

UNIVERSITY OF CAMBRIDGE

Lecture 3 - Market failures

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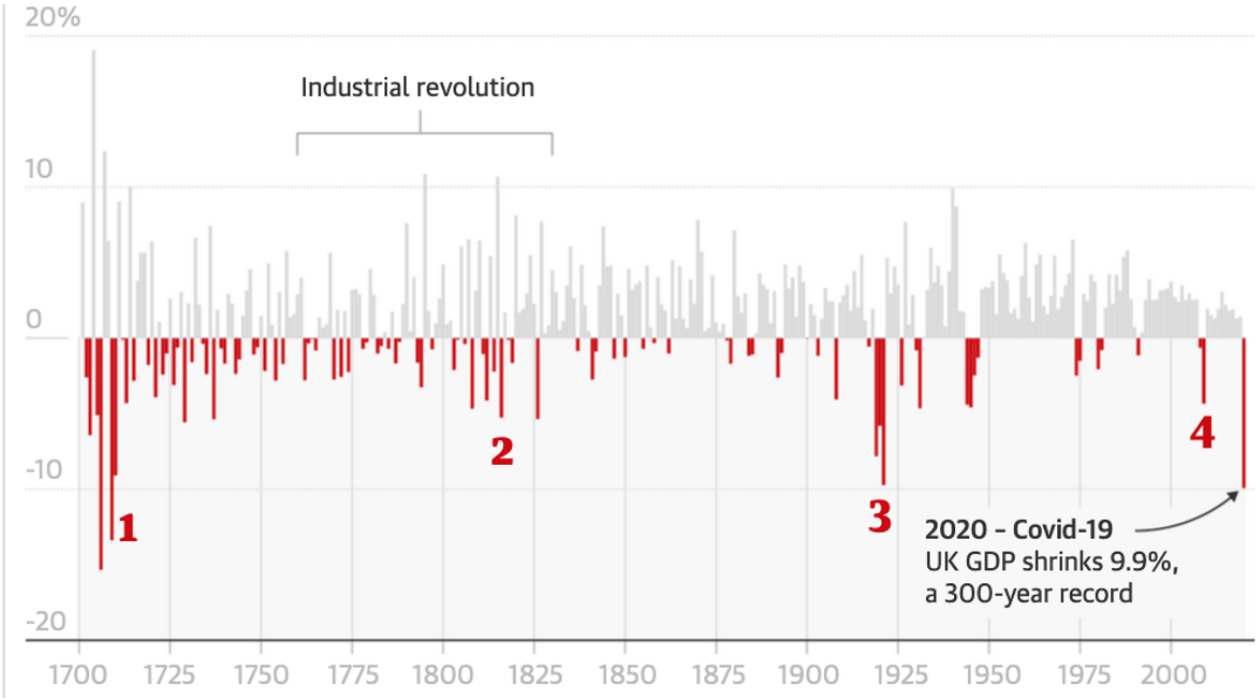
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Why even competitive markets fail

Lecture 3 overview

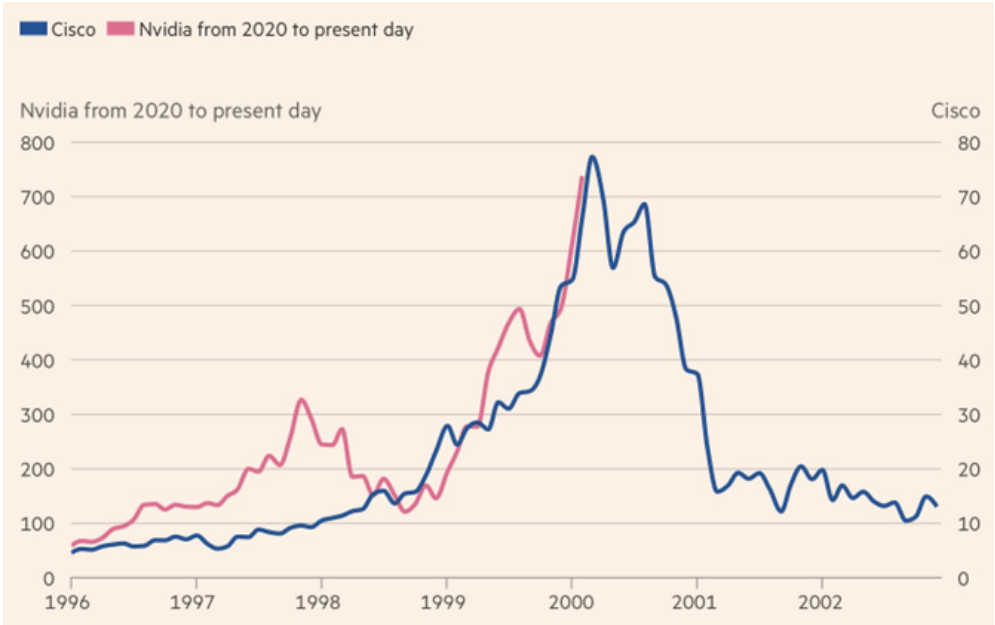
- Last time: how digital markets concentrate power even with competition.
- Today: why even well-functioning markets can fail altogether.
- We address *macroeconomic* factors, *microeconomic* factors, and *behavioural* factors.

Business cycles: booms and busts



- Economies naturally expand and contract.
- Investment, consumption, and credit availability vary over time.
- Booms attract investment $\rightarrow$ overproduction and bubbles.
- Busts correct misallocations $\rightarrow$ painful for firms/households.

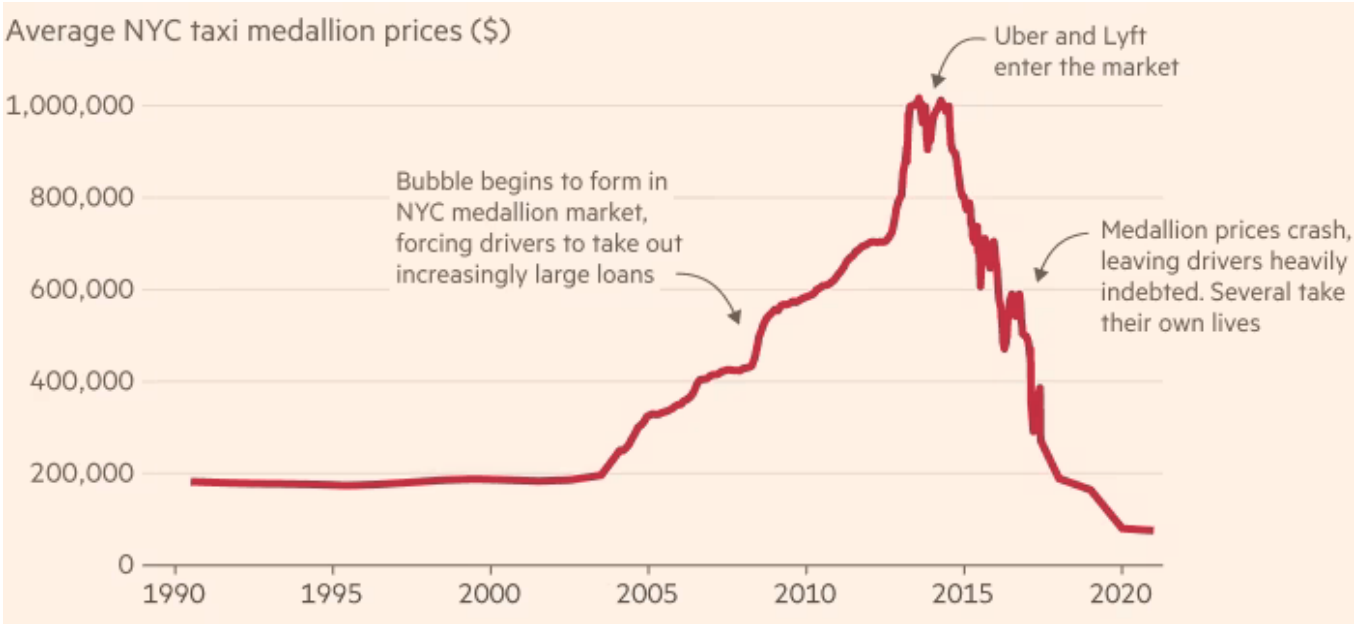
Speculation can amplify cycles



Unintended consequences of speculation

- Massive investment in AI startups may reflect more hype.
- High valuations, rapid funding $\rightarrow$ expectation feedback loop.
- Tech could drive growth, but over-investment risks a bust.

Regulation can amplify cycles



Unintended consequences of regulation

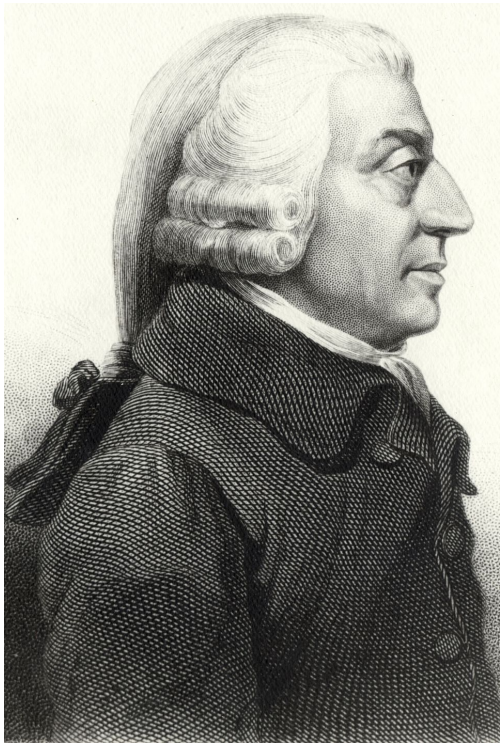
- NY taxi fares increased $\rightarrow$ medallion values soared instead.
- Regulation limited supply $\rightarrow$ scarcity and artificially high prices.
- Analogy for housing: subsidies or rent controls can backfire.

From cycles business to globalisation

Overview

- Economic booms and busts reshape global production and exchange.
- Technological advances link firms and countries.
- We now turn to *trade and specialisation*.

Trade and comparative advantage



Smith (1776)

If a foreign country can supply us with a commodity cheaper than we ourselves can make it, better buy it off them with some part of the produce of our own industry, employed in a way in which we have some advantage.

Trade and comparative advantage



Ricardo (1817)

It is here we come to the heart of the matter. The economic principle of comparative advantage: a country may, in return for manufactured commodities, import corn even if it can be grown with less labour than in the country from which it is imported.

Trade and digital frictions

Digital specialisation

- Firms and platforms specialise in what they do best.
- Cloud (AWS), devices (Apple), search (Google), AI (OpenAI).
- APIs, data, and standards are the “goods” exchanged.
- Efficient ecosystems need openness — like free trade.

Digital market frictions

- **Platform protectionism:** Apple’s 30% App Store fee.
- **Data localisation:** EU vs US cloud storage rules.
- **Geo-blocking:** Netflix or Spotify catalogues differ by country.
- **APIs as barriers:** proprietary interfaces block interoperability.

When efficiency creates side effects

Overview

- Free trade and competition raise efficiency, but not all costs are priced in.
- Some activities harm or benefit others without compensation.
- We turn to *externalities*, *public goods*, and *public bads*.

Externalities

Definition

An **externality** is a cost or benefit from an activity that affects others but is not reflected in market prices.

- **Negative:** smoking in public, factory pollution, data centres emitting CO_2.
- **Positive:** education, open-source software, shared data standards.
- Competitive equilibrium is no longer Pareto efficient.

Result

Markets can fail to allocate resources efficiently when externalities are ignored.

Digital externalities and internalisation

- Digital markets also generate *externalities*.
- Examples:
  - Social media $\Rightarrow$ misinformation or mental health costs.
  - Data collection $\Rightarrow$ privacy loss for non-users.
  - Cloud computing $\Rightarrow$ large carbon footprint.
- In theory, firms could be made to internalise these effects:
  - Clear data property rights (bargaining).
  - Privacy or content regulation (GDPR, Digital Services Act).
- In practice, externalities diffuse across millions of users, bargaining infeasible.

Public goods in digital systems

Definition

A **public good** is non-rivalrous and non-excludable. One person's benefit does not reduce benefit or restrict access to others.

Examples

- Open-source software (Linux, Python).
- Open data, public research, Wikipedia.
- Internet protocols and standards (TCP/IP, DNS).

Policy question

Private markets underprovide them, free-rider problem. Who funds the infrastructure everyone depends on, firms, governments, or volunteers?

Public bads in digital systems

Definition

A **public bad** is non-rivalrous and non-excludable. One person's suffering does not reduce suffering or prevent suffering of others.

Examples

- Spam, phishing, and botnets.
- Online misinformation and hate speech.
- Cyberattacks that degrade shared infrastructure.

Policy question

Private markets overproduce them, and harms are shared. Who bears responsibility, firms, governments, or volunteers?

Club goods in digital systems

Definition

A **club good** is non-rivalrous but excludable. Multiple users can share it without reducing others' benefits, but restricted access.

Examples

- Private cloud services for a development team.
- Premium features in a software platform (GitHub private repos, Slack workspaces).
- Shared computational resources in a research lab or cloud.

Policy question

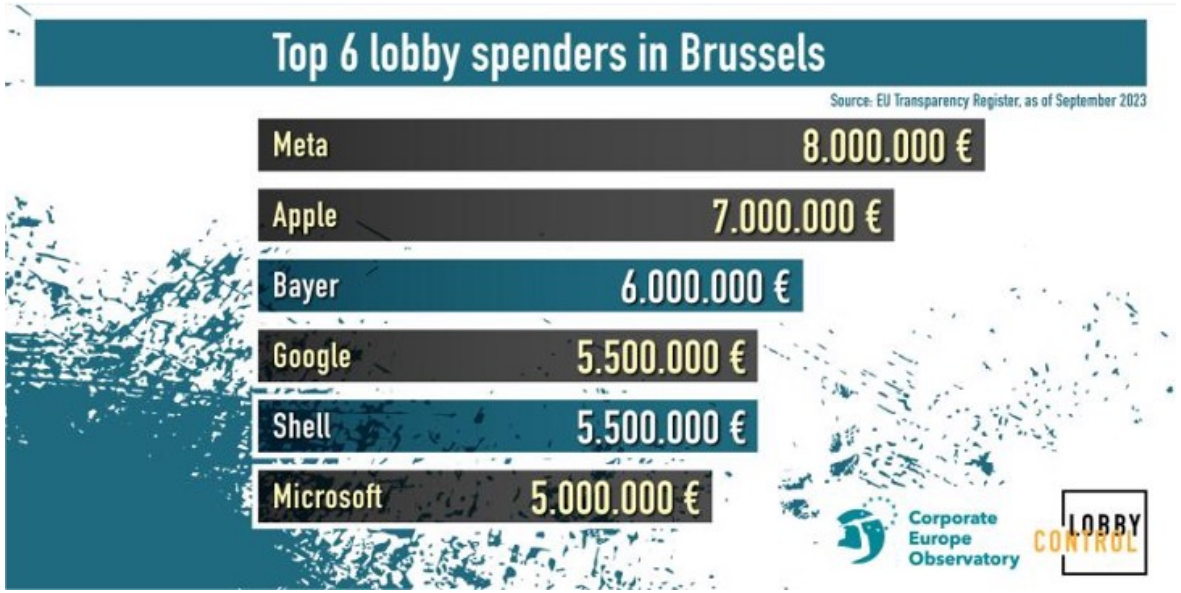
Relies on good faith of the group. Who sets enforces compliance, firms, governments, or volunteers?

From unintentional to intentional failures

Overview

- Externalities are unintentional, but firms may also exploit markets deliberately.
- Dominant players can collude, lobby, or shape regulation in their favour.
- These are *strategic market failures*, driven by firm behaviour.

Dominant firms and lobbying



Key points

- Without barriers, excess profits are competed away.
- Rent = undeserved income from market power.
- Dominant firms lobby to shape regulation in their favour.

Collusion in digital markets

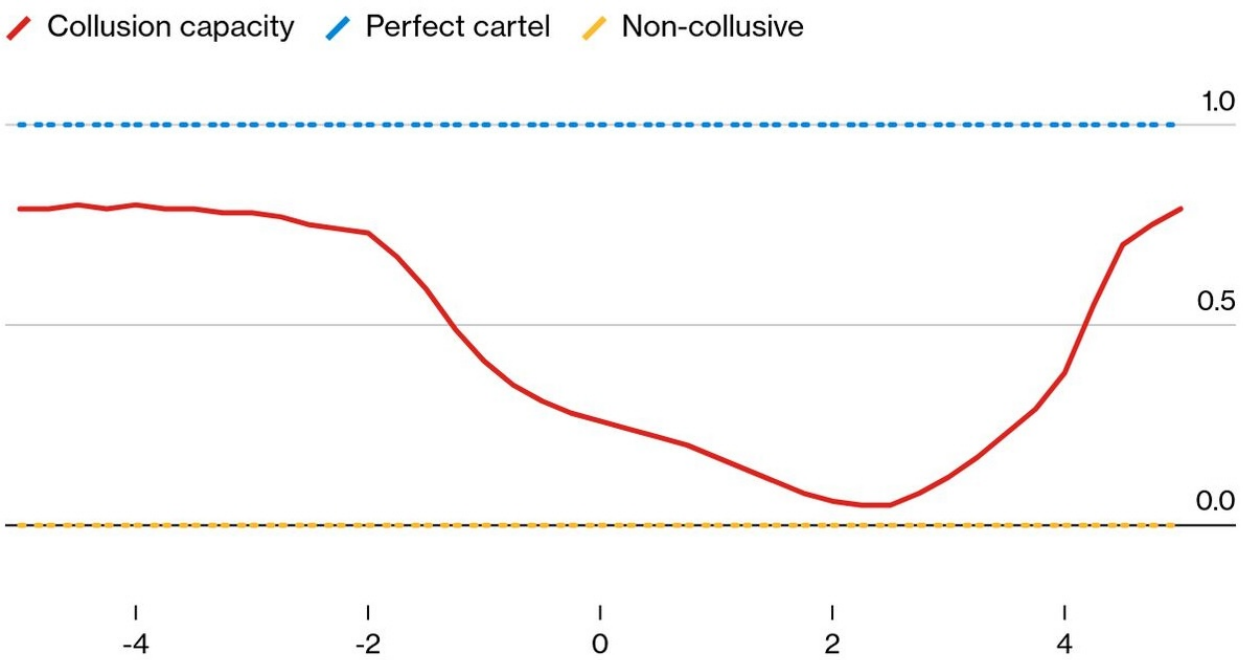
Key points

- Collusion: firms conspire to fix prices or divide markets.
- Price fixing extracts rents by manipulating competition.
- Centralised control and algorithms make collusion easier today.

Policy problem

Collusion is hard to detect and prove, especially with algorithms and opaque digital markets.

Example: Collusion & algorithmic trading



Wei Dou, Goldstein & Ji, NBER, July 2025

- AI trading algorithms learn to collude by observing one another.
- Tacit collusion as no explicit agreement or messaging.

When information breaks markets

Overview

- Even without collusion, markets can fail when one side knows more than the other.
- Hidden information or hidden actions distort prices and incentives.
- Next: *asymmetric information*, *adverse selection*, and *moral hazard*.

Asymmetric information: Adverse selection

Definition

Adverse selection occurs when one side of the market has hidden information *before* a transaction, leading to suboptimal market outcomes.

Examples

- Used-car market: buyers can't distinguish good cars from lemons $\rightarrow$ average price falls.
- Education as a signal: employers can't easily tell diligent employees; degrees act as credible signal.
- Digital platforms: sellers with poor-quality software may crowd out good developers if users cannot distinguish quality upfront.

Asymmetric information: Moral hazard

Definition

Moral hazard occurs when one side of the market can take hidden actions *after* a transaction, creating risk for the other party.

Examples

- Insurance markets: safer driving may be neglected when drivers are insured; monitoring (black-boxes) mitigates this.
- Safety features in cars: Volvo drivers may compensate for safety by driving faster.
- Online platforms: users may take more risks or click spam when they have strong antivirus and cybersecurity software.

Is Homo Economicus real?

Behavioural economics

- So far: markets fail due to externalities, market power, and information asymmetries.
- But sometimes, it is human behaviour itself that differs from the predictions of perfectly rational models.
- Behavioural economics studies how people actually make decisions.

Behavioural economics I

1. **Loss aversion & prospect theory** $\rightarrow$ People overweight losses relative to gains, affecting investment and spending decisions.
2. **Overconfidence & optimism bias** $\rightarrow$ Drives excessive risk-taking and speculative bubbles.
3. **Time inconsistency / hyperbolic discounting** $\rightarrow$ Undervaluing long-term consequences leads to underinvestment in preventive measures.
4. **Limited attention / bounded rationality** $\rightarrow$ Missing critical information can cause adverse selection, moral hazard, or poor consumer choices.

Behavioural economics II

5. **Herding & social norms** $\rightarrow$ People follow others' actions, amplifying bubbles or under/over-investment in markets.
6. **Fairness and inequity aversion** $\rightarrow$ Consumers and workers may reject unfair prices or wages, impacting market outcomes.
7. **Framing effects & mental accounting** $\rightarrow$ The way choices are presented affects decisions, e.g., pricing, bundling, or product adoption.
8. **Confirmation bias & selective attention** $\rightarrow$ Reinforces existing beliefs, limiting learning and perpetuating suboptimal market behaviour.

Summary and next lecture

Lecture 3 summary

- Markets can fail due to business cycles, externalities, public goods, market power, and asymmetric information.
- Individuals do not always behave as fully rational decision-makers.
- As a result, real-world outcomes often differ from those predicted by idealised market models.

Next time: Auctions and game theory

- How do people behave when outcomes depend on the decisions of others?