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Improving Competitiveness of a Construction Company

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Abstract: Competitive edge is a multifaceted problem for any construction company. One of the problems is that evaluation of competitiveness has to be an important phase in selecting the subcontractor for state or municipal contract. This will both reduce risks and improve efficiency of state investment. This view on the problem of competitiveness evaluation is rather new and its solution can be made within the framework of the cost-oriented approach. We suggest that the focus should be made on the structure of the construction company's assets that ensures the necessary cash flow volume for fulfilling the state municipal contract. The first step should be the analysis of that structure and searching the possibilities to optimize it along the criterion of maximizing the possible changes of cash flow as a result of transactions with some assets. The next part of the investigation describes the procedures for evaluating the influence of the environment. Coefficients of liquidity and risk are used for that. If the coefficient of liquidity is used in its classical form, then the coefficient of risk is defined as the relationship between the assets value of the construction organization and the cost of the construction-assembly works on the contract. In the conclusions of the investigation, alternative target functions are formulated that make it possible to carry out mathematical modeling the processes of improving the competitiveness of a construction company.

Key words: Evaluating assets of a construction company · Efficiency · Competitiveness

INTRODUCTION

Improving competitiveness of a construction company is a combination of managerial processes aimed at determining the range of key factors of success, identifying industrial and managerial processes influencing these factors and stimulating their progress in the construction company.

The philosophy of assets management is that maximizing the assets value is assumed as the primary target of the company [1]. Generally speaking, the company should have two sets of objectives: financial ones for top managers and non-financial ones for the rest of the staff in the organization [2-4]. Investigations showed that traditional financial indexes, such as income or income growth rate, do not sometimes correctly reflect the process of creating new value and that companies should directly monitor creating of new value [5-6].

Within the framework of the philosophy of the assets evaluation, applied methods are being actively developed; they make it possible to manage the company's efficiency.

Thus, during the start-up stage of the company, the method of scoring (also known as Bill Payne Method or Benchmark Method) is applicable [7-9].

This method can be used by companies who are just starting to enter the market; it differs from similar methods in that it explicitly accounts for regional peculiarities in evaluation [10]. This method is based on the market approach - (the standard BSV-VI), i.e. the value and the potential efficiency of the company is conditioned by its similarity with successful companies in the region by its structure and available resources. This method is less usable for established companies. Jeffrey Sohl emphasizes that [11]. In the part of a construction company that is characterized by the high rate of material assets and uniqueness of the construction product (buildings, facilities and structures); this method is not very accurate or universal.

The well-known extravagant method (or asset-based evaluation approach - BSV-IV) is more widely spread due to its simplicity and the possibility to prove the results.

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It consists in evaluating all the company's assets minus debts. Its modification called the Berkus method has been more and more often used recently [12, 13].

This method is a modification of BSV-IV by introducing empirical coefficients (for example, Dave Berkus suggests that the value of the company be increased by 20% if the company has professional management). The method is based on the expert evaluation and Berkus himself revised the coefficients and reintroduced them in the abstract form [12].

The methods based on the analysis of super-profits conditioned by the difference between the actual and the "normal" industry-average profits (income approach) - (BSV-VII) best reflect the influence of such factors of competitiveness as the rate of accounting for environment changes, the strategy of the company etc [14].

Agreeing to the proposals and reasoning of the above-mentioned authors in general, let us try to answer the question – what should be the basis of a construction company's competitiveness evaluation in the contract works market?

MATERIALS AND METHODS

The investigation used methods of system approach, abstracting, logical and comparative analysis and synthesis, economical-statistical processing of information, organization projecting and economic-mathematical modeling.

The Main Part: We can propose the following method to ensure competitiveness of the construction organization on the basis of changing the structure of assets.

Stage 1: Investigating the available assets of the company and evaluating the assets and their separate elements:

- Investigating the available assets of the company in the natural expression (n);
- Analysis of the legal status of the assets;
- Analysis and monitoring of the movable assets and real estate;
- Appreciation of the assets elements value (Vn) and the entire assets of the company or organization [15-17].

Stage 2: Investigating the possible changes in the structure of the assets:

- Planning the variants of changes in the assets of the organization: creating, restructuring, trading of the elements of the assets.

Stage 3: Evaluating the possible changes of the cash flow as a result of transactions with the elements of the assets:

- Evaluating the possible changes of the cash flow of the company as a result of transactions with the elements of the assets (ΔCfc);
- Evaluating the possible changes in the value of the entire assets as a result of changes in the structure of the assets of the construction company (ΔVc).

Stage 4: Selection of the variant of changing the structure of the assets of the construction company to ensure the necessary cash flow for fulfilling the state or municipal contract:

- Determining the required expenses for fulfilling the state and municipal contract for construction-assembly works;
- Selection of the variant of changes in the assets that ensures the necessary cash flow for fulfilling the state or municipal contract for construction-assembly works [18]:

$$\sum_{i=1}^{n} \Delta CFn \geq Vctr, \quad (1)$$

where ΔCFn - the cash flow of the company, $Vctr$ - the value of the entire assets of the construction company.

Stage 5: Evaluation of the efficiency of the assets management system and the newly-formed innovative advantageous market position for unconditional fulfilling of the contractor's obligations on the contract:

- Forming the optimal structure of the assets;
- Unconditional fulfilling of the state or municipal contract;
- Evaluation of the competitiveness level of the organization on the basis of integrated implementation of innovative competitive advantages.

The influence of factors from both the external and internal environment in the modern conditions needs to be considered with utmost attention. Erroneous analysis of each of these factors causes various risks, negatively

affects the competitiveness level of the construction organization. In order to solve the problem of, on the one hand, the ratio of the high level of competitiveness and, on the other hand, of the acceptable level of risk of the construction organization, requires the constant search of new indexes.

Using the value-related approach cannot help but consider the degree of liquidity of the organization's assets, because, whatever their value is, the capability and the quickness of their transformation into monetary assets add to their value. That is why using the coefficient of liquidity and the coefficient of risk can be quite reasonable for the purposes of the present investigation.

The coefficient of liquidity of the organization's assets can be determined in the following way:

$$Kliq = \sum_{i=1}^{n} E \cdot Dliqe, \quad (2)$$

where *Kliq* is the coefficient of liquidity; *E* is the share of the element in the structure of the assets of the construction organization; *Dliqe* is the degree of liquidity of the elements of the construction organization's assets (fully merchantable, partially merchantable, non-merchantable).

The coefficient of risk can be determined by the ratio between value of the assets of the construction organization and the cost of construction-assembly works on the contract:

$$Krisk = \frac{Vac}{Vctr}, \quad (3)$$

where *Vac* is the value of the assets of the construction company, in thousand roubles; *Vctr* is the value of construction-assembly works on the contract (the amount of financing from the state or municipal budget), in thousand roubles.

The risk of unauthorized use of financial assets rises if this coefficient is below one. And vice versa, the closer this coefficient of risk is to the value of one, the less the risks are. Thus, the contractor has the possibility to take some managerial solutions to change the structure of the assets, if the finance is insufficient for fulfilling the contract, so as to form the required cash flow and fulfill the contract in time:

$$Krisk = \frac{Vac}{Vctr} \geq 1 \quad (4)$$

The main feature of the presented method for evaluating the competitiveness of the construction organization is that it can be used by both the construction organization and the customer, because the customer's main requirement is met, that is, the proper fulfilling of the contract with consideration of the maximum decrease of the initial price of the contract.

The main principle of the value-related approach is the principle of maximizing the value of the organization and coordination of the interests of the customer and the contractor.

While managing the efficiency of a construction company, it is important to focus on the maximizing the value, because it, along with such financial indexes as net profit, profitability of investment etc., is the most generalizing index and it characterizes the combination of all the factors of the organization's development [19-20]. The target function of the value-related model of organization management has the form:

$$Vc = \sum_{i=1}^{n} V_r \rightarrow \max, \quad (5)$$

where *Vc* is the value of the company's assets; *n* are the objects in the assets of the construction organization that are factors in the value; V_r is the value of the objects in the assets of the construction organization.

It can be complemented by the above-mentioned target function of improving the competitiveness:

$$C = f(CF) \rightarrow \max, \quad (6)$$

where *C* is the level of competitiveness of the construction company or organization; *CF* is the cash flow of the organization.

$$CF \rightarrow Vctr, \quad (7)$$

where *Vctr* is the value of construction-assembly works on the contract (the amount of financing from the state or municipal budget), in thousand roubles.

That is why they can be complemented by the following demands:

$$Kliq = \sum_{i=1}^{n} E \cdot Dliqe \geq 1, \quad (8)$$

where *Kliq* is the coefficient of liquidity; *E* is the share of the element in the structure of the assets of the construction organization; *Dliqe* is the degree of liquidity of the elements of the assets of the construction organization (fully merchantable, partially merchantable, non-merchantable).

$$Krisk \odot \frac{Vac}{Vctr} \rho \ 1, \quad (9)$$

where *Krisk* - the coefficient of risk, *Vac* is the value of the assets of the construction company or organization, in thousand roubles; *Vctr* is the value of construction-assembly works on the contract (the amount of financing from the state or municipal budget), in thousand roubles.

The indexes of synergetic efficiency of value factors manifestation [21] can be complemented by consideration of transactional overhead costs:

$$Ec \odot (P \lambda e^{\lambda t} \rfloor TC_{ext}) / (\Leftarrow L^{\alpha} \rfloor C^{\beta} \rfloor Ms^{\varphi}) \rfloor TC_{int}) \rho \ max, \quad (10)$$

where P is the result of the synergetic project, L is the labor cost; C is the amount of investment (capital); α is the coefficient of elasticity by labor; β is the coefficient of elasticity by investment; where e is the basis of the natural logarithm; *Ms* is the target function of managerial solutions (*management aim*); φ is the coefficient of elasticity of managerial solutions; λt is the coefficient considering the non-linearity of the synergetic effect, i.e. the rate of technical progress, $TC_{ext.}$ are the external transactional overhead costs; $TC_{int.}$ are the internal transactional overhead costs.

Therefore, we obtained three target functions, characterizing three aspects of improving efficiency of a construction company: value increase, improving competitiveness and synergetic efficiency reaching the maximum in one economical sphere.

Almost any difficult practical task of solution taking is multi-criterial (multi-purpose). The phrase “solution taking” itself assumes the presence of the subject performing this action. And here we encounter the problem of solving similar tasks – the human factor. Due to this, the solution taking theory gains particular importance in the presence of many criteria (target functions).

For the first time, the problem of multi-criterial (vector) optimization was raised by the Italian economist V. Pareto during mathematical investigation of commodity exchange. Further on, the interest to the problem of vector optimization grew due to development of computer-aided methods in the works of economists-mathematicians [22].

The vector task of mathematical programming is traditionally the basis of the mathematical model that describes an economical system or a technical object [23]. That is why it is considered that the solution of the vector optimization task can only be some kind of a compromising solution somehow corresponding to all the components of the vector criterion, which can be quite acceptable for solving *partial tasks* of improving the efficiency of a construction company.

CONCLUSIONS

Practical implementation of the proposed method enables the construction organization to do the following:

- On the basis of the required financial assets, to unconditionally fulfill the state or municipal contract, by making the required amount of transactions with elements of the assets;
- Decrease the risk of non-fulfilling the state or municipal contract;
- Increase the level of competitiveness; increase the efficiency of the construction company.

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