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Market capitalization of construction companies: the specifics of the valuation of assets and liabilities within the framework of the cost approach

The market capitalization of a company should be viewed as a strategic indicator of economic growth. The assessment of the market capitalization of an enterprise entails the application of three standard approaches, including the cost approach based on the assessment of assets and liabilities. The application of the net asset method in the valuation process provides for the adjustment of balance sheet indicators; assets and liabilities obtain market valuations. Adjusted net assets can reflect the investment attractiveness of companies, having significant amounts of work in progress, substantial profitability fluctuations, which fully applies to the construction industry. Accounts receivable and accounts payable are part of the monetary relations of an enterprise; they have a specific circulation pattern, that predetermines the methodological problems of their market valuation. This article explores possible approaches to adjusting the book value of receivables and payables, suggests corrective factors, including the time period for debt repayment, financial capabilities of an enterprise. Proposed approaches to the discount rate are to take into account the time factor. A system of indicators and a methodology for adjusting overdue debts are proposed to assess the financial condition of the debtor.
Keywords: *business valuation, cost approach, assessment of accounts receivable, assessment of accounts payable, cost factors, taking into account the time factor, debt adjustment*

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INTRODUCTION

The general state of the construction industry can have a negative impact on the activities of construction contractors. In recent years, the construction industry has demonstrated a positive trend, or a growing amount of work performed. In 2020 and 2021, the growth in the amount of work reached 100.7 and 100.6 %, compared to the previous year. At the same time, the business confidence index has remained low since 2020. Despite the growing amount of work performed, the availability of construction machines, whose service life exceeds the standard depreciation period, remains at a high level in the industry. In particular, in 2021, the share of near-end-of-life construction machines ranged from 33.6 to 63.0 %, which boosts the risks for construction companies.

The current situation reduces the investment attractiveness of the construction industry and inevitably reduces its economic stability. Under such conditions, the market capitalization of a construction organization becomes a universal criterion for the financial and economic activities of a company[1]. The corporate market value assessment and use as a management indicator will solve the following most important tasks [1]:

- solving investment problems, focused on attracting investors, merging companies;
- identifying the effectiveness of long-term management solutions related to the modernization of current industries and establishing new ones; developing new types of products; entering new markets.

Valuation standards ensure the use of three approaches to the market value of a company, including cost, income and comparative ones. Features of the application of these approaches and corresponding methods are considered in the works of domestic and foreign scientists[2] [2–8]. From the standpoint of assessing the investment attractiveness of companies, it is advisable to determine the market capitalization using the cost approach, which is based on determining the market value of corporate assets and liabilities. Despite its significant labour intensity, the cost approach allows to reliably display the property status, its dynamics, weaknesses and possible points of growth.

The cost approach allows determining not only the direction of business development, but also development tools, since both assets and liabilities are assessed. This approach to valuation is dominant in the valuation of companies whose activities entail large sets of property, significant amounts of work in progress, fluctuations in profitability, large indicators of receivables and payables. These features are typical for the construction industry.

Accounts receivable, like bills of exchange, IOUs, and other similar securities, can circulate on the free market in a specific form. This specificity lies in the fact that accounts receivable are not goods and can be realized in the form of an assignment of claims. Therefore, there are certain restrictions

1 Federal State Statistics Service. URL: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/finance (accessed: July 10, 2022) (rus.).

2 Kozyr Yu.V. Assessment of receivables. URL: http://sroroo.ru/upload/iblock/ada/ada317715bf57d213fbab1cd38ba3db5.pdf (accessed: February 10, 2022). (rus.).

imposed on the market valuation of this asset. Accounts payable are also part of the financial relations of an enterprise; their value affects the market value of a business undertaking, risks and uncertainties.

The study of approaches and specific methods for assessing the receivables and payables allows us to conclude that the assessment tools conveying the activities of construction companies have not yet been generated in full in the current economic environment. Given the importance and the problematic nature of the assessment of receivables and payables, we consider them in more detail.

METHODS OF MARKET VALUATION OF RECEIVABLES AND PAYABLES

According to the Federal Standard of the Market Valuation (Federal Standard No.8)[3], two valuation hypotheses might be used when a cost approach is applied to evaluate a company: a business entity is either considered as a growing concern or its winding-up and sale of assets is expected. In any case, the market valuation of the company's assets and liabilities is required. Potential assessment approaches are considered in the works of domestic scientists[2] [1, 4, 9, 10]. The economic instability triggers non-payments, a mismatch between the real and nominal values of receivables and payables; therefore, the assessment needs to take into account trends in the development of the economy, including a particular industry.

The analysis of current approaches to valuating receivables shows that two stages are considered:

- the analysis and grouping of receivables subject to the parameters of debtors;
- the adjustment of the book value of receivables based on a proposed ratio (or several ratios) to get to the market value of an asset.

In the course of valuation, receivables are divided in two types: delayed receivables (still to be paid) and overdue receivables (past due). Ways to evaluate overdue and delayed receivables are different since as of the date of valuation overdue receivables are already depreciated and the prospects to collect delayed receivables are still to be ascertained.

The following information should be taken into account when receivables are analyzed [7]:

- the history of collecting receivables; the percentage of overdue or unpaid receivables in the total debt owed to a specific debtor;
- possible trends in the depreciation of receivables as a result of inflation and other factors at the present stage of economic development in a specific sector of economy;
- the probability of bad debts subject to the industry where the debtor belongs;
- the corporate payment deferment policy;
- the corporate behaviour in relation to the repayment of liabilities when accumulating receivables.

In case of a guaranteed repayment, no receivables are adjusted and their market value shall be equal to the book value. Bad debts are of zero value [7].

Almost all and every research into the market valuation of receivables is focused on finding a mechanism of determining the depreciation of receivables, but approaches differ. For instance, only the factor of inflation is suggested to be taken into account and used to calculate the current value of receivables by adjusting it for each overdue month. Monthly inflation is taken as a discount rate and by the way of discounting one can determine the loss of value of receivables in the *i*-th period and then cumulatively for the whole period of being overdue [11].

The ratio method of valuation is based on the following formula[4]:

$$C = C_B k_o, \quad (1)$$

where C is a market value of receivables, monetary units; C_B is the book value of receivables, monetary units; k_o is the receivables depreciation ratio, unit fraction.

The method allows for unbiased results, if the depreciation ratio can be linked to parameters of a specific debtor, probability of collection, overdue period, which requires the systematization of receivables of a specific company using the above attributes.

A more thorough look into the valuation problem is implemented in a method of adjustment ratios used to adjust the book value of receivables[5]. The market value of the debt is calculated according to the formula C:

$$C = C_B \varphi = C_B \frac{1}{(1+i_o)^t}\left[k_1 d_1 + k_2 d_2 + ... + k_j d_j\right], \quad (2)$$

where C_B is the balance sheet value of accounts receivable; φ is the cumulative ratio of a decrease in the book value of debt, unit fraction; i_o is the discount rate corresponding to a return on risk-free investments, unit fraction; k_{1-j} are the ratios describing the depreciation of receivables using various factors, monetary units; d_{1-j} are the weights of ratios k_{1-j}, unit fraction.

Depreciation ratios, provided for by this method, reflect the factors listed below: the financial condition of the debtor, the financial collateral for the receivables, the debtor's goodwill, the period when receivables are overdue. The share of the said ratios in the total result is determined by experts using weights.

Yu.V. Kozyr[2] proposes a differentiated approach to discounting the nominal value of receivables. Specifically, in case of doubtful receivables the discount rate shall be formed based on a risk-free rate and the market risk premium and in case of receivables, the collection of which is beyond any doubt, the rate is to be calculated as follows:

$$i = \frac{i_D + i_K}{2}, \quad (3)$$

where i_D is the average interest rate for deposits, unit fractions; i_K is the average interest rate for deposits, unit fractions.

M.O. Ilyin[6] proposes to determine the discount rate as the weighted average cost of capital:

$$i = i_D d_E + i_K d_B, \quad (4)$$

3 Federal valuation standard "Business valuation (FSO No. 8)". Approved by Order of the Ministry of Economic Development of Russia No. 326 (dated June 1, 2015). (rus.).

4 Coefficient method for estimating receivables. URL: http://www.inbico.ru/metodologiya/debitorskayazadolgennost/83koefficientnayametodikaocenkidebitorskoizadolgennosti.html (accessed: December 13, 2021) (rus.).

5 National college of appraisers. Methodology for estimating receivables. URL: http://www.inbico.ru/metodologiya/42?debitorskayazadolgennost/81?metodikaocenkidebitorskoizadolgennostinko.htm (accessed: July 30, 2022). (rus.).

6 Ilyin M.O. Methodological problems of estimating the value of the rights to claim receivables. URL: https://srosovet.ru/content/files/00/18/2d.pdf (accessed: December 13, 2021). (rus.).

where i_D is the weighted average cost of capital, unit fractions; d_E is the share of equity, unit fractions; d_B is the share of debt, unit fractions.

As for the probability of collecting receivables, calculation is based on the following formula[6]:

$$C = C_B \frac{1}{(1+i)^t} p, \quad (5)$$

where t is a period of time between the date of valuation and the most probable forecasted date of collection of receivables; p is an integral ratio of repayment probability, unit fractions.

To determine the probability of return, the Harrington scale, adapted for assessment purposes, was proposed, according to which the probability of return ranges from 0 (bad debt) to 1.0 (absolutely reliable)[6].

The use of the scale requires exhaustive information about the debtor, its goodwill, payables, structure of current assets, prospects of receiving income and its growth.

Hence, one can conclude, that approaches to valuating receivables, choosing reasons for adjustment, methods for reasoning discount rates and period are quite ambiguous.

RESEARCH RESULTS AND RECOMMENDATIONS FOR THE VALUATION OF RECEIVABLES

Figure shows the logical scheme we propose to valuate receivables as part of property approach to business valuation.

The proposed method of determining the market value of receivables requires that the account is taken of the two factors: the time factor of depreciation and the financial status of a debtor as a potential opportunity to settle the liabilities. Bearing the time factor in mind, we propose adjusting both overdue and delayed receivables using various discount periods and given the probability and time of repayment. The following approaches to determining the overdue period t_p to be taken into account are in place.

Overdue receivables:

$$t_p = t_o + t_e,$$

where t_o — period of being overdue, months; t_e — expected time of collection, months.

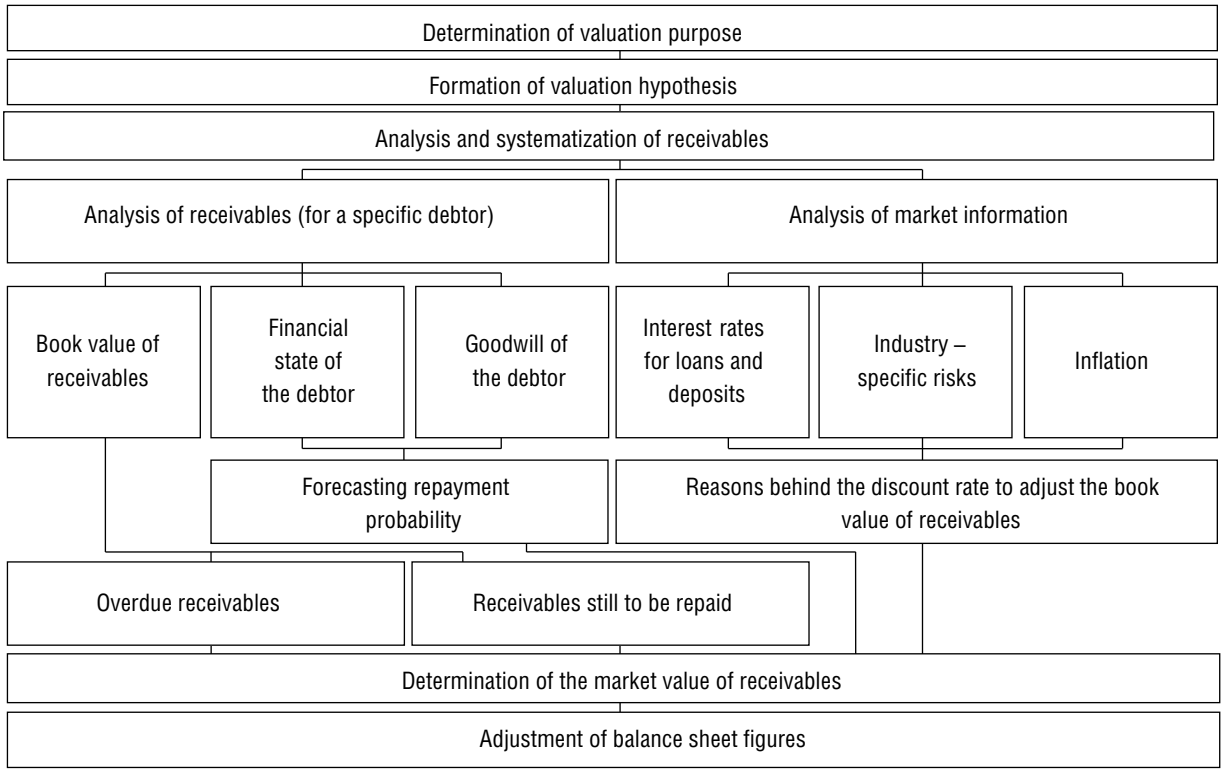
Delayed receivables:

$t_p = t_e$.

A risk-free capital investment rate, valid as of the date of valuation, should be used as a discount rate.

To assess the company's solvency, we recommend using relative liquidity ratios differing in terms of liquid assets treated as sources of coverage of short-term obligations, specifically [12]:

- cash ratio k_{CR} shows what part of current liabilities might be covered by the most liquid assets of the debtor (reference value $k_{CR} \geq 0.2$);
- critical liquidity ratio k_{CL} shows what part of current liabilities might be covered in the nearest time (reference value $k_{CL} \geq 1$);
- current liquidity ratio k_{CrL} shows the payment potential of the debtor provided that the settlements with its debtors are timely, and the sale of products is well-paced (reference value $k_{CrL} \geq 2$);
- for financially unstable debtor companies additional indicators of financial stability might be used and their values might be a reason for a probable period of debt repayment. These indicators include[4]:



The tentative valuation of receivables as part of the cost approach to business valuation

1) equity ratio k_a (reference value $k_{CR} \geq 0.5$);

2) current asset coverage ratio k_{CAC} (reference value $k_{CAC} \geq 0.1$).

During the adjustment of the book value of receivables its share in the total value of assets shall be taken account of: if this share exceeds 30 %, this is deemed critical and might materially affect the future proceeds of the company [2]. That factor is the one to be born in mind for the purpose of forecasting the income flow during the business valuation.

The assessment of accounts payable is an assessment of the company's ability to obtain borrowed funds, since its share in the capital structure is the criterion used to assess the reliability of the borrower. A change in this indicator affects the company's liquidity and solvency indicators. To assess the state of accounts payable with subsequent adjustment, the following indicators are analyzed [12]:

- the average amount of accounts payable;
- the turnover ratio of accounts payable;
- the period of repayment of accounts payable;
- the share of accounts payable in the current liabilities.

For the purpose of assessing the value of the company, accounts payable are analyzed as a whole. The balance sheet value of its credit and loan liabilities is adjusted taking into account the interest rates of banks [13]. To make the final conclusions about the cost of accounts payable, it is advisable to focus on the criterion of the optimal ratio of accounts receivable and accounts payable, taking into account the fulfillment of the following condition [14]:

$$R_{adm} + \Delta OP \geq \Delta OC + LRR + P_{adm}, \quad (6)$$

where R_{adm} — allowable receivables; ΔOP — a change in the operating profit associated with the production and sale of products; ΔOC — a change in operating costs associated with the production and sale of products; LRR are the losses due to the untimely repayment of receivables; P_{adm} — allowable accounts payable.

For an in-depth analysis of accounts payable, it is necessary to analyze the balance of liabilities as of the end of the period according to the terms of formation. A comparative analysis of accounts payable and accounts receivable, determination of the company's net credit position will allow to more reasonably determine its market capitalization.

CONCLUSIONS

As seen from the analysis of the present investment and construction area, the number of factors, that can have a negative effect on a construction business, grows. This requires new strategic management targets of a construction business. One of potential approaches is managing market capitalization, which requires the market valuation of balance sheet figures. The most problematic assets to be valuated are accounts payable and accounts receivable. The availability of situation-specific and various solutions is the reason behind numerous valuation approaches and methods. Having considered the current views and solutions, the authors focus on an approach based on the economic balance as the most suitable method of capitalization management. Special focus is placed on selecting methods of valuating receivables as the least studied aspect of the problem. Authors limited themselves to considering a cost approach without detracting from the importance of income and comparative approaches.

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Рыночная капитализация строительных компаний: специфика оценки активов и пассивов в рамках затратного подхода

Рыночную капитализацию компании следует рассматривать как стратегический показатель экономического роста. Оценка рыночной капитализации предприятия предусматривает применение трех стандартных подходов, включая затратный подход на основе оценки активов и обязательств. Применение в процессе оценки метода чистых активов предусматривает корректировку балансовых показателей, активы и обязательства получают рыночные оценки. Скорректированные чистые активы способны отражать инвестиционную привлекательность компаний, имеющих значительные объемы незавершенного производства, существенные колебания показателей доходности, что в полной мере относится к строительной сфере. Дебиторская и кредиторская задолженности являются частью денежных отношений предприятия, имеют специфику обращения, что предопределяет методические проблемы их рыночной оценки. В данной статье исследованы возможные подходы к корректировке балансовой стоимости дебиторской и кредиторской задолженности, предложены корректирующие факторы, среди которых временной период погашения долга, финансовые возможности предприятия. Предложены подходы к формированию ставки дисконта для учета фактора времени. Предложена система показателей для оценки финансового состояния должника, методика корректировки просроченной задолженности.

Ключевые слова: *оценка бизнеса, затратный подход, оценка дебиторской задолженности, оценка кредиторской задолженности, факторы стоимости, учет фактора времени, корректировка задолженности*

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