Job Polarization and Employment Protection in Europe

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Job market polarization

• **Definition**
  - rising relative demand for labor in jobs at the bottom and top relative to the middle of the skill distribution (Goos and Manning, 2007)

• **Mechanisms**
  - routinization - substitution of routine job tasks by modern technologies (Autor, Katz and Kearney, 2006)
  - offshoring - moving certain job tasks to low-wage countries (Firpo, Fortin and Lemieux, 2011)
Job polarization in the U.S.

Source: Autor et al. 2006
Job polarization in Europe

• United Kingdom
  • Goos and Manning (2007)

• Germany
  • Spitz-Oener (2006)
  • Dustmann, Ludsteck and Schonberg (2009)

• Cross-country comparison
  • Goos, Manning and Salomons (2009)
Research Questions

- How to measure skill requirements of jobs (occupations)?
- What drives cross-country differences in polarization patterns?
- Do labor market institutions dampen polarization?
Measuring polarization - challenges

- How to measure skill-requirements of occupations?
  - average wage
  - average educational attainment
  - occupational dictionary
  - other?

- Where to measure skill-requirements of occupations?
  - country-level measures
  - European-wide measure
  - external measure
Occupational skill requirements
in the polarization literature

- Dictionary of Occupational Titles (DOT) ⇒ O*NET
  (Autor and Dorn, 2009; Firpo, Fortin and Lemieux, 2011)

- Average educational attainment
  -zero elasticity of substitution between workers of different skill levels-
  (Autor, Katz and Kearney, 2006; Goos and Manning, 2007)

- Average wages
  -infinite elasticity of substitution between workers of different skill levels-
  (Goos, Manning and Salomons, 2009)
Occupational skill requirements

a new approach

The skill intensity of occupations

- Assumes nonzero, finite elasticity of substitution between workers of different skill levels
- Takes into account wages and educational attainment of workers
- Log of the relative productivity of high and low educated workers
Occupational skill requirements

a new approach

Assume the following occupation-specific production function:
Constant Elasticity of Substitution (CES)

\[ Y_j = \left( \frac{\alpha_{Cj} L_{Cj}^{(\sigma_j-1)/\sigma_j} + \alpha_{Nj} L_{Nj}^{(\sigma_j-1)/\sigma_j}}{\sigma_j} \right)^{\sigma_j/(\sigma_j-1)} \]

In equilibrium:

\[ \frac{\alpha_{Cj}}{\alpha_{Nj}} = \frac{w_{Cjt}}{w_{Njt}} \left( \frac{L_{Njt}}{L_{Cjt}} \right)^{1/\sigma_j} \]
Implementation

\[
\frac{\alpha_{Cj}}{\alpha_{Nj}} = \frac{w_{Cjt}}{w_{Njt}} \left( \frac{L_{Njt}}{L_{Cjt}} \right)^{\frac{1}{\sigma_j}}
\]

Estimating skill-requirements

• Use the available estimate of the elasticity of substitution between high and low educated workers
  \( \sigma_j = 1.5 \) for all \( j \).

• Estimate occupational skill requirements using the observed wages and worker allocation across occupations in the US

  \( \Rightarrow \) exogenous skill-requirements measure

  \( \Rightarrow \) cross-country consistency
Data

- European Union Labour Force Survey
- Unified across all Member States and some associate countries
- Sample selection follows Goos et al. (2009)
  - 1993-2006
  - Prime-age individuals
  - 2-digit ISCO occupations
Methodology

- Analyze 21 occupations (without public sector and agriculture)
- Match each occupation with the estimate of skill intensity as of 1993
- Define quintiles of occupational skill intensity based on employment share
- For each quintile measure within-country employment share in 1993 and 2006
- Compare changes in employment shares between 1993 and 2006 across countries
Cross-country heterogeneity

- Observed patterns
  - The strongest polarization in Denmark, Finland, and Ireland
  - The weakest polarization in the Netherlands, Norway, and Sweden

- Possible channels
  - economic cycles
  - educational attainment
  - industrial composition
  - employment protection legislation
Extent of job polarization and country characteristics

\[ \hat{\text{ExtPol}} = 0.02 - 2.13 \cdot g\text{Educ} + 0.08 \cdot \text{shManuf} - 0.03 \cdot EPL \]

\[ (0.07) \quad (0.50) \quad (0.02) \quad (0.01) \]

- \( \text{ExtPol} \) - extent of polarization
  (highest change in employment share – lowest change)

- \( \text{Educ} \) - growth in average educational attainment
  (in years)

- \( \text{shManuf} \) - share of employment in manufacturing sector

- \( EPL \) - employment protection legislation index
  (in 0-5 range)
Polarization and employment protection

Motivation

Challenges

Cross-country comparison

Conclusion

- Ireland
- Denmark
- Austria
- United Kingdom
- Finland
- Spain
- France
- Netherlands
- Norway
- Sweden
- Portugal
Discussion

- Job polarization is observed in all analyzed European countries
- "Gross" polarization is the strongest in Southern Europe
- Country-specific economic conditions explain 50% of variation in the extent of polarization
  - educational attainment
  - industrial structure
- "Net" polarization is the strongest for countries with mild employment protection legislation
  - Employment protection limits the possibility of adjusting firms’ workforce in response to technological change
  - Employment protection dampens the polarization effect
  - Relaxing employment protection legislation could reduce low-end inequality