

Appropriate Strategies of Transport Companies for More Efficient Management with the Aim of their Further Assessment Using the Operations Research Methods

Prikladne strategije transportnih kompanija poradi djelotvornijeg menadžmenta s ciljem njihove daljnje procjene koristeći operativne metode istraživanja

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Summary

This article is aimed to present the basic characteristics in evaluating the real economic and operational activity which may lead to streamlining of the transport company's management. The basic materials which can be used for evaluation include the balance sheets and the profit and loss accounts. Last but not least, the author included his own observations and knowledge of the urban public transport and the required information from the Ministry of Transport of the Czech Republic and some methods of the applied mathematics (operations research).

KEY WORDS

operational analysis
economic analysis
cost analysis
transport performances

Sažetak

Ovaj članak ima za cilj prezentirati osnovne karakteristike procjene realne ekonomske i operativne djelatnosti koja može dovesti do modernizacije menadžmenta prijevozne kompanije. Osnovni materijali koji se mogu koristiti za procjenu uključuju bilancu i računovodstvo zarade i gubitka. Zadnje, ali ne najmanje važno autor uključuje svoja vlastita opažanja i znanje urbanog javnog prijevoza i traženu informaciju od Ministarstva transporta Češke republike in eke metode primijenjene matematike. (operativno istraživanje)

KLJUČNE RIJEČI

operacionalna analiza
ekonomska analiza
analiza troška
izvedba prijevoza

1. INTRODUCTION: Main Goals of the Transport Company Evaluation

The main goal is to ensure the transport services of the town and the region in accordance with the legislation of EU, Czech Republic and relevant state administration and local government measures arising from the program materials and resolutions while meeting the quality standards of individual modes of transport and optimal using of transport performances and public budget funds.

The above goals will be achieved through a narrow cooperation of the operators and by establishing more narrow cooperation with the regional offices, transport experts, the public as well as the transport academicians and researchers (regular workshops, etc.). Decision-making of the transport company will be subject to meeting the conceptual intentions and tasks imposed by the operator [1], [2].

The basis for accomplishing the above goal is efficient spending of money on ensuring the transport services and all of the other associated activities. Savings can be achieved by [2-4]:

- Optimizing the leading of lines/links within the town and in coordination with neighbouring municipalities and the South Bohemia Region and increasing the number of transported passengers, including the reorganization of the travels to the first loading and the operation of associated activities.
- Ensuring the narrow link to the companies, shopping malls, shops, etc.,
- Optimizing the underused links,
- Permanent influencing the employees in order to streamline the operation and transportation (use of more economic

methods of transportation), modification of contracts in the field of repairing and purchase of spare parts and by changing the repair strategy, including the billing of costs in the company's internal accounting.

The company can continue to achieve the profit, especially by

- Providing the consulting services in the public urban transport (by drawing-up the studies, surveys, etc.),
- Selling the supporting services (advertising, irregular transportation, alternative transport for the lock-outs of the Czech Railways, repairing activity for the third parties, fuel and parking management, etc.),
- Cooperation in solving the integrated transport system (ITS),
- Transport engineering activity,
- Pedagogic, publishing and research activity (solution of project grants in cooperation with other institutions). The strategy is aimed to publish the intentions of the company, implementation of the transport solution of the urban public transport as well as the associated activities by means of newspapers [5-7].

2. ECONOMIC ANALYSIS

With respect to the division of individual costs in relation to the posting of public budget's financial means per a calculation unit (CZK/travelled km), we can conclude that the monitored transport company can implement the strategy described below in the text.

The table 1 shows the share of individual costs listed in the Profit and Loss Account of the transportation operations of the transport company (bus transport) in the total costs compared with other comparable carriers ensuring the public urban transport in the Czech Republic with respect to the share of the amount of individual costs in the total costs (provided in %). Also with respect to the differences of the operations, these modified indicators provide an equivalent and comparable view of the structure of costs.

While the costs, such as direct wages, fare, fuel, rubber rims, etc., are comparable and do not distinguish by more than approximately 2 %, the amount of repairs and maintenance shows an extreme difference of approx. 16 % of the total costs of

the carrier under consideration in comparison with approx. 5 % of the total costs of other carriers. Similar reserves can be found in case of the overhead costs with a difference of 3.5 %. The poor management of the majority of the transport companies in the Czech Republic is also proved by the expert study of the Bisnode agency from 2010 – comparison of transport companies' management in the Czech Republic based on the Economic Value Added (EVA). In fact it is about how long the company is able to efficiently derive maximum value from the invested money – especially the operator's money [1], [2]. [8].

3. ECONOMIC VALUE ADDED

The economic value added (EVA) is used for evaluating the transport company's performance. This model was created in 1993 by the American company Stern Stewart Management Services. The calculation of this indicator consists of the difference in the operating profit/loss net of the corporate income tax. The average costs of capital are characterized as the use of the external and the company's own capital by the company related to the costs of the company's own capital and external capital. Each business unit may have different composition of the total capital. At present it is common to procure the external capital in the form of loans, as it is practically cheaper than the company's own capital to a certain amount where the tax shields function and the risk for shareholders is not so high. As a general principle, the higher the value of the external capital is, the higher required return is expected by shareholders. The reason is a risk of non-payment of the external capital in the form of loans or otherwise.

$$EVA = NOPAT - WACC \times C; NOPAT = (EBIT * (1 - t)); WACC^1$$

t rate of the corporate income tax
EBIT earnings before interest and taxes

The prerequisite of the economic value added is to have higher benefit from the invested capital in comparison with the costs of capital. In general, it is the payment of all obligations to shareholders, banks, etc.

Table 1 Quantification of the amount of selected costs per a total amount of costs per CZK/ travelled km (Bus transport) of the selected carrier

Selected indicators	2010 in CZK	2011 in CZK	2012 in CZK	2013 in CZK	2014 in CZK	2015 in CZK	Comparison with other carriers (in percentage)	
							Average % of costs per the specific transport company in 2012	Average % of costs of other carriers 2014
Fuel	10.45	11.25	12.65	12.13	13.17	13.41	24.00	22.01
WAGES	11.4	11.03	10.17	11.35	11.59	13.23	21.12	22.00
REPAIRS AND MAINTENANCE	10.44	9.61	8.64	8.80	8.97	10.86	16.35	4.87
OVERHEAD COSTS	7.08	7.37	8.41	8.17	7.87	6.83	14.34	9.8
Total costs	56.58	54.71	53.43	54.74	54.86	61.35		

Source: authors

¹ company's own capital/total capital * costs of company's own capital + external capital/total capital * costs of the external capital * (1 - t)

Three situations may happen:

EVA > 0 a company creates a value for the owners (overprofit)

EVA < 0 company's value is reduced

EVA = 0 invested capital returns without the carried interest.

Table 2 Calculated values of EVA of selected transport companies

	EVA absolutely in thousand CZK	EVA relatively in %
Pilsen City Transport Company	-27,236	-2.01
Hradec Králové Transport Company	-36,237	-3.74
Brno Transport Company	-229,392	-4.36
Prague Transport Company	-3,877,597	-6.02
Transport Company of Liberec and Jablonec nad Nisou	-95,615	-8.25
Ostrava Transport Company	-425,166	-9.2
Opava Transport Company	-22,169	-9.22
Pardubice Transport Company	-42,544	-10.06
České Budějovice Transport Company	-81,687	-10.28
Olomouc Transport Company	-78,733	-11.53
Děčín Transport Company	-41,688	-12.01
Most and Litvínov Transport Company	-70,574	-14.33

Source: authors

In majority of cases, a total review of the technology related to the repairs and other activities is needed. If found to be disadvantageous, it is necessary to alter the contract and to continue in the stabilization steps [4], [5], [9].

Other reserves need to be searched in the quality of provided transportation services. Also the still insufficient links between the fields and the quality of waiting rooms for the link, delays, state of associated services, etc. have their impact, too. All of these aspects are mostly the main reason for the reduced interest in the public urban transport.

The main task of the transport companies is to improve the linking between some connections, to consistently check the quality of the transport process and to exert pressure on improving the entire travelling culture, limitation of the delays (mostly by modifying the central database with the time measurement and in many cases by insufficient preference) and also the relation of the personnel to the travelling public.

With respect to the threatening shortfall of public services funding from the public budgets based on the budgetary tax specification, the funding of transport companies needs to be stabilized. The basic criterion for the total demands for the public urban transport is modelling the amount of costs for the period of 2016 – 2018. This period stems from the necessity of the transport planning and the approved Plan of Transport Services in the territory of regions for the 2016-2020 period [4], [5], [10].

Modelling is made in three strategies 1, 3 and 5 % of possible inflation modes. The table does not consider possible saving in reducing the overhead costs (including the costs of repairs) for the monitored transport company.

Table 3 Model of amount of price per 1 travelled km – bus transport

	Model of amount of price per 1 travelled km – bus transport						
	2014	2015	2016	2017	2018	2019	2020
1 % increase	54.86	55.41	55.96	56.52	57.08	57.65	58.23
3 % increase	54.86	56.51	58.20	59.95	61.74	62.36	62.98
5 % increase	54.86	57.60	60.48	63.51	66.68	67.35	68.02

Source: authors

With respect to the performance in the public urban transport, no considerable increase in the number of travelled kilometres is expected. The goal is to stabilize the company with respect to the financial requirements and to ensure the corresponding system of the public urban transport.

This can be done by gradual decreasing the costs in the item "repairs". The table below shows modelling of the amount of possible costs per a unit and its reflection in the trend analysis of the amount of costs with respect to the increase in inflation. The benchmark year is 2014; relatively high saving can be achieved until 2017 while respecting the above principles [3-5], [11].

Table 4 Strategy of gradual decrease in costs or repairs in line with the trend of the 2015-2017 period

	2014	2015	2016	2017
trend - annual decrease by 0.77 CZK	7.87	7.10	6.33	5.56
difference in decrease		-0.77	-0.77	-0.77

Source: authors

Table 5 Savings in the repair cost reduction when the inflation increases

	Model of amount of price per 1 travelled km – bus			
	2014	2015	2016	2017
1 % increase	54.86	54.64	54.41	54.19
3 % increase	54.86	55.74	56.64	57.57
5 % increase	54.86	56.83	58.90	61.08

Source: authors

The data in the tables show the reduction of subsidies per the unit of transport performance with respect to the reduction of costs of repairs and maintenance. This is the important moment for the future development of the company under review. Given the high costs of individual modes of transport, the need for the capacity and use of the means of transport in relation to the frequency of passengers will be thoroughly considered in ensuring the transport services [6-8].

4. CONCLUSION

The article considers the possibility of evaluation the economic situation of the transport company. The evaluation was based upon the public available data from the selected economic reports. Within the economic health evaluation, an appropriate procedure of how to eliminate the risk factors which are the cause of the poor economic situation or could contribute to the financial situation in the next period was suggested. This

procedure can be used as an example for application to any financial analysis as well as the consideration of the financial health of the transport company [5], [8], [12].

Thanks to the permanent necessity to state the current financial situation of transport companies, especially due to their involvement in the transport services being implemented, this analysis is also usable as a reference document for the public transport customer (orderer). The evaluation of the economic situation and the outlook for the company's management in the five-year period, as carried out in this article, requires the regions (municipalities) to draw-up the transport services plan for their territories. These plans are also implemented for the 5-year period.

In assessing the economic situation of more transport companies, their condition can be compared using the methods of the operations research. These data will not have to be standardized or otherwise modified, which makes their use in the particular operations research method easier [8-11], [13].

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