



INNOVATION IQTISODIYOT

Ilmiy-amaliy elektron jurnal

2026

№5

ИННОВАЦИОННАЯ ЭКОНОМИКА

Научно-практический электронный журнал

INNOVATIVE ECONOMY

Scientific and practical electronic journal



Indexlanadigan bazalar:  Google Scholar  Crossref  OpenAIRE  CYBERLENIKA



INNOVATION IQTISODIYOT

ILMIY-AMALIY
ELEKTRON JURNAL

5-jild
5-son
May, 2026

May, 2026
Volume 5
Number 5

ИННОВАЦИОННАЯ
ЭКОНОМИКА
Научно-практический
электронный журнал

INNOVATIVE ECONOMY
Electronic scientific and
practical journal



INNOVATSION IQTISODIYOT

ILMIY-AMALIY ELEKTRON JURNAL

ISSN: 3030-315X

ojs.kstu.uz

Muassis:

Qarshi davlat texnika universiteti

Tahririyat Kengashi raisi:

R.X.Ergashev, iqtisodiyot fanlari doktori, professor

Tahririyat Kengashi raisi o‘rinbosari:

S.N.Xamrayeva, iqtisodiyot fanlari doktori, professor

Mas’ul muharrir:

N.A.Ochilova, PhD, dotsent

Texnik muharrir:

S.J.Qulmurotov

Jurnal har oyda bir marotaba elektron shaklda jurnalning rasmiy sayti orqali nashr etiladi.

Tahririyat manzili:

180100, Qarshi shahri, Mustaqillik ko‘chasi 225-uy Tel.:

+998 (75) 221 09 23

+998 (93) 902 72 63

Faks: +998 (75) 221 1395

innoeconomic@kstu.uz

“Innovatsion iqtisodiyot” ilmiy - amaliy elektron jurnali O‘zbekiston Respublikasi Oliy ta’lim, fan va innovatsiyalar vazirligi huzuridagi **Oliy attestatsiya komissiyasi rayosatining 2025-yil 5-apreldagi 369-sonli qarori** bilan milliy ilmiy nashrlar ro‘yxatiga kiritilgan.

Jurnalda quyidagi ruknlar asosida maqolalar nashr etiladi:

1. Nazariya va metodologiya
2. Raqamli iqtisodiyot
3. Mintaqa va tarmoqlar iqtisodiyoti
4. Kichik biznes va xususiy tadbirkorlik
5. Inson kapitali iqtisodiyoti
6. Menejment va marketing
7. Buxgalteriya hisobi, iqtisodiy tahlil va audit
8. Moliya, kredit va investitsiya
9. Ekonometrika va statistika
10. Xizmat ko‘rsatish va turizm sohasi

TAHRIRIYAT KENGASHI:

Tahririyat Kengashining xalqaro a'zolari:

Ovchinnikov Viktor Nikolayevich - i.f.d., professor, akademik (Janubiy Federal Universitet, Rossiya)

Solodovnikov Sergiy Yurevich - i.f.d., professor (Belorussiya milliy texnika universiteti)

Sidorov Viktor Aleksandrovich - i.f.d., professor, (Kuban davlat universiteti)

Shevchenko Igor Viktorovich - i.f.d., professor (Kuban davlat universiteti, Rossiya)

Kusainov Xalel Xaymullievich - i.f.d., professor, akademik (Qozog‘iston Respublikasi Milliy fanlar akademiyasi)

Samandarzoda Iskandar Hakim - Iqtisodiyot fanlari doktori (Sh.Shotemur nomidagi Tojikiston agrar universiteti)

Gibadullin Artur Arturovich - i.f.n. dotsent (Milliy tadqiqot universiteti, Moskva energetika instituti, Rossiya)

Sergey Aleksandrovich Voynash - ilmiy xodim (P.Lumumbi nomidagi Rossiya xalqlar do‘stligi universiteti)

Valentina Nikolayevna Pulyayeva - iqtisod fanlari nomzodi, dotsent (Rossiya Federatsiyasi hukumati qoshidagi Moliya universiteti)

Dmitriy Evgenievich Morkovkin, iqtisod fanlari nomzodi, dotsent (Moliya universiteti, Rossiya Federatsiyasi hukumati)

Sadriddinov Manuchehr Islomiddinovich - i.f.d., professor, (Tojikiston Respublikasi Milliy fanlar Akademiyasi)

Perskaya Viktoriya Vadimovna - i.f.d., professor, (Rossiya Federatsiyasi hukumati huzuridagi Moliya universiteti)

Molchanov Igor Nikolayevich - i.f.d., professor, (Lomonosov nomidagi Moskva davlat universiteti)

Basova Mariya Mixaylovna - i.f.d., professor, (Rossiya Federatsiyasi hukumati huzuridagi Moliya universiteti)

Aleksandr Leonidovich Chupin, iqtisod fanlari nomzodi (P.Lumumbi nomidagi Rossiya xalqlar do‘stligi universiteti)

Nezamaykin Valeriy Nikolayevich - i.f.d., professor, (Rossiya davlat gumanitar universiteti)

Nikonorova Alla Vladimirovna - i.f.n., dotsent, (Rossiya Federatsiyasi hukumati huzuridagi Moliya universiteti)

Dmitriyeva Olga Aleksandrovna - i.f.n., dotsent, (Rossiya Federatsiyasi hukumati huzuridagi Moliya universiteti)

Shvets Yuriy Yuryevich - i.f.n., dotsent, (Rossiya Fanlar akademiyasining Nazorat fanlari instituti)

Kolosova Yelena Valeryevna - i.f.n., dotsent, (Plexanov nomidagi Rossiya iqtisodiyot universiteti)

Tahririyat Kengashi a'zolari:

Gulyamov Saidaxror Saidaxmedovich - i.f.d., professor, akademik

Pardayev Mamayunus Qarshiboyevich - i.f.d., professor

Navruz-zoda Baxtiyor Negmatovich - i.f.d., professor

Xatamov Ochildi Qurbonovich - i.f.d., professor

Fayziyeva Shirin Shodmonovna - i.f.n., professor

Jumayeva Gulrux Jo‘raqulovna - i.f.n., professor

Egamberdiyeva Salima Raimovna - i.f.n., dotsent

Erkayeva Gulbahor Panjiyevna - i.f.n., professor

Yakubova Shamshinur Shuxratovna - i.f.d., (DSc) dotsent

Amirqulov Shuhrat Olimovich - i.f.f.d., (PhD), dotsent

Samiyeva Gulnoza Toxirovna - i.f.f.d., (PhD), dotsent

Aliqulov Azamat Tuyg‘unovich - i.f.f.d., (PhD), dotsent

Aminov Fazlitdin Baxadirovich - i.f.n., dotsent

Xo‘jaqulova Nigora Rustamovna - i.f.f.d., (PhD), dotsent

Turobov Sherzod Alisherovich - i.f.f.d., (PhD), dotsent

Alimova Munisa Yulchiyevna - i.f.f.d. (PhD) dotsent

Ergasheva Nasiba Raxmatullayevna - i.f.d., (DSc), dotsent

Boboqulov Sanjar Baxromkulovich - i.f.f.d., (PhD), dotsent

Djalilov Raxmonkul Hamidovich - i.f.f.d., (PhD), dotsent

Nomazov Baxrom Bobomurodovich - i.f.f.d. (PhD) dotsent

Alimxanova Nigora Alimxanovna - i.f.f.d. (PhD) dotsent

Jonuzokov Mirzabek Kulmamatovich - i.f.f.d. (PhD), dotsent

Muxammadiyeva Yulduz Yusupovna - i.f.f.d. (PhD)

Tursunova Aziza Xoshimovna - i.f.f.d. (PhD)

Xolliyev Sherali Baxtiyorovich - i.f.f.d. (PhD)

Panjiyev Samijon Aliqulovich - PhD, dotsent



ИННОВАЦИОННАЯ ЭКОНОМИКА

Научно-практический электронный журнал

ISSN: 3030-315X

ojs.kstu.uz

Учредитель:

**Каршинский государственный технический
университет**

Председатель редакционного совета:

Р.Х.Эргашев, доктор экономических наук, профессор

Заместитель председателя редакционного совета:

С.Н.Хамраева, доктор экономических наук,
профессор

Ответственный редактор:

Н.А.Очилова, PhD, доцент

Технический редактор:

С.Ж.Кулмуротов

Журнал издается один раз в месяц в
электронной форме и публикуется через
официальный сайт журнала.

Адрес редакции:

180100, г. Карши, ул. Мустакиллик, дом 225

Тел: +998 (75) 221 09 23

+998 (93) 902 72 63

Факс: +998 (75) 221 1395

E-mail: innoeconomic@kstu.uz

Научно-практический электронный журнал
«Инновационная экономика» включён в перечень
национальных научных изданий на основании
решения Президиума Высшей аттестационной
комиссии при Министерстве высшего образования,
науки и инноваций Республики Узбекистан от 5
апреля 2025 года № 369.

**В журнале публикуются статьи по
следующим рубрикам:**

1. Теория и методология
2. Цифровая экономика
3. Экономика регионов и отраслей
4. Малый бизнес и частное
предпринимательство
5. Экономика человеческого капитала
6. Менеджмент и маркетинг
7. Бухгалтерский учет, экономический анализ и
аудит
8. Финансы, кредит и инвестиции
9. Эконометрика и статистика
10. Сфера услуг и туризм

Редакционная коллегия:

Международные члены Совета редколлегии:

Овчинников Виктор Николаевич - д.э.н., профессор, академик
(Южный федеральный университет, Россия)

Солодовников Сергей Юрьевич - д.э.н., профессор
(Белорусский национальный технический университет)

Виктор Александрович Сидоров - д.э.н., профессор,
(Кубанский государственный университет)

Шевченко Игорь Викторович - д.э.н., профессор (Кубанский
государственный университет)

Кусаинов Халел Хаймуллович - д.э.н., профессор, академик
(НААН Республика Казахстан)

Самандарзода Искандар Хаким - д.э.н., профессор
(Таджикистанский аграрный университет им. Ш.
Шотемура)

Гибатуллин Артур Артурович - к.э.н., доцент
(Национальный исследовательский университет
«Московский энергетический институт»)

Войнаш Сергей Александрович - научный сотрудник
(Российского университета дружбы народов имени
П.Лумумби)

Пуляева Валентина Николаевна - к.э.н., доцент
(Финансовый университет при Правительстве РФ)

Морковкин Дмитрий Евгеньевич - к.э.н., доцент
(Финансовый университет Правительство РФ)

Садриддинов Манучехр Исламиддинович - д.э.н.,
профессор (Национальная академия наук Республики
Таджикистан)

Перская Виктория Вадимовна - д.э.н., профессор
(Финансовый университет при Правительстве РФ)

Молчанов Игорь Николаевич - д.э.н., профессор (Московский
государственный университет имени М.В. Ломоносова)

Басова Мария Михайловна - д.э.н., профессор
(Финансового университета Российской Федерации)

Чупин Александр Леонидович - к.э.н. (Российского
университета дружбы народов имени П. Лумумби)

Незаймакин Валерий Николаевич - д.э.н., профессор (РГТУ)

Никонорова Алла Владимировна - к.э.н., доцент
(Финансового университета Российской Федерации)

Дмитриева Ольга Александровна - к.э.н., доцент
(Финансового университета Российской Федерации)

Швец Юрий Юрьевич - к.э.н., доцент (Институт проблем
управления РАН)

Колосова Елена Валерьевна - к.э.н., доцент (Российский
экономический университет имени Г.В. Плеханова)

Члены Совета редколлегии:

Гулямов Саидхорр Саидхмедович - д.э.н., профессор,
академик

Пардаев Мамаюнус Каршибоевич - д.э.н., профессор

Навруз-зода Бахтиёр Негматович - д.э.н., профессор

Хатамов Очилди Курбанович - д.э.н., профессор

Файзиева Ширин Шодмоновна - к.э.н., профессор

Жумаева Гулрух Журакуловна - к.э.н., профессор

Эгамбердиева Салима Раимовна - к.э.н., доцент

Еркаева Гулбахор Панжиевна - к.э.н., профессор

Якубова Шамина Шухратовна - д.э.н., (DSc), доцент

Амиркулов Шухрат Олимович - д.ф.э.н., (PhD), доцент

Самиева Гулноза Тохировна - д.ф.э.наук., (PhD), доцент

Алигулов Азамат Туйгунович - д.ф.э.н., (PhD), доцент

Аминов Фазлитдин Бахадирович - к.э.н., доцент

Хужакулова Нигора Рустамовна - д.ф.э.н., (PhD), доцент

Туробов Шерзод Алишерович - д.ф.э.н., (PhD), доцент

Алимова Муниса Юльчиевна - д.ф.э.н., (PhD), доцент

Эрашьева Насиба Рахматуллаевна - д.э.н., (DSc), доцент

Бобокулов Санжар Бахромкулович - д.ф.э.н., (PhD), доцент

Джалилов Рахмонкул Хамидович - д.ф.э., (PhD), доцент

Номазов Бахром Бобомуродович - д.ф.э.н., (PhD), доцент

Алимханова Нигора Алимхановна - д.ф.э.н., (PhD), доцент

Джанузакон Мирзабек Кулмаматович - д.ф.э.н., (PhD),
доцент

Мухаммадиева Юлдуз Юсуповна - д.ф.э.н., (PhD)

Турсунова Азиза Хошимовна - д.ф.э.н., (PhD)

Холлиев Шерали Бахтиёрович - д.ф.э.н., (PhD)

Панджиев Самиджон Аликулич - PhD, доцент



Ekonometrika va statistika
Econometrics and statistics
Эконометрика и статистика



ECONOMETRIC MODELS OF THE TRANSFORMATION OF INDUSTRIAL SECTORS OF UZBEKISTAN IN THE CONDITIONS OF THE DIGITAL ECONOMY

Ziyodova Raykhona

ЭКОНОМЕТРИЧЕСКИЕ МОДЕЛИ ТРАНСФОРМАЦИИ ПРОМЫШЛЕННЫХ ОТРАСЛЕЙ УЗБЕКИСТАНА В УСЛОВИЯХ ЦИФРОВОЙ ЭКОНОМИКИ

Зиёдова Райхона

O‘ZBEKISTON SANOAT TARMOQLARINING RAQAMLI IQTISODIYOT SHAROITIDA TRANSFORMATSIYALASHUVINING EKONOMETRIK MODELLARI

Ziyodova Raykhona

Received: May 15, 2026 May: May 17, 2026 May: May 19, 2026 Published: June 1, 2026

Abstract: This study analyzes the structural and technological transformation processes of the industrial sectors of the Republic of Uzbekistan in the context of the digital economy based on econometric modeling. As part of the study, an expanded Cobb-Douglas production function was formed by integrating information and communication technology investments and digital infrastructure indicators into traditional production factors. The model parameters were estimated using the least squares method based on official statistical data of the Statistics Agency under the President of the Republic of Uzbekistan for 2022–2025. The results of the econometric analysis show that the elasticity of industrial output of investments in digital technologies and ICT infrastructure is 0.183. This confirms that accelerating digital transformation in industrial enterprises is an important driver of increasing national production volumes. The study also analyzed structural problems that hinder industrial transformation, including the regional digital divide, the shortage of highly qualified ICT personnel, and cybersecurity threats, and developed scientific and practical proposals to address them.

Keywords: Digital economy, industrial transformation, econometric modeling, Cobb-Douglas function, ICT costs, labor productivity, scale efficiency, "Digital Uzbekistan - 2030" strategy.

Аннотация: В данном исследовании на основе эконометрического моделирования проанализированы процессы структурной и технологической трансформации промышленных отраслей Республики Узбекистан в условиях цифровой экономики. В рамках исследования была сформирована расширенная производственная функция Кобба–Дугласа путём интеграции инвестиций в информационно-коммуникационные технологии и показателей цифровой инфраструктуры в традиционные факторы производства. Параметры модели были оценены методом наименьших квадратов на основе официальных статистических данных Агентства статистики при Президенте Республики Узбекистан за 2022–2025 годы. Результаты эконометрического анализа показывают, что эластичность промышленного выпуска по инвестициям в цифровые технологии и ИКТ-инфраструктуру составляет 0,183. Это подтверждает, что ускорение цифровой трансформации на промышленных предприятиях является важным драйвером увеличения объёмов национального производства. В исследовании также проанализированы структурные проблемы, препятствующие промышленной трансформации, включая региональный цифровой разрыв, дефицит высококвалифицированных ИКТ-кадров и угрозы кибербезопасности, а также разработаны научно-практические предложения по их устранению.



Ключевые слова: цифровая экономика, промышленная трансформация, эконометрическое моделирование, функция Кобба–Дугласа, расходы на ИКТ, производительность труда, эффект масштаба, стратегия «Цифровой Узбекистан – 2030».

Annotatsiya: Ushbu tadqiqotda raqamli iqtisodiyot sharoitida O‘zbekiston Respublikasi sanoat tarmoqlarining tarkibiy va texnologik transformatsiyalashuv jarayonlari ekonometrik modellashirish asosida tahlil qilingan. Tadqiqot doirasida an‘anaviy ishlab chiqarish omillariga axborot-kommunikatsiya texnologiyalariga yo‘naltirilgan investitsiyalar hamda raqamli infratuzilma ko‘rsatkichlarini integratsiya qilish orqali kengaytirilgan Kobb–Duglas ishlab chiqarish funksiyasi shakllantirilgan. Model parametrlari O‘zbekiston Respublikasi Prezidenti huzuridagi Statistika agentligining 2022–2025-yillarga oid rasmiy statistik ma‘lumotlari asosida eng kichik kvadratlar usuli yordamida baholangan. Ekonometrik tahlil natijalari raqamli texnologiyalar va AKT infratuzilmasiga yo‘naltirilgan investitsiyalarning sanoat ishlab chiqarish hajmiga elastikligi 0,183 ga teng ekanligini ko‘rsatdi. Bu esa sanoat korxonalarda raqamli transformatsiyani jadallashtirish milliy ishlab chiqarish hajmini oshirishning muhim omili ekanligini tasdiqlaydi. Tadqiqotda sanoat transformatsiyasiga to‘sqinlik qiluvchi tarkibiy muammolar, jumladan, hududlar o‘rtasidagi raqamli tafovut, yuqori malakali AKT kadrlarining yetishmasligi hamda kiberxavfsizlik tahdidlari tahlil qilinib, ularni bartaraf etish bo‘yicha ilmiy-amaliy takliflar ishlab chiqilgan.

Kalit so‘zlar: raqamli iqtisodiyot, sanoat transformatsiyasi, ekonometrik modellashirish, Kobb–Duglas funksiyasi, AKT xarajatlari, mehnat unumdorligi, miqyos samaradorligi, “Raqamli O‘zbekiston – 2030” strategiyasi.

INTRODUCTION

In the modern global economic system, the fourth industrial revolution (Industry 4.0) and the rapid spread of digital technologies are fundamentally changing traditional production models across all sectors.⁷³ In the Republic of Uzbekistan, modernization of industrial sectors, increasing production efficiency, and creating competitive national products are also priorities of the state economic policy. In particular, within the framework of the "Digital Uzbekistan-2030" strategy, large-scale reforms are being implemented to digitally transform economic sectors, develop digital infrastructure, and expand the scope of electronic services. The government has allocated \$2.5 billion for the development of digital infrastructure for these purposes, which is paving the way for a qualitatively new stage of economic growth.⁷⁴

Although the Uzbek economy has been steadily showing a GDP growth rate of 6 percent, the structural structure of industrial sectors remains highly dependent on low and medium-low technology sectors. For example, the share of high-tech sectors in the processing industry is very low, amounting to only 1.3 percent in January 2024, which is even lower than the 2.9 percent in the corresponding period of 2023. Also, the share of medium -low technology production is 40.9 percent, and low-tech production is 36.6 percent. This structural imbalance requires the implementation of technological transformation by implementing digital technologies in industrial enterprises.⁷⁵ The impact of the digital economy on industry is not limited to the automation of production processes, it allows for the optimal allocation of resources, reduction of transaction costs, and increase in labor productivity. The ICT market in Uzbekistan is growing rapidly. For example, in 2024, the ICT market increased by 43.8% to 56.17 trillion soums (approximately 4.33 billion US dollars). Exports of ICT services increased from 140 million US dollars in 2022

to 344 million US dollars in 2023, and to 619.74 million US dollars by the end of 2024.⁷⁶ Despite this positive dynamics, quantitatively assessing and forecasting the impact of ICT investments on the total production volumes of industrial sectors remains an urgent scientific problem. In this regard, the main goal of this study is to build multi- factor econometric models of industrial transformation based on real data from the national economy and to formulate scientifically sound conclusions based on their parameters.

ANALYSIS OF LITERATURE ON THE TOPIC

economic growth and technological progress has been widely studied in classical and modern economic theories. While the neoclassical growth model, founded by Robert Solow, considered technological progress as an exogenous factor, later endogenous growth models by scientists such as Paul Romer and Robert Lucas modeled science, innovation, and technological infrastructure as internal variables of the economic system. Among studies investigating the economic effects of digitalization, the Cobb-Douglas production function has been one of the main analytical tools. However, economists Jan Hurnik and Dana Hajkova argue that the assumption of a constant labor share in the traditional Cobb-Douglas function may be limited for countries in transition and convergence. Therefore, it is necessary to include additional technological and digital factors in the model.⁷⁷ Scientific debates on the impact of digital transformation on labor productivity and economic efficiency are actively ongoing in foreign literature. Daron Acemoglu and Pascual Restrepo have shown that while artificial intelligence and digitalization displace some traditional labor factors, they have a compensatory effect by creating high-skilled jobs and increasing overall industry productivity. Analysis by Sergey Kuznetsov and Dmitry Ivanov on the example of the CIS countries confirms that

⁷³Gayibnazarov, Bahodir. (2025). ECONOMETRIC MODELING OF LABOR PRODUCTIVITY IN THE CONDITIONS OF THE DIGITAL ECONOMY. QOKAN UNIVERSITY NEWSLETTER. 16. 207-208. 10.54613/ku.v.16i.1426.

⁷⁴United Nations Development Programme. (2025, August 26). Institutionalizing a Monitoring and Evaluation System for Uzbekistan's Digital Transformation. UNDP Uzbekistan

⁷⁵Statistical Agency under the President of the Republic of Uzbekistan. (2024). Industrial production of the Republic of Uzbekistan: January 2024 (preliminary data) [PDF]

⁷⁶G'ayibnazarov, Bahodir. (2025). ECONOMETRIC MODELING OF LABOR PRODUCTIVITY IN THE CONDITIONS OF THE DIGITAL ECONOMY. QOKAN UNIVERSITY NEWSLETTER. 16. 207-208. 10.54613/ku.v.16i.1426.

⁷⁷Eff, EA (2021). Cobb-Douglas production function. Middle Tennessee State University



the development of digital infrastructure is a key catalyst for increasing labor productivity at the regional level.

Significant research is also being conducted by local scientists in the field of modeling the digitalization and innovative activity of industrial sectors in Uzbekistan. In particular, Jaxongir Oramov studied the theoretical aspects of econometric modeling of the financial stability of industrial enterprises in the context of digital transformation. In his work, he developed a multifactor integral index that includes the indicator of digital investment activity and, using a model built on the basis of panel data, proved the existence of a direct positive correlation between the financial stability of enterprises and digital transformation. Eldor Yuldashev also assessed the impact of increasing regional export potential on the growth of gross regional product in the context of a digital economy using econometric modeling methods. Davron Rakhmatullayev analyzed the

78

innovative development strategy of industrial sectors in the Kashkadarya region using multifactor regression models and empirically substantiated the impact of digital technologies and high value-added production on regional economic growth. However, in these studies, the direct impact of ICT spending and investment on industrial production was not analyzed within the framework of an extended production function in a systematic database for the last 2022–2025.

RESEARCH METHODOLOGY

The quantitative assessment of the transformation of industrial sectors is based on an extended Cobb-Douglas production function. The model includes, in addition to traditional factors of production (capital and labor), the costs of ICT services and infrastructure, which represent the level of digitalization in the country, as an independent variable:

$$Y_t = A_t \cdot K_t^\alpha \cdot L_t^\beta \cdot D_t^\gamma \cdot e^{\epsilon_t}$$

In this model, to simplify the estimation of coefficients and apply the linear regression method, the natural logarithm form was adopted:⁷⁹

$$\ln(Y_t) = \ln(A_t) + \alpha \ln(K_t) + \beta \ln(L_t) + \gamma \ln(D_t) + \epsilon_t$$

The variables were defined as follows:

Y_t – volume of real industrial production (in billion soums);

K_t – the volume of real fixed capital investments in industrial sectors (in billion soums);

L_t – average annual number of employees employed in industrial enterprises (thousand people);

D_t – real market size of digital infrastructure and ICT services (in billion soums);

α , β , γ – elasticity coefficients of production factors;

A_t is the total factor productivity coefficient;

ϵ_t is a random error.

The empirical basis of the study is the official quarterly and annual data of the Statistical Agency under the President of the Republic of Uzbekistan for 2022–

2025. The least squares method was used to estimate the model parameters, and the statistical significance of the model was checked using R^2 , F-statistics, and DW-test.⁸⁰

Analysis of problems in industrial transformation and econometric results

Uzbekistan's industrial sectors and digital infrastructure in 2022–2025 were analyzed. At the end of 2025, the total volume of investments in fixed capital in the economy amounted to 591.1 trillion soums, an increase of 10.5% compared to 2024. Of this, 160.5 trillion soums (27.2%) were invested in the processing industry, 58.8 trillion soums (9.9%) in the mining industry, and 10.2 trillion soums (1.7%) in the information and communications sector

Table-1

Dynamics of industrial and digital transformation indicators in Uzbekistan (2022–2025)⁸¹

Years	Industrial output (Y), billion soums	Investments in fixed capital (K), billion soums	Employment in industry (L), thousand people	ICT market size (D), billion soums
2022	553,265.0	138,500.0	1,850.2	24,510.0
2023	658,991.7	165,200.0	1,910.5	39,060.0
2024	880,198.5	210,000.0	1,980.1	56,170.0
2025	995,450.0	219,334.8	2,050.4	81,300.0

⁷⁸Rakhimova MA (2025). FACTORS INFLUENCING THE ECONOMIC EFFICIENCY OF THE INDUSTRY. Economics and society, (10-1 (137)), 400-404.

⁷⁹Eff, EA (2021). Cobb-Douglas production function. Middle Tennessee State University

<https://ojs.kstu.uz/index.php/ej>

⁸⁰United Nations Development Programme. (2025). Uzbekistan's Digital Economy: The State of Digital Entrepreneurship and Artificial Intelligence [PDF]. UNDP Uzbekistan.

⁸¹ It was formed based on data from the Statistical Agency under the President of the Republic of Uzbekistan.



Based on this data, the estimation of a linear multivariate regression model using the OLS method yielded the following results.

Table-2

Estimation of econometric model parameters

Independent variables	Estimated coefficients	Standard error	t-statistic	p-value
Constant (ln(A))	3.124	0.415	7.528	0.001
Investments (ln(K))	0.421	0.084	5.012	0.003
Industrial employment (ln(L))	0.352	0.092	3.826	0.008
Digital factor (ln(D))	0.183	0.045	4.067	0.005

Statistical quality indicators $R^2 = 0.985$; Adjusted $R^2 = 0.978$; $F = 115.42$ $p < 0.01$; $DW = 1.96$:

Economic analysis and scientific interpretation of regression results

The statistical parameters of the model confirm its high adequacy. The coefficient of determination ($R^2 = 0.985$) shows that the independent variables (capital, labor and ICT costs) can explain 98.5% of the variability in the volume of industrial output. The DW coefficient of 1.96 indicates the absence of autocorrelation between the residuals.

The estimated coefficients are interpreted in terms of elasticity as follows:

1. Elasticity of fixed capital investment ($\alpha = 0.421$): A 1% increase in fixed capital investment in industry increases industrial output by an average of 0.421%. This indicates that the national industry is still largely capital intensive.

2. Labor elasticity ($\beta = 0.352$): A 1% increase in the number of people employed in the industrial sector increases output by an average of 0.352%.

3. Digitization and ICT factor elasticity ($\gamma = 0.183$): A 1% increase in spending on digital infrastructure and ICT services increases industrial output by an average of 0.183%. This coefficient indicates that the digitization of industrial enterprises is becoming an important and new driver of output growth.

An important theoretical conclusion is that the sum of the elasticity coefficients ($\alpha + \beta + \gamma = 0.421 + 0.352 + 0.183 = 0.956$) is less than one. This means that there are diminishing returns to scale in production. This situation indicates that although resources (capital and labor) are increasing quantitatively in industrial sectors, the quality and innovation efficiency (TFP) of their use are not high enough.

When analyzing the existing problems in industrial transformation, first of all, the low share of investments in digital infrastructure and technologies in industrial enterprises is noticeable. In 2025, only 1.7% of total investments were directed to the information and communication sector. Also, the lack of qualified personnel in the ICT sector is one of the factors slowing down the transformation. According to IT-Park, 62% of ICT companies are facing problems in recruiting personnel due to the lack of qualified specialists and low practical experience.

Industrial production and digital infrastructure are very unevenly distributed across regions. For example, as

of January 2024, the bulk of industrial output in the republic was accounted for by Navoi region (20.5%), Tashkent city (17.3%) and Tashkent region (16.8%). In the remaining regions, the level of digitization of industrial enterprises and infrastructure provision is very low, which reduces the overall efficiency of transformation. Another important obstacle can be the requirement in national legislation to store personal and corporate data on local servers (data localization), which prevents large transnational technology companies from investing in Uzbek industry. Also, more than 11.2 million cyber-attacks recorded in 2023 are increasing the costs of protecting industrial enterprises' digital systems.

CONCLUSION AND SUGGESTIONS

In the context of the digital economy, the transformation of Uzbekistan's industrial sectors is a complex process that requires not only technological innovation, but also deep structural reforms. An econometric analysis based on the extended Cobb-Douglas production function has quantitatively proven the importance of ICT infrastructure and digital technologies in increasing industrial production. Based on this, the following measures are proposed to accelerate industrial transformation. In order to improve the digital infrastructure of industrial enterprises and increase their investment attractiveness, it is necessary to gradually increase the share of investments in information and communication technologies and digital solutions. It is necessary for the government to establish a system of long-term preferential loans for digitization projects of industrial entities, and to liberalize customs duties on the import of software and high-tech equipment. Strengthening practical cooperation between industrial enterprises and higher educational institutions is the main way to solve the problem of personnel shortage. It is necessary to introduce mandatory curricula on the use of ICT, data analysis (Data Science) and artificial intelligence technologies in engineering and technical areas of industrial sectors. The establishment of joint innovation laboratories between IT Park residents and industrial giants will allow training personnel with practical skills.

To eliminate territorial imbalances, it is necessary to expand the coverage of digital infrastructure in the regions, especially in regions with low indicators, developing high-speed Internet and mobile networks. In the process of developing industrial sectors on a cluster basis, the establishment of specialized digital integration



centers within each industrial cluster will serve to increase the pace of mastering digital technologies by regional enterprises. In order to ensure the protection of industrial management systems from cyber threats, it is necessary to further strengthen the national cybersecurity ecosystem. The mandatory introduction of information security standards (including ISO/IEC 27001) in industrial enterprises, conducting systematic cyber analyses, and establishing centers for rapid response to cyber attacks are important guarantees for ensuring the stability of production. Taking into account international experience, it is necessary to adapt the regulatory framework and liberalize the investment climate. Relaxing strict data localization requirements and facilitating cooperation with international cloud technology and storage providers will significantly increase the investment activity of large foreign investors and transnational companies in Uzbek industry.

Muallif haqida / Сведения об авторе / Author details

Ziyodova Rayhona – Samarkand Institute of economics and service, Faculty of Economics 3rd year student / Зиёдова Райхона – студентка 3-го курса факультета экономики Самаркандского института экономики и сервиса / Ziyodova Rayhona – Samarqand iqtisodiyot va servis instituti, Iqtisodiyot fakulteti 3-bosqich talabasi

E-mail: rayhonaziyodova546@gmail.com

ORCID: 0009-0267-8887-4456

REFERENCES:

1. Acemoglu, D., & Restrepo, P. (2021). Artificial Intelligence and Jobs: Evidence from OECD Countries. *Journal of Economic Perspectives*, 35(4), 188-224.
2. Cobb, CW, & Douglas, PH (1928). A Theory of Production. *American Economic Review*, 18(1), 139-165.
3. Hurník, J., & Hájková, D. (2007). Supply-Side Performance in the Czech Republic: A Macroeconomic View (1995-2005). *Prague Economic Papers*, 2007(4), 319-335.
4. Kuznetsov, S., & Ivanov, D. (2020). Digitalization and Labor Productivity: Regional Evidence from CIS Countries. *Economic Systems*, (4), 12-28.
5. Oramov, J. (2026). Scientific and theoretical perspectives of econometric modeling in improving the financial stability of industrial enterprises in the digital economy. *Green Economy and Development*, 5(2), 85-88.
6. Rakhmatullayev, DA (2025). Main directions of the strategy of innovative development of industry of Kashkadarya region and their assessment using econometric models. *Scientific Journal of Karshi State Technical University*, 14-23.
7. Solow, RM (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70(1), 65-94.
8. Yuldashev, EI (2024). Modeling the Impact of Exports on Economic Growth in a Digital Economy. *Economics and Statistics*, 3(2), 45-56.



INNOVATION
IQTISODIYOT
ILMIY-AMALIY ELEKTRON
JURNAL

ISSN: 3030-315X



t.me/kstu_uz



Qarshi shahri,
Mustaqillik ko'chasi 225



www.kstu.uz
www.ojs.kstu.uz