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Article

Econometric Models for Enhancing Economic Potential based on the Optimization of the Retail Trade System in the Region

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Abstract: This article examines the optimization of the retail trade system as a factor in strengthening the economic potential of a region, using the Kashkadarya region of Uzbekistan as an example. Drawing on official statistical indicators and a review of scholarly literature, the article substantiates a multifactor econometric model reflecting the relationship between regional retail trade turnover and its principal determinants, investment volume, population income, the level of digitalization, and the development of trade infrastructure. The findings indicate that retail trade functions as a base sector of the regional economy, and that its systematic optimization, supported by econometric modeling and quantitative forecasting, can serve as an effective instrument for shaping regional economic policy.

Keywords: Retail Trade, Econometric Model, Economic Potential, Regional Economy, Trade Infrastructure, Digitalization, Retail Turnover, Regression Analysis, Consumer Market, Investment, Kashkadarya Region

1. Introduction

In the context of the deepening market reforms carried out in Uzbekistan, the retail trade sector occupies a special place among the branches of the regional economy, since it directly links production with final consumption and reflects the real purchasing capacity of the population. The development strategy of New Uzbekistan for 2022–2026 defines the development of trade infrastructure in the regions — including the establishment of large wholesale-retail centers, logistics and storage facilities, modern trade centers in districts and cities, and mobile trade points in rural areas — as one of the priority tasks of regional economic policy.

Kashkadarya region, with its large territory, developed industrial base, and population exceeding 3.7 million people as of 1 January 2026, possesses considerable potential for the expansion of the consumer market. According to the data of the National Statistics Committee, the region's gross regional product grew by 6.8 percent, industrial output by 7.2 percent, and the volume of market services by 13.6 percent. Within this structure, the retail trade turnover of the region increased by 8.6 percent compared with the corresponding period of the previous year, confirming the growing role of the consumer market in regional economic dynamics [1]. In addition, the turnover of public catering enterprises in the region reached 10,892.9 billion soums in January–July 2025, representing 114.2 percent of the corresponding period of the previous year, while the

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volume of market services rendered by small-business entities amounted to 20,403.6 billion soums, or 73.2 percent of the total volume of market services in the region [2].

These indicators demonstrate that the retail trade system of the region is developing at a steady pace; however, its further growth depends on the extent to which its optimization is based on scientifically substantiated, quantitative approaches. The relevance of this study lies in the fact that the application of econometric modeling to the retail trade system makes it possible to identify the quantitative relationships between retail turnover and its determining factors, and, on this basis, to enhance the region's overall economic potential.

The theoretical and practical aspects of retail trade development have been the subject of research by a number of local scholars. Sh. K. Ahmedov examined the factors influencing the development of the retail trade network, showing that housing-construction prospects, population dynamics, the volume and structure of demand, forms of goods sale, living standards, and access to commodity resources are the principal determinants of retail-network growth [3]. L. I. Ergasheva analyzed global trends in the development of the retail sector in emerging economies and the specific features and structural problems of the retail market of Uzbekistan, formulating scholarly conclusions on the development of trade infrastructure, the improvement of logistics systems, and the expansion of electronic commerce [4].

B. D. Safarov, examining the possibilities of applying big-data analysis and predictive-marketing approaches to increase retail efficiency, employed regression models, propensity-score matching, and generalized linear models based on large volumes of transactional and behavioral data, and showed that the targeted planning of marketing campaigns and customer segmentation has a positive effect on sales volume and profitability indicators [5]. These local studies are situated within a broad international literature on retail economics. Classical demand theory provides the microeconomic foundation for modeling consumer expenditure, notably through the Almost Ideal Demand System [6], while empirical studies of retail transformation in emerging economies document the rapid rise of modern retail formats and their determinants [7]. The economic consequences of large-scale retail expansion, including effects on prices, productivity and local markets, have been analyzed in detail [8], and the strategic and structural dimensions of retail management are systematized in the retailing-management literature [9]. More recent work emphasizes the transition toward omni-channel and digitally enabled retailing [10], [11].

In the international literature, regional econometric and dynamic models are widely used to describe, analyze, and forecast economic development within a set of territories, taking into account both internal structural relationships and inter-regional interactions, which provides a methodological basis for constructing regional retail-trade models [12]. Taken together, these studies confirm that although the qualitative and structural aspects of retail trade development in Uzbekistan have been widely studied, the construction of quantitative econometric models linking regional retail trade turnover with investment, income, digitalization, and infrastructure factors remains an insufficiently developed area, which defines the scholarly niche of the present study.

2. Materials and Method

This study employs comparative analysis and correlation-regression (econometric) modeling approaches to examine the optimization of the retail trade system in Kashkadarya region. The empirical basis of the study consists of indicators on retail trade turnover, investment volume, population income, and market-services development published by the National Statistics Committee of the Republic of Uzbekistan and the Kashkadarya regional statistics department for the period 2015–2025. The specification and

estimation of the model follow standard econometric practice for multiple linear regression with time-series data [13], [14], [15].

Within this methodology, a multifactor econometric model is formulated in which regional retail trade turnover is treated as the dependent variable, while investment volume, population income, the level of retail-sector digitalization, and the development of trade infrastructure are treated as explanatory variables. The general form of the proposed regression model is as follows:

$$RTt = \beta 0 + \beta 1 \bullet INVt + \beta 2 \bullet INCt + \beta 3 \bullet POPt + \beta 4 \bullet DIGt + \beta 5 \bullet INFRt + \varepsilon t$$

where RTt denotes the volume of retail trade turnover of the region in year t; INVt is the volume of investment directed toward trade and service infrastructure; INCt is the real income of the population; POPt is the size of the region's population; DIGt is an indicator reflecting the level of digitalization of retail trade (share of non-cash and online transactions); INFRt is an index characterizing the development of trade infrastructure (number of modern trade objects, warehouse and logistics facilities per capita); β0 is the constant term; β1–β5 are the regression coefficients to be estimated; and εt is the random error term. Such a specification makes it possible, once a sufficient time series of regional data has been compiled, to estimate empirically the contribution of each factor to the growth of retail trade turnover and to identify the direction of regional policy measures with the greatest expected effect.

3. Results and Discussion

The analysis of statistical indicators for Kashkadarya region shows that retail trade turnover has been growing steadily in recent years, outpacing the growth rate of gross regional product (8.6 percent against 6.8 percent), which points to the increasing role of the consumer market in the region's economic dynamics. At the same time, the more rapid growth of market services (13.6 percent) and the turnover of public catering enterprises (114.2 percent of the corresponding period of the previous year) confirms that consumer demand in the region is expanding faster than production capacities in some segments, creating both opportunities and structural pressures for the retail-trade system.

Applying the proposed econometric model to the regional context makes it possible to identify a set of factors that either support or constrain the optimization of the retail trade system. These factors are summarized in Table 1.

Table 1. Factors influencing the optimization of the retail trade system in Kashkadarya region

Supporting factors	Constraining factors
Growth of gross regional product and industrial output creates rising purchasing power and demand for consumer goods	Uneven distribution of modern trade infrastructure between urban centers and rural districts
Expansion of market services and small-business activity broadens the retail supply base	Limited application of econometric and analytical tools (regression, forecasting) in planning retail networks
Growing population and urbanization increase the potential size of the consumer market	Insufficient integration of digital payment and e-commerce systems in a large share of retail outlets
State programs on trade-infrastructure development (wholesale-retail centers, logistics, storage facilities) support network expansion	Shortage of specialists capable of applying quantitative and econometric methods in trade management

Supporting factors	Constraining factors
Diversification of retail forms (stores, supermarkets, mobile outlets) improves accessibility for the population	Limited investment resources directed specifically toward retail-network modernization

The analysis shows that the supporting factors are largely connected with macroeconomic growth, state infrastructure programs, and demographic expansion, while the constraining factors are concentrated around the uneven distribution of digital and physical trade infrastructure and the limited application of quantitative management methods, including econometric modeling itself, at the level of individual enterprises and district trade departments.

From the standpoint of the proposed regression model, the expected direction of relationships can be substantiated theoretically: an increase in investment (INV) and population income (INC) is expected to have a positive effect on retail trade turnover (RT), since both expand the resource base of trade enterprises and the purchasing capacity of the population; population growth (POP) is expected to expand the scale of the potential market; and improvements in digitalization (DIG) and trade infrastructure (INFR) are expected to increase the efficiency with which existing demand is converted into realized turnover. These expected relationships are consistent with the microeconomic theory of consumer demand [6] and with international evidence on the drivers of modern retail growth [7], [11]. Once the corresponding regional time-series data are compiled in full, this specification provides a basis for empirically estimating the elasticity of retail trade turnover with respect to each of these factors, for ranking policy priorities accordingly, and for quantitative forecasting of retail turnover [16].

5. Conclusion

The results of the study show that the optimization of the retail trade system is an important factor in strengthening the economic potential of Kashkadarya region, since retail trade is closely linked with investment activity, population income, and the development of trade and digital infrastructure. Although the region's retail trade turnover and market-services volume are growing at a steady pace, the uneven development of digital and physical trade infrastructure and the limited use of quantitative and econometric methods in retail-network planning remain the main problems restraining the sector's full development. The multifactor econometric specification proposed in this study provides a scientifically grounded, quantitative framework through which regional retail trade turnover and its principal determinants can be systematically monitored, modeled, and forecast, thereby supporting the formation of evidence-based regional economic policy.

REFERENCES

[1] National Statistics Committee of the Republic of Uzbekistan / Kashkadarya regional statistics department, “Socio-economic indicators of Kashkadarya region, 2025–2026.” [Online] . Available: https://stat.uz/uz/matbuot-markazi/qo-mita-yangiliklar/66972

[2] Kashkadarya regional statistics department, “Turnover of public catering enterprises and volume of market services in Kashkadarya region, January–July 2025.” [Online] . Available: https://t.me/s/qashstatuz/11857

[3] Sh. K. Ahmedov, “Retail trade and the factors of its development,” Journal of Science-Innovative Research in Uzbekistan, vol. 2, no. 12, pp. 557–561, 2024.

[4] L. I. Ergasheva, “Global trends in retail trade development in emerging economies and the experience of Uzbekistan,” ACUMEN: International Journal of Multidisciplinary Research, vol. 3, no. 3, pp. 197–202, 2026, doi: 10.5281/zenodo.19038539.

[5] B. D. Safarov, "Big data analysis and predictive marketing for optimizing efficiency in retail trade," Economics and Innovative Technologies, vol. 14, no. 1, pp. 87–99, 2026, doi: 10.55439/EIT/vol14_iss1/786.

[6] A. Deaton and J. Muellbauer, "An almost ideal demand system," American Economic Review, vol. 70, no. 3, pp. 312–326, 1980.

[7] T. Reardon, C. P. Timmer, C. B. Barrett, and J. Berdegué, "The rise of supermarkets in Africa, Asia, and Latin America," American Journal of Agricultural Economics, vol. 85, no. 5, pp. 1140–1146, 2003, doi: 10.1111/j.0092-5853.2003.00520.x.

[8] E. Basker, "The causes and consequences of Wal-Mart's growth," Journal of Economic Perspectives, vol. 21, no. 3, pp. 177–198, 2007, doi: 10.1257/jep.21.3.177.

[9] M. Levy, B. A. Weitz, and D. Grewal, Retailing Management, 10th ed. New York: McGraw-Hill Education, 2019.

[10] P. C. Verhoef, P. K. Kannan, and J. J. Inman, "From multi-channel retailing to omni-channel retailing," Journal of Retailing, vol. 91, no. 2, pp. 174–181, 2015, doi: 10.1016/j.jretai.2015.02.005.

[11] D. Grewal, A. L. Roggeveen, and J. Nordfält, "The future of retailing," Journal of Retailing, vol. 93, no. 1, pp. 1–6, 2017, doi: 10.1016/j.jretai.2016.12.008.

[12] P. Nijkamp and J. Poot, "Regional econometric and dynamic models," in Handbook of Regional and Urban Economics. Amsterdam: Elsevier. [Online] . Available: https://www.sciencedirect.com/science/article/abs/pii/S1574008000800139

[13] D. N. Gujarati and D. C. Porter, Basic Econometrics, 5th ed. New York: McGraw-Hill/Irwin, 2009.

[14] J. M. Wooldridge, Introductory Econometrics: A Modern Approach, 6th ed. Boston, MA: Cengage Learning, 2016.

[15] W. H. Greene, Econometric Analysis, 8th ed. New York: Pearson, 2018.

[16] R. Fildes, S. Ma, and S. Kolassa, "Retail forecasting: Research and practice," International Journal of Forecasting, vol. 38, no. 4, pp. 1283–1318, 2022, doi: 10.1016/j.ijforecast.2019.06.004.