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Article

Methods and Criteria for Integral Assessment of the Level of Development of the Textile Industry on the Example of the Surkhandarya Region

Shoyimov Adiz Sadredinovich [1]

1. Independent researcher at Termiz State University

* Correspondence

Abstract: The article develops methods and criteria for assessing the level of development of the textile industry in Surkhandarya region. It also presents scientific proposals and conclusions aimed at increasing the level of activity of the textile industry in Surkhandarya region.

Keywords: The volume of textile production, the volume of investments in the sector, the number of people employed in the sector, the export of textile products, and labor productivity.

1. Introduction

The textile industry is a multifactorial and complex system, and assessing the level of its development is very complex. Assessing the textile industry through individual indicators cannot fully reflect the real state of the industry. To date, the approach of integral assessment of the development of industrial sectors is widely used in economic research. At the same time, the integral assessment provides an opportunity to generalize the main factors affecting the development of the network in a single indicator and compare by region. Processes like this provide a number of advantages, such as formation of a convenient knowledge base for econometric modeling and forecasting of key network indicators.

2. Analysis of Literature on the Topic

In the economic scientific literature, the issues of identifying the development trends of the main indicators of the standard of living of the population and their assessment based on econometric methods have been widely studied by foreign and domestic scientists, and empirical analyses in this area have been scientifically substantiated using economic and statistical methods. As an example, the scientific works of M.K. Abdullayeva, O.S. Homidov, O.A. Abduganiyev, N.M. Mahmudov, T.L. Saaty, Азгальдов Г.Г., Райхман Э.П., Esther Duflo, Y.A. Roslyakova, N.Varshney, D.Jain, Dr.Pracheta and J.Sachs analyzing the main indicators of the standard of living of the population can be cited [1]. In the above scientific works, scientists analyzed these issues based on economic and statistical methods and tried to scientifically illuminate the specific content and main characteristics of the indicators of industrial development. For example, one of the leading economists of our country, M.K. Abdullayeva, in her works pays special attention to the implementation of a

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number of important reforms in the social economy, social protection of the population and improving their living standards [2].

O.S. Khomidov in his work deeply analyzed the scientific and theoretical foundations of research and modeling of sustainable economic development of the living standards of the population in the regions.

O.A. Abdug'aniyev also touched upon the development of the living standards of the population in his research work entitled "Econometric models of increasing the efficiency of production of agricultural products included in the consumer basket [3]".

3. Methodology

The main goal of the study is to develop scientific and practical proposals and recommendations for increasing the level of the textile industry in the regions. Economic and statistical methods were widely used in the research process.

4. Analysis and Results

Within the framework of our study, the Integral Index of Textile Industry Development (TSRII) was proposed to assess the development of the textile industry. In the first chapter, the system of korsatkichlar orqalı orqalı ко'ratkichlar e'yərlatlatan is calculated, and the total average value of the ular is determined. Tadqiqotimiz davomida Surxondaryo viloyati misolida to‘qimachilik sanoati rivojlanishining integral indeksi darajasini aniqlashni to‘rtta asosiy komponent asosida shakllantirdik[4]. These are: the production volume of textile products;(IChH) The amount of investments directed to the industry (IH); Number of people employed in the network (BS); Export of textiles (ME); Labor productivity (MU).

Production of textile products (IChH) Output - An indicator that represents the real economic activity of the industry. It reflects the region's industrial potential, resource utilization rate, and ability to respond to market demand. This indicator is considered to be the basic measure of the development of textile industry.

The nominal value is determined by the following formula:

$$\mathrm{IChH} = \sum_{i=1}^{n} Q_i \cdot P_i$$

Here:

Q_i – i-the quantity of the product in type,

P_i – i-The price of a variety of products

Agar real o‘sish baholanayotgan bo‘lsa (inflyatsiyani hisobga olib):

$$\mathrm{IChH}_{\mathrm{real}} = \frac{\mathrm{IChH}_{\mathrm{nominal}}}{\mathrm{Deflyator}}$$

Annual Growth Rate:

$$T_{\mathrm{IChH}} = \frac{\mathrm{IChH}_t}{\mathrm{IChH}_{t-1}} \cdot 100\%$$

Volume of Investment Focused on Textiles (IH) Ratio- Expansion of production capacity serves as a key factor of technological innovation and innovation development. It represents the level of involvement of capital in the textile industry.

Total investment:

$$\mathrm{IH} = \sum_{j=1}^{n} I_j$$

Here, I_j – Investment elements focused on fixed capital.

Investment activity coefficient:

$$K_{inv} = \frac{IH}{IChH}$$

Basic Capital Renewal Rate:

$$K_{inv} = \frac{\text{New fixed assets}}{\text{Total industrial employment}}$$

Number of Persons Employed in Textiles (BS) - The employment indicator reflects the socio-economic importance of the network. It also represents the level of use of labor resources.

Average annual employment:

$$BS = \frac{BS_{boshi} + BS_{oxiri}}{2}$$

Employment Growth Rate:

$$T_{BS} = \frac{BS_t}{BS_{t-1}} \cdot 100\%$$

Employment rate:

$$U_{BS} = \frac{BS}{Total\ industrial\ employment}$$

Export of Textiles (ME) Indicator - represents the competitiveness of the foreign market of textiles. A high export share means that there is a good product quality and international demand. The indicator of export of textile products is a complex indicator that reflects the external cost efficiency of the industry and makes it possible to conduct an in-depth analysis of the sustainability of regional industrial development when its volumetric, relative and dynamic forms are combined.

Eksport hajmi quyidagicha aniqlashimiz mumkin:

$$ME = \sum_{k=1}^{r} Q_{eksport,k} \cdot P_{eksport,k}$$

Here, $Q_{eksport,k}$ – k-quantity of exported products;

$P_{eksport,k}$ – k-export price of the type of product;

r – quantity of exported products.

Ratio of exports to production:

$$K_{eks} = \frac{ME}{IChH}$$

This indicator tells you how much of the produced **product is export-oriented**. Shows the level of competitiveness economically. It is used to assess the level of export orientation of the industry and determine diversification policies.

Export growth rate:

$$T_{ME} = \frac{ME_t}{ME_{t-1}} \cdot 100\%$$

Labour Productivity (MU) Indicator in Textiles - Mehnat unumdorligi ishlab chiqarish samaradorligining asosiy ko‘rsatkichidir. U bir ishchiga to‘g‘ri keladigan ishlab chiqarish hajmini ifodalaydi.

If real efficiency is assessed:

$$MU_{real} = \frac{IChh_{real}}{BS}$$

Productivity growth rate:

$$T_{MU} = \frac{MU_t}{MU_{t-1}} \cdot 100\%$$

Since the indicators are in different units of measurement, it is necessary to bring them into a comparable form. For this, the methods of normalization and standardization are

used. Usually, normalization is the process of bringing the indices expressed in different units of measurement between 0 and 1. It is used to compare indicators and calculate an integral index [5]. This method is widely used in economic and statistical analysis, especially in the compilation of integral estimation models, economic ratings and econometric models. Normalization of indicator values in our work we used the following decree:

$$Z_{ij} = \frac{X_{ij} - X_{min}}{X_{max} - X_{min}}$$

Here, Z_{ij} - normalized value;

X_{ij} - j- The value of the indicator for i-year;

X_{max}- maximum value;

X_{min}- minimum value.

Standardization, on the other hand, is the process **of normalizing indicators through mean value and standard deviation**. This method is widely used in statistical analysis, econometrics, and multifactor modeling.

In the course of our study, statistical data for 2010–2015 were analyzed in order to identify the main factors affecting the production of textile products in the Surkhandarya region. To study the interaction of these factors in depth, their indicators were standardized. Indicators formed on the basis of standardized data are presented in Table 1 below.

Table 1. Standardized values of statistical data of factors influencing the production of textile products in the Surkhandarya region for 2010-2025[1]

Years	Production of textile products (mlrd.so'm)	Investments in fixed capital from all sources of financing of regional textiles (mlrd.so'm)	Number of items (Thousand people)	Export of textile products (Thousand dollars)	Labor productivity
2010	0,042135	1	0,425532	0,099016	0,020421
2011	0,049522	0,595263	0,460993	0,107425	0,037013
2012	0,058012	0,710963	0,524823	0,110537	0,035737
2013	0,068843	0,719188	0,496454	0,138669	0,051053
2014	0,084453	0,703331	0,609929	0,138464	0,057435
2015	0,094448	0,538995	0,702128	0,134517	0,060625
2016	0,087311	0,201997	0,680851	0,128238	0,06254
2017	0,081227	0,099197	0,617021	0,131644	0,06956
2018	0,151424	0,125395	0,531915	0,284677	0,076579
2019	0,220049	0,379351	0,702128	0,313404	0,206765
2020	0,325879	0,40927	0,765957	0,425453	0,220166
2021	0,414778	0,538798	0,836879	0,495625	0,283982
2022	0,435687	0,395248	0,929078	0,468945	0,436503
2023	0,640794	0,340495	0,893617	0,717079	0,630504
2024	0,918188	0,330738	0,992908	0,924746	0,825782
2025	1	0,130674	1	1	1
O'rtacha	0,292047	0,451181	0,698138	0,351152	0,254667

In the next part of our work, the production volume of textile products ,(IChH) the amount of investments into the sector (IH), number of people who are busy in the network (BS), Export of textile products (ME), Indicators of Productivity of Labor Productivity (MU)

[1] Author's accounts based on the data of the Department of Statistics of the Surkhandarya region

T.Saaty [6] Effective management and effective management of hierarchical systems. Qualifiers are important in the implementation of quality management, improvement and optimization processes in social, economic, technological and scientific systems [7]. Based on the rule, we have identified a group of ekspert-mutahassslar with a certain number of companies with a certain number of years of experience in the field of enterprise economy.

Table 2. Indicators for the assessment of the integral index of the development of the textile industry in the Surkhandarya region[2]

№	Display name	Indicator symbol	Indicator value	Expert survey results
1	Production of textile products	IChH	0,292047	0,30
2	The amount of investments in the grid	IH	0,451181	0,25
3	Tarmoqda band bo'lganlar soni	BS	0,698138	0,15
4	Export of textile products	ME	0,351152	0,20
5	Labor productivity	MU	0,254667	0,10

When assessing the level of development of the textile industry, normalized values for each selected indicator were determined, and weight coefficients were assigned to them based on expert assessments.

The normalized value of the index in the volume of production of textile products was 0.292047. According to the results of an expert survey, it was established that its weight is equal to 0.30. From this we can see that the volume of production of textile products is the most important factor in the development of the industry [8]. Typically, the production volume represents the total economic potential, production capacity as well as the level of meeting the market demand of the textile industry. The high share of this indicator in the integral index is related to the level of development of the production base of the industry.

The normalized value of the investment in the grid is 0.451181, which is one of the highest values in the table. According to the results of expert assessment, the weight of this indicator was 0.25. Investments is a key factor for technological renewal of textile industry, expansion of production capacity and introduction of modern equipment [9]. Therefore, the relatively high value of the investment index is directly related to the prospects for the future development of the industry.

The normalized value of the number of items was 0.698138. We can see that this is the largest value in the table. Experts gave this indicator a weight coefficient of 0.15. This means that while the level of employment is important in the development of the network, its impact on production or investment performance has been slightly underestimated. Nevertheless, the high employment rate indicates that new jobs are being created and socio-economic stability is being ensured in the region.

The normalized value of export volume is **0.351152**, according to expert estimates, its weight is **0.20**. Export indicators reflect the competitiveness of the industry in the international market. The growth of export volumes is evidenced by the quality level of manufactured products, availability of foreign market demand and the development of export infrastructure. For this reason, the share of export indicators in the integral index is significantly calculated [10].

The normalized value of labor productivity is **0.254667**. Experts gave this indicator a weight coefficient of **0.10**. This indicator reflects the efficiency of the use of labor resources in production processes. Growth of labor productivity is associated with the introduction of modern technologies, automation of production and improving the qualification level of employees. And the relatively small weight coefficient means that this indicator has an indirect effect on other indicators.

[2] Development of the author based on scientific research

According to the results of our analysis, the volume of **production and the amount of investments** are distinguished as the most important factors in the development of the textile industry [11]. According to experts, the weight of these indicators **was 0.30 and 0.25**, respectively . Also, the export volume is one of the important indicators, its weight is **0.20**. And the indicators of employment and labor productivity were assessed as additional indicators of the social and economic efficiency of the industry [12]. As a result, the selected system of indicators allows a comprehensive assessment of the main economic, production and social factors of the development of the textile industry and provides **a methodological basis for calculating the index of integral development**.

In the next phase of our study, the integral coefficient is determined by the sum of the averaged arithmetic group indices. Given the importance of indicators, the integral indicator more accurately reflects the effectiveness of the studied object.

The following formula is used:

$$S_{int} = \sum_{i=1}^{n} \omega_n S_n$$

The following formula was used in calculation of the integral index of the development of the textile industry:

$$TSRII = \sum_{i=1}^{5} \omega_5 S_5 = \omega_1 \cdot IChH + \omega_2 \cdot IH + \omega_3 \cdot BS + \omega_4 \cdot ME + \omega_5 \cdot MU$$

here, $S_1 = IchH$; $S_2 = IH$, $S_3 = BS$; $S_4 = ME$; $S_5 = MU$;

$\omega_1, \omega_2, \omega_3, \omega_4, \omega_4, \omega_5$ - respectively IChH, IH, BS, ME va MU weights of indicators.

Based on all the above accounting processes, an integral index of the development of the textile industry in the Surkhandarya region was determined.

$$\textbf{TSRII} = 0{,}30 \cdot 0{,}292047 + 0{,}25 \cdot 0{,}451181 + 0{,}15 \cdot 0{,}698138 + 0{,}20 \cdot 0{,}351152 + 0{,}10 \cdot 0{,}254667 = \mathbf{0{,}40083}$$

To construct the integral coefficient scale of the development of the textile industry, we use the Sturges method and derive the following integral coefficient scale (Table 3)

Table 3. An integral index of the development of the textile industry

Evaluation criteria[3]

№	Innovatsion faollik darajasi va indeksi oralig'i	Content interpretation	Suggestions and suggestions
1	Extreme $0.80 < TSRII \leq 1.00$	The network is high-tech and has achieved a competitive level in the international market	Expansion of production of innovative products, export diversification and development of high-tech production
2	It's fine $0.60 < TSRII \leq 0.80$	The textile industry has a high level of development, the investment and export volume is significantly reduced	Development of research activities, expansion of international cooperation, strengthening of integration into global value chains
3	Medium (Emerging) $0.40 < TSRII \leq 0.60$	The industry has entered the stable development phase, the production volumes and export indicators have a growth trend	Introduction of innovative technologies, production of high value-added products, increase of labor productivity
4	Low $0.20 < TSRII \leq 0.40$	The network is in the stage of formation, there is production and employment, but efficiency	Modernization of production, implementation of technological renewal, increase export volumes and improvement of investment climate

[3] Development of the author based on scientific research

		and competitiveness are not enough	
5	Very low $0.00 \leq TSRII \leq 0.20$	The textile industry is almost underdeveloped, the production and investments are insufficient, and the export potential is not formed	Strengthening government programs for the development of the industry, creation of new enterprises, infrastructure development and attracting investments

The criteria for assessing the integral index of development of the textile industry are divided into five categories: innovative activity and level of development of the industry. These criteria are used to assess the technological level, production volume, investments, export potential and competitiveness of the industry [13]. The table shows that the higher the index value, the higher the level of innovation development of the network [14]. Conversely, when the index is low, network development is sluggish, and production volumes, investment, and export opportunities are not adequately formed.

When comparing the result of our study with the developed evaluation scale, it is **close to the range of 0.21- 0.40.** This indicates that the textile industry is on the verge of a low level **of development [15]**. However, the fact that the index value **is very close to the 0.41 threshold** also indicates that the process of transition to the average stage of network development has begun.

5. Conclusion

Analysis of the composition of the integrated index shows that one of the factors that has had the greatest impact on the development of the network is the volume of investments directed to the network. In recent years, this indicator has been achieved by the creation of new textile enterprises in the region, expansion of production facilities and introduction of modern technologies. The high proportion of people employed in the industry indicates the important role of the textile industry in the regional labor market. This industry is emerging as an important economic sector for creating new jobs and employment in the region. However, the relatively low formation of production volumes and export indicators to a certain extent prevent the integral index from reaching a higher level [8]. Ayniqsa eksport hajmining barqaror o‘sish sur’atlariga ega emasligi tarmoqning xalqaro bozordagi raqobatbardoshligini oshirish zarurligini ko‘rsatmoqda.

In this context, for the further development of the textile industry in the Surkhandarya region, it is necessary to implement measures in such areas as modernization of production processes, expansion of the production of finished textile products with high added value, expansion of export geography, introduction of innovative technologies, and increasing labor productivity. Implementation of such measures will in the future bring the integral index of the textile industry of the Surkhandarya region to the level of average and high development

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