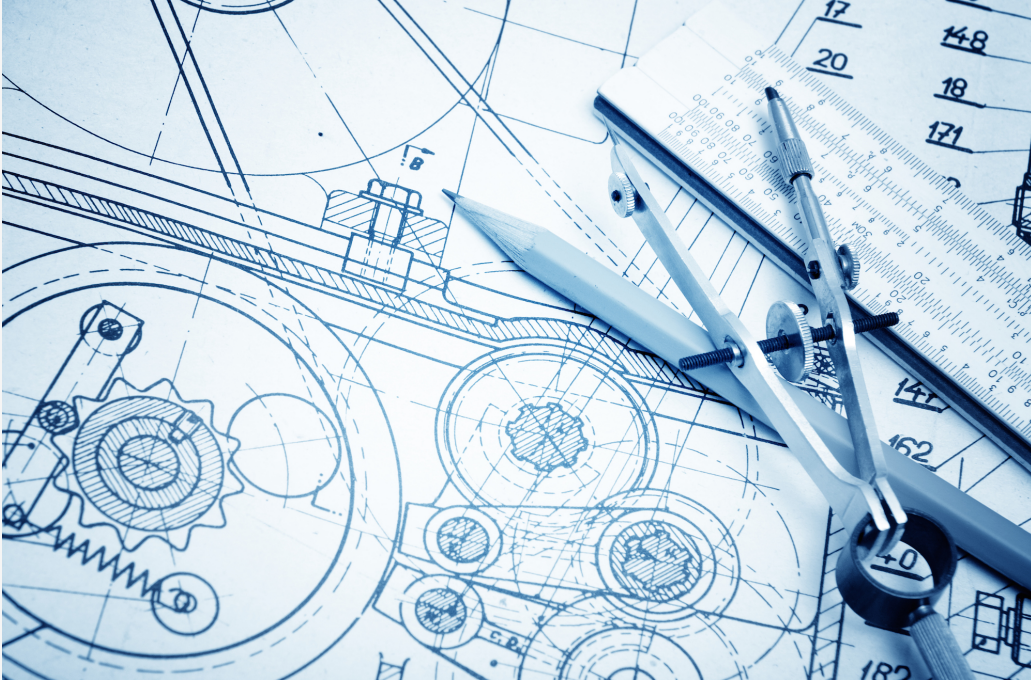
- **Economic calculation problem**: how to determine which of the infinite technologically-feasible options are *economically* viable?

- **How to best make use of dispersed knowledge to coordinate conflicting plans of individuals for their own ends?**

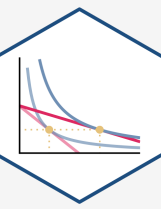- ONLY can be **discovered** through competition, prices, profits & losses

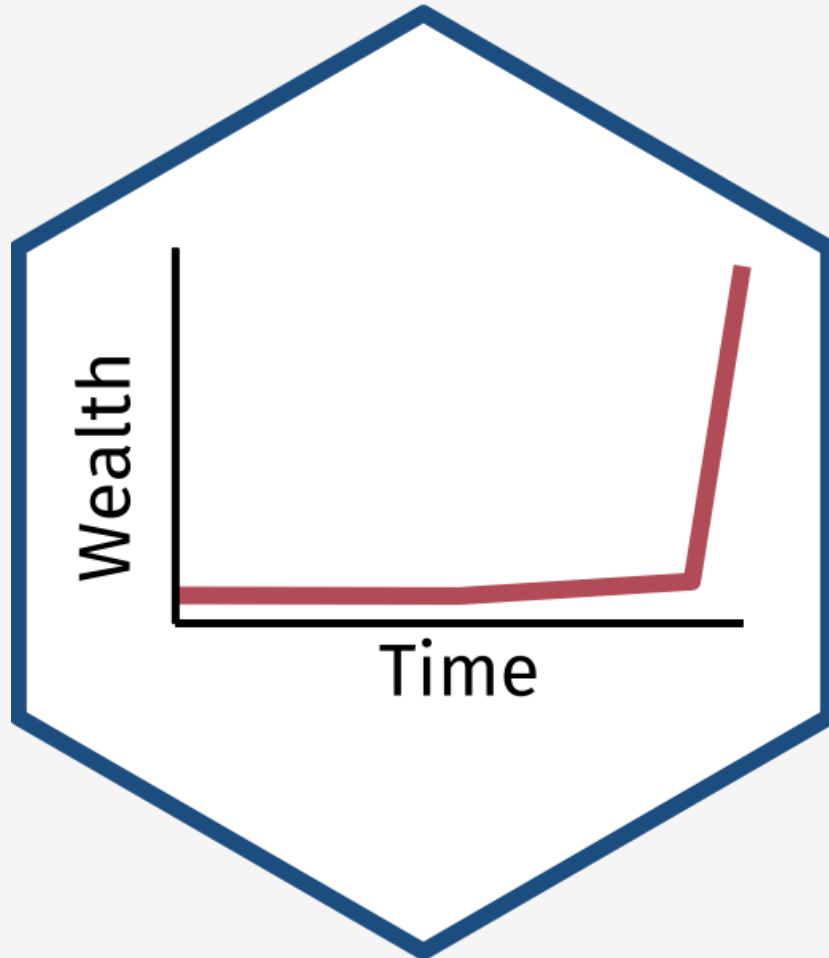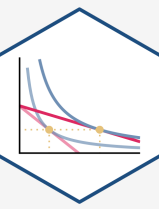# What if there Were No Prices? I
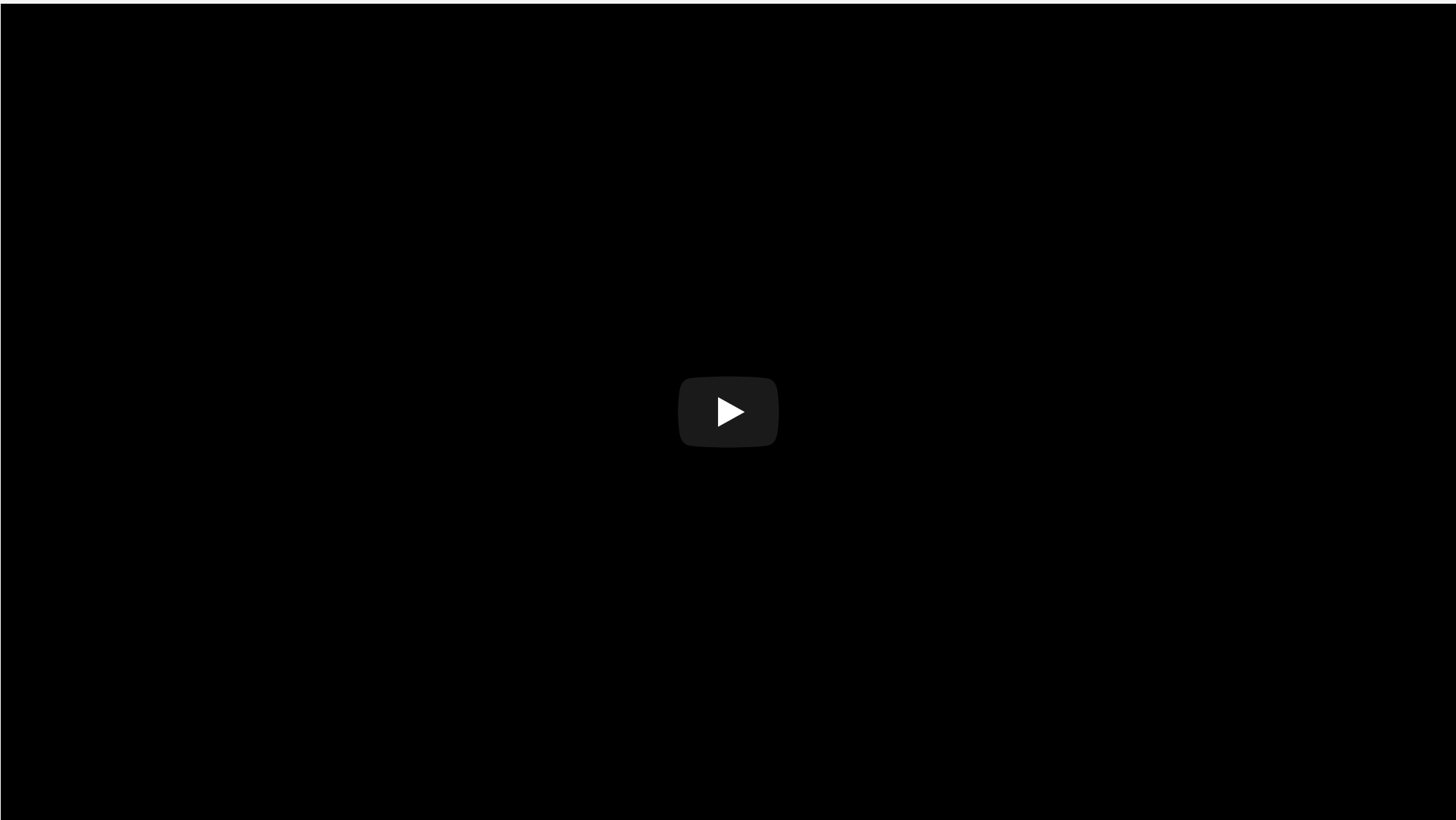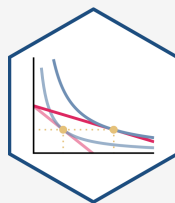
What if there Were No Prices? II
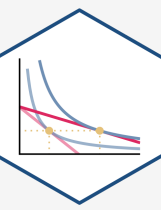
For More On The Socialist Calculation Debate

See lesson 4.2 in my History of Economic Thought Course: The Socialist Calculation Debate

And How Did The Soviet Union "Work" For So Long?

See lesson 11 in my Economics of Development Course: Russia and the Post-Communist Transition