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FINANCIAL SUPPORT OF THE ADAPTIVE MANAGEMENT SYSTEM OF CONSTRUCTION ENTERPRISES

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ABSTRACT

The article examines the impact of financial support on the management of economic entities and develops a methodical approach to assessing the level of financial support of the system of adaptive management of construction companies. It is noted that today the introduction of modern management systems into the practical activities of construction companies, capable of adapting business entities to the existing conditions of doing business, is of particular importance. It is the financial support that needs special attention in the system of adaptive management of construction companies. The main existing approaches of Ukrainian and foreign scientists to the definition of «financial security» of economic entities are considered. It is established that the financial support of construction companies has certain features related to the specifics of production and economic activities and existing management systems. It is emphasized that the financial support of construction companies significantly affects the overall management system and effective management decisions, due to the possibility of creating certain conditions to maximize net cash flow, the growth of which will increase the self-financing of the entity and reduce its dependence on external sources. The key characteristics and features of financial support of the system of adaptive management of construction enterprises are highlighted. It is concluded that the proposed methodical approach to assessing the level of financial support of the system of adaptive management of construction companies allows to build a universal reliable simulation model with a predetermined level of efficiency and the ability to make additional changes. It is proposed, in the future, to assess the level of financial security of construction companies as an element of adaptive management, which will certainly allow you to make effective management decisions on all activities of the business entity.

Keywords: financial support, construction enterprises, adaptive management, system, methodical approach, estimation

JEL Classification: C13, G20, L74

INTRODUCTION

The construction complex occupies an important place in the development of the country's economy, as the growth of the performance of almost all sectors of the national economy and the solution of many social and economic problems depend on the state of its functioning. Today, the introduction of modern management systems in the practical activities of construction companies, capable of adapting business entities to the existing conditions of doing business, is of particular importance. It is the financial support that needs special attention in the system of adaptive management of construction companies.

ANALYSIS OF RESEARCH AND PROBLEM STATEMENT

The works of many scientists and practitioners are devoted to the issue of adaptive management of enterprises, including construction. Among them: S. Alekseev, [1], A. Bursak [2], S. Kravchenko [3], Y. Pinda [4], O. Raevneva [5] and others.

Modern aspects of financial support of construction companies have been studied in the

works of many Ukrainian scientists. Among them: K. Dakas [6], A. Polyaneck [7], K. Trubayeva [8], T. Fesenko [9] and others.

Despite the significant achievements of these authors, the issues of developing methodical approaches to assessing the level of financial support of the system of adaptive management of construction companies are unresolved.

The purpose of the article is to develop a methodical approach to assessing the level of financial support of the system of adaptive management of construction companies.

RESEARCH RESULTS

In a general sense, the management system of the enterprise is a continuous interaction and coordination of actions of personnel to perform management functions to achieve the main goal of production, economic and commercial activities. It includes the following elements: management functions, organizational management structure, technical management tools, management methods and tools, information support, financial support, management decisions.

The main task of management in modern macroeconomic conditions is the adaptation of economic entities to the ever-changing conditions of the external and internal environment. That is, the system of adaptive management today is the most rational type of management, the feature of which is innovation, flexibility and readiness to challenge the external and internal environment.

Building an effective system of adaptive management of a construction company is based on the theory of change management, the essence of which is to constantly adjust the activities of the company, update its structure and find new opportunities to meet the requirements and demands of Ukrainian and foreign markets, which are constantly and rapidly changing [10].

The system of adaptive management is reflected primarily in the quantitative analysis of the efficiency of the enterprise and its divisions through a system of key financial indicators.

Construction companies in Ukraine today face great difficulties in terms of financial security, despite the relative stability in the industry. This is due to many economic, organizational and social factors.

First of all, let's consider the main existing approaches of Ukrainian and foreign scientists to the definition of «financial security» of economic entities.

For example, O. Kyrylenko defines financial support «as the formation of trust funds of economic entities in a sufficient amount and their effective use» [11]. V. Oparin considers financial security as «a subsystem of the financial mechanism that characterizes the content of the impact of finance on various aspects of society» [12]. O. Romanenko interprets financial support as «covering costs at the expense of financial resources accumulated by business entities and the state» [13].

Summarizing the considered approaches to the definition of this concept, we can identify the main features and characteristics of the financial security of the business entity:

- system of financial relations, which operates on the basis of forms and methods of creation, distribution, mobilization and use of financial resources;
- element of the financial mechanism;
- the process of organizing the financing of production and economic activities of the enterprise;
- method of financial impact on the economic and social development of the business entity;
- implementation of the reproduction process at the expense of own and borrowed financial resources.

But, according to the authors, the financial support of construction companies has certain features related to the specifics of production and economic activities and existing management systems.

The financial support of construction companies should be understood as a set of organizational and economic measures to attract, distribute and effectively use all types of financial resources involved in the operation of the business entity. These activities are carried out through self-financing, lending, budget financing, donor financing, etc.

It should be noted that in their financial and economic activities, construction companies do not often use only one method of financial security, and in most cases optimally combine different methods.

To improve the financial situation of construction companies, it is necessary to combine the capabilities of the state and

the private sector. Regarding financial flows in the process of interaction of public-private partnership (PPP) participants in the implementation of the state policy of construction development, the main ones are the mobilization of financial resources: revenues from the state budget, local budgets; receipt of temporarily free funds of insurance companies, private pension funds, banks, support and incentives for banks and insurance companies to participate in PPP, etc.

The formation of approaches to financial support of adaptive management of construction companies is one of the important scientific tasks, as the current level of financial support disrupts the pace of production, threatens the financial and economic security of construction companies and negatively affects the competitiveness of the construction industry.

The level of financial security and in general the financial activity of economic entities is greatly influenced by environmental factors that are dominant in today's socio-economic conditions, especially in the pandemic COVID-19, which affected all spheres of life.

Among the factors of the external environment that affect the financial activities of the enterprise and financial management, it is necessary to highlight the impact of crisis processes unfolding in the external environment, the interests of business owners, legislation, regulations governing financial relations, etc. [14].

The financial support of construction companies significantly affects the overall management system and effective management decisions, due to the possibility of creating certain conditions to maximize net cash flow, the growth of which will increase the self-financing of the entity and reduce its dependence on external sources of funding.

That is, financial security is an integral part of the financial and economic activities of a construction company, which allows to form a rational structure of equity and debt capital, increase the efficiency of their use and get a balanced inflow and outflow of incoming and outgoing cash flows.

To further study the impact of financial support on the system of adaptive management of construction companies, consider its key characteristics and features (*Table 1*).

Table 1. Key characteristics and features of financial support of the adaptive management system of construction enterprises	
Key feature	Features of manifestation of the characteristics of financial support of the adaptive management system
Formation of sources of financing of enterprise assets	Financial support affects the management system (the ratio of own and borrowed sources of funding, their relationship with certain types of assets), which ensures the achievement of the planned level of activity and development of the enterprise
Achieving financial stability of the enterprise	Quality financial security is the basis of financial stability, which can promote the development and storage of own assets and capital in a changing environment and guarantee its solvency and investment attractiveness in the future
Formation of a powerful resource supply of the enterprise	Financial support is a functional component of the resource provision of the enterprise, which is aimed at obtaining by the business entity all the necessary types of resources, subject to their careful placement and efficient use in order to increase the level of solvency and liquidity
Participation in the distribution policy of the enterprise	High-quality financial support allows to determine the sequence and efficiency of the distribution of enterprise resources on the basis of increasing the efficiency of their use
Formation of a rational capital structure of the enterprise	Financial support to preserve the potential and maintain the level of economic growth of the enterprise is always aimed at restoring and increasing savings and capital accumulation
Formation of an effective financial mechanism of the enterprise	Financial support to strengthen the relationship of its sources makes it possible to use modern financial instruments (taxes, fees, fines, benefits, etc.)
Ensuring the appropriate level of solvency of the enterprise	Financial support should be aimed at effective management of financial stability of the enterprise, ensuring timely receipt and expenditure of funds, maintaining its continued solvency and liquidity for the development of business relations and increase the level of competitiveness
Ensuring sustainable growth of the production potential of the enterprise	The analysis of the economic potential of the enterprise will provide an opportunity to assess the results already achieved for a comprehensive sound approach to the formation of an effective process of managing financial resources in the system of adaptive management of the business entity
Achieving the appropriate level of self-financing of the enterprise	Identification of key areas of financial support of the enterprise and analysis of promising sources of its financing (internal and external) with the priority of the principle of self-financing

In general, the importance of financial management in the general management system of construction companies lies in the organization of financial services, which allows to attract additional financial resources on the most favorable terms, invest them with the greatest effect and conduct profitable operations in the financial market. However, the involvement of individual financial sources by construction companies always depends on the scale of their activities, profitability, investment attractiveness, strategic goals and tax preferences.

Particular attention needs to be balanced and scientifically sound assessment of the level of financial support of the system of adaptive management of construction companies, which allows to determine and analyze the existing level and plan it in the future, which will certainly allow management of construction companies. Another to stimulate the processes of adaptation of the whole business entity in a changing environment.

In order to assess the level of financial support of the system of adaptive management of construction companies, of course, it is necessary to analyze the financial stability of economic entities according to the classical scheme on the basis of the balance of enterprises in the annual financial statements. From the set of indicators of financial stability, the authors proposed to choose those indicators whose change in values due to adaptive management is assumed to be the most significant (*Table 2*).

Table 2. Indicators of financial stability		
Group of indicators	Legend	Indicators
Solvency analysis	P_i^{sol}	Solvency ratio
		Funding ratio
		Coefficient of own working capital
		Equity maneuverability ratio
Analysis of business activity	P_i^{ba}	Asset turnover ratio
		Inventory turnover ratio
		Fixed assets turnover ratio
		Working capital ratio
Profitability analysis	P_i^{pr}	Gross profitability
		Profitability of the main activity
		Profitability of operating activities
		Profitability of the enterprise
		Return on equity

Combination of indicators of financial stability in groups:

$$G^j = \{P_i^j | i = \overline{1, n}, j = \overline{1, k}\}, \quad (1)$$

where i is the indicator of the j -th group), allows not only to conduct a qualitative analysis, but to assess the effectiveness of the results of adaptive management according to the method proposed by the authors.

Based on the study of the dynamics of changes in financial stability indicators, a medium-term forecast should be made. The forecasting period (T_{fp}) is determined under the condition:

$$T_{fp} > T_{in}, \quad (2)$$

where T_{in} — the period of inertia on the selected indicators of the enterprise — the object of study.

The ultimate goal of economic and mathematical modeling for forecasting financial stability indicators is not to state the advantages and disadvantages of the construction industry, but, first of all, the ability to make management decisions aimed at improving the level of financial stability for individual indicators and groups of indicators in general.

The adaptive management strategy should be expressed through a system of adjustment factors k_i^j :

$$\tilde{G}^j = \{k_i^j \cdot P_i^j | i = \overline{1, n}, j = \overline{1, k}\}. \tag{3}$$

In the first step of building a system of adaptive management, the value of the correction factors k_i^j is determined empirically based on the assessment of financial stability in accordance with management tasks in both magnitude and direction ($k_i^j > 1$ – to increase, $k_i^j < 1$ – to reduce).

And the authors propose to evaluate the effectiveness (E) of the constructed strategy on the basis of comparing the actual ($P_{fi} = P_i^j$) and planned ($P_{pi} = k_i^j \cdot P_i^j$) values of financial stability indicators by groups G^j :

$$E = \frac{1}{n} \sum_{i=1}^n \frac{P_{pi}}{P_{fi}} \cdot 100\%, \tag{4}$$

where n is the number of indicators in each j -th group.

The proposed scale for evaluating the effectiveness of the adaptive control system is presented in *Table 3*.

Table 3. Scale for assessing the effectiveness of financial support of the built system of adaptive management	
Deviation	Level of efficiency
< 5%	extremely high
[5; 15)%	high
[15; 25)%	moderate
[25; 50)%	average
> 50%	low

The efficiency of the constructed system of adaptive control after a single introduction of correction factors may not meet the objectives of the modeling. Therefore, to build a simulation model that would meet the conditions of adequacy and accuracy in terms of efficiency, it is necessary to apply iterative methods, the essence of which is successive cyclical changes in the values of the correction factors. The algorithm for constructing an iterative model is presented in *Figure 1*. As an initial model, it is proposed to use a system of correction factors (3), selected empirically.

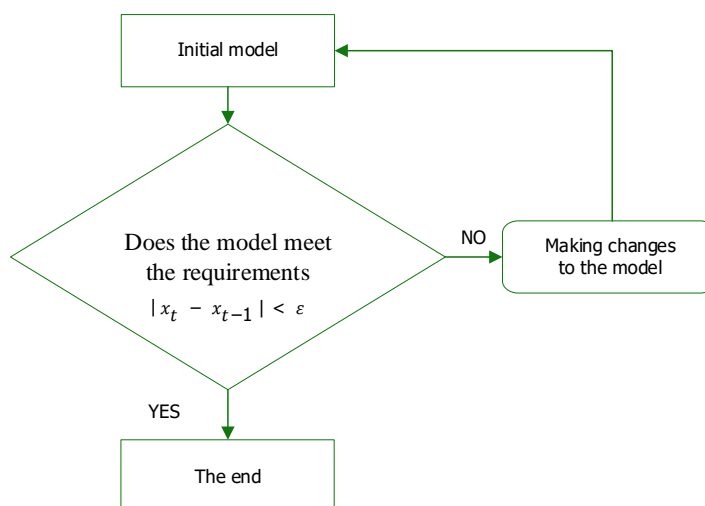


Figure 1. Scheme of construction of an iterative simulation model

The number of consecutive iterations t directly depends on the quality of the initial model (which in turn depends on the quality of the analysis of financial stability and experience of the researcher) and the predetermined accuracy ε . The iterative process is terminated if the condition:

$$|x_t - x_{t-1}| < \varepsilon, \tag{5}$$

where t is the number of the last iteration.

The proposed methodical approach to assessing the level of financial support of the system of adaptive management of construction companies allows you to build a universal reliable simulation model with a predetermined level of efficiency and the ability to make additional changes.

That is, the assessment of the level of financial security of construction companies should become an element of adaptive management, which will certainly allow you to make effective management decisions, both in terms of financing and for all activities of the business entity in general.

Today, in conditions of macroeconomic instability, the management of construction companies must seek to reach a break-even level of activity by finding and implementing the most effective financing systems. All management mechanisms and tools should be used, not only classic, but also new ones, which are able to solve the problem of finding sources of business financing.

It should be remembered that financial support involves not only the independence of enterprises from external sources of financing, but also the provision of highly efficient production and commercial activities that can bring the company to a new level.

CONCLUSIONS

As a result of the study, it was found that the construction industry is facing great difficulties in terms of financial security, despite the relative stability in the industry. It is concluded that the proposed methodical approach to assessing the level of financial support of the system of adaptive management of construction companies allows to build a universal reliable simulation model with a predetermined level of efficiency and the ability to make additional changes. It is proposed, in the future, to assess the level of financial security of construction companies as an element of adaptive management, which will certainly allow you to make effective management decisions on all activities of the business entity.

The prospect of further research should be the development of ways to improve the efficiency of financial security in the system of adaptive management of construction companies.

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ФІНАНСОВЕ ЗАБЕЗПЕЧЕННЯ СИСТЕМИ АДАПТИВНОГО УПРАВЛІННЯ БУДІВЕЛЬНИМИ ПІДПРИЄМСТВАМИ

Досліджено вплив фінансового забезпечення на управління суб'єктами господарювання і розроблено методичний підхід до оцінювання рівня фінансового забезпечення системи адаптивного управління будівельними підприємствами. Зазначено, що сьогодні особливого значення набуває впровадження у практичну діяльність будівельних підприємств сучасних систем управління, здатних адаптувати суб'єкти господарювання до чинних умов ведення бізнесу. Саме фінансове забезпечення потребує особливої уваги у системі адаптивного управління будівельними підприємствами. Розглянуто основні підходи вітчизняних і зарубіжних науковців до визначення поняття «фінансове забезпечення» суб'єктів господарювання. Установлено, що фінансове забезпечення будівельних підприємств має певні особливості, пов'язані із специфікою виробничо-господарської діяльності та чинних систем управління. Акцентовано увагу, що фінансове забезпечення будівельних підприємств істотно впливає на загальну систему управління та ухвалення ефективних управлінських рішень, що обумовлено можливістю створення певних умов для максимізації чистого грошового потоку, зростання якого забезпечить підвищення рівня самофінансування суб'єкта господарювання і знизить його залежність від зовнішніх джерел фінансування. Виділено ключові характеристики та особливості фінансового забезпечення системи адаптивного управління будівельними підприємствами. Зроблено висновок, що запропонований методичний підхід до оцінки рівня фінансового забезпечення системи адаптивного управління будівельними підприємствами дозволяє побудувати універсальну надійну імітаційну модель із наперед заданим рівнем ефективності та можливістю внесення додаткових змін. Запропоновано, у подальшому, оцінку рівня фінансового забезпечення будівельних підприємств розглядати як елемент адаптивного управління, що, безумовно, дозволить ухвалювати ефективні управлінські рішення за всіма видами діяльності суб'єкта господарювання.

Ключові слова: фінансове забезпечення, будівельні підприємства, адаптивне управління, система, методичний підхід, оцінка

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