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Improving the efficiency of using fixed assets and their influence on regional development

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ABSTRACT

The article is devoted to the study of the problem of increasing the efficiency of the use of fixed production assets and their influence on the development of the region. The study of the efficiency indicators of the region's production potential is one of the key tasks of improving the regional development of the region's production base. The solution to the problem consists in strengthening the orientation toward the increasingly full use of intensive factors of economic growth. Activities to implement these tasks are among the least capital-intensive ways to develop regional production infrastructure. At the same time, along with a low capital intensity of product growth, a significant increase in labor productivity and a decrease in current production costs are ensured.

Key words:

production base, fixed production assets, production efficiency, economic development.

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1. INTRODUCTION

The huge variety of economic, geographical and natural climatic conditions in different regions of Russia determines the need to study their role in shaping the main parameters of the development of the production program and its close connection with the functioning of the social sphere. The objective basis for the territorial differentiation of socially necessary labor inputs, and, consequently, the economic conditions for the development of the production base of construction industry in the region, is the position of the economic theory that the value of production, being formed in the production process, is realized in the exchange of goods. Based on the social division of labor, commodity exchange can be carried out in the whole country or within a region, what is related to the nature of production and consumption of a particular type of product. Depending on this, the socially necessary labor costs are formed either at a common level for the entire country or under the influence of local bonds that organize the market for the sale of goods and serve as a reason for regional differences. (Granberg A.G. 1985)

In classical economic science it was noted that one must be able to take into account the really existing inevitability of the difference in regional development. Agriculture in the Kaluga Gubernia is not the same as in Kazan. The same applies to the entire industry. (Kolosovsky N.N. 1969) This provision on the need to carefully take into account the regional features of a sector when solving long-term problems of its development is entirely related to construction industry and its production base as a complex directly related to the natural and economic conditions of its activities. (Lvov D., Dementiev V. 1994)

The analysis carried out in the paper testifies that under the influence of local conditions on the level of the production base development of a region and the technical and economic indicators of the work of its enterprises in various regions varies within very substantial limits. (Petrakov N. Ya. 1974) The analysis showed that the deviation of the regional indices of the production base development from the average indicators for the country should be considered to a large extent as an objectively conditioned phenomenon associated with the effect of the following factors:

- scale and level of concentration of capital investments in the region, their territorial, sectoral, reproductive and technological structures;

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- programs for the formation of territorial production complexes;
- degree of development of individual regions of the country in terms of transport and their supply of labor resources;
- provision of the region with a raw material base for the production of building structures and parts (Ashby U. R.1996).

Under the influence of the set of regional conditions, different levels of concentration of the same production are formed in different regions of the country, what provides with certain "privileges" in obtaining an economic effect for enterprises located in areas with a high density of capital investments in construction and installation works, and with a developed transport network. Therefore, it is substantiated to consider distinguishes in technical and economic indicators in the territorial aspect as a regional factor affecting the costs. This regularity was repeatedly pointed out by economists who dealt with territorial problems of economics and planning.

In this regard, it seems reasonable to conclude that the set of indicators characterizing the progressive changes in the structure of the production base of construction industry, the level of costs and the efficiency of production of building structures and parts in the country as a whole should be considered as averaged values reflecting the general patterns of development of the production complex. To use these indicators for specific regions, their justified differentiation, taking into account regional peculiarities, is necessary. (Bandman M. K. 1971)

2. METHODS OF RESEARCH

In the process of investigating the questions posed, the authors used a new methodological approach the essence of which is that the study of patterns for formation and development of regional complexes is viewed from the standpoint of social reproduction. This methodological approach allowed the authors to analyze regional complexes, on the one hand, as a system of economic relations, and on the other hand, as a subsystem of social production, which enters into economic ties with the national economy as a whole.

3. MAIN PART

A prerequisite for choosing economically justified directions of a sector development is to elucidate the quantitative influence of various factors on the efficiency of the use of fixed assets. This allows us to correctly understand the reasons for the change in the

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return on assets in certain periods of the sector's development, to identify the main links in the chain of various factors, and to determine the possible reserves for further improving the efficiency of the use of fixed assets (Bandman M. K. 1971).

The researches conducted have showed that the level of production capacities use by enterprises, the pace of renewal of their production equipment, as well as the level of prices for the means of production, have a decisive influence on the dynamics of capital productivity in the region. The share of environmental protection costs in the total volume of capital investments allocated for the development of the region's production base is about 0.8-1%.

It should be noted that the use of available reserves requires a comprehensive solution to the problem of improving the equipment work load and its timely updating and modernization.

Significant reserves of growth in capital productivity in all regions of Russia are associated with a reduction in the period of development of newly introduced enterprises and facilities. (Petrakov N. Ya. 1974) According to the calculations, the return on assets in the production base of the region can be increased by no less than 3% due to the normalization of the process on developing new production capacities.

The authors have elaborated and experimentally tested methods for identifying reserves to improve the use of the production assets of the production base in relation to the tasks of regional strategic planning and management.

The change in the return on assets (f) in the planned period as a result of any of the factors considered (i- th factor) can be estimated by the formula

$$\Delta f_i = f_{pi} - f_{\delta} \quad (1)$$

where f_{pi} is the calculated indicator of capital productivity, determined from the condition that only the i- th factor will have an impact in the period under consideration; f_{δ} - the actual return on assets indicator in the base period.

To determine the value f_{pi}, we have developed formulas (see Table 1), which allowed taking into account the degree of influence of each factor on the value of the return on assets.

It is advisable to supplement the factorial analysis of the reserves for improving the use of fixed production assets by a comprehensive assessment of the growth potential of the return on assets at the forms of production organization that have formed at the

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enterprise. Such an analysis, in our opinion, will characterize the reserves that are to be mobilized in the first place, because they are the least capital intensive and can be implemented, as a rule, within a year.

One of the main trends in the development of the region's production base is an increase in the level of concentration of production. (Porter M.E. 2004)

An analysis of the current level of production concentration and its impact on the value of capital productivity testifies to the significant reserves of growth in return on assets due to an increase in the average capacity of enterprises in the main branches of the region. The generalization of the results of optimization calculations for the feasibility study of the production base capacities of enterprises, taking into account the rational radii of transportation of steel structures and components, points to the economic feasibility of increasing the average capacity of enterprises in the production base by 2 to 3 times, which will ensure growth (the return on average by 10-14 %).

Table 1. Calculation formulas for conducting a factoring analysis of the dynamics of the rate of return on assets

Name of factor	**The calculation formula for determining the influence of the i-th factor**
Change in concentration of production	$\Delta f_k = \frac{\sum^{n} f_{\delta k}(g_{\delta k} - g_{pk})}{100}$
Change in the level of specialization of production	$\Delta f_c = \frac{k_c \alpha (y_p - y_\alpha)}{1 - k_c \alpha (y_p - y_\alpha)}$
Change in the level of equipment use by time	$\Delta f_b = f_\alpha (\frac{k_{bp}}{k_{b\alpha}} - 1)$
Change the level of use of equipment for performance	$\Delta f_n = f_\alpha (\frac{k_{np}}{k_{n\alpha}} - 1)$

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Change in the range of products	$\Delta f_H = \pm \frac{\sum^{l} \lambda_{\alpha m} d_{\alpha m} - \sum^{l} \varphi_{\alpha m} d_{pm}}{\sum^{l} \varphi_{\alpha m} d_{\alpha m} \sum^{l} \varphi_{\alpha m} d_{pm}}$
The change in the level of stock-raising of laborers and the prices of means of labor	$\Delta f_{\phi} = -f_{\delta} \frac{k_{m\phi}(k_p - 1)}{\phi_{\delta} k_p + k_{m\phi}(k_p - 1)}$

Legend:

n - the number of groups of enterprises with different levels of production concentration;

g $_{\delta k,}$ g $_{pk}$ is the share of the enterprises of the k-th group in the total value of the fixed production assets in terms of growth, respectively, in the base and calculated years;

k $_{c}$ - the coefficient characterizing the relationship between the level of specialization of the enterprise and the reduction in the need for equipment;

α - share of equipment in the total value of fixed production assets;

y $_{\delta}$, y $_{p}$ - indicators of the level of specialization in the base and calculated years, respectively;

k $_{в\delta}$, k $_{вр}$ - weighted average coefficients of equipment use by time in the base and calculated years, respectively;

k $_{п\delta}$, k $_{пр}$ - weighted average coefficients of equipment use by productivity, respectively, in the base and calculated years;

φ $_{\delta m}$ - average capital intensity of production of the m-th stock item group of products in the base year;

l - number of stock item groups of products with different capital intensity of production;

d $_{\delta m,}$ d $_{pm}$ - the share of output of the m-th stock item group in the total output, in the base and calculated year, respectively;

k $_{tf}$ is the coefficient for comparison of unit labour and materialized labor requirements, characterizing the need for additional fixed assets for the release of one average annual worker (rubles / person).

k $_{p}$ - planned growth of labor productivity in the accounting year in relation to the base year.

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The increase in production concentration creates the prerequisites for the successful development of the second most important form of production organization - the specialization of enterprises. (8) High economic efficiency of specialization of enterprises from the region's production base is convincingly substantiated in the works of a number of scientists and specialists.

In addition, it will contribute to overcoming the crisis of the industry as a whole, what is characterized by the dynamics of the industrial production index for the Belgorod region (see Table 2).

Table 2.

	Year	January	February	March	April	May	June	July	August	September	October	November	December
Index of industrial production. %	in% to the previous month												
	2015	86.6	98.5	109.7	96.3	92.8	98.2	105.7	106.2	104.6	104.5	100.8	100.9
	2016	85.9	96.9	107.9	101.4	98.0	102.6	95.4	103.7	105.4			
	in% to the corresponding month of the previous year												
	2015	103.1	108.1	101.9	103.3	99.1	100.5	103.4	104.7	105.5	104.1	108.7	103.3
	2016	102.3	103.8	98.7	101.7	105.5	110.2	101.2	101.5	102.5			

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Period from the beginning of the reporting year in% to the corresponding period of the previous year											
2015	103.1	104.9	104.0	103.9	103.2	103.7	103.7	103.8	103.9	104.1	104.6	104.7
2016	102.3	103.3	101.6	101.9	102.7	105.4	104.8	104.9	104.1			

Index of industrial production

4. SUMMARY

The main direction of management in the field of capital productivity growth is the increase in the level of use of fixed assets. At the same time, it seems right to agree with the point of view of many economists who suggest that the attention for planned calculations should be focused on identifying reserves to improve the use of the most active part of the fixed production assets, namely, the park of equipment. (Gardiner B., Martin R., Tyler P.1998).

Lowing in the use level of equipment at the enterprises of the region's production base was due to a number of socio-economic, technical and organizational factors. (Nekrasov N.N. 1974)

Firstly, the understaffing of enterprises by industrial and production personnel and, in the first place, workers of the leading specialties, was systematically increased due to the predominant use of extensive factors in the development of the region's production base.

Secondly, the quantity of the specialized equipment (conveyors, automated technological lines, special equipment and adaptations, etc.) at the enterprises has increased. A full load of such equipment can be provided only under the condition of inter-branch unification of structures and parts, development of sub-specialization of enterprises. In the conditions of the existing disunity of the enterprises which form the region's production base and the adopted organizational structure for their management,

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the growth of the specialized process equipment fleet leads, as a rule, to a decrease in the time of its use, and, consequently, to a decrease in the return on assets.

Thirdly, a significant part of the whole-shift and inter-shift downtime of equipment (50-60%) is associated with unscheduled repair of equipment, interruptions in the supply of raw materials and consumables, semi-finished products, component parts, and other organizational reasons.

5. CONCLUSIONS

In solving the problems of growth in capital productivity as a result of improving the process of reproduction of fixed assets, industrial enterprises of the region play an important role. It should be noted that the return on capital grows in the industrial sector. In a number of works, it is shown that this growth was largely the result of a faster growth in the value of machinery compared to the increase in their productivity.

An important aspect of mobilizing reserves of growth in capital productivity is an increase in the share of the active part of fixed production assets in their total value. In this connection, it seems expedient to use planned calculations of active and passive capital intensity indicators (active to passive return on assets).

The complex process of renewing the fixed assets of the production base of the region for the purpose of its intensification presupposes the implementation of a wide range of measures to introduce new equipment, inventions and rationalization proposals aimed at improving the use of production capacities and fixed assets of enterprises, increasing labor productivity, saving material resources, organizing and expanding production of new effective management methods. The overwhelming majority of these measures are implemented in practice by means of technical re-equipment and reconstruction of existing enterprises, which ensures high rates of renewal of fixed assets.

At present, the nature of technical re-equipment and reconstruction of enterprises in the production base has changed significantly. The focus has been moved from increasing the production capacities of enterprises (although these goals are not excluded) to the change in the range of products, the improvement of technology, what contributes to improving the quality of parts, their economy and durability. In the long term, technical re-equipment and reconstruction related to mechanization and automation of technological processes, especially heavy labor-intensive support operations, will

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become more important in the future, which makes it possible to expand production without increasing the number of employees, and even if it decreases.

Improving the management of fixed assets is not a new direction for increasing the return on assets and improving the use of fixed assets of the organization, but it is given very little attention to, what contradicts the current trends in the development of the market economy.

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