

## **Financial analysis of the construction company's product quality management system**

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**Abstract:** This scientific study considers the issues of financial analysis of the construction company's products quality management system. The functioning of this system is of great importance in the activities of a construction company, since the quality of products is one of the main evaluation criteria of its activities; therefore, the analysis of the financial component of this system is of primary importance in terms of evaluating the final quality of construction products. The relevance of the subject matter is determined by the need for a thorough study of the features of the functioning of construction enterprises in terms of the financial component of the activity of the quality management system of manufactured products in order to create effective control tools and improve various aspects of their activities. The purpose of this study is to identify the main aspects that affect the financial performance of construction companies in terms of trends in improving the quality of products. The leading approach in this study is a combination of a system analysis of the features of the functioning of enterprises in the construction sector with an analytical study of the financial component of the activities of enterprises in the construction sector in the context of the functioning of the product quality management system of these companies. The main results obtained in the course of this study should be considered an assessment of the economic efficiency of the activities of the construction organisations selected as an example of quality management systems in Almaty, as well as a statement of differences in the activities of the construction companies selected for the analysis of quality management systems. The applied value of this study

is determined by the possibility of practical application of the results obtained in the course of it to develop optimal criteria for assessing the quality of the functioning of the quality management system of a construction organisation in the context of the financial aspect of its activities.

Keywords: return on assets, construction business, quality audit, production costs, economic efficiency.

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## 1. Introduction

The construction sector is closely connected with the economic processes in society and the situation in the country; therefore, it is influenced by the phenomena and trends of the social and economic development of society and the situation that has developed in it in general. Construction companies, in order to remain competitive in such periods, are forced to look for progressive ways to manage their activities. The most modern scientific approaches, principles, methods, and models of management of a construction organisation in general are reduced to a single thesis: without improving the quality management of production, an effective increase in the competitiveness of a construction company is impossible [1; 2]. Therewith, one of the most substantial problems of improving the competitiveness and sustainability of construction enterprises is the effective management of ensuring the required level of quality of manufactured commercial construction products. Effective management in most cases refers to the ability of the management system to ensure the required level of quality of construction products due to the correct organisation of production in accordance with the price-quality ratio determined by the market segment where it is consumed [3; 4]. Therewith, to correctly assess the effectiveness of the functioning of the quality management system for manufactured construction products, it is necessary to consider the economic result from its practical application.

The basis of the financial and economic activities of enterprises should be an effective management system. In various companies, enterprises, as well as objects of economic activity, such a system differs in the functional orientation of its elements. This also applies to construction companies. This happens due to various reasons, but the main

thing is that all economic entities differ both in their scale and types of activities, as well as in their legal forms [5-7]. At the same time, the quality management of construction products implies the need to consider a number of components specific to this particular industry. The quality problem was and remains one of the most acute problems of the construction industry. This is conditioned by the fact that the manufacturer, taking advantage of the high demand for commercial construction products, often does not meet the basic requirements for its quality. Another of the main reasons for this state of affairs in construction is the lack of effective methods for assessing and managing the required quality of construction products [8-10]. In addition, the market demand for specific construction products is essential, which, in contrast to its quality, acts as a direct, initial criterion for accurately determining its consumer properties. As for the quality itself, this indicator, describing the "internal properties of construction products", is only a derivative of a particular market need, which can, apart from the consumer value, almost completely determine its competitiveness in the construction market. Thus, the main criterion for assessing the quality of a particular type of construction product should be the consumer value that meets the condition that the consumer of two objects with approximately equal quality will choose an object with a lower cost [8]. In relation to the issues of financial analysis of the functioning of the quality management system of construction products, this fact is of paramount importance.

Notably, to create the conditions necessary for the financial well-being of a construction company, systematic monitoring and analysis of its financial performance are required. The same applies to the analysis of the financial condition of the quality management system of a construction

organisation. If necessary, corrective and preventive actions to improve the situation should be developed and implemented. And if it turns out that financial problems are derived from quality problems, then the latter cannot remain outside the scope of professional interests of the financial manager [11]. In other words, the problems of product quality of a construction organisation are largely related to the lack of a clear, well-thought-out system for regulating the issues of timely assessment of the quality of construction products, in the context of the costs involved in creating and regulating the functioning of a quality management system for construction products. The issues of financial analysis of the functioning of the quality management system of a construction organisation require a detailed study, in relation to the realities of the functioning of each specific construction company.

## 2. Literary Review

A review of the literature covering various aspects of the financial analysis of the construction company's product quality management system clearly demonstrates the variety of scientific approaches to the study of the subject matter. Thus, upon studying the issues of marketing management of the construction sector in the Republic of Kazakhstan, A. Zh. Kydyrbayev [12] notes that real estate is one of the most complex, exclusive, and socially significant goods, which requires specially developed marketing methods. Therewith, the research scientist notes that the marketing strategy of any construction company, without exception, allows understanding how to plan and implement all kinds of activities in the company aimed at implementing plans and tasks. It is related to issues aimed at increasing the company's sales and revenue [12]. For its part, the team of authors represented by Z. A. Mebaduri, T. V. Uchayeva и D. A. Burlakov [1], in a joint study of quality management issues of a construction company, emphasise that the price criterion is the most important criterion for stimulating the quality of construction products, while the price formation is influenced by the consumer properties of

construction products, as well as the ratio of supply and demand. The competitiveness of construction products is directly proportional to their quality, but inversely proportional to the price. Competitiveness management is possible while ensuring an optimal quality-price ratio. It is possible to ensure a relatively low cost of production only by reducing production costs, managing costs, but without reducing the quality characteristics of construction projects.

In turn, A. Sh. Magdiyev and M. N. Karakhanov [3], upon examining various aspects of assessing the effectiveness of product quality management of a construction company, point to the fact that the cost of improving the quality of construction products is directly related to the increase in the cost of its production, which also affects the cost of its implementation. Therewith, the manufacturer provides an increase in the economic effect of consumption, which in turn affects the reduction of operating costs of finished construction products. Thus, there is a close interrelation between various factors that determine the ratio of price and quality of products of a construction company, which is emphasised by the authors. Researchers V. B. Melekhin and A. Sh. Magdiyev [8] pay attention to the competitiveness of construction products in the market, as a fundamental criterion for assessing their actual quality. According to scientists, competitiveness is usually understood as a characteristic of the final construction product, reflecting its difference from the products of a competitor, both in terms of a higher degree of compliance with specific public needs, and in terms of lower costs for its provision. Meanwhile, the quality of construction products is understood as its ability to optimally meet the needs of the customer, at minimal cost [8]. In part, this opinion is shared by T. A. Lunina [11], who explores the issues of cost management problems related to the quality of construction products. According to the researcher, conventional ideas about the costs associated with quality usually take into account only the costs of the company arising from the non-compliance of the manufactured products with the requirements, without determining

the damage from the lack of efficiency of production processes. The problem with cost management is that it is often possible to identify and estimate only a small part of the costs, mistakenly believing that all possible components have been identified.

Researchers A. V. Sharkova, T. I. Chinayeva and A. S. Klepatskaya [13], in their joint analysis of the construction company's activities from the standpoint of studying profit opportunities, note that construction is one of the types of economic activity and a key fund-forming industry that has a substantial impact on the economy and the growth of the well-being of the country and its economic entities. This is a branch of the national economy intended for the commissioning of new, as well as the reconstruction, expansion, modernisation, technical re-equipment, and capital repairs of existing industrial and non-industrial facilities. The authors also draw attention to the fact that the construction industry has the main task of creating conditions for the development of the state's economy. The construction sector belongs to the category of the most important sectors of the economy, which makes it necessary to create and implement high-quality tools for conducting financial analysis in this industry [13]. Thus, the comparison of the opinions of researchers on the issues submitted for consideration reflects the urgent need for their deep and comprehensive study, in order to determine the factors that affect the components of the financial analysis of the quality management system of the construction organisation.

### 3. Materials and Methods

This scientific study sets the task to investigate the issues of financial analysis of the construction company's products quality management system. The objects of the study are construction companies in Almaty (Kazakhstan), in the context of the functioning of the quality management systems of their products and the assessment of the financial aspect of the activities of these systems. The leading approach in this study is a combination of a system analysis of the features of the functioning of enterprises in the construction sector with an analytical

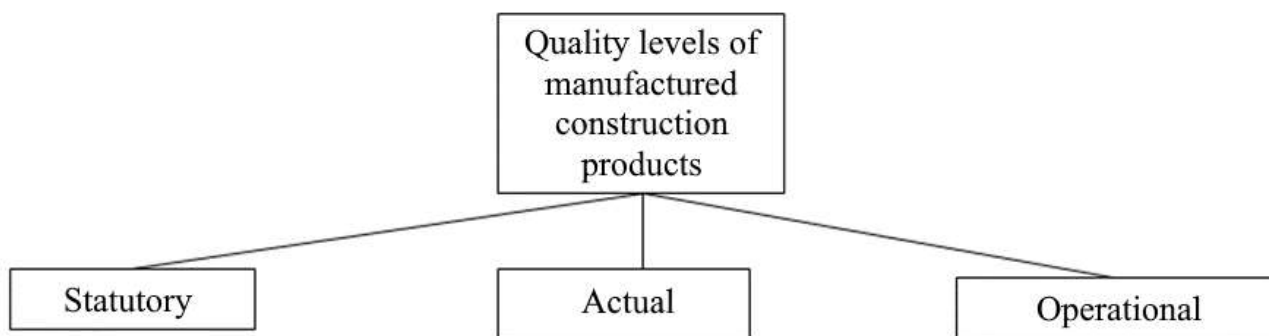
study of the financial component of the activities of enterprises in the construction sector in the context of the functioning of the product quality management system of these companies. The system analysis of the features of the functioning of the enterprises of the construction sector is carried out based on the available scientific publications within the framework of the subject of scientific research, which, in combination with an analytical study of the financial aspect of the functioning of the quality management system of the enterprises of the construction industry, provides the development of a complete and objective picture of the scientific research of the subject matter. Conducting a systematic analysis of the activities of construction companies in general and in the context of studying the functioning of the product quality management system of these enterprises helps to identify factors that affect the financial component of the activities of the quality management system of construction companies, which generally contributes to the search for answers to the questions identified by the subject under study.

A deep analytical study of the financial aspect of the functioning of the quality management systems of construction campaigns is intended to shape a complete picture of the study and to develop the material for the preparation of the final conclusions of this scientific study. To expand the understanding of the activities of construction companies and the functioning of quality management systems for construction products in the context of the analysis of the financial component of their activities, some of the materials for the analysis are taken from publications in foreign sources containing scientific developments of foreign authors in the chosen research area. To facilitate the perception of information and create the highest quality, detailed and objective picture of scientific study, all materials taken from publications in foreign sources and cited in this scientific study are translated into English. The chosen combination of materials and methods of scientific study meets the subject matter and contributes to its maximum quality coverage

with the development of objective conclusions that reflect the essence of the subject matter. The methodology of this study involves the identification of the main structural elements that determine the line of research in the context of the subject, and contributes to the identification of factors that affect the quality of financial analysis of the activities of construction companies in relation to construction companies in the Republic of Kazakhstan in general and the city of Almaty in particular. In general, the chosen combination of materials and methods of this study can be used in the future to conduct further scientific research.

### 3. Results

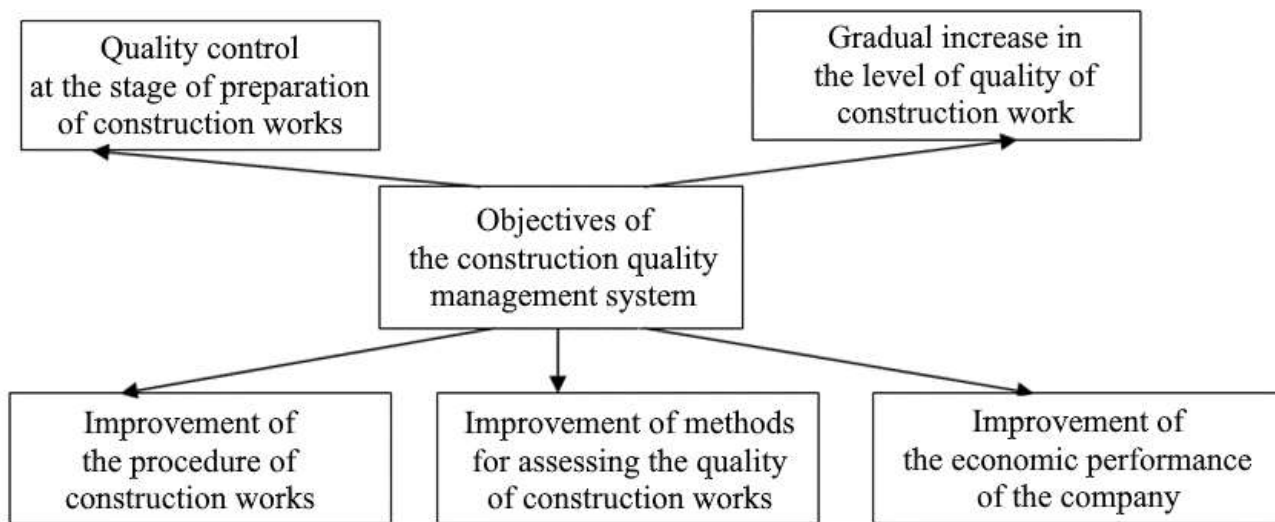
Scientific study on the issues of financial analysis of the quality management system of construction companies has led to the following results. A study of the activities of companies located geographically in Almaty (Republic of Kazakhstan) was conducted. As an example, the following construction organisations were selected: limited liability partnership (LLP) "KazMirStroy", LLP "Simaks Solano", LLP "Bramir Company". The study of the components of the activity of the quality management system at these enterprises allows identifying the concepts of the quality level of the manufactured construction products that are common to these organisations (Figure 1).



**Figure 1.** Quality levels of products produced by construction companies in Almaty

The statutory level of product quality is determined by the requirements of the State Standard (GOST), as well as other statutory documents. The statutory level of quality of the final products of construction companies is regulated at the stages of scientific and experimental research, based on the need to solve socio-economic problems, the prospects for the development of the scientific and technical procedure, the technical and economic capabilities of the country. The actual level determines the quality of specific

products of construction companies, achieved at the stages of design development. The actual level of quality at the design stage depends on the degree of compliance with its statutory level. The operational level of quality is manifested and maintained at the stage of operation of completed construction projects. In general, the quality management systems of the construction companies under consideration have the same objectives, which are schematically presented in Figure 2.



**Figure 2.** Tasks of the construction work quality management system

The head of the construction company is directly responsible for the development and implementation of the quality management system of the construction company. In the context of the analysis of the financial component of the activity of the quality management system of these companies, it is necessary to note the

differences in the values of indicators that determine the effectiveness of the functioning of product quality management systems at construction enterprises in Almaty, taken as an example in this scientific study. The comparative values of the indicators taken for the study are presented in Table 1 (data are presented for 2020).

**Table 1.** Indicators that determine the effectiveness of the functioning of product quality management systems at construction enterprises (Almaty)

No.	Indicators	Units	KazMirStroy LLP	Simaks Solano LLP	Bramir Company LLP
1	Volumes of products sold	thousand tenge	3,564.56	2,845.78	3,245.98
2	Total cost of production	thousand tenge	1,287.45	1,564.76	1,376.34
3	Unit costs	tenge	1,207.8	1,085.18	1,179.79
4	Costs of the quality management system activity	thousand tenge	885.4	786.8	825.34
5	Losses on product defects	thousand tenge	30.2	28.8	27.5
6	Total product profitability	%	25.6	24.4	24.8

The data in Table 1 demonstrates that the profitability of the construction company's products directly depends on the efficiency of the quality management system, in the context of reducing the costs associated with losses on product defects, its cost price, as well as the costs of operating the quality management system in general and increasing the volume

of products of construction companies. In the context of the subject matter, it is advisable to present a comparative description of the features of the activity of the product quality management systems of the mentioned companies in Almaty. The data is presented in Table 2.

**Table 2.** Comparative characteristics of the functions of the quality management systems of construction companies (Almaty)

	KazMirStroy LLP	Simaks Solano LLP	Bramir Company LLP
Content of the functions of the quality management system	Coordinates the activities of all departments for product quality control. Provides high-quality verification of compliance of manufactured products with the declared performance characteristics	Supervises the development and implementation of measures to ensure a comprehensive audit of the quality control of the company's products	Provides inspection control of the quality of the company's products in accordance with the planned indicators and in accordance with the stated operational requirements

The information presented in Table 2 demonstrates that the quality management systems of the construction organisations that were taken as an example perform similar functions, with non-fundamental differences that relate mainly to the internal organisation of activities at enterprises. The effectiveness of the quality management systems of the construction companies of Almaty taken as an example in the context of financial analysis is assessed according to the following aspects: audits of financial activities, calculations of the ratio of costs and losses directly related to ensuring the proper level of quality of products, maintaining the pace of strategic development of enterprises. The management of construction companies regularly analyses the financial performance of the quality management systems of enterprises at specified intervals. The analysis is intended to correct the goals in the field of compliance with the quality standards of construction products and control of the system costs. Tasks of the financial analysis of the quality management system are as follows:

- to ensure compliance of the quality management system parameters for all elements of the selected financial model of the company's activities;
- to implement the financial policy in the field of product quality control;
- to ensure maintenance of the proper quality parameters in the context of the specified consumption characteristics;
- to determine the need for corrective and proactive actions aimed at improving the financial performance of the quality management system;
- to prioritise expenses for the activities of the quality management system.

As an example, the study considered the economic efficiency of the quality management system of construction products

of the company "KazMirStroy" LLP for the fiscal year 2020. To perform the necessary calculations, the initial data were as follows:

1. The total volume of products sold – 3,564.56 thousand tenge.
2. The total cost of production – 1,287.45 thousand tenge.
3. The cost of the quality management system – 885.4 thousand tenge.
4. The cost of producing a unit of production – 1,207.8 tenge.

In this case, the value of the programme indicator for controlling the output of a unit of production can be determined according to the formula:

$$R_{pr} = C_{qms}/C_{pr}=885,400/300 = 2,951.3 \quad (1)$$

where:  $C_{qms}$  – the cost of the quality management system;  $C_{pr} = 300$  work hours – the labour intensity of the output of one unit of production.

Accordingly, to determine the price parameter of one conventional unit of production of a construction company, the following ratio should be used:

$$P_{pru}=OR/R_{pr}=3,564,560/2,951.3=1,207.8 \text{ tenge} \quad (2)$$

The economic efficiency of the quality management system of a construction company in this particular case is determined by the ratio of the total prime cost of annual production to the price of a conventional unit of production:

$$E_{ef}= P_{pr}/ P_{pru}= 1,287.45/1,207.8 = 1.067 \quad (3)$$

This indicator demonstrates the high economic efficiency of the quality management system of KazMirStroy LLP in the 2020 financial year. The high economic efficiency of the construction organisation in

general contributes to strengthening the investment attractiveness of the company. In the current economic conditions, the attractiveness of a construction company for potential investors is of great importance, since it is directly related to the strengthening of its overall financial condition. The success of the quality management system of any construction organisation is determined by the maintenance of high quality standards of manufactured construction products, combined with a tendency to reduce the cost of its production. Consumer requirements for the quality of construction companies' products are gradually increasing, which leads to stricter requirements for the quality management system of construction companies, including in the context of the financial aspect of their activities.

The profitability of the products of construction companies depends on a number of factors, among which an important role is played by compliance with quality standards and the cost of production. Therefore, in the current conditions, the quality management system of a construction company is entrusted with a great responsibility for maintaining compliance with the specified standards and minimising the costs of its production. In general, the financial analysis of the activities of quality management systems taken as an example of construction organisations in Almaty demonstrates the high economic efficiency of their activities, which should have a positive impact in the future on the pace of development of the construction industry in the Republic of Kazakhstan in general and the city of Almaty in particular.

#### **4. Discussion**

The discussion of various aspects of the financial component of the activities of construction organisations by scientific researchers clearly demonstrates the diversity of opinions on the issues raised in the subject of this study. Thus, the team of authors represented by T. A. Bogatova, N. V. Alekseyeva and S. A. Shigilcheva [14], in a joint study of various aspects of the analysis of the financial performance of an organisation, points out the importance of conducting such an analysis in principle.

According to the researchers, in the market economy, the indicators "profit" and "profitability" occupy a central place in the system of economic indicators of the organisation, while maximising profit is the primary task of financial management. For this reason, the analysis of the report on financial results allows solving the following tasks: analysis of the dynamics of all profit indicators; determination of the impact of factors affecting profit; analysis of profitability indicators in dynamics; identification of reserves for profit growth. On their part, A. V. Sharkova, T. I. Chinayeva and A. S. Klepatskaya [13], analysing the activities of construction industry enterprises in the context of studying profit indicators, note that the financial component of the activities of construction organisations is the provision and distribution of financial resources. The competitiveness of any organisation depends on the rational management of financial resources. Furthermore, the authors address the fact that, given the rather difficult conditions in which construction organisations operate in recent years, it is advisable to develop a system of measures aimed at preventing insolvency and improving the efficiency and competitiveness of construction organisations. One of such measures is to increase profits, which creates a stable basis for the organisation's activities. Achieving the maximum amount of profit and the level of profitability determines the main goal of business activity, protects the interests of owners and reduces the risks of liquidation and bankruptcy of business structures [13].

At the same time, A. D. Yakhno [15], upon assessing the solvency of a construction company as a factor of effective management, points to the crucial role of the financial component in the activities of the construction company. The author notes that the competitiveness and solvency of a construction company are determined primarily by the rational organisation of finance. The issues of financing and lending are particularly complex in the construction sector due to the technical and economic features of construction production. The financial condition of the enterprise is constantly interested in the construction



participants, especially creditors (commercial banks) [15]. In a joint study of possible ways to improve the financial stability of a construction organisation, A. A. Grigoryeva and O. Ye. Pirogova [16] indicate the dependence of the indicator under consideration on a variety of factors, both external and internal. According to the researchers, the financial stability of an organisation depends on both internal and external factors. Internal factors are influenced by the degree of management of the organisation's activities, the level of development of financial management, the degree of coherence of the company's work as a complex structure of interrelations. External factors do not depend on the internal activities of the company. The authors also address the fact that currently there are a considerable number of methods of financial analysis of the organisation, each of which has its positive and negative sides [16].

In turn, in a joint study of the issues of improving the tools for analysing the financial condition of construction enterprises, M. A. Vlasenko and I. V. Baranova [17] indicate the presence of several factors that have a substantial impact on the financial condition of construction industry companies in modern conditions. According to researchers, a major issue in the process of assessing the financial stability of construction organisations is the fact that the recommended values of the coefficients of liquidity, solvency, and financial stability, presented in the economic literature, do not reflect the specific features of the industry affiliation of the organisations under study [17]. In a joint study of the issues of financial and economic activities of construction organisations in modern conditions, Ye. S. Sergushina, S. Ye. Sergushin, Ye. A. Vechkanova and A. V. Morozkina [18] note the importance of a correct financial assessment of the activities of an enterprise in any field of activity from an economic standpoint. According to the researchers, the assessment of the financial situation of an organisation describes its activities in terms of prestige for investors, business activity, credit, and competitiveness in a particular industry. At present, the economy is in an unstable position, which

forces the organisation to review the terms and conditions of agreements with customers and suppliers, as all the efforts of management are aimed at reducing costs and economic risks. This situation also affected the construction industry. In addition, researchers note the role of the construction industry in the economy of the state in general and in the context of the subject of the study in particular. Construction constitutes one of the most important sectors of the economy both in Russia and in the world. It accommodates about 10% of the employed population and the country's strategic reserves. The global crisis that is currently being observed has led to negative consequences that have led to changes in the internal housing and construction market [18].

The issues under consideration are reflected in the studies of foreign researchers investigating various aspects of the financial analysis of the management system of enterprises in the construction industry. In particular, M. Shahpari, F. M. Saradj, M. S. Pishvae, S. Piri [19] note the importance of high-quality financial analysis in the activities of various structures of a construction company. According to the authors, planning, cost, and quality are the most important factors that determine the productivity and efficiency of the construction company. For their part, the researchers Y. Pan and L. Zhang [20], who study the use of artificial intelligence in construction, note the essential importance of a qualitative analysis of the financial component of the construction company's activities for its due functioning. The authors draw attention to the fact that financial analysis in the construction industry is extremely important from the standpoint of maximum ordering of the organisation's activities, in the context of taking into account all the components of the material side of its activities [19]. Thus, the majority of researchers point to the importance of financial analysis in the activities of various structures of a construction company and the variety of methods for performing such analysis. This determines the broad prospects for the development of the subject matter in the future and the need to expand this area of research.

The activity of the quality management system of a construction company is of great importance from the standpoint of creating the necessary conditions for quality control of the company's products, maintenance of its competitiveness in the market and requires a financial analysis that takes into account the various components of the quality management system of a construction company. In the current situation caused by the global economic crisis, a considerable number of construction organisations are forced to reduce the volume of announced plans and implement such measures as reducing the volume of housing stock commissioning, freezing the construction of new construction projects, selling sites previously received for construction, etc. These circumstances lead to a decrease in the level of business activity, as well as negatively affect the profitability of construction projects. The importance of financial analysis of the activities of construction companies in general and their individual systems in particular is also determined by the current market relations. Analysis of the financial and economic components of the construction organisation's activities allows correctly determining the amount of internal funds, and then estimate the ability to engage in economic activities. Indicators of the profitability of the construction company, the business activity and investment attractiveness should be at the proper level, which would contribute to the growth and development of the construction industry in general, as well as have a positive impact on the economic development of the state.

## 5. Conclusions

The study of the financial analysis of the construction company's product quality management system led to the following conclusions. Financial analysis involves the consistent consideration of a number of factors that affect the quality of the functioning of the quality management system of a construction organisation, such as the economic efficiency of the quality management system, the total cost of production and the costs of the operation of

the product quality management system. Comparison of the considered parameters suggests the overall effectiveness of the quality management system of a construction company in the context of managing its financial activities. In modern realities, a qualitative analysis of the financial and economic activities of construction companies is of significant importance, since it allows timely identification of problems in the activities of these companies, thus contributing to the maintenance of high indicators of their cost-effectiveness and profitability. Therewith, the analysis of the financial activities of a construction company constitutes a set of measures to identify crisis situations, as well as to identify opportunities for their practical resolution.

The conducted scientific research testifies to the high financial stability of the quality management systems of the construction companies of the city of Almaty, taken for consideration as an example. The profitability indicators of enterprises have high values, which indicates the stability of the financial situation of the construction organisations in general and their product quality management systems, in particular. Positive trends in the growth of profitability indicators taken as an example of the construction companies of the city of Almaty indicate the stable functioning of the quality management systems of these organisations and constitute the basis for developing a positive forecast regarding the prospects for the development of the construction companies in question in the future. Therewith, the trends taking place in the economy of the Republic of Kazakhstan in general and in the construction industry in particular require improvement of scientific approaches to the consideration of financial analysis of the activities of construction enterprises and their individual systems, which, in turn, necessitates further in-depth and comprehensive study of various aspects of the financial component of the activities of construction companies in the Republic of Kazakhstan.

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I declare that the authors have no competing interests.

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The authors have no conflicts of interest to declare that are relevant to the content of this article.

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