Economics in the Digital Age
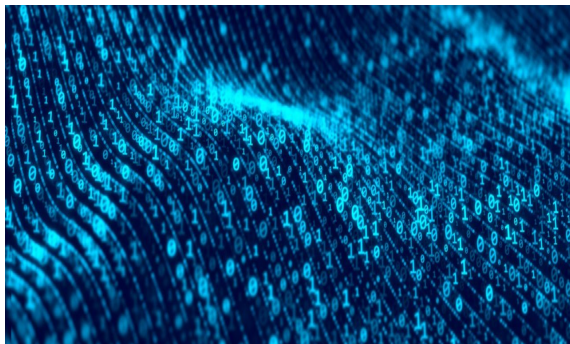
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Digitisation

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- Digitisation has affected our lives drastically.
  - ▶ Affected how we can store, process and transmit data
  - ▶ Led to the emergence of new markets, business models, economic phenomena.
- These have introduced intellectual and practical challenges to economists and policy makers

The new (digital) economy

Introduction to economics

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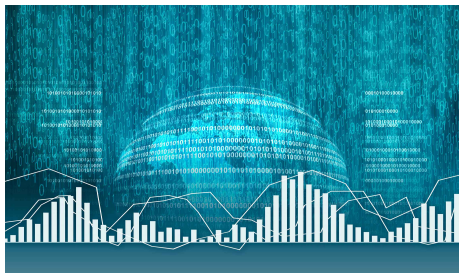

Digital economy presents both academics and policy makers a new set of challenges: textbook competition theory cannot easily be applied!

The new (digital) economy

- European commission report on competition policy for the digital era states three main characteristics of the digital economy:
  1. Extreme returns to scale
  2. Network externalities
  3. The role of DATA

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I will talk about

- The challenges introduced by data

- An experimental project depends on use of consumer data

The challenges introduced by data

- Data has become one of the most important issues, if not the most important one, in the ongoing debate about regulating the digital sector:
  - ▶ Policy reports: EU Competition Commission report (2019), Furman et al 2019
  - ▶ Policy hearings: FTC's recent hearing on Privacy, Big Data and Competition
  - ▶ Newly established specialist policy teams: UK CMA's Data, Technology and Analytics Unit

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  - Policy reports: EU Competition Commission report (2019), Furman et al 2019
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  - Newly established specialist policy teams: UK CMA's Data, Technology and Analytics Unit
- Concerns are wide ranging: Privacy, collusion, barriers to entry, exploitative practices and data driven mergers
- For instance: In the technology sector, many data-intensive markets contain a firm that is dominant or near-dominant, raising a wide range of concerns about the role of data in long-run market dynamics and the consolidation of market power

The challenges introduced by data

- Three commercial uses of data:
  1. Firms use data to inform improvements in their product
  2. Online advertising platforms use data about consumers to target advertisements.
  3. Firms use customer data to offer personalised prices (i.e., to price discriminate)
- The approach of the economic literature has typically been to focus on one of these applications (especially price discrimination or ad targeting)

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Ongoing work to answer questions such as:

When should we promote or prevent data acquisition by firms?
What are the long-run implications of data collection for consumer welfare?
Should mergers that involve the acquisition of data be treated differently?

Use of data: An experiment

- Internet has simplified transactions between business entities and consumers
- In June 2019, online sales made up 18.9% of all retail sales and this has been increasing every year (ONS, UK).
- Consumers can now get almost personalised service from online shops, but this also means that they are more prone to exploitation.

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- Consumers can now get almost personalised service from online shops, but this also means that they are more prone to exploitation.
- Answer questions on consumer welfare in e-commerce using empirical and experimental tools

Use of data: An experiment

- Price discrimination and personalised product positioning
  - Price discrimination: A basic example is peak vs. off-peak train tickets.
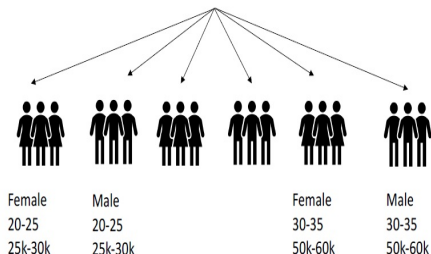
Use of data: An experiment

- Price discrimination and personalised product positioning
  - ▶ Price discrimination: A basic example is peak vs. off-peak train tickets.
  - ▶ Personalised price discrimination, personalised product positioning: Historical consumer data makes it possible to cater consumers individually, in other words, it is easier to serve personalised products -

Use of data: An experiment
Design

We have partnered with a retailer from EU who also owns online retail shop. We will conduct experiments to understand how the historical consumer data can be used, and how this might effect consumer welfare and firms' profits.

1. **Analysing the data** supplied by our partner (of course all ethical approvals will be taken before we start)
2. **Use ML techniques to separate consumers into small groups**

Female	Male			Female	Male
20-25	20-25			30-35	30-35
25k-30k	25k-30k			50k-60k	50k-60k

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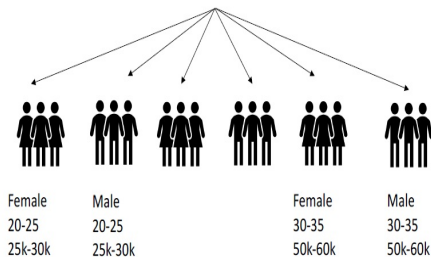

5% off   10% off   5% off

3. **Randomly offer discounted prices** to measure consumer reaction to different discounts, at the same time controlling for consumer heterogeneity.

- We will do another experiment but this time to measure sensitivity to product positioning.

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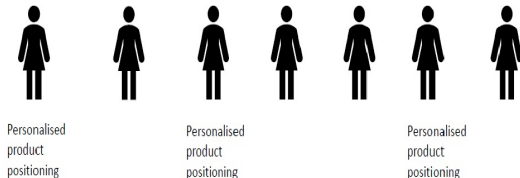
  2 **Randomly offer personalised product positioning**, at the same time controlling for consumer heterogeneity.

Use of data: Consumer search

- With the advent of internet retailers, individuals potentially have access to a very wide range of alternative suppliers and products before making a purchase decision.
- Our choices (which seller to buy from, which house to make an offer on, which job adverts to apply for) will be based on our preferences but also in the way we search for and process the wealth of information available on an internet platform.
- These preferences and search behaviours are crucial to sellers' advert-posting decisions, to platform design and to a policy maker assessing welfare.
- With the availability of clicking data, it is now possible to model learning behaviour while searching.

Wrap up

- Digital age introduced new challenges for economists, one of which is DATA
- Economists still trying to understand/solve problems/challenges introduced by data.
- We also use models which use data for the common good.
- Privacy and ethics

Thank you...

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