ASSESSMENT OF REGIONAL HANDICRAFT SECTOR DEVELOPMENT BASED ON A MULTIPLE REGRESSION MODEL (THE CASE OF KASHKADARYA REGION)

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Abstract. This paper proposes a four-factor multiple regression model to assess the development of the regional handicraft sector. The model is tested on real statistical data from handicraft enterprises in Kashkadarya region (n = 20), ***revealing a statistically significant effect of employment share and the volume 15of*** services on output ($R^2 = 0.9996$). Based on the findings, practical recommendations for the development of the handicraft sector are proposed.

Keywords: *handicraft, regional development, empirical model, multiple regression, econometrics, Kashkadarya region.*

Handicraft is a sector that relies on local resources and traditional knowledge and makes a significant contribution to regional economic development. According to the United Nations Conference on Trade and Development (UNCTAD), exports of handicraft and design products worldwide continue to show steady growth. In recent years, Uzbekistan has pursued a consistent state policy aimed at supporting handicraft, outwork, and micro-entrepreneurship; in particular, regulatory documents on the comprehensive socio-economic development of Kashkadarya region set the task of accelerating the establishment of handicraft micro-centers [1]. Nevertheless, the quantitative assessment of regional handicraft-sector development remains insufficiently grounded in econometric practice. The purpose of this paper is to assess the development of the regional handicraft sector using a multiple regression model and to test it on real regional data.

A review of the relevant literature shows that Uzbek economists have generally analyzed the socio-economic effect of developing handicraft and outwork from the perspective of family entrepreneurship and regional development, while the prospects of digitalizing handicraft and its forecasting through trend models have been examined in separate works. However, research assessing the regional handicraft sector through a multiple econometric model grounded in real statistical data remains limited, which underscores the relevance of this paper.

The following four-factor linear regression model was adopted as the research methodology:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

where Y is the volume of output produced by handicraft enterprises; X_1 is the share of the population engaged in handicraft-related small business and entrepreneurship; X_2 is investment attracted to the sector; X_3 is the number of active handicraft enterprises; X_4 is the volume of handicraft services. The model's parameters are estimated using ordinary least squares (OLS), and its statistical reliability is verified through Student's t-test, Fisher's F-test, and the Durbin–Watson autocorrelation criterion.

The proposed model was tested on annual statistical data for handicraft enterprises in Kashkadarya region (n = 20) [2]. The estimated model takes the following form:

$$\hat{Y} = -617.94 + 286.96 \cdot X_1 - 0.871 \cdot X_2 - 833.09 \cdot X_3 + 5.525 \cdot X_4$$

The estimation results for the model's variables are presented in the table below:

Variable	Coefficient	t-stat	p-value	Conclusion
Intercept	-617.94	-2.787	0.0138	Significant
X_1 — employment share	286.96	3.886	0.0015	Significant
X_2 — investment	-0.871	-2.145	0.0487	Significant

X_3 — number of enterprises	-833.09	-1.543	0.1437	Not significant
X_4 — services volume	5.525	7.266	0.0000003	Significant

Table 1. Estimation results of the regression model's coefficients [2].

The model's overall quality indicators showed high precision: $R^2 = 0.9996$; adjusted $R^2 = 0.9995$; $F(4,15) = 9797.68$ ($p < 0.001$). The employment share (X_1) and services volume (X_4) variables proved highly statistically significant, investment (X_2) was also significant, while the number of active enterprises (X_3) proved statistically insignificant ($p = 0.144 > 0.05$) and was excluded from the adequate model. The Durbin–Watson statistic ($DW \approx 2.47$) confirmed the absence of autocorrelation.

The economic interpretation of the coefficients is as follows: holding other factors constant, a one-percentage-point increase in the employment share raises output by an average of 286.96 million UZS, while each additional million UZS in services volume raises output by 5.525 million UZS — making these the two strongest positive drivers. The negative coefficient on investment is explained by the fact that, in the short term, new investment is often still at the construction and equipment-installation stage, meaning its effect on output is subject to a time lag.

The findings indicate that expanding employment and the volume of services in the handicraft sector are the strongest positive drivers of output. Accordingly, the following practical recommendations are proposed: (1) prioritize increasing the number of artisans and expanding vocational training programs within regional policy; (2) expand the network of handicraft services (workshops, training, repair services); (3) apply dynamic models with lagged variables in future research to more accurately assess the effect of investment on output. In conclusion, the multiple regression model has been confirmed, using real regional data, as a reliable and practically applicable empirical tool for assessing the development of the regional handicraft sector.

References

1. Resolution of the President of the Republic of Uzbekistan No. PF-91, “On Measures to Create Favorable Conditions for Engaging the Population in Handicraft and Developing Handicraft Activities,” 12 June 2023. // https://lex.uz/docs/-6490321
2. Norqobilova F.A. Assessment of the development of the folk crafts sector in the region based on trend models // Innovation Technologies. — 2023. — Vol. 52, No. 4. — P. 140–144.
3. UNCTAD. Creative Economy Outlook: Trends in international trade in creative industries. — Geneva–New York: United Nations, 2018.
4. Gujarati D.N., Porter D.C. Basic Econometrics. 5th edition. — New York: McGraw-Hill/Irwin, 2009.
5. Wooldridge J.M. Introductory Econometrics: A Modern Approach. 7th edition. — Boston: Cengage Learning, 2019.