

INNOVATIVE DEVELOPMENT AND TECHNOLOGICAL MODERNIZATION OF INDUSTRY IN THE BUKHARA REGION: AN INSTITUTIONAL APPROACH AND ANALYSIS BASED ON CHINESE EXPERIENCE

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Abstract: This article analyzes the innovative development and technological modernization of the industry in the Bukhara region from the perspective of institutional factors. A comparative approach is applied using empirical findings from China on the relationship between public employment at the city level and economic growth. The study examines the interconnections between public sector expansion, innovative activity, investment flows, and the crowding-out effect of the private sector. The results contribute to the development of evidence-based recommendations for improving industrial policy in the Bukhara region.

Keywords: Innovation, Industrial Modernization, Public Employment, Investment, Bukhara Region, China Experience, Economic Growth.

In the contemporary economy, industrial development is determined not merely by production volume, but by the implementation of innovative technologies, digital transformation, and efficient institutional management. The economic experience of China demonstrates that while public sector expansion can support economic growth under specific circumstances, excessive bureaucratization can decelerate innovative processes. In the economy of the Bukhara region, the process of industrial modernization depends precisely on the balance between these two opposing trends: state intervention and market mechanisms.

In economic literature, the relationship between public employment and economic growth remains ambiguous. On one hand, the public sector builds infrastructure, provides public goods, and stabilizes the investment climate. On the other hand, it absorbs skilled labor, crowds out the private sector, and diminishes innovative activity.

Empirical findings across Chinese cities indicate that an increase in the share of public servants reduces GDP growth by an average of 0.471 percentage points. This outcome confirms the presence of a "crowding-out effect," where the diversion of resources toward the public sector leads to a decline in private innovative activity.

The industrial sector of the Bukhara region is characterized by specific structural features, including a heavy reliance on raw material resources such as oil and gas, textiles, and construction materials. Furthermore, there is an uneven distribution of technological renewal across sub-sectors. The vast majority of investments are channeled into infrastructure and large-scale state projects, which leaves the share of innovative startups and private industrial enterprises relatively low. This structural landscape mirrors the experience of certain smaller, less developed cities in China, where public sector expansion historically slowed down innovative growth.

To better conceptualize these institutional dynamics, the following matrix contrasts key development indicators observed in Chinese urban centers with the current industrial ecosystem of the Bukhara region.

Indicator	Chinese Cities	Bukhara Region
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Impact of Public Employment	Negative effect on growth (-0.471%)	Potential negative pressure is present
Innovative Activity	Low in institutionally weakened regions	Uneven innovation across industry
Investment Direction	High dependency on state-led projects	Priority placed on heavy infrastructure
Role of the Private Sector	Clear instances of crowding-out effects	Currently in the developmental stage

This comparative analysis indicates that the dominance of public investments in the Bukhara region could similarly restrict the development of an innovative private sector.

Based on structural analysis, several critical institutional problems are identified within the regional economy. These include an insufficient innovative infrastructure and a low rate of digital technology adoption across production lines. The region also faces the migration of highly qualified personnel away from local industrial clusters. Furthermore, the investment activity of the private sector remains limited, a challenge that is compounded by a high bureaucratic burden within public administration.

Empirical data from China indicates that the structural linkage between innovation and investment directly determines the trajectory of economic growth. Increased innovative activity leads to a higher GDP growth rate, whereas an expansion in public employment causes a decline in innovative investments. Within the context of the Bukhara region, technological modernization must not be restricted to the simple replacement of production equipment. Instead, it must be pursued through the comprehensive digitalization of management systems, the strategic development of industrial clusters, and the systematic creation of a local startup ecosystem.

The analysis demonstrates that the innovative development of industry in the Bukhara region depends on achieving a stable balance between public sector expansion and private sector activity. Drawing upon the empirical lessons of China, excessive public employment and bureaucratic expansion can create an institutional drag that decelerates innovative processes. Consequently, industrial policy in the Bukhara region must prioritize stimulating private entrepreneurship, increasing innovative investments, and accelerating technological modernization as its core strategic directions.

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