KDI-Brookings Joint Seminar 2024

Digital Transformation and Artificial Intelligence: Implications for Inequality and Global Economic Convergence

Discussion of:

The Labor Market Impacts of AI Technology

: A Case Study of Korea

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Overview

- Summary of this paper
- Discussion #1:
- Discussion #2
- Future direction and policy implications

Contribution of this paper

- The actual impact of AI technology on the labor market is difficult to predict in advance, as economic and social factors come into play.
  - No matter how advanced the technology, it may not be used due to economic considerations or existing vested interests.
  - There is a need to distinguish between technological feasibility and economic feasibility.
- While the adoption of AI is still in its early stages, there is a need for empirical analysis of its impact on the labor market.
  - Although there have been many discussions about the future impact of AI on the labor market, empirical results based on concrete data are still very rare.

Overview of empirical results(1)

- Firm-level analysis examines changes in revenue, employment, and labor costs before and after AI adoption
  - Although an increase in AI-related personnel is expected in companies that adopt AI technology, in the long term, a reduction in employment or labor costs due to the technology may also occur.

- Regional labor market analysis examines changes in employment and wages as AI exposure rates increase.
  - While the demand for AI-related labor is expected to rise as the number of workers exposed to AI technology increases, employment or wage reductions may occur in other areas.

Overview of empirical results(2)

- The endogeneity problem: AI technology adoption does not occur by chance; it systematically reflects the characteristics of the company
  - For example, companies with high growth potential may show a strong interest in using AI technology for innovation.
  - Additionally, companies experiencing labor shortages are likely to have a strong interest in labor-saving technologies
- Estimating by using predicted adoption and exposure rates from past regional industrial compositions as instrumental variables
  - Based on the industrial composition of each region in 2012 and the development of AI adoption rates by industry nationwide after 2012, the predicted AI adoption and exposure rates for each region are calculated and used as instrumental variables for estimation.
  - It is assumed that the industrial composition across regions in 2012 is unrelated to AI technology

Summary of empirical results

- The overall impact of AI on the labor market has not been significant, at least so far.
  - At the firm level, employment and wages have not changed significantly after the adoption of AI.
- When analyzed by age group, men aged 15–29 experienced a decline in employment, and those aged 30–44 saw a decrease in wages.

- For women, both employment and wages decreased noticeably in the 15–29 age group.

Discussion #1

- In terms of job composition, there are already clear directional changes, and it is necessary to pay attention to future trends.
  - Han (2023) contains empirical results categorized by educational level and occupation as well.

- As the AI exposure rate increases, the demand for professional jobs rises, while the demand for middle-skilled jobs such as service, clerical, and sales positions decreases.

- It appears similar to the impact of existing software and robotics, but since AI adoption is still in its early stages, this may change in the future.

Discussion #2

According to Acemoglu and Restrepo (2018; 2019), the displacement effect on labor demand caused by machines is mitigated by the following four forces:

1. Automation (at the extensive margin):
   - AI models taking over and reducing costs in certain tasks e.g. text summary, data classification, advanced pattern recognition, and computer vision tasks that can be profitably automated.
2. Labor-augmenting technological change:
   - Increasing the productivity in tasks that are not fully automated and may even raise the marginal product of labor
3. Deepening of automation (at the intensive margin):
   - Increasing the productivity of capital in tasks that have already been automated.
4. New tasks:
   - New tasks may be created thanks to AI and these tasks may impact the productivity of the whole production process.

Future Direction

- Implications for innovation policy
  - "The gap in AI adoption between companies of different sizes is likely to further widen existing productivity disparities
  - However, how to respond to the innovation gap by company size is generally unclear, and this is especially true in the case of AI technology, where the spread of innovation is expected to have a direct impact on the labor market.
- Social safety nets for global perspective
  - Recently, discussions on preemptive regulations to ensure AI safety have been accelerating internationally.
  - At the first AI Safety Summit, held on November 1-2, 2023, at Bletchley Park in Buckinghamshire, UK, the Bletchley Declaration was adopted.
  - It emphasizes the need to ensure the safety of AI by making its design, development, adoption, and use human-centric, trustworthy, and responsible, and highlighting the importance of international cooperation.

Thank You

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