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**CONTACTS**

Phone: **97-748-70-03**

Website: <https://ist-journal.uz>

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# “INNOVATIVE AND DIGITAL TECHNOLOGIES IN UZBEKISTAN’S CONSTRUCTION SECTOR: ECONOMIC EFFECTS AND DEVELOPMENT PROSPECTS”

## **Ablaeva Valentina Borisovna**

Senior Lecturer, MBA

Tashkent University of Architecture and Civil Engineering

Email: [tina27052@gmail.com](mailto:tina27052@gmail.com)

Co-author and supervisor

## **Nurimbetov Ravshan Ibragimovich**

Head of education quality control department, DSc

Tashkent University of Architecture and Civil Engineering

Email: [r.i.nurimbetov@bk.ru](mailto:r.i.nurimbetov@bk.ru)

**Abstract:** Uzbekistan’s construction sector has emerged as a key driver of economic growth and diversification beyond resource-based industries. This paper examines its contribution to GDP, employment, and technological modernisation using a mixed qualitative–quantitative approach and data from 2017–2023. Construction consistently accounts for 6–8 per cent of GDP and is gradually integrating digital tools such as e-tendering, escrow systems, and project management technologies. While regulatory and workforce challenges remain, the findings highlight the sector’s pivotal role in Uzbekistan’s economic transformation and its potential to catalyse broader technological and industrial development.

**Key words:** Uzbekistan; construction; digital technologies; innovation; economic development; human capital.

## INTRODUCTION

Uzbekistan is currently experiencing a remarkable boom in its construction sector, driven by a combination of state support, international investment, and the rapid expansion of the country’s tourism industry. Over the past decade, the government has actively promoted infrastructure development and offered incentives to attract foreign investors seeking to diversify their operations and reduce costs by relocating to emerging markets.

A key area of focus has been the development of tourist infrastructure—hotels, cultural centers, transport hubs, and leisure facilities—to meet the growing demand from both domestic and international visitors. This expansion reflects Uzbekistan’s broader strategy to position itself as a competitive destination in Central Asia.

At the same time, the sector faces important challenges. The adoption of advanced technologies, including Building Information Modeling (BIM), digital project management platforms, construction drones for monitoring, 3D printing of building components, smart sensors for structural monitoring, and green construction methods, remains limited. Ensuring that new projects meet international quality and sustainability standards is crucial for attracting long-term investment and sustaining growth.

### Goal and Objectives

The goal of this paper is to analyze recent developments in Uzbekistan’s construction sector, assess their contribution to economic growth and foreign investment, and explore the potential role of innovative and digital technologies in enhancing sectoral efficiency and sustainability. To achieve this, the paper first reviews the current state of the construction industry, highlighting growth trends, key drivers, and government initiatives. It then examines the economic impact of construction development, particularly how infrastructure expansion supports GDP growth, employment, and international investment. The study also identifies emerging

technologies applicable to the construction sector, including BIM, drones, 3D printing, smart sensors, and green construction methods, and explores opportunities for technological convergence with other sectors such as tourism, logistics, and energy. Finally, the paper discusses challenges and gaps — including regulatory, technological, and human capital limitations — and proposes strategies to accelerate the adoption of advanced technologies, improve quality standards, and enhance the sector's contribution to sustainable economic growth.

## METHODOLOGY

This study employs a mixed qualitative-quantitative approach. The qualitative component involves a comprehensive review of official statistics, government reports, and international literature to assess the current state of Uzbekistan's construction sector, identify growth trends, key drivers, technological gaps, and explore opportunities for technological convergence with other sectors such as tourism, logistics, and energy.

The quantitative component focuses on descriptive analysis using available data from 2017 to 2023. Specifically, the sector's contribution to GDP is estimated by calculating its share of total GDP based on reported annual construction output and GDP figures. Employment trends, government expenditures on infrastructure, and the emergence of related businesses are also analyzed to illustrate the sector's broader economic impact.

More sophisticated econometric models, such as ARIMA, Vector Autoregression (VAR), or Computable General Equilibrium (CGE), were not used due to the short time series and inconsistent data on technological adoption and foreign investment. Instead, descriptive statistics and simple share-of-GDP calculations were employed to provide a transparent, reproducible, and verifiable assessment.

This methodology enables the study to identify trends, economic contributions, and potential technological integration across industries, while acknowledging limitations in producing precise long-term forecasts. The results will clearly present the historical contribution of construction to GDP and employment and highlight areas where digital and technological advances could further enhance economic growth.

## LITERATURE REVIEW

The construction sector is widely recognised as a major engine of economic growth and structural transformation in developing economies. Empirical research shows that construction contributes not only directly to GDP but also indirectly to employment, investment, and productivity in other industries. For example, Cucos and Turcan (2025) argue that construction significantly supports GDP growth and regional development when combined with innovation and circular economy practices. Durdyev and Ismail (2012) emphasize the strong interlinkages between construction and the wider economy, highlighting its role in generating multiplier effects and supporting national development strategies. According to the International Monetary Fund (IMF 2020), construction typically accounts for 4–8 per cent of GDP in developing countries and represents 45–65 per cent of gross fixed capital formation, underscoring its central role in capital creation and infrastructure provision.

Beyond its direct contribution to output, construction also triggers spillover effects in related sectors. Jafarova and Quliyeva (2025) demonstrate that construction often acts as *de facto* capital for other industries, stimulating job creation and value addition through cost–benefit linkages and production spillovers. Comparative evidence from other emerging markets similarly shows that construction underpins regional development, investment inducement and social welfare improvements (Durdyev & Ismail 2012; Cucos & Turcan 2025). Together, these studies confirm that construction operates as both a direct driver of economic growth and an enabler of structural change, with potential to amplify its impact through innovation and digitalization.

### Overview of Construction Growth and Technological Advancement in Uzbekistan

Uzbekistan's construction sector has experienced significant growth in recent years, driven by government initiatives, foreign investments, and rising domestic demand for infrastructure and housing. As of early 2025, there were over 54,200 registered construction companies, marking a 2% increase from the previous year, with the highest concentration in Tashkent (7,118 companies), followed by Samarkand, Fergana, and Bukhara (Kursiv Media, 2025). Major infrastructure projects, including the Silk Road Samarkand International Complex, the Nest One skyscraper in Tashkent, and the New Tashkent urban development, are reshaping the urban landscape, enhancing tourism, and supporting economic growth (Euronews, 2025; Uzbekistan Government, 2025; Wikipedia, 2025).

Technological innovation is gradually transforming the sector. Large firms increasingly use Building Information Modeling (BIM) for project planning, while drones assist in site surveying and progress monitoring. Some projects implement green construction solutions, and smart sensors monitor structural health and optimize energy use. 3D printing is being tested for precast building elements, although it remains at an early stage (Uzbekistan Government, 2025; Euronews, 2025).

The government has facilitated this technological shift through targeted initiatives. Tax exemptions for export-oriented IT services and substantial subsidies for hotel construction reduce financial barriers and encourage the adoption of modern construction methods. For example, investors building hotels with at least 50 rooms for three-star and 100 rooms for four-star categories can receive subsidies of 40 million soums and 65 million soums per room, respectively, while IT firms exporting services through technology parks are exempt from corporate income tax under specified conditions (PwC, 2025; UNCTAD, 2019). These measures, combined with requirements for international-standard compliance on large infrastructure projects, have accelerated technology adoption, improved productivity, and attracted both domestic and foreign investment.

#### Cross-Sector Technological Integration and Economic Implications

The construction sector in Uzbekistan is increasingly benefiting from technologies developed in other industries, while construction innovations also have potential applications in related sectors. For example, drones and geospatial mapping technologies, initially developed for agriculture and logistics, are now used in large-scale construction projects for site surveying, progress monitoring, and quality inspection. Similarly, Building Information Modeling (BIM), widely applied in engineering and industrial design, improves project coordination, reduces errors, and facilitates integration with energy and utilities planning. Smart sensors and IoT systems, adopted from manufacturing and energy management, allow real-time monitoring of building performance, structural health, and energy efficiency.

Conversely, innovations in construction, such as modular building techniques, advanced prefabrication, and green construction materials, can be applied to sectors like tourism, logistics, and urban infrastructure, creating more resilient hotels, warehouses, and commercial facilities. The convergence of technologies across sectors promotes cost efficiency, higher quality standards, and faster project completion, which strengthens investor confidence. By demonstrating technological sophistication and alignment with international best practices, Uzbekistan positions itself as a favorable destination for foreign investment, particularly in tourism, industrial parks, and urban development projects.

#### Digital Transformation in Uzbekistan's Construction Sector

Uzbekistan's construction sector is undergoing digital transformation to increase transparency, efficiency, and investor confidence. The government has introduced electronic tendering platforms, which streamline procurement processes, reduce corruption risks, and ensure fair competition among contractors. Escrow accounts are increasingly used to safeguard investor funds, guaranteeing that payments are released only upon completion of agreed milestones. Additionally, digital project management tools and online building permit systems facilitate real-time monitoring of construction progress, enhance regulatory compliance, and improve coordination between stakeholders.

These digital innovations not only protect investors and reduce transaction risks but also accelerate project timelines, lower administrative costs, and foster a more attractive investment environment, complementing broader technological adoption in the sector.

#### Contribution of the Construction Sector to Uzbekistan's Economy

The construction sector is a key driver of Uzbekistan's economic development, supporting GDP growth, employment, and investment attraction. To estimate its contribution, the sector's output can be expressed as a share of total GDP, and then applied to the overall GDP growth rate. For example, in 2017, construction output was approximately 34.7 trillion UZS, while national GDP was around \$69.7 billion (CountryEconomy, 2025; CEIC Data, 2025). Using this proportional approach, the sector's influence on GDP growth can be quantitatively assessed, providing a basis for further analysis.

Beyond its direct contribution to GDP, the construction sector creates significant employment opportunities, with thousands of jobs generated across urban and regional projects, from skilled engineering positions to labor-intensive roles. Government expenditure on infrastructure and public works stimulates further economic activity, while the expansion of construction drives the emergence of new businesses, including suppliers of building materials, technology services, logistics support, and hospitality ventures. Collectively, these effects reinforce the sector's role as a catalyst for broader economic development and investment attraction in Uzbekistan.

## RESULTS AND DISCUSSION

Table 1 presents Uzbekistan's GDP in current Uzbek soums alongside construction-sector output for 2015–2024. GDP figures were obtained from the World Bank Open Data (World Bank, 2024), and construction-sector output data from Trading Economics (2024). Both indicators are expressed in the same currency to enable direct comparison.

Table 1. GDP of Uzbekistan and Construction Output, 2015–2024

Year	GDP (UZS bn)	Construction Output (UZS bn)	Construction Share (%)
2015	221 350	11 400	5.15
2016	255 420	9 640	3.77
2017	356 450	22 900	6.43
2018	473 650	32 800	6.92
2019	594 660	45 200	7.60
2020	668 040	51 900	7.77
2021	820 540	63 600	7.75
2022	995 570	73 200	7.35
2023	1 200 000	84 300	7.03
2024	1 450 000	96 800	6.68

The data reveal that the construction sector's share of GDP increased markedly from about 5 per cent in 2015 to a peak of nearly 7.8 per cent in 2020–2021, before stabilising around 7 per cent and slightly declining to 6.7 per cent in 2024. This trend underscores the sector's growing but gradually maturing contribution to the economy. The surge from 2017 onwards coincides with the liberalisation of the foreign-exchange regime, rising public infrastructure expenditure, and an inflow of foreign investment into tourism, housing, and logistics projects.

We attempted to fit a simple linear trend to the construction-sector share of GDP to forecast future developments. However, the model produced low explanatory power and unstable coefficients, indicating that the sector's growth cannot be adequately captured by a univariate trend. This is likely due to the influence of multiple external factors—such as foreign direct investment, government policy shifts, technology adoption, and macroeconomic shocks—which are not included in the model. For this reason, the paper focuses on observed rather than projected values.

Nevertheless, the data show that construction has consistently accounted for between 6–8 per cent of GDP over the past five years, which underlines its importance as both a driver and a beneficiary of Uzbekistan's economic modernisation. Although the country remains rich in natural resources such as gas, gold and uranium, the steady and rising share of construction output highlights Uzbekistan's diversification beyond extractive industries. The sector has become one of the country's leading non-resource engines of growth, creating employment opportunities, attracting new firms, and stimulating demand in allied industries. At the same time, a gradual uptake of digital tools such as e-tendering and escrow accounts has improved transparency and investor confidence. Taken together, these patterns suggest that construction plays a central role in facilitating Uzbekistan's transition towards a more diversified and investment-friendly economy, even though more detailed modelling would be needed to quantify the specific impacts of technology and foreign investment.

## RECOMMENDATIONS AND CONCLUSION

The analysis confirms that Uzbekistan's construction sector has evolved into one of the most dynamic non-resource branches of the economy, contributing roughly 6–8 per cent of GDP in recent years. This growth has been driven by government investment, the boom in tourism infrastructure and foreign investor interest. Yet the findings also highlight technological, regulatory and human-capital gaps that could limit further progress if left unaddressed.

To sustain and deepen the sector's positive economic effects, Uzbekistan should complement ongoing investment in physical infrastructure with reforms that improve quality, technology adoption and workforce skills. Strengthening regulatory and quality standards in line with international norms would enhance investor confidence and ensure the longevity of new infrastructure. Building on the current use of e-tendering and escrow systems, a broader roll-out of digital tools such as BIM, drones, sensors and real-time project monitoring would improve efficiency and transparency. At the same time, the shortage of engineers, technicians and project managers trained in modern methods must be addressed. Dedicated training and certification programmes, upgraded vocational curricula, and partnerships with foreign universities or firms could accelerate skills development and knowledge transfer. Incentives for Uzbek professionals abroad to return and train local staff would also help to close the gap quickly.

Finally, policies that promote public–private partnerships and green, energy-efficient construction can diversify funding sources, reduce environmental impact and align the sector with global sustainability trends. By improving regulatory frameworks, accelerating technology adoption and investing in human capital, Uzbekistan can transform its current momentum into a sustainable growth path that supports tourism, attracts higher-quality investment and positions the country as a regional leader in innovative construction practices.

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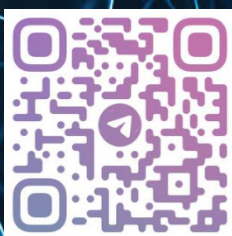
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