



Technology, Trade and Occupational Employment

A Cross-Country Analysis of Technology and Trade's Impact on Occupational
Employment and Inequality

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Outline

- 1. Introduction**
- 2. Research Question**
- 3. Literature Survey**
- 4. Research Strategy**
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Introduction

- **What are the recent trends in labor markets?**

Job polarization

Declining real wages of low-skilled jobs

- **How technology affects labor earnings?**

Skill-Biased Technical Change (SBTC)

- **How trade affects labor earnings?**

Offshoring (Trade in Tasks)



Research Question (Preliminary)

How did the recent developments in technology and offshoring activity in European Union affect the demand for different skills and earnings of different occupations in the late 20th and 21st Centuries?

Technology and Heterogenous Labor-SBTC

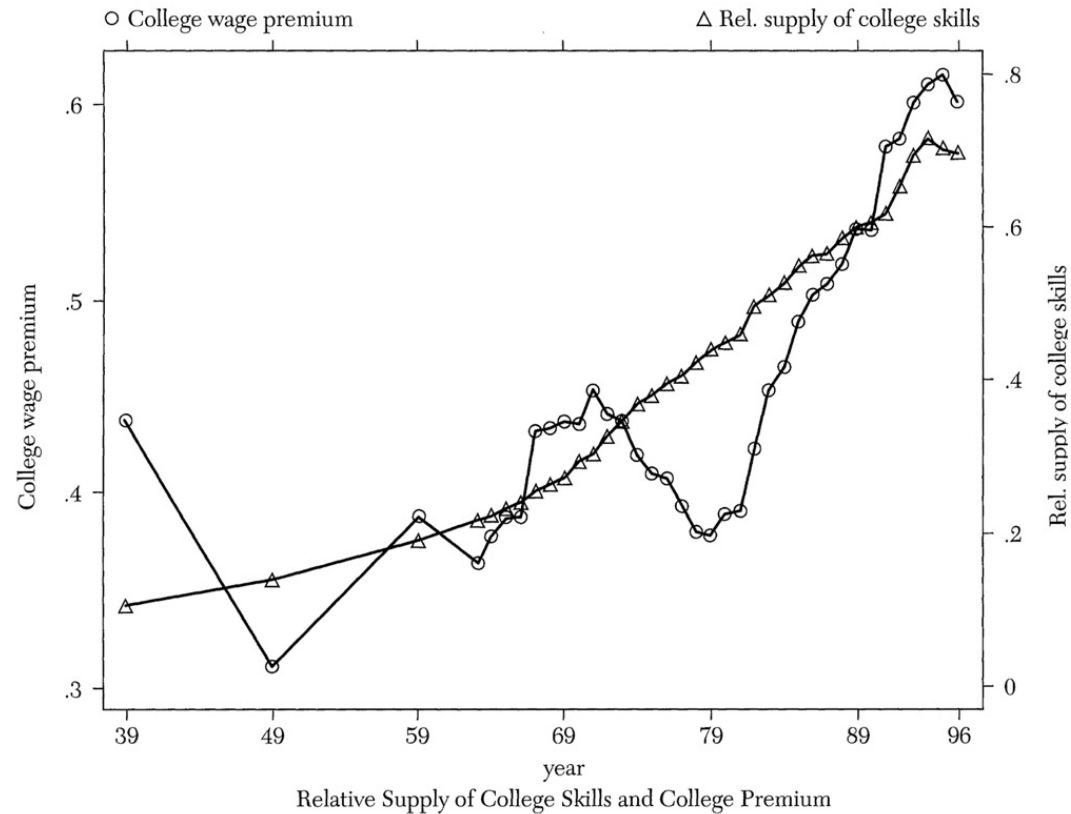


Figure 1 The Behavior of the (log) College Premium and Relative Supply of College Skills adapted from "Technical change, inequality, and the labor market" by Acemoglu D.

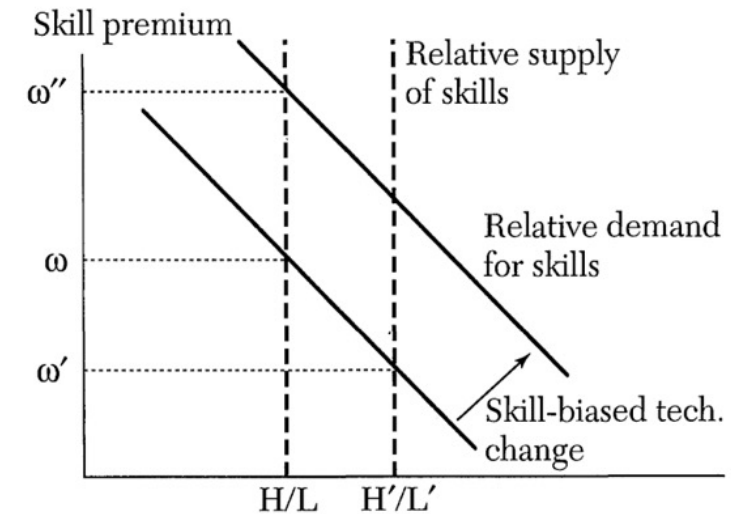


Figure 2 Relative Demand for Skill adapted from "Technical change, inequality, and the labor market" by Acemoglu D.

Skills, Tasks and Occupations

- *CES Production Function of Katz and Murphy Framework:*

$$Y(t) = [(A_l(t)L(t))^\rho + (A_h(t)H(t))^\rho]^{1/\rho}$$

$A_l(t)$ and $A_h(t)$ are factor Augmenting technology terms of low and high skilled labor

- Skill is defined as “Worker’s endowment of capabilities for performing various tasks”.

Skills, Tasks and Occupations

- *Production Function of Acemoglu and Autor,*

$$Y(i) = A_l \alpha_l(i) l(i) + A_m \alpha_m(i) m(i) + A_h \alpha_h(i) h(i) + A_k \alpha_k(i) k(i)$$

$A_l(t), A_m(t), A_h(t), A_k(t)$ are low skill, medium skill, high skill and capital biased technologies respectively and α 's are task productivity schedules for task i .

- A task is defined as “Unit of work activity that produces output (goods and services)”. In contrast, a skill
- Aggregation of tasks produces goods and services

$$Y = \exp \left[\int_0^1 \ln y(i) di \right]$$

- ❖ Skills match Tasks
- ❖ Occupations are sets of tasks

Trade in Tasks: Offshoring

What makes a task (or a job) offshorable?

Autor, Levy, and Murnane (2003)

- *face-to-face and on-site interactions*
- *routine vs. non-routine*
- *cognitive vs. non-cognitive* aspects of occupations.

What can measure offshoring?

- *Foreign direct investment outflows?*

Research Strategy

Katz and Murphy

$$Y(t) = [(A_l(t)L(t))^\rho + (A_h(t)H(t))^\rho]^{1/\rho} \longrightarrow$$

OLS

$$\ln \omega = 0.025 \cdot t - 0.56 \cdot \ln\left(\frac{H}{L}\right),$$

(0.01) (0.20)

Goos, Manning and Salomons

$$Y_i(T_{i1}, T_{i2}, \dots, T_{iJ}) = \left[\sum_{j=1}^J (\beta_{ij} T_{ij})^\eta \right]^{\frac{1}{\eta}} \text{ with } \eta < 1. \longrightarrow$$

Analysis of Variance
ANOVA

Research Strategy

Acemoglu and Autor

$$Y(i) = A_l \alpha_l(i) l(i) + A_m \alpha_m(i) m(i) + A_h \alpha_h(i) h(i) + A_k \alpha_k(i) k(i)$$



Research Strategy

Data Sources:

European Union Labor Force survey (ELFS)	Occupation level labor supplies
OECD STAN	Industry level outputs
The World Bank Group	Foreign Direct investment
Penn Table	Macroeconomic (Control) variables
UN Comtrade Database	Trade quantities
European Community Household Panel (ECHP)	Occupation level labor earning
European Union Statistics on Income and Living Conditions (EU-SILC)	Occupation level labor earning

Preliminary Table of Contents

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- 2. View From the Shoulders of Giants: Survey of Current Literature**
- 3. Data Sources**
- 4. Recent Trends in the European Union Labor Markets**
- 5. Theoretical Framework**
- 6. Results of Empirical Analysis**
- 7. Conclusion**

References

- Acemoglu, D. (2002). Technical change, inequality, and the labor market. *Journal of Economic Literature*, 40(1), 7-72.
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Thank you for your attention

Any Questions?