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# DIRECTIONS FOR ENSURING SUSTAINABLE ECONOMIC GROWTH BASED ON IMPROVING THE SECTORAL STRUCTURE OF THE REGIONAL ECONOMY

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**Abstract.** This study examines the theoretical and methodological foundations for modernizing the sectoral structure of a regional economy and assessing its impact on long-term sustainable economic growth. Alongside quantitative rates of economic dynamics, the paper analyzes structural quality indicators, inter-sectoral functional integration, production cooperation, technologically related diversification, and the productivity of natural and economic resource utilization as an integrated system. At the empirical assessment stage, structural-dynamic analysis, interregional comparative analysis, the Herfindahl–Hirschman concentration index (HHI), and the Location Quotient (LQ) are employed. Based on the macroeconomic growth indicators of the Republic of Uzbekistan for 2019–2025 and regional sectoral shares for Q1 2025, interregional structural imbalances are identified.

**Keywords:** regional economy, sectoral structure, structural transformation, related diversification, sustainable economic growth, inter-sectoral integration, value added, regional specialization.

## Introduction

Profound structural shifts occurring in the global economy necessitate reshaping regional development strategies in accordance with contemporary demands, ensuring a spatially balanced distribution of productive forces, and expanding the drivers of economic growth. The reconfiguration of international supply chains, the accelerating pace of technological renewal, the widespread adoption of digital platforms, and the tightening of environmental standards are fundamentally transforming the sustainability criteria of regional economic systems.

Assessing the level of regional economic development solely through the absolute or relative growth rates of Gross Regional Product (GRP) is insufficient for drawing objective conclusions. Two regions recording identical annual growth rates may exhibit substantial differences in structural resilience, socio-economic efficiency, and long-term competitive potential. In particular, whereas a region whose economic growth relies predominantly on primary raw material extraction remains highly vulnerable to external price fluctuations, a region grounded in manufacturing industries, knowledge-intensive services, innovation activities, and small-business cooperation demonstrates markedly higher structural stability. Consequently, improving the sectoral structure emerges as a primary strategic factor determining the qualitative substance of economic growth.

Consistent structural reforms implemented in Uzbekistan in recent years—aimed at the technological modernization of industrial sectors, the accelerated development of the services sector, and the diversification of regional production capacities—further heighten the relevance of this research topic. According to World Bank estimates, the average annual real growth rate of Uzbekistan's economy remained around 6 percent during 2017–2025 [13]. Nevertheless, transitioning toward a long-term growth trajectory that ensures sustainable and inclusive employment requires enhancing private-sector competitiveness, deepening market mechanisms, and upgrading the quality of human capital as priority conditions [13].

Positive macroeconomic growth indicators are not evenly distributed across the country's regions. While certain regions exhibit a high concentration of extractive and heavy industries, others are dominated by the agricultural sector or traditional services. Under such conditions, developing scientifically grounded criteria to preserve the advantages of regional specialization while harmonizing economic diversification processes assumes critical importance.

The core scientific problem of this study lies in identifying an optimal balance when refining the sectoral structure of a regional economy: on the one hand, preserving the region's natural and economic potential and existing competitive advantages, and on the other hand, mitigating inter-sectoral disproportions, extending value-added chains, and strengthening resilience against external market risks. While numerous prior studies have examined sectoral concentration, regional specialization, and structural shifts in isolation, this article integrates these categories with the structural quality of economic growth within a unified methodological framework.

*Research Hypothesis:* Deepening inter-sectoral production cooperation, stimulating technologically related diversification, and expanding the share of high-value-added activities—while preserving historically established specialization trajectories in a regional economy—significantly enhance the long-term sustainability of economic growth.

**Literature review**

The functional relationship between the sectoral structure of a regional economy and economic growth rates has been extensively analyzed within several foundational concepts of classical and modern economic theory:

The theory of the division of labor and specialization founded by A. Smith identifies production concentration as a decisive source for increasing resource utilization productivity [12]. In the context of regional economics, this principle substantiates the priority development of sectors aligned with a region's natural and raw-material base, labor force qualifications, and infrastructure capacities. Meanwhile, the school of regional economic analysis established by W. Isard demonstrates that transport costs, distance to markets, and spatial agglomeration economies play a decisive role in the territorial location of industries [4].

Excessively one-sided specialization renders a regional economy vulnerable to external market shocks. J. Schumpeter interprets economic development not merely as a quantitative expansion of existing output volumes, but as a process of structural renewal driven by new technologies, products, and organizational combinations [11]. A. Hirschman's theory of forward and backward linkages proves that investments directed into leading sectors stimulate additional demand and production activity across adjacent industries [2]. Furthermore, M. Porter's concept of competitive advantage and clusters substantiates that territorial cooperation among firms, specialized suppliers, and research and educational institutions enhances innovation efficiency [10].

In empirical research, J. Imbs and R. Wacziarg identified a non-linear relationship between sectoral diversification and re-specialization across changing stages of economic development [3]. Investigating determinants of regional growth, K. Frenken, F. van Oort, and T. Verburg demonstrated the fundamental distinction between technologically related and unrelated variety [1]. Whereas related variety across sectors boosts labor productivity by building new value-added chains upon the knowledge and technological base of existing industries, unrelated diversification acts as a protective portfolio mechanism that safeguards employment and income stability during economic downturns [1].

Contemporary scholarly studies focusing on Uzbekistan's regions have also devoted considerable attention to sectoral composition, industrial diversification, and resource efficiency. Notably, studies by N. M. Mamarasulov and D. Mukhsimova have widely applied the HHI and LQ indicators to quantitatively assess sectoral concentration and specialization levels in regional economies

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[5, 6]. In addition, improving the efficiency of natural resource utilization and ensuring ecological-economic balance in sustainable regional development have been systematically examined in our own prior research [14]. Unlike existing studies, this article investigates sectoral structure not merely as a static ratio of sector shares, but through an integrated evaluation framework encompassing specialization, related diversification, inter-sectoral integration, and resource efficiency.

**Research methodology**

The methodological framework of the study is designed to identify structural disproportions in regional economic systems, quantitatively measure sectoral concentration and relative specialization, and conduct a comprehensive assessment of qualitative indicators of economic growth. Empirical calculations are based on official data from the National Statistics Committee of the Republic of Uzbekistan covering macroeconomic dynamics for 2019–2025 and the sectoral composition of regional GRP for Q1 2025 [7, 8].

*Structural-dynamic analysis method*

To evaluate structural shifts in the sectoral composition of a regional economy, the relative share of each type of economic activity in Gross Regional Product is calculated using the following formula:

$$\text{Sij} = \frac{\text{VAij}}{\text{GRPi}} \times 100 \qquad (1)$$

where Sij is the share of sector j in the GRP of region i (in percent); VAij is the gross value added generated by sector j in region i; and GRPi is the total Gross Regional Product of region i.

*Herfindahl–Hirschman concentration index (HHI)*

To quantitatively determine the degree of sectoral concentration or diversification of a regional economy, the Herfindahl–Hirschman Index is utilized:

$$\text{HHIi} = \sum (\text{sij})^2 \quad (\text{j} = 1, ..., \text{n}) \qquad (2)$$

where sij = Sij / 100 denotes the sector share expressed in decimal form, and n is the number of sectors analyzed. The index ranges between 0 and 1: values approaching 1 indicate a high dependence of the regional economy on a narrow range of sectors. In this study, HHI is applied as a primary structural diagnostic instrument, as it does not on its own fully capture the depth of inter-sectoral cooperation or value-added intensity.

*Location Quotient (LQ)*

The degree of specialization of a given region in a specific sector relative to the national average is determined using the Location Quotient (LQ):

$$\text{LQij} = \frac{VAij}{GRPi} / \frac{\text{VAj}}{\text{GDP}} \qquad (3)$$

where VAj is the national gross value added of sector j, and GDP is the country's Gross Domestic Product. If LQij > 1, the region possesses relative specialization and a competitive advantage in that sector; if LQij = 1, the regional sector share matches the national average; and if LQij < 1, the sector is relatively underdeveloped within the regional economy.

*Regional Structural Quality Index (RSQI)*

To provide a holistic evaluation of the qualitative indicators of regional economic growth, an original Regional Structural Quality Index (RSQIi) is proposed. Drawing on international composite index construction practices—specifically the United Nations Development Programme's Human Development Index methodology—to eliminate subjectivity in expert weighting and ensure cross-regional comparability, an equal weight coefficient (wk = 0.20) is assigned to all five components:

$$\text{RSQIi} = 0.20 \cdot \text{Di} + 0.20 \cdot \text{Ii} + 0.20 \cdot \text{Pi} + 0.20 \cdot \text{Ri} + 0.20 \cdot \text{Gi} \qquad (4)$$

where each indicator is normalized to the [0, 1] interval via the Min–Max normalization method: Xnorm = (Xi − Xmin) / (Xmax − Xmin). The economic content of the components is defined as follows:

Di – Diversification component: assessed on the basis of the inverse concentration indicator (1 − HHIi);

Ii – Inter-sectoral integration component: the combined share (%) in GRP of value added generated by manufacturing industries and producer services (transport and logistics, ICT, financial, and engineering-business services);

Pi – Labor productivity component: the ratio of real regional GRP to total employment in the regional economy;

Ri – Resource efficiency component: gross value added generated per unit of energy and water resource consumption;

Gi – Economic growth stability component: the ratio of the mean annual real GRP growth rate to its standard deviation over the study period.

**Analysis and Research Results**

*Growth Dynamics of Uzbekistan's Economy in 2019–2025*

Analysis of official data from the National Statistics Committee indicates that during 2019–2025, Uzbekistan's Gross Domestic Product at current prices increased from UZS 620.1 trillion to UZS 1,849.7 trillion, expanding nearly 2.98-fold in nominal terms (Table 1) [8].

**Table 1.**

**Macroeconomic Growth Dynamics of Uzbekistan's Economy in 2019–2025**

| Year | GDP Volume (at current prices, UZS trillion) | Real Growth Rate (at constant prices, %) |
|---|---|---|
| **2019** | 620.1 | 6.8 |
| **2020** | 705.1 | 1.6 |
| **2021** | 861.2 | 8.2 |
| **2022** | 1,041.9 | 6.1 |
| **2023** | 1,261.8 | 6.3 |
| **2024** | 1,535.4 | 6.7 |
| **2025** | 1,849.7 | 7.7 |

Source: Compiled by the author based on data from the National Statistics Committee of the Republic of Uzbekistan [8].

As shown in Table 1, although the real GDP growth rate decelerated to 1.6 percent in 2020 due to external restrictions associated with the global pandemic, economic activity rebounded rapidly in subsequent years. Specifically, annual real growth stabilized within the 6.1–8.2 percent range during 2021–2025, reaching 7.7 percent in 2025. Nevertheless, the sustainability of aggregate macroeconomic growth directly depends on sectoral balance across regions.

*Imbalances in the Sectoral Structure of Regional Economies*

A comparative analysis of the sectoral composition of regional GRP for Q1 2025 confirms the emergence of substantial structural disparities in specialization levels across regions (Table 2) [7].

**Table 2.**

**Sectoral Structure of Gross Regional Product in Selected Regions (Q1 2025, in percent)**

| Region | Agriculture | Industry | Construction | Services |
|---|---|---|---|---|
| Navoi | 5.3 | 78.5 | 3.4 | 12.8 |
| Kashkadarya | 16.2 | 22.2 | 8.2 | 53.4 |
| Jizzakh | 24.8 | 22.9 | 6.9 | 45.4 |

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|---|---|---|---|---|
| Namangan | 14.3 | 19.5 | 7.7 | 58.5 |
| Samarkand | 19.0 | 17.7 | 5.7 | 57.6 |
| Surkhandarya | 23.9 | 9.6 | 10.1 | 56.4 |
| Tashkent City | - | 25.4 | 8.9 | 65.7 |

Source: National Statistics Committee, Q1 2025 GRP Press Release [7]. Note: The agricultural share for Tashkent City is not reported separately in the official release.

Based on a comparative synthesis of the empirical indicators presented above (location quotients, concentration levels, and structural shift dynamics), the analyzed regions can be classified into four structural-functional types according to their economic development models and diversification profiles:

*1. Region with high industrial concentration (Navoi Region):* Industry accounts for 78.5 percent of GRP. While this figure reflects substantial industrial capacity, heavy reliance on global commodity market conditions amplifies structural vulnerabilities.

*2. Region with relative multi-sectoral balance (Kashkadarya Region):* A relatively balanced structure has formed across services (53.4%), industry (22.2%), and agriculture (16.2%), creating favorable conditions for expanding inter-sectoral value-added chains in petrochemicals and the agro-industrial complex.

*3. Regions with predominant agricultural specialization (Jizzakh and Surkhandarya Regions):* Agriculture accounts for 24.8 percent and 23.9 percent of GRP, respectively. Transitioning from primary raw-material production toward deep food processing and modern agro-logistics systems represents the principal development reserve in these regions.

*4. Region led by the services sector (Tashkent City):* Services represent 65.7 percent of GRP, reflecting a post-industrial development model that necessitates expanding high-tech, financial, digital, and scientific-consulting services.

*Assessment of Sectoral Concentration (HHI) and Specialization (LQ)*

Herfindahl–Hirschman Index values calculated from regional sectoral shares clearly demonstrate quantitative disparities in regional concentration levels (Table 3).

**Table 3.**

**Degree of Sectoral Concentration in Selected Regions (Q1 2025)**

| Region | HHI Value | Analytical Characterization |
|---|---|---|
| **Navoi** | 0.6366 | Very high concentration |
| **Tashkent City** | 0.5041 | High concentration |
| **Namangan** | 0.4066 | Relatively high concentration |
| **Surkhandarya** | 0.3946 | Relatively high concentration |
| **Kashkadarya** | 0.3674 | Relatively high concentration |
| **Jizzakh** | 0.3248 | Relatively lower concentration |

Source: Author's calculations based on data from Table 2.

According to the calculations, the highest sectoral concentration is recorded in Navoi Region, whereas relatively lower values are observed in Jizzakh and Kashkadarya Regions. At the same time, a low HHI value does not automatically guarantee high economic efficiency: if diversification relies on traditional sectors characterized by low labor productivity, regional competitiveness will not improve sufficiently.

To identify relative specialization trajectories across regions, Location Quotients (LQ) were computed using Q1 2025 national average sector shares (agriculture — 9.52%, industry — 27.87%, construction — 6.52%, services — 56.09%) (Table 4) [7].

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**Table 4.**

**Location Quotients (LQ) of Regions Across Core Sectors (Q1 2025)**

| Region and Sector | Regional Share (%) | National Share (%) | Location Quotient (LQ) |
|---|---|---|---|
| Navoi – Industry | 78.5 | 27.87 | 2.82 |
| Jizzakh – Agriculture | 24.8 | 9.52 | 2.60 |
| Tashkent City – Services | 65.7 | 56.09 | 1.17 |
| Kashkadarya – Services | 53.4 | 56.09 | 0.95 |

Source: Author's calculations based on data from the National Statistics Committee [7].

The resulting LQ values demonstrate strong relative specialization of Navoi Region in industry (LQ = 2.82), Jizzakh Region in agriculture (LQ = 2.60), and Tashkent City in services (LQ = 1.17). In Kashkadarya Region, an LQ of 0.95 in the services sector indicates substantial untapped potential for expanding engineering, technical maintenance, digital management, and logistics services supporting industrial and agricultural enterprises.

Full-year 2025 real GRP growth rates across regions (Tashkent City — 11.3%, Syrdarya — 9.8%, Namangan and Jizzakh — 8.2%, Kashkadarya — 6.8%; Q1 growth in Navoi — 10.5%) confirm that regions with diverse sectoral specializations can achieve strong growth dynamics; however, sustaining this momentum requires tailored structural policies suited to each region's profile [9].

*Conceptual Model and Differentiated Development Directions*

Drawing on the empirical findings, a four-stage structural-transformation model for enhancing the quality of regional economic growth has been formulated:

*Stage 1. Baseline regional potential assessment:* conducting an inventory of the region's natural and raw-material resources, labor potential, engineering and transport infrastructure, and geo-economic location advantages;

*Stage 2. Comprehensive diagnostics of sectoral structure:* quantitatively evaluating HHI, LQ, labor productivity, resource intensity, and the depth of value-added chains;

*Stage 3. Targeted structural transformation mechanisms:* implementing related diversification, inter-sectoral industrial cooperation, digital integration, and energy- and water-saving technologies;

*Stage 4. Sustainable regional growth outcomes:* generating high value added, expanding stable employment, and ensuring ecological-economic security.

Table 5.

Differentiated Directions for Improving the Sectoral Structure of Regional Economies

| Region | Core Economic Feature | Proposed Priority Directions |
|---|---|---|
| **Navoi** | High industrial concentration (HHI = 0.6366) | Intra-industrial diversification, deep raw-material processing, and ecological modernization |
| **Kashkadarya** | Balanced mix of industry, services, and agriculture | Petrochemical value chains, agro-industrial cooperation, and producer services |
| **Jizzakh** | High agricultural specialization (LQ = 2.60) | Deep food processing, cold-storage warehousing, and transport-logistics hubs |
| **Surkhandarya** | Predominance of agriculture and services | Agro-clusters, water-saving technologies, and eco-/cultural tourism services |
| **Namangan** | Active services and light industry sectors | Full textile value chain, digital services, and small-scale industrial cooperation |

| | | |
|---|---|---|
| **Tashkent City** | Advanced service-oriented economy (LQ = 1.17) | High-tech, financial, R&D, and export-oriented business services |

Source: Developed by the author based on regional structural diagnostics.

**Discussion of Results**

The empirical findings obtained in this study underscore the necessity of updating several conceptual approaches in formulating regional economic policy. First, in line with the conclusions advanced by K. Frenken et al., specialization and diversification in regional development practice should be applied not as mutually exclusive alternatives, but as complementary mechanisms [1]. Administratively establishing industries disconnected from a region's existing production competencies and resource base leads to the inefficient allocation of capital and labor. Conversely, building processing and specialized service chains around leading industries on the basis of related diversification (for example, developing engineering, polymer processing, and green logistics services integrated with petrochemicals in Kashkadarya Region) generates substantial multiplier effects.

Second, drawing on A. Hirschman's theory of inter-sectoral linkages, it should be emphasized that the sustainability of regional economic growth is determined not merely by the number of sectors, but by the density of cooperative and technological linkages among them [2]. In regions with high agricultural potential such as Jizzakh and Surkhandarya, high value added is created only when primary agricultural production is integrated into a unified chain encompassing food processing, modern packaging, cold-storage warehousing, and digital trade infrastructure.

Third, applying a uniform structural template across all regions of the country is economically unwarranted. An effective sectoral structure does not imply the mechanical equalization of all sector shares, but rather their harmonization in accordance with each region's resource endowment, comparative advantages, and ecological carrying capacity [14].

*Research Limitations and Future Directions:* In this article, HHI and LQ indicators were calculated across four broad economic activity sectors based on Q1 2025 data. Future research will calculate empirical values of the proposed RSQI index across all 14 administrative-territorial units of Uzbekistan using multi-year panel data and detailed two-digit NACE/OKED (IFUT) sectoral classifications, as well as rigorously test inter-factor impacts through econometric regression models.

**Conclusion**

Improving the sectoral structure of a regional economy is a decisive prerequisite for transitioning from a traditional, resource-intensive quantitative growth model toward an innovative, sustainable development trajectory generating high value added. Theoretical and empirical analyses conducted within this study confirm that the long-term economic stability of regions and their resilience to external shocks directly depend on deepening inter-sectoral production cooperation, stimulating related diversification grounded in existing technological capabilities, and ensuring resource efficiency. Accordingly, in designing regional economic policy, abandoning one-size-fits-all approaches in favor of targeted mechanisms tailored to each region's structural-functional type—focused on deep raw-material processing and expanding cluster-cooperation linkages—constitutes a strategic priority. Based on the research findings, the following scientific and practical recommendations are put forward:

*1. Introduce a regional structural diagnostic system:* implement an analytical monitoring mechanism that regularly computes HHI, LQ, labor productivity, and the proposed composite RSQI index across regions;

*2. Stimulate inter-sectoral production cooperation:* apply targeted tax and credit incentives to foster long-term supply and subcontracting linkages between large enterprises in industry, agriculture, and services and local small businesses;

*3. Prioritize high-value-added manufacturing:* reorient regional investment programs from primary raw-material extraction and cultivation toward deep processing and the production of competitive finished goods;

*4. Strengthen regional innovation ecosystems:* expand technology transfer and applied innovation partnerships among higher education institutions, research centers, and production clusters;

*5. Establish resource efficiency as an investment selection criterion:* mandate water- and energy-saving metrics alongside ecological safety indicators in evaluating state-supported regional investment projects.

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