AUTOMATION AND INTERNATIONAL COMPETITION

Making globalization work for all
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Important questions

• AUTOMATION: Does increasing international competition from low-wage countries drive automation?
• PRODUCTIVITY: How does automation affect firm performance?
• JOBS: How does automation affect employment – and the use for different skill types?
Competition and Firm Response

Increasing International Competition

Firms

Intensive increase

Innovation
- Productivity ↑
- Employment ?
  - Substitution ↓
  - Size ↑

Limited increase

No Innovation
- Productivity →
- Employment →
- Substitution →
- Size →
Increasing international competition from China

• Led (surviving) firms to invest more in automated production capital
  [Kromann and Sørensen, 2016]

• Was a driver of technical change in (surviving) firms
  [Bloom, Draca, and Van Reenen, 2016]
Share of investments in M&E targeted at automation in 2010

Source: Authors’ survey on automation in manufacturing firms
Investment in automation increase firm performance

• Firms with high increases in automation have faster productivity growth than other firms

• New investments improve the efficiency of all stages of the production process.
  [Bartel, Ichniowski, and Shaw 2007, Kromann and Sørensen, 2016]

• New investments shift business strategies towards producing more customized products.
  [Bartel, Ichniowski, and Shaw 2007]
How does automation affect employment?

• Aggregate level:
  – Negative effects on employment and wages from robots.
    [Acemoglu and Restrepo, 2017]
  – No aggregate effect from technology and large negative effect from import penetration.
    [Autor, Dorn, and Hansson, 2015]

  “While technology affects the labor market at the occupation level by shifting occupational composition within sectors, trade competition has a broad sectoral impact and depresses employment across all occupation groups in manufacturing”
How does automation affect employment?

• Firm level:
  – Firms that invest intensively in automated production capital have unchanged or slightly increasing employment.
    [Kromann and Sørensen, 2017 – Preliminary result]
  – Chinese import competition led to reallocation of employment between firms towards more technologically advanced firms.
    [Bloom, Draca, and Van Reenen, 2016]
Number of Manufacturing firms

• Firm exits may play an important role in understanding employment effects

Source: Statistics Denmark
What is the mechanism if automation reduces aggregate employment?

• Important differences in implications between:
  – Automation do not lower employment + jobs are lost because of firm closes and direct effect of import competition
  – **OR** Firms that automate reduce employment

• Better understanding of:
  – Drivers of automation?
  – Barriers to automation?

• Future:
  – Are technology changing in the sense that computerization of ”non-routine task-intensive activities” becomes possible?
References


