ECONOMIC AND FINANCIAL ANALYSIS OF TRANSPORT PROJECTS

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Summary: The paper deals with the problems of transport projects' rating, namely with concentration on the economic and the financial analysis. At first, it compares basic aspects of the economic and the financial analysis of the project and further engages in the financial analysis with respect to viability and effectiveness of the project. In the framework of the project's viability evaluation it deals with liquidity and capital structure indicators, effectiveness is judged on the basis of static and dynamic parameters.

Key words: Project, Transport projects

1. INTRODUCTION

Transport projects' rating represents the evaluation from the point of view of representative indicators related to the project itself. However, it is necessary to make also economic and financial analyses of these projects to achieve a complex conception of the evaluation. The matter is especially the cash flow analysis, the project could be threatened without it due to investor's momentary insolvency or other reasons connected with the financial situation of subjects relating to the project.

The rating must be made with respect to the project's life cycle, to all its stages. The financial analysis requires the project's analysis from this complex view, i.e. including all stages of the life cycle. This is necessary for the decision-making about the project's future realization, in its preliminary stage. We must include not only the investment stage but also the operational one, when further cash flows awakened by investments enter the analysis. The financial analysis is therefore used in the preliminary stage of the project and is documented in a material called technical-economic study or feasibility study [1].

2. ECONOMIC AND FINANCIAL ANALYSIS

We must explain the difference between the financial analysis and the economic analysis. The financial analysis deals with the project from the market point of view of the investor (or further participants) whereas the economic analysis from the point of view of the national economy, i.e. it deals with the analysis of the project's impacts on the economy of a given country. It is evident that the economic analysis has its sense only in the case of extensive, technically or economically important projects or such ones in that national economy effects represent the primary goal (e.g. development projects). The financial

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analysis is an essential prerequisite and the first step for the economical analysis [2], in which it is necessary to involve also considerations about noneconomic demands and effects of the project.

A quick orientation in basic aspects of the economic and the financial analysis provides the figure 1.

FINANCIAL (MARKET) **ANALYSIS**	**ECONOMIC** (NATIONAL ECONOMY) **ANALYSIS**
Position of investors, banks, shareholders etc.	Position of the government, economists etc.
Viability and effectiveness of the project	Impact of the project on the national economy
Market prices	Economic (shadow) prices
Direct effects of the project	Direct and indirect effects of the project
Financial effects of the project	Financial and nonfinancial effects of the project

Source: ČKAIT, authors

Fig. 1- Basic aspects of the economic and the financial analysis of the project

The figure 1 shows that a project effective from the entrepreneurial (microeconomic) point of view needn't be always effective from the macroeconomic point of view and vice versa.

Future financial behaviour of the project can be simulated on the basis of input data to a given time horizon through a specialised simulation model, i.e. computer model for the feasibility study [3]. The most important outputs of this model are [4]:

- cash flow,
- profit and loss statement,
- balance sheet – balance of assets and liabilities, which represents information about financial behaviour of the project from three standpoints:
  - real cash flows,
  - profit formation and taxation,
  - financial management.

The advantage of this approach is international compatibility of the results.

2.1 Cash flow

Cash flow conception is very simple and practically independent on a particular chart of accounts because it works only with real cash flows (e.g. depreciation is not a component of cash flow but profit and loss statement).

Cash flow can be understood as a balance of money incomes and expenses concerning a determined time unit, usually year [5].

According to which particular cash flows are included in incomes and expenses we can differentiate:

- cash flow for financial planning (financial cash flow) – all flows (operation and financing of the project),
- net cash flow (operational cash flow) – only flows relating to operation.

2.2 Profit and loss statement

Profit and loss statement is a usual document. With regard to the fact that it includes income tax calculation it respects national legal regulations and charts of accounts. Its structure keeps generally accepted principles and at the same time it abstracts away from details irrelevant for the preliminary analysis of the project.

2.3 Balance sheet

The aim of balance sheet is to provide information about assets and liabilities in an accumulated form in particular years (in the financial analysis of the project they are simulated, potential future values like in the case of cash flow and profit and loss statement) [6].

Assets include:

- current assets – cash, receivables, stock,
- fixed assets – investment assets.

Liabilities (assets are covered by them) usually include:

- current liabilities (short-term liabilities – valid bills, short-term credits etc.),
- long-term debts,
- equity – basic, usually share capital + undistributed profit.

Balance equality is valid for every balance sheet. That means that total assets must be always identical to total liabilities.

3. REAL FINANCIAL ANALYSIS

It is usually possible to differentiate two basic standpoints in the financial analysis of the project:

- the standpoint of strictly financial viability of the project,
- the standpoint of effectiveness of the project as an investment.

3.1 Orientation structure of the financial analysis

The figure 2 enables a basic orientation in the typical structure of the financial analysis. The structure is general and particular cases can include either only some of its components or develop some of them in detail.

Proper arrangement or combination of the data from three basic overviews concerning financial behaviour of the project (cash flow, profit and loss statement, balance sheet) enables to calculate or determine necessary indicators or characteristics that represent the financial analysis of the project in the structure presented in the figure 2. We can mention especially financial viability and investment's effectiveness [3].

<table>
<tr><td rowspan="3">STANDPOINT OF FINANCIAL VIABILITY</td><td colspan="2">LIQUIDITY ANALYSIS</td></tr>
<tr><td colspan="2">CAPITAL STRUCTURE ANALYSIS</td></tr>
<tr><td colspan="2">FINANCIAL INDICATORS</td></tr>
<tr><td rowspan="8">STANDPOINT OF INVESTMENT'S EFFECTIVENESS</td><td rowspan="3">STATIC PARAMETERS</td><td>Simple rates of returns</td></tr>
<tr><td>Investment's repayment time</td></tr>
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<tr><td rowspan="3">DYNAMIC PARAMETERS</td><td>Net present value</td></tr>
<tr><td>Internal rate of return</td></tr>
<tr><td>Investment's repayment time</td></tr>
<tr><td rowspan="2">RISK AND UNCERTAINTY ANALYSIS</td><td>Profitability threshold, break-even point</td></tr>
<tr><td>Sensitivity analysis</td></tr>
</table>

Source: ČKAIT, authors

Fig. 2 - Financial analysis of the project – structure

3.2 Financial viability

Financial viability generally means an ability of the project to cover financially all its liabilities in real time, regardless the character and the origin of used financial resources.

The project is potentially financially viable, if the accumulated value of its financial cash flow is not negative [3].

Liquidity – an ability to pay or meet obligations in required real time (prompt solvency). Liquidity analysis can be based on [7]:

- financial cash flow (real time corresponds to the time unit for cash flow calculation),
- so called net working capital, which is equivalent to the difference between current assets and current liabilities. Positive value indicates a rate of the project's ability to cover its liabilities (usually within the year) by potential transformation of its current assets (especially stock, receivables) into money.

Capital structure – it influences both financial viability of the project and its economic effectiveness. Financial resources can be divided into [5]:

- internal (net profit, depreciation, investment assets disposal, interest etc.),
- external (basic, share capital, credits, subventions, grants, donations, nonreturnable loans etc.).

From the balance sheet point of view resources can be divided into:

- own (basic capital, subventions etc.),
- foreign (credits etc.).

From the time point of view capital can be divided into:

- long-term,
- short-term.

It is valid generally:

- higher share of own resources increases financial viability, however, it lays higher financial demands,
- financing from foreign resources is cheaper, it increases parameters of economic effectiveness,
- long-term capital should cover both fixed assets and the basis of current assets (or there is a danger of financial crisis).

The capital structure represents in principle a share of the own and the foreign capital in total liabilities as resources of the project's financing.

Financial indicators – we can mention following as typical [3]:

$$ZV_K = \frac{Dl_D}{V_K} * 100 \quad (1)$$

where:

ZV_K own capital indebtedness [%],
Dl_D long-term debt [CZK],
V_K equity (share) capital [CZK].

$$BML = \frac{B_A}{B_Z} \quad (2)$$

where:

BML current liquidity rate,
B_A current assets [CZK],
B_Z current liabilities [CZK].

Receivables and cash are regarded as highly liquid assets, stock has lower liquidity.

$$ZML = \frac{B_A - Z}{B_Z} \quad (3)$$

where:

ZML stricter liquidity rate,
B_A current assets [CZK],
Z stock [CZK],
B_Z current liabilities [CZK].

$$KD = \frac{CCF}{Dl_D} * 100 \quad (4)$$

where:

KD debt cover [%],
CCF net cash flow [CZK],
Dl_D long-term debt [CZK].

$$KDL_S = \frac{CCF}{Dl_S} * 100 \quad (5)$$

where:

KDL_S debt servicing cover [%],
CCF net cash flow [CZK],
Dl_S debt servicing [CZK].
Debt servicing represents debt repayments and interest.

The indicators of indebtedness cover indicate the project's ability to cover debt repayment (including interest) by net, operational revenues from internal resources. Higher values indicate higher financial security of the project.

3.3 Investment effectiveness

It lies in the project's ability to settle expended investment costs by its revenues in reasonable time and to increase the value of the investment. It depends on cash flows related to operation, not only from the point of view of their amount but also time (static and dynamic approach).

Static parameters don't take into consideration the time value of money and are evaluated always for a determined time period (usually year) [3]:

- simple rates of returns, with respect to the accumulated capital value,

$$VZ_K = \frac{CZ}{ZK} * 100 \quad (6)$$

where:
VZ_K basic capital return [%],
CZ net profit [CZK],
ZK basic capital [CZK].

$$VV_k = \frac{CZ}{VK} * 100 \quad (7)$$

where:
VV_K own capital return [%],
CZ net profit [CZK],
VK own capital [CZK].

$$VC_I = \frac{CZ + U}{CIN} * 100 \quad (8)$$

where:
VC_I total investment return [%],
CZ net profit [CZK],
U interest [CZK],
CIN total investment costs [CZK].

- repayment time (investment settlement) represents time (usually in years) in that the project creates such accumulated revenues that balance accumulated investment costs. Repayment time is generally defined as such year in that accumulated net cash flow comes to a non-negative value for the first time. Repayment time is not a

universal parameter. It indicates nothing about the return of the project from the point of view of the determined time period,

- indicators of effectiveness represent efficiency of investment management, i.e. how investment costs transform into the output of the project (receipts from products or services selling),

$$OI = \frac{T}{CIN} \tag{9}$$

where:

OI investment turnover,
T receipts [CZK],
CIN total investment costs [CZK].

$$IVP = \frac{CIN}{NPS} \tag{10}$$

where:

IVP investment provision of workforce,
CIN total investment costs [CZK],
NPS operational force costs [CZK].

$$OZ = \frac{T}{HZ} \tag{11}$$

where:

OZ stock turnover,
T receipts [CZK],
HZ stock value [CZK].

Dynamic parameters consider the time value of money – they convert future cash flows values into present values through discounting [3]:

- interest, where i stands for interest rate in %/100,

$$BH_n = SH * (1 + i)^n \tag{12}$$

where:

BHn future value in n-year [CZK],
SH present value [CZK],
i interest rate [%/100].

- discounting, where i stands for discount rate in %/100,

$$SH = \frac{BH_n}{(1+i)^n} \tag{13}$$

where:

SH net value [CZK],
BHn future value in n-year [CZK],
i discount rate [%/100].

Discount rate represents the importance of time and money. It is important for the evaluation of investment opportunity costs in investor's decision-making. Interest rate for long-term credits is used as discount rate due to simplification.

Net present value is defined as a sum of discounted net cash flows from the beginning of the construction by a determined time horizon of its operation. It is regarded as one of the most important parameters for project's rating. Positive value indicates that the project can be interesting for the investor.

In projects with a significant difference in investment costs it is suitable to use this index:

$$CSH_i = \frac{CSH}{SHI} \tag{14}$$

where:

CSHi net present value index,

CSH net present value [CZK],

SHI investments present value [CZK],

where investments present value means a sum of discounted investment costs.

Internal rate of return is such discount rate value for that net present value is zero. It is dependent only on the project itself, i.e. on cash flows size and their distribution in time.

Investments repayment time (dynamic) is such year in that accumulated discounted cash flow comes to a non-negative value for the first time. It mustn't be interchanged with static repayment time, which is a specific case of dynamic repayment time for discount rate equal to zero [2].

Risk and uncertainty analysis represents a complex of activities for other solutions than were expected in the simulative module, which is deterministic and is not able to predict them.

Profitability threshold, break-even point represents such volume of realized production (in a determined year) at that receipts cover costs of production (services).

4. CONCLUSION

Any investment projects, i.e. business plans, must be carefully judged in advance from the point of view of their feasibility. The project, however, don't represent only a technical and organizational problem but it is also an economic activity last but not least.

It is therefore necessary to judge every project also as a business, i.e. from the point of view of its financial and economic viability and effectiveness. This is the basic role of the economic and the financial analysis of the project.

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