On the Development of a System of Indicators for Assessing Financial Condition of Freight Truck Transport Enterprises

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Abstract. The article is devoted to the relationship analysis indicators of economic effect and efficiency of the freight road transport enterprises in modern economic conditions. The main indicators characterizing the relationship between revenue and costs of a freight transportation company are financial stability and operating leverage. Using the liquidity ratio of the cash flow, the optimal criteria for these indicators were obtained, as well as the share of fixed costs in revenue, which determine the increase in solvency of freight road transport enterprises. At the same time, the optimal levels of the specified financial and economic indicators are considered in the context of seasonality and size of economic entities. The optimal levels of indicators are determined separately for large freight road transport enterprises with more than one hundred units of rolling stock and for medium cargo road transport enterprises with up to one hundred units of rolling stock. To assess the performance of freight trucking companies, profitability indicators are used, in particular cost-effectiveness. The indicator of profitability of costs allows you to set the marginal rate based on the market situation and the level of costs, as well as determine the revenue from sales, taking into account the established tariff. Using indicators that have an impact on the change in the value of cost-effectiveness, the minimum possible value of the indicator was obtained, which determines the lower limit of the sustainable functioning of freight road transport enterprises, determining the excess of income over expenditure.

1. Introduction

In modern market conditions, the issues of financial stability and competitiveness are of particular importance for each enterprise. For many freight transport companies, unprofitable today, the problems of assessing their own financial condition are particularly relevant.

Analysis of the financial condition of enterprises today is carried out on the basis of the Methodological Guidelines for analyzing the financial status of organizations approved by order No. 16 of the Federal Service for Financial Recovery and Bankruptcy (FSFR) of January 23, 2001 [17]. The main indicator characterizing the ability of an enterprise to pay its obligations, according to this document, is the degree of solvency. The degree of solvency is determined by the ratio of the value of liabilities (borrowed funds) and the size of the average monthly revenue (average monthly cash flow from sales) and describes the overall situation with the organization's solvency [15, 19].

The calculation of the degree of solvency is carried out according to the data of the accounting reporting forms of the "Balance Sheet" and the "Report on Profit and Loss". However, the tax

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legislation, subject to a number of conditions, allows freight organizations to move to a simplified taxation system that is more beneficial for enterprises, which does not provide for filling out accounting reporting forms [12, 13]. As a result, in the absence of financial statements, the organization is unable to assess its own degree of solvency. The similar problems of determining the financial condition are facing freight transport divisions of other enterprises. As a rule, for such units only the expenditure part is formed, which makes it impossible to produce an effective financial analysis of the subdivision's work [1, 2].

Thus, the absence of the first and second accounting forms sets the task of freight forwarders to assess their financial condition and trends in solvency based on the available data on the composition of expenses and revenue.

2. Main provisions

Indicators based on the categories of expenses and revenue, as well as characterizing the financial condition of the company are the financial strength margin (DFT), which determines the part of the revenue remaining after covering all the expenses of the organization (formulas (1), (2)), and operating leverage (OL) (production leverage), characterizing the relationship between costs and profit (formula (3)) [12, 18]. Since the last two indicators characterize the connection of the results of economic activity with fixed costs, it is with their help it is advisable to assess the level of financial stability of the freight road transport enterprise. However, both the stock of financial strength and the operating leverage (OL) are considered in dynamics, since they are not standard indicators, and therefore with their help it is possible to determine only the trend of changes in the financial condition of the organization, but not its level [3, 5].

$$FSM = R - R_{bp} - \frac{C_f}{M_i} \text{ rub.} \tag{1}$$

$$FSM = \frac{R - R_{bp}}{R} * 100\%, \tag{2}$$

Where R is the revenue from transportation services provided, rub.

R_{bp} - revenue at break-even point, rub;

C_f - fixed costs, rub;

M_i - marginal income, rub.

$$OL = \frac{1}{1 - \frac{C_f}{Q * (T/ - C_v^/)}}, \text{ factor} \tag{3}$$

Where Q is the value of the volume of traffic in physical terms;

$T/$ - tariff per unit of transport work, roubles / t, t-km;

$C_v /$ - variable costs per unit of transport work, roubles / t, t-km, km, auto-h.

Another indicator characterizing cash flow, and, consequently, the ratio of incomes and expenses is the cash flow liquidity ratio (LR_{cf}) (formula 4), which should have a value not lower than one. Exceeding one speaks of cash flow, contributes to the growth of their balances at the end of the period and thereby increases the company's absolute liquidity ratio [4, 5]

$$LR_{cf} = \frac{P_{cf}}{N_{cf}}, \text{ ratio} \tag{4}$$

Where P_{cf} - positive cash flow, roubles;

N_{cf}- negative cash flow, rub.

According to the legislative acts, an enterprise is considered financially stable to one degree or another while it is solvent. Calculation of payments can be carried out at the expense of the revenue received from current activities and through the sale of property. Legislatively is established period during which the organization must pay on the obligations incurred. For strategic enterprises and enterprises of the fuel and energy complex - these are 6 months, for all other legal entities - 3 months. After this period, the freight transport company may be declared bankrupt [20, 24].

An analysis of the terms of contracts of several trucking companies with companies supplying electricity and heat, water and communication services revealed that in the absence of payment for consumed resources within a month after the delivery period, these companies have the right to

suspend the supply of these resources. The absence of at least one of the listed resources leads to an immediate halt of the production process. In this connection, payment for obligations must occur within a month [6, 7]. This means that the monthly average costs should be covered by the average monthly revenue, that is, the following relationship should be observed monthly: $R > C_g$.

A sign of deterioration in financial condition is the excess of the enterprise costs over its revenue. In this case, the organization can not cover its costs and becomes unprofitable. Consequently, for successful work and development of an organization, the cash flow liquidity ratio should exceed one [11, 26].

The use of correlation and regression analysis allows establishing the relationship between groups of studied parameters. The sample size depends on the criteria selected for analysis [16, 23]. Analysis of the relationship between the stock of financial strength and operating leverage with the cash flow liquidity ratio according to the data of eight freight road transport enterprises of the city of Omsk showed a strong direct relationship between the first and third indicators and a strong inverse relationship between the last two indicators. Having determined the size of the stock of financial strength and operating leverage corresponding to the critical point of the liquidity ratio, it is possible to obtain the optimal values for these indicators in the area of the efficiency improving of enterprises.

Since the stock of financial strength and operational leverage depends on fixed costs (formulas 1,3), while in the winter months the value of these costs in our climatic conditions increases significantly, it makes sense to define these criteria separately for winter (from October to March) and summer (from April to September) periods of the year. In addition, since in the cost structure (as studies have shown) for large (having more than one hundred cargo rolling stock units) freight transport companies, the share of fixed costs is higher than that of average (having from ten to one hundred cargo rolling stock units), the calculation of optimal criteria must be made separately for these two groups of enterprises.

As a result of statistical processing of the initial data of six freight road transport enterprises, three of which are large and three are medium, regression equations were constructed characterizing the relationship between the liquidity ratios of the cash flow with the financial strength margin and the operating lever. Functional dependencies were obtained using the Master Function program built into EXCEL.

During construction, linear dependencies of each cash flow liquidity ratio in the winter and summer months (y_1, y_2, $y_1^/$, $y_2^/$ - functions) on the financial strength and operational leverage in the same periods (x_1, x_2, $x_1^/$, $x_2^/$ were obtained - arguments). The possibility of using the obtained equations was confirmed: a multiple correlation coefficient (R) (about 90 percent), determining a strong relationship between effective and factor indicators, Fisher criterion (F), indicating the adequacy of all models, as well as Student's criterion (t), confirming the regression coefficient significance [12].

As a result of the calculations made using these regression equations, the conditions were determined under which the cash flow liquidity ratio takes a standard value greater than one, which indicates an increase in the financial stability of the freight road transport enterprise. On the basis of the calculations made, it was determined that financial stability is increasing for freight transport companies with a rolling stock of more than 100 units in the winter period at operating leverage levels from 0 to 2.18 and financial strength margin of more than 0.43, respectively. In the summer period, these figures should be from 0 to 1.42 and more than 0.69, respectively. In turn, in the winter, financial stability increases for freight transport companies with rolling stock up to one hundred, with an operating leverage from 0 to 7.01 and a financial strength margin of more than 0.21. In the summer period, these indicators with an increase in financial stability usually range from 0 to 1.59 and more than 0.61, respectively.

Since the stock of financial strength and operating leverage depend on the level of fixed costs, using correlation and regression analysis, it is possible to determine the optimal level of the fixed costs share in the revenue of a freight transportation company in the area of increasing its solvency.

The share of fixed costs (RC_f) determines the part of the proceeds, which, with the existing scope of work, goes to cover fixed costs (formula (5)).

$$RC_f = \frac{C_f}{R} * 100, \%$$ (5)

The multiple correlation coefficient, as well as the Student's and Fisher's criteria, confirmed the possibility of using the obtained regression equations between the share of fixed costs in the company's revenues and the financial strength margin, as well as the operating leverage. During the construction, linear dependences of the share of fixed costs in revenue ($(x_1, x_2, x_1', x_2'$ – functions) on the value of financial strength and operational leverage ($(x_1, x_2, x_1', x_2'$ – arguments) were obtained [12]. The multiple correlation coefficient (R), which is on average more than 80 percent in all equations, determined a strong relationship between effective and factor indicators. Fisher criterion (F) confirmed the adequacy of all models, and Student's criterion (t) - the significance of the regression coefficient.

On the basis of the obtained equations, it is easy to determine the level of the share of fixed costs in the revenue of freight road transport enterprises in the field of increasing their financial stability. To do this, it is enough to put standard levels of operational leverage and financial strength in the regression equations. As a result of the calculations made, it was obtained that with the standard amount of operating leverage in the winter period, for large cargo transportation companies the share of fixed costs ranges from 34 to 44%, and in the summer period from 15 to 27%. For medium-sized transport enterprises, these figures range from 36 to 37% and from 15 to 19%, respectively. With a standard indicator of financial strength, the share of fixed costs in the revenue of large freight transport enterprises was from 27 to 46%, in summer - from 15 to 26%; medium-sized enterprises had in winter from 22 to 35%, and in summer - from 14 to 19%.

The table shows that in the obtained values for the enterprises under consideration there is a high consistency. The size of the share of fixed costs in revenue, in which the growth of financial stability and solvency of freight trucking companies, depending on the season and the number of freight rolling stock, is different. For large trucking companies in the winter period, the share of fixed costs in revenues with increasing financial stability ranges from 20 to 40%, and in the summer period - from 15 to 30%. For companies with a trucks rolling stock of less than 100 units in the winter, this figure should have values from 30 to 45%, and in the summer - from 14 to 25%.

Table 1 shows the scheme of mutual influence of operational analysis indicators, and their optimal levels for determining the tendency of change in absolute liquidity and, as a result, solvencies of freight road transport enterprises.

Table 1. Indicators of operational analysis involved in determining changes in the solvency of the freight road transport company, and their mutual influence.

Type of enterprise	Period	Operational Analysis Indicators				The growth rate of payments property
		The share is constant revenue costs	Stock financial strength (ZFP)	Operating lever arm (PR)		Cash liquidity ratio flow
Freight trucking companies with more than a hundred units of rolling stock	April-September	15% 30%	-	> 0.69	0 ÷ 1.42	
	October-March	20% 40%	-	> 0.43	0 ÷ 2.18	more than 1
Freight trucking companies with up to one hundred units of rolling stock	April-September	14% 25%	-	> 0.61	0 ÷ 1.59	
	October-March	30% 45%	-	> 0.21	0 ÷ 7.01	

In addition to the above indicators, profitability indicators are one of the significant indicators of the efficiency of freight road transport enterprises, since profitability, unlike profit, more fully expresses the final result of economic activity, since it takes into account the ratio of effect to consumed resources [8, 10, 20].

As the main indicator of performance evaluation, a cost-effectiveness indicator has been proposed for freight road transport enterprises, since, by changing the value of cost-effectiveness, the freight transport company receives an instrument for setting tariffs, taking into account market conditions, the ratio of variable and fixed costs, affecting the financial sustainability of an enterprise unstable economic environment [21, 25]. In relation to the enterprise, the cost-effectiveness indicator is an internal factor that, taking into account market conditions and the level of costs, sets a marginal tariff on the one hand, and an external one on the other hand, allowing determining the planned sales revenue based on the established tariff [22].

When evaluating the effectiveness of activities, it becomes important to compare the actual level of the indicator with the lowest possible, i.e. the threshold value adjusted for the regional and sectoral conditions of the road transport industry. The minimum possible value of the indicator reflects the normal conditions of functioning which ensure the process of reproduction.

To calculate the lowest possible value of the cost-effectiveness, 6 typical cargo transportation companies of Omsk and Omsk Region were selected, classified as large and medium by the average number of rolling stock with financial independence. For comparison, the following indicators were selected: profit from the sale of motor-car products (P) and total costs (C_g), financial stability, the ratio of variable and fixed costs that affect the change in the minimum possible value of cost-effectiveness of freight road transport enterprises.

As a result of the calculations, the lowest possible profitability of the costs of a freight transport company at the level of 13% was obtained, which determines the lower limit of the sustainable functioning of the freight transport company in a rapidly changing economic environment, characterizing a stable excess of income over cost. Significant reserves of increasing sustainability, ensuring the financial independence of the enterprise, are embedded in the management of the costs of

the enterprise, since an increase in costs leads to a decrease in the value of the profitability of the costs of the freight road transport enterprise, and as a result, to a decrease in the stability of the enterprise. The weighted average share of fixed costs in revenue for medium-haulage trucking companies should be 30%. The share of fixed costs in revenue is determined by the inequality $C_f / R \leq 0.30$. The increase in the share of fixed costs in revenue indicates a decrease in financial stability, and, as a consequence, a decrease in the specified rate of return.

The objective function of cost-effectiveness has the form:

$$t(x_1, x_2) = \frac{(m_1 x_1 + m_2 x_2) - c_0}{c_0 + b_1 x_1 + b_2 x_2} \rightarrow max$$

The values of m_1, m_2 characterize part of the profit remaining after covering variable costs. The costs required for the sale of motor vehicle products x_1, x_2 are made up of variable costs equal to b_1, b_2 and fixed C_0 arising from the sale of motor vehicles. Total costs for the main activity are determined by the equation: $Z(x_1, x_2) = C_0 + b_1 x_1 + b_2 x_2$. The profit from the sale of motor vehicles x1, x2 equal to the difference in profits remaining after covering variable and fixed costs is described by the equation of the first degree: $P(x_1, x_2) = (m_1 x_1 + m_2 x_2) - C_0$.

For the sale of motor vehicle products x_1, x_2 it is necessary to expend d_{11}, d_{12} financial resources and d_{21}, d_{22} of labour resources for the purchase of inventories, that is, for realization, you will need $d_{11} x_1 + d_{21} x_1$ and $d_{12} x_2 + d_{22} x_2$ units. The consumption of each resource should not exceed its reserve k_1, k_2.

If the profitability values do not meet the requirements of a freight transport company, it is necessary to apply the cost minimization model and find their optimal value. The constraint system has the form: $d_{11} x_1 + d_{21} x_1 \leq k_1$, $d_{12} x_2 + d_{22} x_2 \leq k_2$, $x_1 \geq 0$, $x_2 \geq 0$, $P \geq 0$, 13, $C_g / R \leq 0,30$.

Setting the level of profitability satisfying the freight transport company, which should be the sale of motor products, will allow the company to determine the maximum costs necessary for the implementation of motor transport products. Achieving a given rate of profitability, ensuring the stable functioning of the enterprise, will make it possible to identify the reserves for reducing the costs of the freight transportation company.

The level of costs is considered to be the resultant factor; the upper limit of which (maximum) determines the possible market tariff with regard to the rate of profitability, i.e. a freight transport company can determine the marginal tariff, allowing you to recover variable and fixed costs. Setting of the profitability rate makes it possible to reasonably predict the amount of profit at a given level of other values [9, 14].

3. Conclusion

As a result of the study, the main indicators of operational analysis were identified. This is a stock of financial strength and operational leverage, as well as an economic indicator - the share of fixed costs in revenue. Then the criteria for their optimal value were calculated, characterizing the increase in solvency of the considered groups of freight road transport enterprises. As a productive indicator confirming the growth of absolute enterprise liquidity and, as a result, its solvency, the liquidity ratio of the cash flow is used, the excess of which one unity indicates an improvement in the financial condition of the company.

As a result of the calculations, it was determined that the optimal levels of these indicators depend not only on the size of economic entities, but also on seasonality. This is associated with significant seasonal temperature fluctuations in our country, which affect the share of certain types of costs in the revenue of motor transport enterprises in certain seasons. In addition, cargo transportation activities in Russia are also seasonal. The study of the dynamics of indicators was made in the context of the winter and summer periods, as well as depending on the size of organizations. Cargo transportation enterprises which had more than one hundred freight rolling stock on their balance were classified as large ones. The middle freight trucking companies had up to one hundred units of rolling stock [27, 28].

The indicator of evaluation of the final results of economic activity should be considered indicator of profitability of expenses. While maintaining the value of cost-effectiveness at a given level, an enterprise receives an instrument for tariff regulation based on the operating conditions of freight road transport enterprises and can independently develop measures to improve its financial position with regard to the conditions of their activities.

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