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Analysis of the Maximum Volume of Production in Cement Production Enterprises in Uzbekistan

Klichev Bakhtiyor Pardayevich
Department of Finance and Accounting at Tashkent State University of Economics, Tashkent, Uzbekistan
klichev.baxtiyor@gmail.com

ABSTRACT

This article covers the issues of implementation of analytical work on the contents of the indicators representing the volume of production developed by the author and their interrelationships. Based on the data of Ohangarontsement JSC, the leading enterprise producing cement products in Uzbekistan, the procedure for calculating the maximum volume of production, the theoretical and practical aspects of the indicators determined by mutual ratios of the proposed indicators representing the volume of production are explained. In the performed calculations, relative indicators, data grouping, logical analysis, index and small number methods were used, calculations were made and analytical solutions were given.

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Introduction

Although in 2019-2021, due to the impact of the pandemic caused by COVID-19, the dynamics of the growth rates of the economies of the world became unstable, as a result of the effective reforms, by the end of 2022, the gross domestic product in Uzbekistan - 5.7 percent, industrial products - 5, 2 percent, construction works - 6.6 percent, agricultural products - 3.6 percent, market services - 15.9 percent, export - 23.6 percent, retail turnover - 12.3 percent.

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GDP per capita was 2,255 US dollars. State budget revenues in 2022 amounted to 202 trillion soums, which increased by 37.2 trillion soums or 22.6% compared to 2021. As of January 1, 2023, the public debt of the Republic of Uzbekistan amounted to 29.2 billion US dollars or 36.4 percent of the GDP.

In the period of accelerated economic integration, enterprises in each country can make management decisions on cost optimization through export and import operations in their activities. In order to have reliable business partners on a global scale, it is necessary for every enterprise to ensure a stable positive financial position and carry out regular analytical work on the effectiveness of operating activities that generate the main income (Qlichev B., 2023 a).

On January 24, 2022, Presidential Decree No. PQ-99 "On measures to create an effective system for the development of production and expansion of industrial cooperation in the Republic" was adopted on January 24, 2022, in order to increase the volume of production and effectively use production capacities. In order to ensure the implementation of this decision, the "Production Production and Industrial Cooperation Expansion Program" for 2022 was approved. It is determined that the work carried out under this program will be carried out in the following directions:

- forecast parameters of expansion of production and industrial cooperation;
- cumulative indicators of production of new products and expansion of existing capacities;
- a list of projects on production of new products and expansion of existing capacities by economic sectors;
- a list of projects for production of new products and expansion of existing capacities by regional enterprises, etc.

The reason we focus on product production and sales volume is that while the costs of materials and labor are usually known with some degree of accuracy at the time the product is being sold, the price of the product is variable. At the same time, it is also important for the company to establish a break-even production and sales volume. Based on the research direction of this article and the content of the decision PQ-99 dated January 24, 2022, it is important to develop a system of indicators representing the volume of production and clarify their content and necessity.

Indicators representing the volume of product production from Uzbek economists A. Vakhobov, A. Ibrohimov, N. Ishonkulov, M. Rakhimov, B. Isroilov, M. Pardaev, J. Isroilov, B. Khasanov, A. Shoalimov, Sh. Ilhomov and Sh. . It is also covered in Tadjibaeva‘s research. In particular, A. Vahobov et al. (A. Vahobov et al., 2013) used the following summary indicators when studying the volume of manufactured products:

- Gross product;
- Commodity product;
- Product sold.

This approach is reflected in the researches of the authors M. Pardaev, B. Isroilov and J. Isroilov (M. Pardaev et al., 2017) and in the researches of the authors M. Rahimov and N. Qalandarova (M. Rahimov, N. Qalandarova, 2019).

A.Shoalimov et al. (A.Shoalimov et al., 2016) propose to express the production and sales volume based on gross product, commodity product and sold product indicators in the analysis of product production and sales volume.

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In our opinion (Qlichev, 2022 a), since it is about the volume of product production, in addition to the generalizing indicators cited by the above authors, there is a need to develop a system of indicators that represent only the volume of production. For example, if we take into account that the gross product includes not only finished products, but also semi-finished products, unfinished production, naturally this indicator is not considered a pure indicator representing the volume of product production. Since the commodity product indicator represents only the ready-to-sell part of the manufactured product volume, this indicator cannot be included among the indicators that fully represent the production volume. The product sold indicator, as the name suggests, does not represent the volume of production.

In our research (Qlichev, 2022 b) it has been shown that the formation of the production volume and other important performance indicators of the companies, their dynamic growth in positive intervals is inextricably linked to the skills and labor productivity of the workers and employees operating in these companies. The increase in labor productivity of workers is one of the main factors that have a positive effect on the important efficiency indicators of companies and the increase in the volume of production.

Methods

In the research work, the data of Ohangarantsement JSC, the leading enterprise in the field of cement production in the Republic of Uzbekistan, was used.

Methods such as quantitative and qualitative, cause and effect, statistical and economic analysis, data grouping, logical analysis, comparative analysis, small numbers and index were used in the research process.

Materials and results

It is no secret that economic entities operating in the field of agriculture or industrial production in our country expand their activities, achieve positive financial results, or in short, "survive" in the conditions of complex competition, directly depends on the volume of product production and sales.

If we pay attention to the directions of work defined in the "Production Production and Industrial Cooperation Expansion Program" approved in our republic for 2022, we can observe that the main emphasis is on the use of existing capacities in production and its expansion projects. At the initial stage of the development of projects for expansion of production capacity in enterprises, it is necessary to study the levels of capacity utilization in previous years, indicators of unused opportunities. It is at this stage that the importance and necessity of the analytical results that can be obtained through the system of indicators and their ratio to each other emerges.

As a result of our analytical research, when analyzing the operational activities of economic entities, it is recommended to consider the following 3 forms of product production volume (Qlichev B., 2023 b):

1. Minimum (critical) volume. (Vmin.)

2. Optimal size. (Wopt.)

3. Maximum volume. (Vmax.)

Minimum size. The minimum volume of product production means the volume of the product at the break-even point. The volume at the break-even point is also used in economic literature as the critical product volume, and the company does not make a profit or a loss from selling this volume of product. As we all know, the first condition for profit is to determine the break-even point. That is why this volume is considered the minimum volume in enterprises, and each unit of product produced in excess of this volume brings a certain amount of profit to the enterprise (Qlichev, B. P. 2022 c).

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Optimal size. The optimal volume of product production is the volume of product production specified in the company‘s production program or business plan for each year. When making a business plan for each coming new year, it is important for enterprises to determine the volume of production based on the possibilities of selling products. Production can be done by everyone, but its realization is an object of economic activity that requires special analytical work. Therefore, enterprises are recommended to produce products only in the volume that is guaranteed to be sold or can be sold, and this volume is called the optimal volume. Why is the correct determination of the optimal size necessary? The main problem in the analytical work carried out on the volume of product production and sales is to prevent the increase of the balance of finished products. In this situation, which is called "saturated warehouse" in the modern business language, the balance in the warehouse does not mean the balance of finished products, but, first of all, the slowing down or complete cessation of the flow of funds directed to their production (Pardayevich, K. B., & Salamovich, T. M. 2021). In addition, the initial production of finished products may become obsolete and lose value, making it even more difficult to sell the finished products.

We can recommend several ways to determine the optimal volume of product production.

1. After studying the total demand and total supply indicators, import and export indicators in the region.

2. On the basis of information about the contracts concluded for the sale of products, the capabilities of competing enterprises and internal requirements.

3. Having studied the average 5-year production volume, sales volume and finished product balances.

Determining the volume of production aimed at the maximum reduction of the balance of finished products by performing analytical work from all the above-mentioned directions in order to achieve effective use of economic resources involved in production and to accelerate the circulation of funds is the basis of our research in this regard (M.S.Tulayev, B.P.Qlichev, 2022 f).

Maximum volume. The volume that the enterprise can produce as a result of the full exploitation of all capacities and resources is called the maximum volume. The correct determination of the maximum volume is important for enterprises, because through the level of the maximum volume and its ratio to other production volumes, it is possible to determine the effectiveness of the enterprise‘s activity or its potential. In addition, the correct determination of the maximum volume of production in enterprises may affect future management decisions at the enterprise level or at the state level. For example, during the COVID-19 pandemic, almost all countries have imposed restrictions or bans on the export of medical masks in order to adequately meet the needs of their population during the imposed quarantine. Naturally, in such conditions, all countries have studied the possibilities of covering the population‘s demand for medical masks with the existing reserves and local production capacities. In Uzbekistan, the maximum daily production capabilities of the enterprises producing medical masks were studied and appropriate decisions were made. Enterprises operating in Uzbekistan, like other countries, satisfy a certain part of their demand for raw materials and other resources through imports. Due to the political and economic situation, the application of international sanctions against some countries limits the possibilities of meeting the demand for resources through imports. Because of this, the need to meet the demand for raw materials and other resources through national production capacity determines the need to determine the maximum level of production volume in enterprises.

We can suggest calculating the maximum volume of product production in economic entities in 2 different ways (Qlichev B., 2023 c).

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1. According to the technical parameters of machines and equipment at the enterprise.

2. If the enterprise does not have the possibility to determine the technical parameters of machines and equipment, according to the highest labor productivity indicator of workers.

In the first method, based on the technical parameters of the machines and equipment involved in the entire production process at the enterprise, the possibility of transferring one hour‘s output is determined and coordinated with each other. Based on the production organization system of the enterprise, the determined indicator is determined by multiplying by the total number of working hours per year.

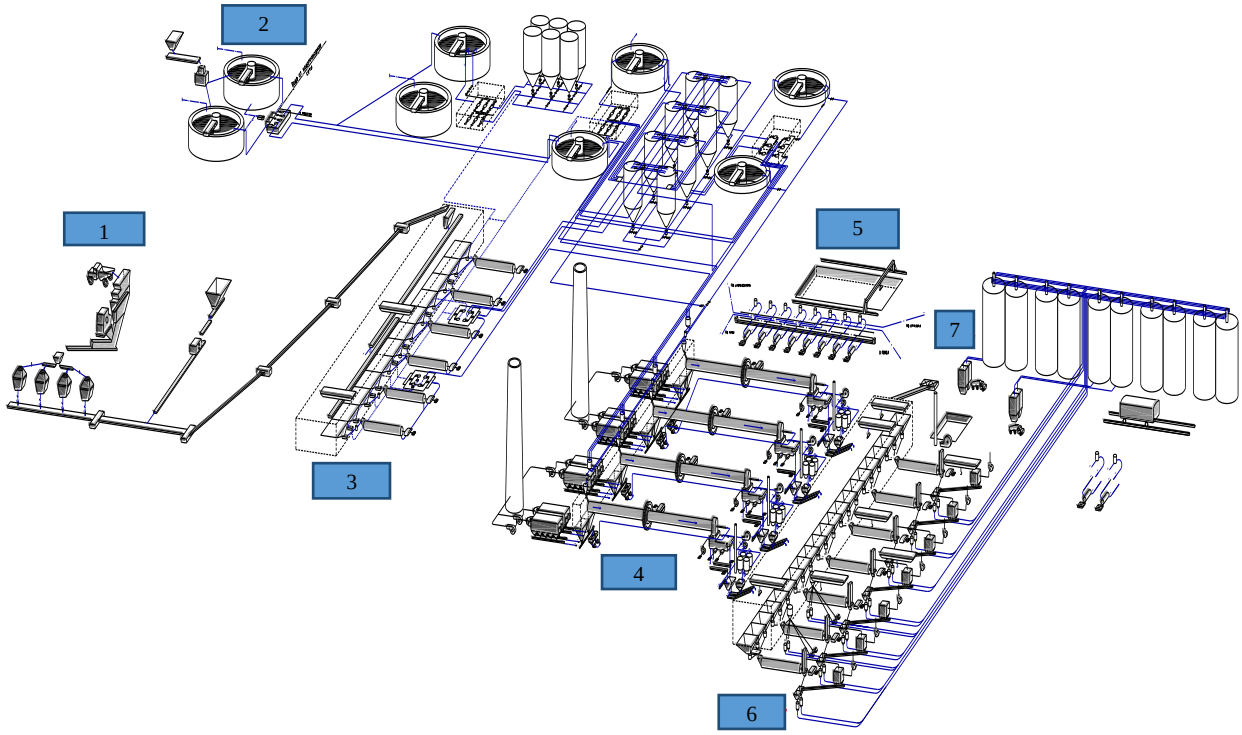

Figure 1. Scheme of technological processes of cement production at Ohangarontsement JSC.

In the second method, if it is not possible to determine the technical parameters of machines and equipment in economic entities, the hourly labor productivity of workers is determined. This indicator is determined by multiplying the total working hours for the year.

We can see from Figure 3 that the technological process of cement production at Ohangarontsement JSC consists of 7 stages. Since it is possible to determine the technical parameters of machines and equipment at these stages, the maximum production volume can be determined using the 1st method we have proposed..

For this, we consider the product transfer capabilities of technologies in all processes.

Stages 1 and 2 shown in Figure 3 are the stage of raw material extraction and delivery to the main production area, where the main materials are limestone (CaCO3) and loess (Al2O3·2SiO2·2H2O) from the Karakhitai quarry (West, Central, Shovazsoy -2 plots) and will be mined from the Shovazsoy quarry. Here, limestone and loess are crushed in jaw and hammer crushers with a capacity of 400

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tons/hour (stage 1). Crushed limestone and loess are transported to the main production area (stage 3) by a belt conveyor with a capacity of 350 tons/hour (stage 2). At this stage, raw materials forming the basis of cement are prepared at a capacity of 370 tons/hour. Prepared raw materials are transferred to the baking shop (stage 4) with a capacity of 290 tons/hour. The hot clinker immediately passes to the cooling zone (stage 5) with a capacity of 360 tons/hour. Here, the cooled clinker is transferred to the cement production (stage 6) workshop, which has a capacity of 330 tons/hour. Here the finished cement is transferred to the final loading and dispatch (stage 7) workshop with a capacity of 380 tons/hour. In table 1 summarizes the technical parameters of all stages at Ohangarontsement JSC.

Table 1. Analysis of the maximum production volume of cement products at Ohangarontsement JSC

	INDICATORS	**UNIT OF MEASURE**	**STAGES OF THE CEMENT PRODUCTION PROCESS**						
			1	**2**	**3**	**4**	**5**	**6**	**7**
1.	Product throughput	tons/hour	400	350	370	290	360	330	380
2.	Working days throughout the year	day	365	365	365	354	346	365	365
3.	Hours worked in a day	hour	24	24	24	24	24	24	24

Based on the data of Table 4, it is possible to determine the maximum volume of work at each stage based on the following formula

$$\boldsymbol{Vmax.} = \boldsymbol{w_1} * \boldsymbol{w_2} * \mathbf{w_3}$$

Here:

$\boldsymbol{Vmax.}$ – maximum production capacity;

$\boldsymbol{w_1}$ – product throughput capacity;

$\boldsymbol{w_2}$ – - working days during the year;

$\mathbf{w_3}$ hours worked in a day

It was considered that cement production in "Ohangarontsement" JSC consists of 7 stages. Determining the individual maximum production volume in these stages can be accepted in the calculation of labor productivity or other analytical indicators in these stages. However, since these stages are interdependent, it is necessary to coordinate the parameters of these stages when determining the maximum volume of total production for the society. Therefore, we propose to coordinate the indicators of cement production stages using the method of small numbers in economic analysis.

In this case, the maximum production volume is determined as follows:

$$\boldsymbol{Vmax.} = \boldsymbol{w_i} * \boldsymbol{w_j} * \mathbf{w_3}$$

Here:

$\boldsymbol{w_i}$ – coordinated indicator for product throughput w_1;

$\boldsymbol{w_j}$ – Coordinated indicator on working days w_(2) during the year

At Ohangarontsement JSC, we summarize the technical parameters of all stages in Table 4 and determine the maximum volume of production by coordinating them with each other with the stage with the smallest capacity.

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Table 2. Analysis of the maximum production volume of cement products at Ohangarontsement JSC

	Indicators	***Unit of measure***	***Stages of the cement production process***						
			1	**2**	**3**	**4**	**5**	**6**	**7**
1.	Product throughput	tons/hour	400	350	370	290	360	330	380
2.	The power received for coordination	tons/hour	w_i = 290						
3.	Working days throughout the year	day	365	365	365	354	346	365	365
4.	Days accepted for coordination	day	w_j = 346						
5.	Hours worked in a day	hour	24	24	24	24	24	24	24
6.	Coordinated total hours worked	a thousand hours	$w_i * w_j$ = 346*24 = 8304						
7.	Maximum volume of production	tons	$Vmax. = w_i * w_j * w_3$ = = 8304 * 290 = 2 408 160						

Conclusion

Having additional information on the analysis of the production volume by determining the proposed maximum volume of product production and using them in the analysis of operational activity, serves to increase the quality and speed of information. In addition, through the maximum volume of production, it will be possible to determine the forecast indicators for increasing the production volume of enterprises in the future. It is possible to obtain information that serves to make effective management decisions through the correlation of the indicators proposed in the analysis of operational activity.

We can get acquainted with the mutual proportions of the listed product production volumes and their content through Table 3.

Table 3. Interrelationships of forms of product production volume and their content

T/R	**Indicators**	**Content**
1.	The ratio of the minimum volume to the optimal volume $\frac{Vmin.}{Vopt.}$	Through this ratio, we can know the duration of cost recovery, or, conversely, the duration of profit within the periods under analysis. During the analysis, the reduction of the cost recovery period and the increase of the profit period are evaluated positively.
2.	The ratio of optimal volume to maximum volume $\frac{Vopt.}{Vmax.}$	Through this ratio, the production potential of the enterprise and the use of its capacities are studied in the analyzed periods.
3.	The ratio of the minimum volume to the maximum volume $\frac{Vmin.}{Vmax.}$	Through this ratio, it is possible to determine the duration of cost recovery or, conversely, the duration of profit during the analyzed periods, if enterprises achieve maximum production and sales.

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To sum up, it is important to organize analysis of the proposed ratios of production volumes in economic entities, to study the level of effective use of the existing potential of enterprises and their dynamics, and to assess the possibilities of increasing the volume of production.

References

1. Qlichev B. (2023 a). Operatsion faoliyat tahlilini tashkil etish masalalari. World Scientific Research Journal, 12(2), 263–271. Retrieved from http://wsrjournal.com/index.php/wsrj/article/view/2557;
2. Qlichev, B. P. (2022 a). Mahsulot sotish hajmi tahlilini takomillashtirish masalalari. *Science and Education*, *3*(5), 1719–1728. Retrieved from https://openscience.uz/index.php/sciedu/article/view/3641;
3. Qlichev, B. (2022 b). KPI tizimi asosida moddiy rag‘batlantirish masalalari tahlili. Arxiv nauchnых issledovaniy, 2(1). izvlecheno ot https://journal.tsue.uz/index.php/archive/article/view/1761;
4. Qlichev B. (2023 b). Korxonalarda mahsulot ishlab chiqarish hajmi tahlilini takomillashtirish masalalari. Issues of improving the analysis of the volume of production at enterprises. Obrazovaniye nauka i innovatsionnыe idei v mire, 13(7), 42–49. Retrieved from http://www.newjournal.org/index.php/01/article/view/2782;
5. Pardayevich, K. B., & Salamovich, T. M. (2021). Issues of development of the analysis of business activity in joint-stock companies of Uzbekistan. *ACADEMICIA: An International Multidisciplinary Research Journal*, *11*(11), 584-591. https://doi.org/10.5958/2249-7137.2021.02539.8 .
6. Qlichev, B. (2023 c). Korxonalarda mahsulot ishlab chiqarish hajmi tahlilini takomillashtirish masalalari. Napravleniya razvitiya blagopriyatnoy biznes-sredы v usloviyax sifrovizatsii ekonomiki, 1(01), 170 – 173, https://doi.org/10.47689/TSUE2022-pp170-173;
7. Qlichev, B. P. (2022 c). Ishbilarmonlik faolligi tahlilini tashkil etish yo‘nalishlari. http://journal.tsue.uz/index.php/archive/article/view/373;
8. Tulayev, M. S., & Klichev, B. P. (2022 d). Voprosы sovershenstvovaniye ucheta korporativnых obligatsii: obyazatelstvo ili kapital. In *Uchet, analiz i audit: ix vozmojnosti i napravleniya evolyutsii* (pp. 146-154);
9. Qlichev B.P. (2022 e). Iste’molchi manfaatlari asosida mahsulotga baho shakllantirish masalalari tahlili. “Iqtisodiyot: tahlillar va prognozlar”, ISSN: 2181-0567, 4 (20)-son, 170-175, UO‘K: 338.4 (575.1) https://ifmr.uz/journals/18;
10. Qlichev B.P. (2014). Boshqaruv hisobida baho shakllantirishni takomillashtirish masalalari. Toshkent moliya instituti. “Moliya” ilmiy jurnali. 2014-yil 5-son, 10-15 betlar. ISSN: 2010-9601;
11. M.S.Tulayev, B.P.Qlichev, (2022 f). Moliyaviy hisob. (Darslik). ISBN 978-9943-8915-9-3, UO‘K: 657(075.8);
12. Klichev, B.P., Choriev, I. X. (2021). The issues of business activity organization in Uzbekistan. Turkish Online Journal of Qualitative Inquiry (TOJQI).Volume 12, Issue 7, July 2021: 4587- 4593
13. https://www.tojqi.net/index.php /journal/article/view/4494.

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