# ESTIMATION OF COMPANY FINANCIAL STREAMS MANAGEMENT EFFICIENCY WHILE IMPLEMENTING INVESTMENT PROJECTS

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In this work some aspects of railway investments such as rolling-stock procurement algorithm, optimal securities portfolio, influence on investment project results, and comparative analysis of different investment ways are taken into consideration.

The choice of this or that form of capital investments financing in the sphere of railway transportation is possible only upon a completed detailed comparative analysis of various forms, taking into account the specificity of the branch.

Each block of the given scheme has a certain algorithm of calculation and at the output it gives data for the following block. Moreover, the blocks are closely connected among themselves; in some cases they even are interconnected. For example, the block of "Condition of financing" is interconnected with the block of "Calculation of the budget of movement of money resources". On the one hand, the repayment of the main sum of the debt on leasing, the bank loan and the interest on long-term financing are reflected in the budget of movement of money resources. On the other hand, cash breaks that occur in the budget of movements of money resources influence the sums of the short-term loans involved. We shall study in details the algorithm of work of each of the blocks of the given scheme.

The block of "Marginal profitability". At the input there is information on the routes of rolling stock use and the discounts given, at the output there is either the parameter of marginal profit per car per day (for projects without export transportations), or the parameters of marginal profit of export and internal transportations per car per day, and also empty and loaded (export and internal) car tariff per car per day.

The block of "Initial data". At the input there are the parameters of marginal profitability and the information received through practical experience (cost of railcars repair and miscellaneous costs). At the output there is adapted data for the block of "Condition of financing" (terms of credit, leasing, interest rates for credit and leasing, etc.), "Calculation of incomes" (the information about marginal profitability and the factor of useful railcars use), " Calculation of depreciation charges " (the information on the schedule of cars delivery, normative terms of amortization, initial cost of the permanent assets, etc.), "Calculation of constants, variables and miscellaneous costs" (cost and periods of repairs, insurance, information services, etc.), "Calculation of sensitivity of the investment project", "Comparative analysis of various forms of investments". In the block of "Initial data" the consolidation of the information necessary for the subsequent calculations is carried out. Also there is adaptation, forecasting and calculation of some initial data for further calculations, the forecast of return and overheads rates, cost of repairs, etc in view of inflation and the update on return rates on the factor of useful use that takes into account downtime for repairs.

The factor of useful use is calculated with formula (1):

$$K_{\text{ПИ}} = \frac{N_{mek} \cdot t_{mek} + N_{\partial en} \cdot t_{\partial en} + N_{kan} \cdot t_{kan}}{N \cdot T} + \alpha_{np}, \quad (1)$$

where: $N$ - the park of rolling stock in use during the given period; $T$ - the duration of the period in days (in the considered project - a quarter); $N_{mex}$, $N_{\partial en}$, $N_{kan}$ - the amount of cars in technical, garage and capital repairs; $t_{mex}$, $t_{\partial en}$, $t_{kan}$ - the duration of technical (3 days), garage (4 days) and capital repairs (7 days), accordingly; $\textit{б}_{np}$ - the factor of other non-productive times;

In practice the factor of useful use of cars varies between 0,97 - 0,99.

Estimating the investments for a project realized with the help of leasing requires the calculation of interest rate on leasing as well. Theoretically, this rate does not exist. As a rule, leasing companies give the leaseholder the in-

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formation on leasing payments without disclosing the rate. But it is possible to calculate the rate independently, knowing the cost of the purchased property and the size of advance payment with formula (2):

$$, \qquad (2)$$

Where: $n$ - the validity of the contract on leasing, years; $\sum \text{ЛП}$ - the sum of leasing payments for all the period of leasing contract; $\text{СИ}$ - the cost of the leased property; $A$ - the advance payment.

In practice the rate on leasing is calculated with the help of extrapolation of the data of a previous period since the changes in leasing payments have insignificant and predicted character.

The block of "Condition of financing". At the inputfrom the block of "Initial data" there are the parameters of leasing, long-term and short-term credits, and also the cumulative monetary stream from the block of "Calculation of the budget of movement of money resources "for the definition of volumes the attracted short-term credits. At the output there is the schedule of repayment of credits and the leasing debt, interest payments for the formation of operational (interest payments, etc.), investment (advance payments on leasing, etc.) and financial (attraction and repayment of credits) monetary streams in the block of " Calculation of the budget of movement of money resources ", and also interest payments in the block of " Calculation of the budget of incomes and charges " and the initial data for the block of " Calculation of the VAT ".

The block of "Calculation of depreciation charges". At the input there is the description of the acquired property and the ways of financing taken from the blocks of "the Initial data" and "Conditions of financing". In the block itself there is quarterly calculation of depreciation charges and residual cost of the acquired property. On the output there is the schedule of simple (for the purposes of book keeping) and accelerated (for the purposes of tax account) amortization for the blocks of " Calculation of the budget of incomes and charges ", " Conditions of financing ", " Calculation of the VAT " (at leasing).

The block of "Calculation of incomes". At the input there are the parameters of income per car per for export and internal transportation taken from the block of " Initial data ", at the output there is the data for the block of "Calculation of the budget of incomes and charges" about the incomes on export and internal transportations generated by the acquired park of rolling stock, distributed per car per quarter.

The block of "Calculation of constants, variables and miscellaneous costs". On - the input from the block "the Initial data" account rates on the car in day. At the output - the data in the block "Calculation of the budget of incomes and charges" about constants, variables and miscellaneous costs for 1 car in a quarter.

The block of "Calculation of the budget of incomes and charges". At the input there is data from the blocks of "Calculation of depreciation charges", "Calculation of constant variables and miscellaneous costs" and "Calculation of incomes" that is needed to form the budget of incomes and charges, and also to calculate the profit tax (the latter being especially important in case of investment project implementation with the help of leasing). At the output there is the data on the profit tax for the block of "Calculation of the budget of movement of money resources", the data for the block of "Calculation of the VAT". The latter block is the basis for calculating the budget of incomes and charges per car per day. The block of "Budget of incomes and charges per car per day" has great value for analysts, but is not connected with the calculation of monetary streams.

The block of "Calculation of the VAT". At the input there is the data on the operations subject to VAT from the blocks of "Condition of financing", "Budget of incomes and charges" and "Depreciation charges". Calculation of the VAT is one of the most complex blocks in the algorithm of investment analysis. Here it is necessary to take into account not only the norms of Russian legislation, but also the practice of its use by fiscal bodies and companies.

According to clause 176 of the Tax Code of Russian Federation the compensation of VAT on export operations "is made not later than three months from day of submission of the tax declaration specified in item 6 of clause 164 of the present Code and the documents stipulated by clause 165 of the present Code by the tax bearer". However in practice due to the problems with collecting the necessary documentation, the

refusals of tax bodies in compensation and the subsequent legal actions the compensation of the export VAT takes place within one year.

As the acquired rolling stock can be intended for use both on internal and on export transportations the compensation factors $щ_{вн}$ and $щ_{эксп}$ are used for the distribution of internal and export VAT. Thus $щ_{вн} + щ_{эксп} = 1$. The calculation of factors is done with formulas (3), (4):

$$\omega_{вн} = \frac{Д_{ВН}}{(Д_{ВН} + Д_{ЭКСП})}, \qquad (3)$$

Where: $Д_{ВН}$ - the income on internal transportations; $Д_{ЭКСП}$ - the income on export transportations.

$$\omega_{эксп} = 1 - \omega_{вн} \qquad (4)$$

The general scheme of VAT calculation is shown in Figure 3 (fig. 3).

At the output there is data on the VAT on compensation or payment in the block of "Budget of movement of money resources".

The block of "Calculation of the budget of movement of money resources and a free monetary stream". At the input there is data from the blocks of "Calculation of the budget of incomes and charges", "Calculation of the VAT" and "Conditions of financing" on receipts and leavings on operational, investment and financial activity during project implementation. At the output there is a forecast of monetary streams for own and invested capital for the block of "Estimation of efficiency of investments". The block of "Calculation of the budget of movement of money resources" is the key one for the project. The monetary stream on own capital is designed in the block. It is the basis for the estimation of sensitivity and the comparative analysis of the investment project.

The block of "Estimation of efficiency of investments". At the input there is data from the block of "Calculation of the budget of movement of money resources" on the monetary stream on own capital, and also the data on the value of the rate of discounting taken from the block of "Initial data". At the output there are such parameters of investment project efficiency as pure discounted income, internal norm of profitability, discounted and simple period of investment project recoupment.

The block of "Calculation of sensitivity of the investment project". At the input there is data about the stream on own capital and the parameters of efficiency of the investment project from the blocks of "Calculation of the budget of movement of money resources" and "Estimation of efficiency of investments" after modifications in the block of "Initial data". The given block is designed for studying the influence of various factors on the parameters of investment project efficiency. The calculation of sensitivity is supposed to be carried out consistently concerning the changeable initial characteristics (for example, the cost of rolling stock, the average income per car per day) and the ways of financing. The importance of the block lies in the definition of critical conditions when an investment project becomes inefficient.

Sometimes the dependence of pure discounted income on the cost of rolling stock has non-linear character. The reason lies in the need to attract short-term credits to cover cash breaks. So, until the volume of the involved short-term credit is either minimal or absent, the dependence remains linear.

As a rule, the analysis of influence of such factor as the income per car per day on the efficiency of the investment project shows that leasing has greater safety factor in comparison with the credit.

The block of "Comparative analysis of various forms of financing of investments". At the input there is data from the block of " Calculation of the budget of movement of money resources on a monetary stream on own capital " and also from the block of "Initial data" (the value of the discount rate).

Having estimated the sensitivity of the investment project to the outside factors in various forms of financing, it is important to define those margin values when the credit becomes more suitable form of financing than leasing, and on the contrary.

Margin value can be found if the following condition is true: $ЧДД_{лизинг} = ЧДД_{кредит}$ . For this purpose it is possible to find boundary conditions, for example for such factors as the interest rate on credit and leasing. The given conditions do not remain at the initial level while all other parameters of the investment project remain unchanged.

It was noticed that the growth of interest rate on the credit, for example by 1 %, results in the same change in pure discounted income,

as well as the growth of the rate on leasing by 0,33 %. The given fact shows, in the process of investment project implementation the growth of the interest rate on leasing doesn't have such negative effect on the investment project as the growth of interest rates on the credit. The reason for the phenomenon is the greater duration of a leasing contract in comparison with credit and the reduction of real (not nominal) payments due to discounting monetary streams. The dependence of credit interest rates and leasing interest rates is shown in Figure 6.

The dependence of the rate on leasing on changes in the credit interest rate provided that pure discounted income of the project implemented with the help of leasing is equal to pure discounted income of the project implemented with the help of credit is described by formula (5):

$$y = ax + b, \tag{5}$$

Where $y$ - the interest on leasing; $x$ - the interest on the credit.

The graph can be considered a straight line which divides the plane into two half planes one of which is the half plane of priority of the credit, and the other is the half plane of priority of leasing.

The analysis above also suits other factors.

As we see from the research results it is necessary make an algorithm to calculate the efficiency of the investment project. Thus it is impossible to use some uniform approach for any branch and any kind of economic activities as it is necessary to take into account the specificity of each investment project.

Thus a simple calculation of project efficiency with various forms of financing is insufficient. The analysis of investment project sensitivity with various forms of financing and the comparative analysis of the used forms of financing are necessary. Without it the company risks to choose the form of financing effective only with a "unique" combination of factors, but extremely sensitive to the changes in external conditions. The model offered by the author allows to minimize the given risks to estimate efficiency of the investment project in dynamics.

1. *Abramov S.I.* Fixed asset investment management. M.: "Examen", 2002.

2. Damodaran Asvat Investment estimation: Tools and methods of estimating any assets. M.: Alpina Business Books, 2005.

3. *Breyley R., Meyers S.* Corporate finance principles. M.: CJSC"Olimp-Business", 2006.

4. *Gazman V.D.* Leasing development in Russia and its concentration // Economic journal of HSE. 2005. № 4.

5. *Dougles Alexander J., Carlson Christina J.* Main principles of franchising: the secrets of attracting the funds of non-profitable companies. Dnepropetrovsk: Belons Business Books, 2007.

6. Transportation logistics: A textbook for transportation universities. M.: "Examen", 2002.