

The intellectual component of the business of the construction industry enterprises

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Abstract. At present, the issues of interrelation and mutual influence of the results of intellectual activity on the final results of the functioning of an enterprise are becoming more and more current, since the world community demonstrates the colossal growth and progressive development of enterprises of various industries using intellectual levers. Russian enterprises also strive to improve the efficiency of the qualitative and quantitative indicators of their companies' activities, but at the same time use mainly material resources, which reduces the efficiency of resulting indicators. The article examines the indicators of the dynamics of economy and innovative development of the Russian Federation, presents the level of innovative activity of organizations in the period 2017-2019. The authors calculated the indicator of J. Tobin, which reflects the value of the intellectual capital of enterprises in the construction industry. The study showed that all the enterprises under consideration have intellectual capital, to a greater or lesser extent, however, its competent use and effective management are decisive in improving the efficiency of an enterprise.

Keywords: innovation, innovative, development, construction.

1 Introduction

Many researchers have proven the economic efficiency and the state need for the development of innovations, as well as their implementation in domestic industrial production, which is a catalyst for the industrial sector as a whole. The main task in this case is to identify and structure the existing intellectual resource of enterprises, which, with its effective management, becomes the capital of the enterprise, which forms innovations. Obviously, the issues related to the qualitative increase in the efficiency of innovation management and innovation potential at enterprises are very relevant. As noted, Vazquez E., Duarte J. Poerschke U. innovation as a digital basis for creating the design of building structures forms an increase in the consumer qualities of materials [1], while, as noted by Hüseyin E. I., Bekir Ö. A. Mehmet H. G, it is advisable to introduce at enterprises such a system of personnel motivation to create innovations, in which its effectiveness will be

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maximized [2] It is important to note that the construction industry is a capital-intensive sector of the economy and ensures the preservation of the life of society [3], Daisuke Y., Mitsuyasu I., Masaaki I believe that the intellectual component of the construction industry business forms the basis for innovative growth and development of the regional economy [4] Many foreign authors are of the opinion that intellectual capital is mainly the knowledge and skills of personnel, formed by them in the process of work, as well as in the development of new goods and services. So, for example, Linh V. Hong B., Boonchai S., Tamon U, Dongmin L., Minhoe K. Dongxia W., Mourad R., Mohammed EG, Rabah D., Rachid B., Bin L., Xiangping X ., Yixin S., Jun Y., Seyed MM, Iman Hajirasouliha emphasize that an innovative product can significantly reduce the cost of construction products, while ensuring an increase in the quality of construction products [5-9]. Modern views on the issues of hygrothermal behavior of a multilayer building envelope, the microstructure of cement paste during carbonization at atmospheric pressure and many other issues of the innovative development of construction industries are widely covered in the works of Sahil G., Sudhir M., Akunyumu, S., Fugar, FDK, Adinyira, E ., Danku, JC, Behzad K., Sherif M., Hassan K., Sonia L., Yanbin Zhang, Zhe Wang, Sheng Ding, C., Salleh, H. [10-14]. Scientist Anund Vogel in his scientific work conducted a study of the relationship of the motivational system for stimulating innovation in the construction sector using the example of the use of consulting contracts [15]. Akinosho, T. D., Oyedele, L. O., Bilal, M.Y. Chen, Y. Zhang, S. Moussaoui, M. Belgasmia in their works consider the assessment of the impact of the effectiveness of innovative construction and technological production on the level of comfort of modern buildings [16-17]. F. Clegg, M. Sears, M. Friesen, T. Scarato, R. Metzinger, C. Russell, A. Stadtner, AB Millerh, Fabbrocino, F., Belliazzi, Abouzar Jafari, Marco Preti class of estimated indicators for choosing an innovative project based on the «smart home» system [18-20].

The purpose of the article is to identify the presence of intellectual components of the business that affect the performance of enterprises in the construction industry.

The goal determined the setting of the following tasks:

1. To consider the dynamics of individual indicators characterizing the construction industry;
2. Identify tools for identifying intellectual capital;
3. To analyze the intellectual components of business in the structure of the value of enterprises in the construction industry

2 Methods

The modern methods and tools for complex analysis based on the systematization and structuring of thematic material, the market capitalization method of Jason Tobin have been used in the article. The approach proposed by J. Tobin makes it possible to identify that part of the company's value that is not reflected in the accounting documents of the company. It is the magnitude of the excess of the market value over the book value that determines the presence of an intellectual component of the business in the form of a recognized brand, positive-goodwill, etc. A significant excess of J. Tobin's coefficient $q > 1$ indicates the significant value of the company in the market. A sample of 20 companies/years was collected as a statistical material. The study resulted in conclusions about the amount of intellectual capital for the 5 largest construction industry enterprises of the Russian Federation.

2.1 Indicators of the dynamics of economy and innovative development of the Russian Federation

Currently, in the segment of industrial production and entrepreneurship in Russia, there is no doubt about the need to search for alternative mechanisms to increase labor productivity. An increase in the share of high-tech equipment, an increase in productivity, the development of new methods and systems of goods production, and trends in innovative development in the country as a whole indicate the high importance of the intellectual component in the organization of the production process. And this applies not only to high-tech sectors of the economy, but also to those that are quite competitive and highly productive in view of the high demand for manufactured products. (Fig. 1).

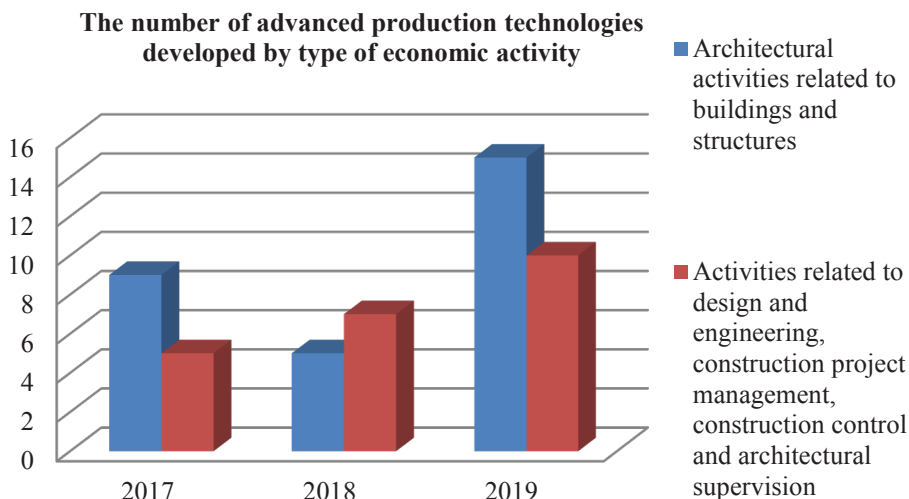


Fig. 1. The number of advanced production technologies developed in the Russian Federation [21]

Along with this, in Russia, there are also difficulties with methodological support and the lack of large-scale practice of the process of systemic management of intellectual assets. Many researchers hold the opinion that investment in intellectual capital is the basis for innovative development, which allows generating and stimulating the process of developing innovations.

Human capital asset as an element of intellectual capital is a highly valuable tool for the formation of an intellectual environment and innovation space, however, today in this issue Russia is far from leading positions in world rankings. Moreover, the trends in innovation activity by type of economic activity are regressive (Fig. 2).

Moreover, the value of the indicator of innovative activity of Russian enterprises correlates with the dynamics of changes in the indicator of government internal expenditures on research and development, which was exponential in the period 2011-2017, but by 2018 it decreased by 0.1 share (Fig. 3).

**The level of innovation activity of organizations
in the Russian Federation by type of economic activity**

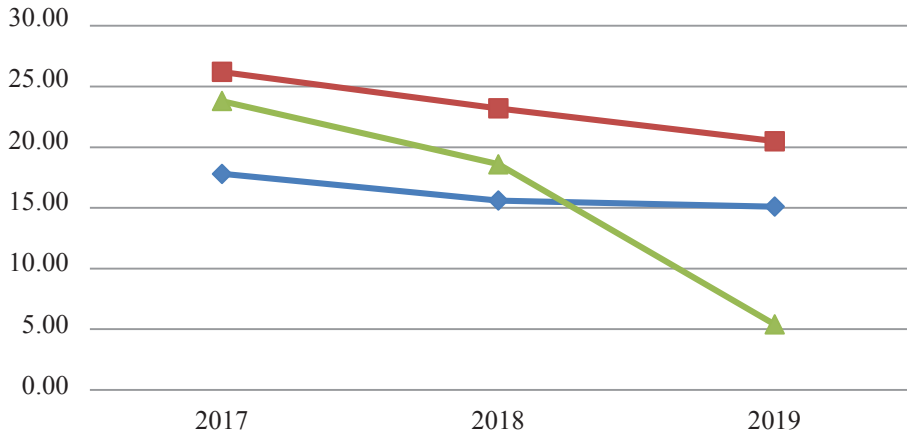


Fig. 2. The level of innovative activity of organizations in the Russian Federation [21].

**Internal expenditures on research and development,
percentage of the gross domestic product as a whole
for the Russian Federation**

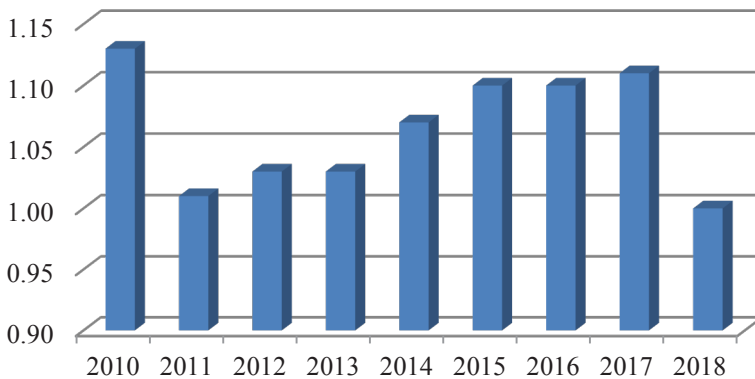


Fig. 3. Dynamics of the indicator of internal expenditures on research and development, in % of GDP [21].

The strong interconnection of intellectual capital with production processes significantly affects the result of production activities, ensuring an increase in productivity and efficiency of the system, while issues related to the theoretical and practical principles of the effective use of intellectual capital at all stages of the life cycle of production and sales of products are of particular importance. It should be noted that intellectual capital influences all processes of the production system: technological, financial, managerial, marketing, etc. The intellectual resource is the basis for the strategic plans of various directions. The efficiency and well-being of the entire system as a whole depends on the state and development of the intellectual component of business. In this regard, the

successful development of individual economic systems, as well as the economy of the state as a whole, is largely determined by their ability to create, use and reproduce intellectual capital, the basis of which is knowledge, information, competence, etc.

2.2 The role of intellectual capital in the business processes of an enterprise

Some researchers consider intellectual capital as a certain potential that allows, on its basis, to create unique innovative products and services, goods, sell a larger volume of products and successfully operate in the industry market, others define it as a set of non-property elements with a deterministic algorithm of use and reproduction.

From our point of view, the value of intellectual capital should always be considered in the context of the actually expected income from intellectual activity and, on this basis, should be expressed by the corresponding value.

Intellectual capital is a resource of an enterprise that acts as a catalyst for the growth of profits through the use of a system of knowledge and information that makes it possible to make the activities of an enterprise more efficient. It sets the pace and nature of the renewal of production technology, products that are effective competitive advantages in the market. Intellectual capital is capital in knowledge and abilities that allow bringing regular income to the owner.

3 Results and discussion

To date, a large number of methods for assessing intellectual capital have been developed and are being implemented, which have both advantages and disadvantages.

The method for assessing intellectual capital, proposed by James Tobin, is to find the component of value that is not reflected in the financial statements, but which allows you to «see» the increase of the market value in relative indicators. The sought quantity is determined by the ratio of the market price of an enterprise to the replacement price of its fixed assets. It is proposed to use the official indicators of capitalization from the stock market as the market value of an enterprise, and for the indicator of replacement of real assets – an enterprise's net assets, which are publicly posted in the balance sheets on the official websites.

Using the data in Table 1 and Table 2, we will assess the intellectual capital of the largest construction companies in Russia.

Table 1. Market capitalization of the largest construction companies of the Russian Federation [22-26].

Companies	Period			
	2017	2018	2019	2020
PAO «Group LSR», RUB bn	85.2	59.9	76.6	87.3
PAO «Group of companies PIK», RUB bn	215.7	248.5	264.5	395.4
«Etalon» Group, RUB bn	30.9	32.3	33.5	36.7
PAO»GC FSK», RUB bn	258.8	206.6	188.8	255.7
PAO GC «Ingrad», RUB bn	5.37	14.8	12.5	19.8

Table 2. Balance sheet value of construction companies of the Russian Federation [27-31].

Companies	Period			
	2017	2018	2019	2020
PAO «Group LSR», RUB bn	86.4	94.4	112.2	137.5
PAO «Group of companies PIK», RUB bn	218.3	245.9	201.3	207.2
«Etalon» Group, RUB bn	129.3	124.5	171.3	180.6
PAO «GC FSK», RUB bn	113.2	185.6	199.6	215.0
PAO GC «Ingrad», RUB bn	4.3	15.8	15.55	16.13

Thus, using the market capitalization method proposed by J. Tobin for construction companies, the following results were obtained (Fig. 4)

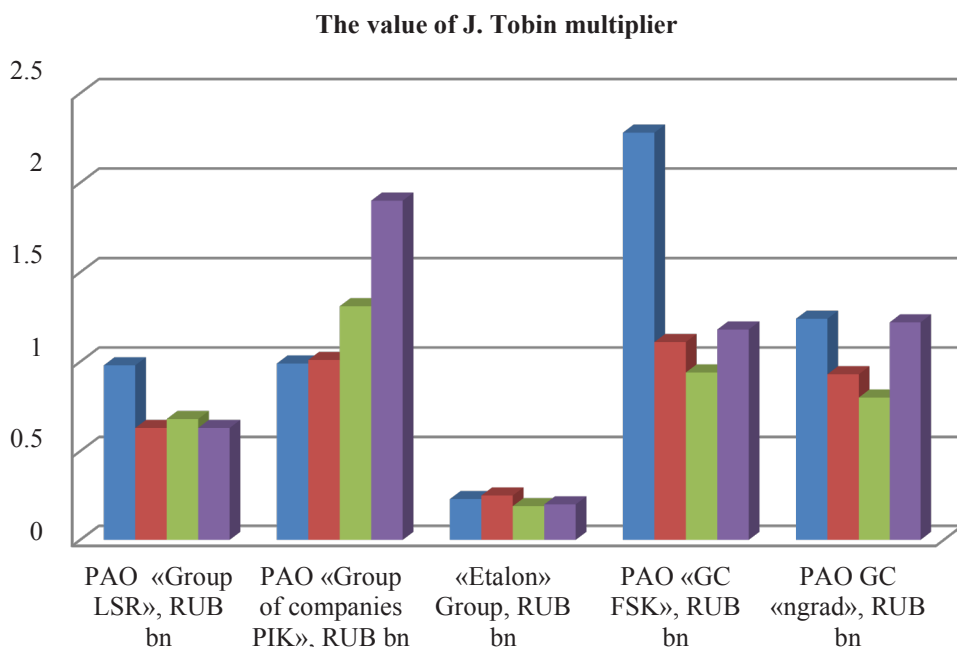


Fig. 4. Diagram of values of the multiplier of J. Tobin for construction enterprises of the Russian Federation.

The approach proposed by J. Tobin makes it possible to identify that part of the company's value that is not reflected in the accounting documents of the company. It is the magnitude of the excess of the market value over the book value that determines the presence of an intellectual component of the business in the form of a recognized brand, positive-goodwill, etc. [32, 33]. A significant excess of J. Tobin's coefficient $q > 1$ indicates the significant value of the company in the market. As can be seen from Figure 4, «Group of Companies PIK» and «Group of Companies FSK» are generally attractive to investors and the market «sees» their value. In addition, in 2017, the «Group of Companies FSK» recorded a high level of intellectual components in the value of the business, the enterprise was estimated more than twice as high as its balance sheet value.

It should be noted that J. Tobin's indicator is an indicator of monopoly rent, acting as the equivalent of a higher profit. In world practice, the following pattern has been recorded: a high value of the indicator of intellectual capital reflects the feasibility of investing in

technology and human capital, since an increase in market capitalization indicates the effectiveness of such investments.

The rest of the companies examined showed a lower value of the intellectual capital indicator, which shows that the market value of enterprises is underestimated, the market «does not see» a value greater than that reflected in the accounting reports. In addition, it is also important to understand the company's development trend, for example, PAO «Group of Companies PIK» has a high intellectual capital. J. Tobin's indicator reflected the growth of intellectual capital from 0.99 to 1.9 for the 4 analyzed years by almost 200 %. It is worth noting that the financial statements of this enterprise recorded a decrease in the book value from 218.3 billion rubles in 2017 up to 207.2 billion rubles by 2020, despite the fact that investors were actively investing in the company's asset, increasing its market value by 2020 by 83 %.

As for large industrial enterprises in Russia today, there is a need not so much to assess intellectual capital as such in absolute or relative terms, but to analyze its impact, including its components - human, organizational, market capital on the ability to remain financially stable, competitive and in demand in the market.

Intellectual capital, like any asset, needs competent management and the ability to grow, which entails the search for tools for effective management and impact.

4 Conclusions

The intellectual capital of an enterprise is formed during the entire life cycle of production activities and is a capital that grows and reproduces over time. The study showed that all the enterprises under consideration have intellectual capital, to a greater or lesser extent, however, its competent use and effective management is decisive in improving the efficiency of an enterprise.

Based on the analysis, it is advisable to formulate recommendations for the development of the construction industry in the Russian Federation:

1. Stimulation at the state level of the innovative activity of organizations in the field of construction technologies that meet global trends.
2. In accordance with the needs of society, actively implement green standards and green construction in Russia;
3. Expediency to clearly regulate the relationship of rights and obligations of participants in the design and construction process, to establish upper standards of profit margins for socially significant and other projects;
4. Due to the high capital intensity of the construction industry, the length of the production cycle and, as a consequence, the high financial risks for investors, it is advisable to provide state support (program) to reduce them.

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