



BDAIM-2025

PROCEEDINGS

of the International Scientific and Practical Conference

Big Data and Artificial Intelligence in Modeling
International Socio-Economic Processes

Tashkent, Uzbekistan

May 27, 2025

University of World Economy and Diplomacy
Moscow State Institute of International Relations
National University of Uzbekistan



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(Conference Proceedings)

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International Scientific and Practical Conference – BDAIM-2025

Big Data and Artificial Intelligence in Modeling International Socio-Economic Processes

The **University of World Economy and Diplomacy (UWED)**, in collaboration with **MGIMO University** and the **National University of Uzbekistan (NUUz)**, hosted the international scientific and practical conference **BDAIM-2025** on **May 27, 2025** in **Tashkent, Uzbekistan**.

The main **goal** of the conference was to unite researchers, policy makers, experts, and educators to explore cutting-edge applications of **big data** and **artificial intelligence (AI)** in modeling **international socio-economic processes**. Particular emphasis was placed on interdisciplinary approaches and digital transformation in economics, governance, and education.

Key Themes of the Conference:

- **Theoretical Foundations:** big data processing, machine learning algorithms, interpretability.
- **Socio-Economic Modeling:** global trade, finance, migration, and digital economies.
- **Global Challenges:** AI for climate change, pandemics, geopolitical risk management.
- **International Relations:** digital diplomacy, media analytics, conflict forecasting.
- **Ethics and Regulation:** AI governance, data protection, algorithmic responsibility.
- **Mathematical Models:** econometrics, game theory, uncertainty and risk analysis.

The event was conducted in a **hybrid format** with participation in **English, Russian, and Uzbek**. The conference provided a high-level platform for **scientific exchange, networking, and policy dialogue**.

The authors are solely responsible for the content and accuracy of their articles

Digital Economy-Driven Industrial Upgrading: Empirical Evidence from China and Implications for Uzbekistan

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Abstract. The rapid advancement of the digital economy has emerged as a pivotal force influencing industrial upgrading across various economies. This paper explores the relationship between the digital economy and industrial upgrading in China, utilizing economic statistical data from the last decade. Through the development of a comprehensive evaluative framework and the application of a fixed effects model, this study analyzes the impact of digitalization on industrial transformation, providing critical insights and implications for Uzbekistan.

Keywords: Digital Economy; Industrial Upgrading; Empirical Evidence (China); Policy Implications (Uzbekistan)

Introduction

In the era of globalization, the digital economy has become a transformative driver reshaping both local and global economic landscapes. The digital economy not only enhances operational efficiencies but also fundamentally alters the structural dynamics of industries. This study focuses on how the digital economy facilitates industrial upgrading in China, using it as a case study to extract valuable lessons for Uzbekistan. The findings aim to inform policymakers and stakeholders in Uzbekistan about leveraging digital transformation to foster industrial development and economic growth.

Literature Review

The term "digital economy" refers to economic activities that leverage digital technologies to drive productivity and innovation. It encompasses two primary dimensions: digital industrialization, which pertains to the growth and expansion of digital sectors, and industrial digitalization, which involves the integration of digital technologies into traditional industries.

Research has established a strong link between digitalization and enhanced industrial performance. Digital technologies not only increase productivity but also promote innovation essential for industrial upgrading. Investments in digital infrastructure and technologies provide a foundation for economic growth and global competitiveness.

Additional studies illustrate how transitions to a digital economy optimize resource allocation and enhance firms' abilities to rapidly adapt to changing market conditions, presenting new opportunities for efficiency, strategic positioning, and industrial transformation.

Research Methodology

Definition of Digital Economy. In this study, we define the digital economy as: "An emerging economic framework supported by advanced information technology, utilizing networks and platforms as carriers, with data as a core production factor, directed towards intelligence, founded on digital industrialization, and centered on industrial digitalization."

This definition highlights the broad impact of emerging technologies, networks, and data while emphasizing the dual drivers of digital industrialization and industrial digitalization.

Data Collection and Indicator System. Utilizing panel data from 2015 to 2024, this analysis employs various economic indicators to evaluate the impact of the digital economy on industrial upgrading. A comprehensive evaluative indicator system was established based on systemic, scientific, hierarchical, feasible, comprehensive, and applicable criteria, summarized in Table 1.

Table 1: Indicator System of Digital Economy (prepared by the author)

<i>The secondary indicators</i>	<i>The indicators</i>	<i>The secondary indicators</i>	<i>The indicators</i>
Industrial digital D1	E-commerce sales	Digital infrastructure construction D3	Optical fiber cable line length
	Number of computers used per 100 people		Mobile phone switch capacity
	Number of enterprises with e-commerce transaction activity		Number of domain names
Digital industrialization D2	Total amount of telecommunications services	Digital economy environment D4	Technology market turnover
	Software revenue		Number of students in school
	Courier business revenue		Number of patent applications granted

Econometric Model. To analyze the relationship between digital economy indicators and industrial upgrading, we apply a fixed effects regression model using Stata. The model is represented as follows:

$$\log \left(\frac{\text{Tertiary GDP}}{\text{Secondary GDP}} \right)_{it} = \alpha + \beta D_{it} + \gamma \text{Controls}_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Control variables include: **lg** represents GDP (economic level) in logarithmic form; **d** is the composite digital economy assessment index; **lf** denotes the level of financial development (logarithmic); **lp** reflects the standard of living (logarithmic); **lo** signifies aging population level (logarithmic); **lc** indicates urbanization level (logarithmic); **lw** is wage level (logarithmic); **lh** is the value added by high-tech industries (logarithmic); **lb** represents social and employment security level (logarithmic).

Empirical Results

Model Results. The fixed effects regression results are summarized in Table 2.

Table 2: Empirical Results (prepared by the author)

	β	t		β	t
d	0.1179**	2.45	lc	-0.1589***	-3.08
lg	-2.0437*	-59.76	lw	0.2139***	3.76
lf	0.0008	0.03	lh	-0.0152**	-2.12
lp	-0.0130	-0.17	lb	-0.0291	-1.21
lo	-0.0020	-0.35	cons	2.1078***	6.09
Time Effect		YES	Area Effect		YES
R^2		Within=0.9727 Between=0.6475 Overall=0.7004	Prob>F		0.0000

*** p<0.01, ** p<0.05, * p<0.1

Analysis of Results The regression output reveals that:

- The digital economy index (d) significantly positively impacts industrial upgrading (coefficient = 0.1179, p = 0.015), indicating that enhanced activities in the digital economy contribute meaningfully to improved industrial performance.
- The ratio of tertiary to secondary industry $\log \left(\frac{\text{Tertiary GDP}}{\text{Secondary GDP}} \right)_{it}$ serves as an effective indicator of industrial upgrading. Important control variables, including urbanization level (lc) and average wages (lw), also display significant relationships with industrial upgrading, underscoring their importance in facilitating industrial transformations.

These results suggest that strategic investments in the digital economy can lead to substantial enhancements in the efficiency and effectiveness of industrial upgrading efforts.

Discussion and Conclusion

This analysis highlights the vital role of the digital economy in fostering industrial upgrading in China. The evaluative framework established and the findings from the fixed effects model illustrate that a strong digital economy can significantly enhance industrial performance. The identified positive relationships between digital economy activities and industrial upgrading provide valuable insights for policymakers in Uzbekistan, enabling them to seize opportunities to enhance their industrial capabilities through digitalization.

Recommendations

For Uzbekistan, leveraging insights from China's experience, the following recommendations are proposed:

(1) Invest in Digital Infrastructure: Prioritize the development of robust digital infrastructure to support and enhance digital economic activities.

(2) Promote E-commerce and Digital Transformation: Encourage businesses to adopt e-commerce strategies and engage more fully with digital technologies to improve productivity and market reach.

(3) Foster Collaborative Efforts: Facilitate collaboration between public institutions and private sector enterprises to co-develop innovative digital solutions and practices.

(4) Enhance Education and Skills Training: Implement targeted educational

initiatives to prepare the workforce with necessary skills and knowledge critical for success in a digital economy.

In conclusion, the digital economy presents an array of opportunities for enhancing industrial upgrading. It is crucial to understand and harness its dynamics to chart a successful path for socio-economic development in emerging markets.

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