



Mykolas Romeris
University

The Role of Artificial Intelligence in Enhancing Labor Productivity in Lithuania

Miglė Eleonora Černikovaite, PhD, Assoc. Prof.
E-mail: miglec@mruni.eu

2025-10-16

International scientific
conference on economic
development and legacy of
Simon Kuznets

Problem Statement

- How does the development of artificial intelligence technologies affect labor productivity in Lithuania?

Challenges:

- Rapid AI integration
- Productivity disparities
- Risks of job displacement and skill gaps

Research Aim and Objectives

- **Aim:** To examine the impact of AI on labor productivity in Lithuania.
- **Objectives:**
 1. Analyze AI adoption and productivity trends.
 2. Identify AI-driven opportunities and risks.
 3. Apply statistical methods to measure the impact of AI on labour productivity
 4. Propose recommendations for sustainable growth.

Theoretical Background

- AI and automation shaping industries globally (Brynjolfsson, E., & McAfee, A., 2014)
- Productivity as a driver of competitiveness and well-being
- AI's dual role: efficiency and risks (Bostrom, 2021)
- Insights from Nordic countries case studies (Högberg, 2020)

Lithuanian Context

- Growing digital infrastructure (World Bank, 2021)
- Innovation-driven policies (OECD, 2015)
- Increasing R&D investments (European Commission, 2024)
- Expanding skilled employment in high-tech sectors (International Labour Organisation, 2023)

Methodology

- **Research Methods:**

- Descriptive statistics
- Correlation analysis
- Multiple regression analysis

- **Data Sources:**

- National statistics of Lithuania
- AI-related patents
- Employment and productivity indicators: employment rate, labor productivity, and hours worked per capita.

Empirical Findings: General

LITHUNIA

Labour productivity correlation coefficients	Laproducti vitybour	Information and communication technology patents	Scientific R&D publications	Employed in the high-tech sector	Number people employed in the information and communication sector	Business expenditure on R&D
Pearson correlation coefficient	1	-0,656	0,606	0,251	0,593	0,594
Significance level (p-level)		0,001	0,002	0,236	0,002	0,002

- Positive correlation between AI adoption and productivity
- High digital intensity sectors show strongest effects (ICT, manufacturing)
- AI reduces operational costs and streamlines processes

Empirical Findings: Regression model

$$Y_n = 99.805 - 0.012x_1 + 0.001x_2 + 0.002x_3$$

Y_n - Labour productivity

X_1 - AI-related patents

X_2 - scientific R&D publications

X_3 - Business expenditure on R&D

- • R&D investment growth boosts innovation
- • Rising AI-related patents signal technological capacity
- • Expansion of skilled workforce drives productivity

Evaluation of Multiple regression model

Rodiklis	Reikšmė
	0,517
ANOVA	0,002
Kuko matas	0,426
VIF	2,583
Durbin-Watson	1,608

This linear regression model has moderate effectiveness, as indicated by the R-squared value of 0.517, confirming that 51.7% of the variation in the phenomenon is explained by the model. The ANOVA statistic with a value of 0.002 indicates that at least one explanatory variable is statistically significant, the highest VIF indicator satisfies the assumptions for model construction, and the Durbin-Watson statistic of 1.608 indicates that there are no serious problems with autocorrelation between variables.

Discussion: Benefits

- • AI enhances efficiency and competitiveness
- • Supports innovation ecosystems
- • Enables higher output with fewer resources
- • Fosters knowledge-based economy

Discussion: Risks

- • Structural labor market changes
- • Potential job displacement
- • Skill mismatches
- • Ethical and regulatory challenges

Policy Implications

- • Invest in digital infrastructure
- • Support reskilling and upskilling
- • Foster collaboration between government, academia, and industry
- • Balance technological progress with social well-being

Comparative Insights from Nordic Countries

- • Strong AI strategies and national policies
- • High digital readiness
- • Lessons for Lithuania:
 - - Early adoption
 - - Focus on education and skills
 - - Inclusive innovation policies

Conclusion

- • AI plays a transformative role in labor productivity
- • Lithuania can enhance competitiveness by:
 - - Strengthening R&D
 - - Building innovation ecosystems
 - - Addressing workforce adaptation
- • Balanced approach ensures sustainable development

Future Research

- • Long-term impact of AI on labor market structures
- • Sector-specific productivity effects
- • Comparative regional studies (Baltics, Nordics)
- • Policy evaluation and best practices

Practical Recommendations

- For Businesses:
 - - Adopt AI tools for process optimization
 - - Invest in employee training
- For Policymakers:
 - - Incentivize R&D
 - - Ensure inclusive access to digital tools
 - - Promote AI ethics and regulation



Mykolas Romeris
University

The Role of Artificial Intelligence in Enhancing Labor Productivity in Lithuania

Miglė Eleonora Černikováitė, PhD, Assoc. Prof.

Email: miglec@mruni.eu