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THE RESEARCH ON COMPETITIVENESS OF ROAD TRANSPORT ENTERPRISES: LITHUANIAN CASE

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In the paper, various opinions of Lithuanian and foreign authors of scientific publications are reviewed and the criteria for assessing competitiveness of road transport are discussed upon. On assessment of competitiveness of services provided by Lithuanian road transport enterprises, not only technical options are taken into account. It is proposed to assess competitiveness of enterprises upon taking into consideration the total set of services provided as well as their quality and the marketing level of the enterprise. In the paper, the factors impacting competitiveness of road transport are discussed upon and the research works required for objective assessment of competitiveness of road transport are foreseen. A model for assessing competitiveness of road transport enterprises realized by the authors is provided. In the end of the paper, conclusions and recommendations are provided.

Keywords: competitiveness of enterprises, competitiveness assessing, concordance, AHP method

1. Introduction

After joining of Lithuania to the European Union (EU) in the year 2004 and the subsequent changes of the business environment, the problems of competitiveness and foreign trade are becoming more and more topical, because the membership in the EU increases the importance of economic and institutional relations with other countries. In the period of economic recession, a considerable number of enterprises (in particular, those involved in providing transport services) could not hold out their position in the market and a still larger number of them obtained no profit from their activities because of the reduced level of consumption and needs in transport services. In course of the recovery of economy, effective using the competitive potential is of a great importance.

The key element of the competitive environment is enterprises. A competitiveness of an enterprise in the world market is bound with its ability to respond to immediate changes of the market and to hold out the position of the enterprise in it. The idea of competitive advantage starts from creation and distribution of the value. An enterprise is recognized competitively advantageous; when its influence predetermines economic changes in the market where it has a certain share [1]. The concept of economic equilibrium is interpreted as an ability of an enterprise to hold its end up and to withstand the negative impact of its rivals. So, an enterprise should be capable to overcome the barriers of strategic difficulties. According to scientist Piccoli, both its ability to defend its position of competitive advantage and an ability to provide a successful response to its rivals become the ones of a great importance [2]. The core of competition is a necessity to contend that is important for competition in the market. Researcher Lobanova emphasized that a market, as an open system (space or territory), cannot be imagined without organizations competing in the said space [3].

According to researcher Gerard de Villiers [4], commercial activities in competitive environment should be focused only to the spheres where they can preserve or obtain competitive advantage. Five factors of six traditional ones included in the service marketing mix (price, promotion, product, humans and process) leave a too little space for introduction of innovations.

According to scientists Marčinskas and Diskienė [5] in the complicated and ever-changing business environment, the ways of obtaining and preserving competitiveness by an organization vary as well; in scientific references, the said ways are assessed ambiguously. So, it may be stated that no universal ways of obtaining and preserving competitiveness by an enterprise exist. A majority of authors assent to the opinion that competitive advantage is obtained by those who:

- 1) may offer an exclusive and unique product or service highly appreciated by the consumer;
- 2) perfected their ability of a particularly sensitive response to the market and adaptation to it (earlier than other market players);
- 3) are the first in finding an access to the principal resources (when other market players cannot find it);
- 4) earlier achieve the highest level of results (as compared to other market players).

Competition is one of the key elements of the market. In each business sector, competition between market subjects takes place. Freight transporting and forwarding enterprises do not present an exception – competition between them takes place as well. However, it is not clear whether the said enterprises pay a great attention to striving to competitive advantage, i.e. improvement of the quality of services provided, assessment of actions of their rivals or control of certain spheres of the activities. So, it may be stated that the principal problem is incomplete using the competitive potential by Lithuanian enterprises involved in providing freight transportation services. In order to analyse the above-mentioned problem, the research work on assessment of an ability of Lithuanian road transport enterprises to compete in the market had to be made.

The aim of this research was to assess the competitiveness of Lithuanian road transport enterprises by using quality expertise multicriteria methods, especially AHP (*Analytic Hierarchy Process*) method.

2. Statistical Indicators of Road Transport Enterprises and Their Fluctuation

In the year 2010, export of services in Lithuania increased by 17.3%, or 1.56 billion LTL (the currency unit of Republic of Lithuania), as compared to the year 2009. Export of services of all principal types was growing, except of export of financial services that reduced by 3.5%. The said growing was mostly caused by export of transport services that increased by 21.6%, or 1.1 billion LTL, travel services – 7.6%, or 0.188 billion LTL, other business services – 22.1%, or 0.155 billion LTL, and building services – 34.2%, or 0.057 billion LTL.

In the early 2011, even a disproportion between transporting capacities and grown demand appeared. Undoubtedly, these factors also caused growing of export of forwarding, logistics and warehousing services: it grew by 276.6 million LTL, or 25.6%, as compared to the year 2009. Export of services in freight transportation by air transport increased by 71.6%, or 15.44 million LTL, by railways – by 1.2%, or 8.8 million LTL, as compared to the year 2009; however, export of services in freight transportation by sea reduced by 2.6%, or 8.7 million LTL. The structure of the sector of services in Lithuania in the year 2010 is shown in Fig. 1.

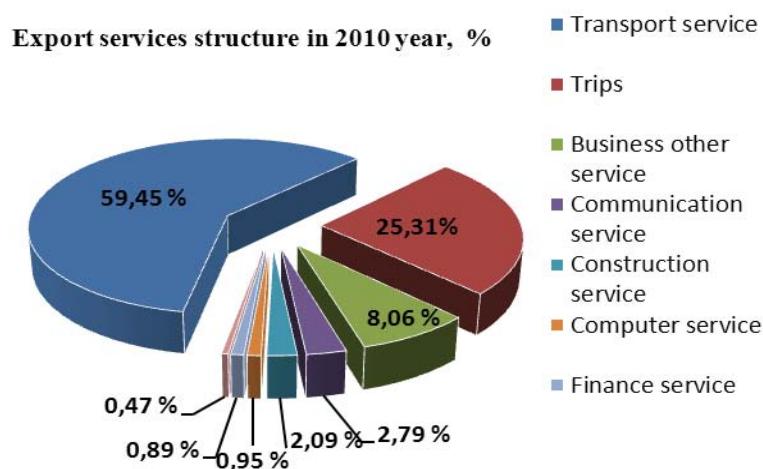


Figure 1. The structure of the export service's sector in Lithuania in the year 2010,%
(http://www.versli Lietuva.lt/files/files/PDF/elanalitinis_naujienlaskis_paslaugos2010.pdf)

In the year 2008, when the economic crisis started, decrease of the annual sales in the road transport sector began earlier than in the whole national economy; in the middle 2009, it declined together with the economy – the income reduced by 27%. In respect of arrest of property, the transport sector was among the highest risk sectors. In the “peak” period that took place within January–April 2009, 1428 arrests of property at 586 enterprises (12.1% of enterprises) were registered.

In the lists of operating national transport enterprises, the below-mentioned enterprises do not exist anymore:

- 1) 45% of enterprises where an arrest of the property was registered within first four months of the year 2009;
- 2) 35% of enterprises where an arrest of the property was registered in early 2010.

Among enterprises with turnover over 4 million LTL, sales increased at 72% of the total number of enterprises. Among enterprises with turnover of 1–4 million LTL, sales increased at 69% of the total number of enterprises. In 2010, in the group of smallest enterprises, sales increased at 45% of enterprises; in addition, 8% new enterprises started their activities; however, 15% of small enterprises were liquidated.

The trends in different branches of Lithuanian road transport differ:

- 1) sales at freight transportation enterprise increased by 61%; in addition, 9% new enterprises appeared;
- 2) sales at urban passenger transportation enterprises reduced by 49%;
- 3) the activities of taxi were the most unsuccessful: within the year, 23% of enterprises were liquidated, and sales reduced at 58% of enterprises.

The competitive environment in road transport reduced. In the year 2010, 13% of enterprises terminated their activities and only 7% new enterprises appeared. For freight transportation enterprises, the following threats remain:

- 1) prices of oil increasingly grow; however, Lithuanian carriers can buy cheap fuel in East countries;
- 2) in the meanwhile, the growing wage-related expenses cause an inconsiderable impact upon freight transportation sector; however, a lack of employees is felt already;
- 3) in case of recovery of the national market, an equalization of flows of freights to Lithuania and from Lithuania may turn into a supplemental reserve for increasing the competitiveness;
- 4) in some segments, the situation may worsen: for example, from the 1st July of the current 2011 year, when flows of vehicles imported to CIS reduce, volumes of transportation by cars may reduce;
- 5) a negative impact may be caused by hardly predictable factors, such as disorders of ferry traffic, changes of road tolls in Poland and other states, a lack of permits for working in Russian market in the end of the year or possible sanctions of EU in respect of Belarus.

In spite of the obstructions, the perspectives for enterprises engaged in freight transportation by roads remain positive in the year 2011. Growing of road transport enterprises is limited by a shortage of equity capital or circulating funds; shortage of investments may appear in future as well.

The number of Lithuanian road transport enterprises in the years 2006–2011 is provided in Table 1. Changes of the number of freight-carrying vehicles in the years 2005–2010 are provided on Figure 2.

Table 1. The number of Lithuanian road transport enterprises in the beginning of the year (2006–2011)

Year	The number of transport enterprises in the beginning of the year
2006	4260
2007	4186
2008	4614
2009	4863
2010	4708
2011	4914

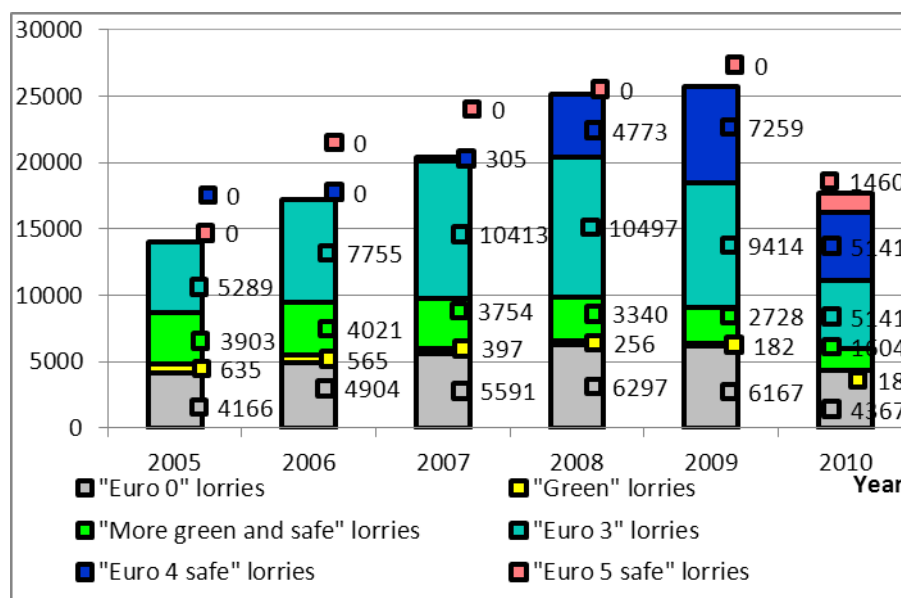


Figure 2. Distribution of Lithuanian freight-carrying vehicles involved in international transportations according to the certificates available (The Review on the Economical and Social Situation of Transport and Communication for the year 2009)

A gross negative impact to business of Lithuanian carriers was caused by the actions of Russian Federation customs service in respect of Lithuanian carriers. On 03 August 2009, intensified inspection of Lithuanian carriers began. It caused long queues of vehicles of Lithuanian carriers at borders with Russia. The strengthened control was applied to Lithuanian carriers only and it lasted for over 2 weeks. Because of this, a majority of consignors refused services of Lithuanian carriers. The introduction of toughened control by Russian customs in respect of Latvian carriers in December 2009 that caused long queues of vehicle at the borders between Latvia and Russia caused considerable losses to Lithuanian carriers as well.

3. The Factors Affecting the Competitiveness of Freight Transportation by Road Vehicles

In order to identify the factors affecting the competitiveness of freight transportation by road vehicles, a survey that involved 146 enterprises engaged in international freight transportation was carried out.

The obtained results show that a legal status of a majority of the surveyed enterprises (90%) are joint-stock companies limited, usually small, i.e. with a number of employees from 1 to 10, or medium-sized, with a number of employees from 21 to 50. A major part of the staff of surveyed enterprises (59%) is presented by drivers. As concerns to the duration of the activities of the enterprises, most of them (70%) were established before 3–5 years. So it may be stated that a major part of the enterprises are mature and stable.

Supplemental services offered by enterprises usually include management of freight-accompanying documents (100%) that is provided by all enterprises surveyed, management of the customs procedures (94%), choosing of the safest itinerary (91%) and consulting on transportation-related issues.

In the opinion of enterprises involved in international freight transportation, a consumer usually provides an advantage to enterprises that have own vehicles. Suppliers also suppose that enterprises with own vehicles are the strongest rivals. Some enterprises state that they feel no competition from the side of other enterprises. However, the opinion of clients on this problem was different: they provide an advantage to the properties of the service provided by enterprises, not to resources possessed by the enterprises.

The principal users of services provided by enterprises involved in freight transportation (in respect of the character of the activities) are forwarding (33%) and wholesale (49%) enterprises. They are the key clients using the said services. In addition, retail trade enterprises may be bracketed to the principal users as well (13%).

The opinions of clients and service providers on choosing the key criteria differed: clients identified the price and the delivery time as the key criteria, while transport enterprises singled out the quality of servicing and safety of transportation; the opinions of clients (companies) and service providers on

exclusivity of a service were quite opposite: transport enterprises pay a great attention to it; however, in the opinion of clients, this property is not important.

The data of the research are reliable enough, because a majority of the respondents were heads of relevant enterprises or their subdivisions being perfectly aware of their activities.

Upon generalization of the research, the factors increasing competitiveness of road transport and the factors reducing competitiveness of road transport can be singled out. They are provided in the Table 2.

Table 2. The factors affecting competitiveness of road transport

The factors increasing the competitiveness	The factors reducing the competitiveness
The geographic situation of Lithuania is favourable for transportations from Central and Western Europe to Eastern Europe and Russia	A major part of stocks of Lithuanian road transport enterprises consists of lorries that conform to the standards Euro 0 and Euro 3
The well-developed network of roads; high quality of roads	Profitability of transport enterprises is mostly reduced by growing of taxes and prices of fuel
In Lithuania, promotion of transport sector is one of priorities of the national economy	In the year 2010, the average wages of road transport employees were the lowest as compared to other transport branches
The share of transport services in Lithuanian export of services equalled to 59.45% (2010)	Enterprises pay the greatest attention to searching and attracting new consumers and less attention to existing consumers
In the year 2010, the flow of direct foreign investments in Lithuania amounted to 1.6 billion LTL, i.e. it increased by 1.2 billion LTL, or increased by almost four times, as compared to the year 2009. Within the year 2010, direct foreign investments in Lithuanian transport sector were growing	As the survey of clients showed, they assess the price and the time of delivery as the key criteria, while only 55% of the surveyed companies consider pricing-related issues important and 6% of the surveyed companies settle the problems of optimisation of distribution
In the early 2011, total 4914 enterprises operated in the road transport sector of Lithuania; a larger number of operating enterprises was registered in the spheres of retail trade and real estate and construction	Freight transportation sector is affected by the shortage of employees (in particular, drivers) that began to be appreciable since the year 2011
Transport enterprises provide a large assortment of freight transportation services combining with each other all types of transport; in addition, a number of supplemental services are provided	–
In the year 2010, the volumes of freight transportation in Lithuania transport sector increased by 8.9%, as compared to the year 2009. In the year 2010, freight transportation by road vehicles increased by 12.6%, as compared to the year 2009	–
A major part of freight and income is contributed by road vehicles	–

4. The Model for Assessing a Competitiveness of Road Transport

For the survey of clients, only four questions were formulated striving to clear up how service receivers choose a service provider, what is their motivation, what properties of a service they single out as the key ones and what properties are out of their interest. For this purpose, a questionnaire of 4 questions was formed. The size of an enterprise, the number of its employees and other indicators were not taken into consideration; the key issue was a frequency of using road transport services. 150 questionnaires were sent by e-mail, and 128 of them were resent; the enterprises were chosen randomly, they were involved in retail and wholesale trade or manufacturing.

In the questionnaire, it was requested to specify one or more versions of choosing an enterprise involved in providing road transport services. The survey showed recommendations of colleagues to be the most effective marketing measure in this sphere: it was specified by 68 enterprises, i.e. almost a half

of the respondents; personal sale is an effective marketing measure as well. The least effective measure is advertising in mass media – only enterprises transporting little freight specified it. In answers of large enterprises, recommendation of colleagues with actions and discounts and personal sales predominated. The above-described attests that enterprises try choosing a reliable carrier and look for lower prices (Fig. 3).

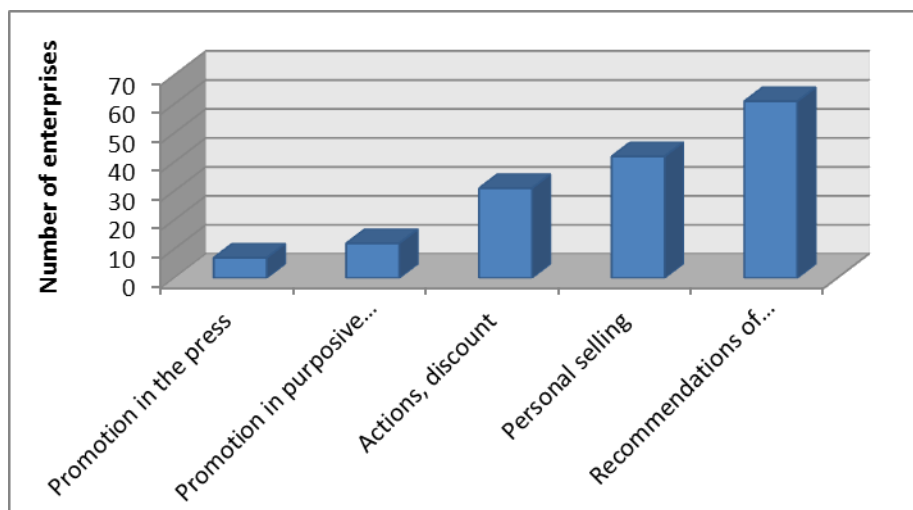


Figure 3. The service-promoting measures of enterprises that mostly affect a choice of clients

In addition, it was asked what criteria are taken into account by enterprises on choosing a carrier: 70% of enterprises pay the greatest attention to the properties (price, time of delivery, safety and so on), 16% of the respondents feel a greater concern about marketing features and only 14% of them – about resources of the carrier (the qualification of the employees, the available stock of vehicles).

Only enterprises transporting little freight took an interest in marketing policy; larger enterprises paid a greater attention to the properties of the services and resources of the carriers.

The fourth question was bound with assessment of importance of nine criteria from 1 to 9 (9 – the most important, 1 – the least important).

The weighted assessment S_{ev} is calculated according to the following formula:

$$S_{ev} = \frac{\sum_{j=1}^n S k_j}{N}, \quad (1)$$

where S_{ev} – the weighted assessment, in scores; $S k_j$ – the assessment chosen by the enterprise, in scores; N – the number of participants of the survey.

The results of the calculations according to the formula (1) are provided in the Table 3.

Table 3. The weighted assessments (by clients) of the properties of the services offered by an enterprise

A criterion of the service	The weighted assessment, S_{ev}
Price	8.19
Time of delivery	7.52
Servicing	5.83
Safety	5.55
Service flexibility	5.19
Terms of payment	5.05
Promoting services	3.00
Innovativeness	2.52
Service exclusivity	2.14

Ranking is not the only method for object comparison. Experts may assess objects (indicators) in units of measurement of the scale of the objects; in percent; in any system of points; they also may assess the values of the weights by paired comparison methods, upon a consideration that the sum of the weights of the objects should be equal to one. If we wish to apply the coefficient of concordance W for establishing the level of consensus of opinion between experts, any assessment of the objects should be transformed into ranking. This task is easily accomplishable because any method establishes the order of importance of the objects as well [6]. For establishing the quantitative importance (weights) of the indicators, T. Saaty AHP (*Analytic Hierarchy Process*) paired comparison method was applied by Saaty [7] and was widely used by Maskeliūnaitė [8].

An example of the values of weights of indicators found on the base of the above-mentioned T. Saaty method upon using the questionnaire for paired comparison of indicators provided by one of the experts is shown in Table 4. In the same Table 4, the respective ranks of the indicators established according to decrease of the weights of the indicators are provided as well.

Table 4. The weights of indicators assessed by one of the experts and the respective ranks on establishing the impact of factors upon competitiveness

Ind.No	1	2	3	4	5	6	7	8	9
Weights	0.083	0.011	0.092	0.021	0.021	0.083	0.049	0.021	0.084
Ranks	10	1	13	3	3	10	7	3	12

Ind.No	10	11	12	13	14	15	16	17
Weights	0.011	0.049	0.049	0.043	0.099	0.092	0.092	0.100
Ranks	1	7	7	6	16	13	13	17

On applying T. Saaty AHP paired comparison method, the level of consensus is determined for each individual expert. In this case, the level of consensus for a group of experts upon applying the coefficient of concordance was determined by prior computation of Saaty weights of the indicators and following ranking of them in accordance with decrease of the weights. The method enables to determine the level of consensus for an individual expert. The level of consensus of 20 experts was acceptable because their consensus ratio was less than 0.1 [9].

It may be seen from the Table 3 that the most important property of enterprise's service is the price, then the time of delivery follows, while servicing, safety and service flexibility gained similar numbers of scores; innovativeness and service exclusivity remained in the end of the list of priority.

Upon singling out the key factors affecting competitiveness of road transport, a model for assessing the competitiveness of road transport, was developed (Fig. 4).

On the base of this model and a survey of experts, it is possible to assess competitiveness K of road transport with sufficient accuracy by assessing the impact of each factor upon competitiveness and the existing situation in scores and making calculations according to the formula:

$$K = \sum_{i=1}^n F_i \cdot k_i, \quad (2)$$

where F_i – the assessment of the i -th factor in scores; k_i – the impact coefficient of the i -th factor.

Assessments of factors in scores and the impact coefficients of factors are established during a survey of experts applying the 100-score system, where an assessment of competitiveness is interpreted as follows: 1–10 scores – an absolutely non-competitive, 11–39 – non-competitive, 40–59 – moderately competitive, 60–89 – competitive, 90–100 – highly competitive branch.

The questionnaire was provided to heads of 20 transport enterprises and they were asked to assess the impact of each factor on competitiveness in scores from 1 to 10 (1 – almost no impact, 10 – very strong impact); in the second column, they ought to specify the character of the impact of the factor (positive, negative, neutral), and in the third column – to assess the existing situation of the factor in Lithuania in scores from 1 to 100 (1 – highly unfavourable situation, 50 – moderate situation, 100 – very favourable

situation). The answers of the heads of all enterprises were obtained, their opinions were coordinated, and after processing the data provided in the questionnaires, the Table 5 was formed.

On applying multi-criteria methods, establishment of the weights of the criteria (indicators) is of a great importance. In calculation of the weights, the assessments provided by the experts are used as a base. The results are applicable in practice, if a sufficient consensus of opinion between experts takes place.

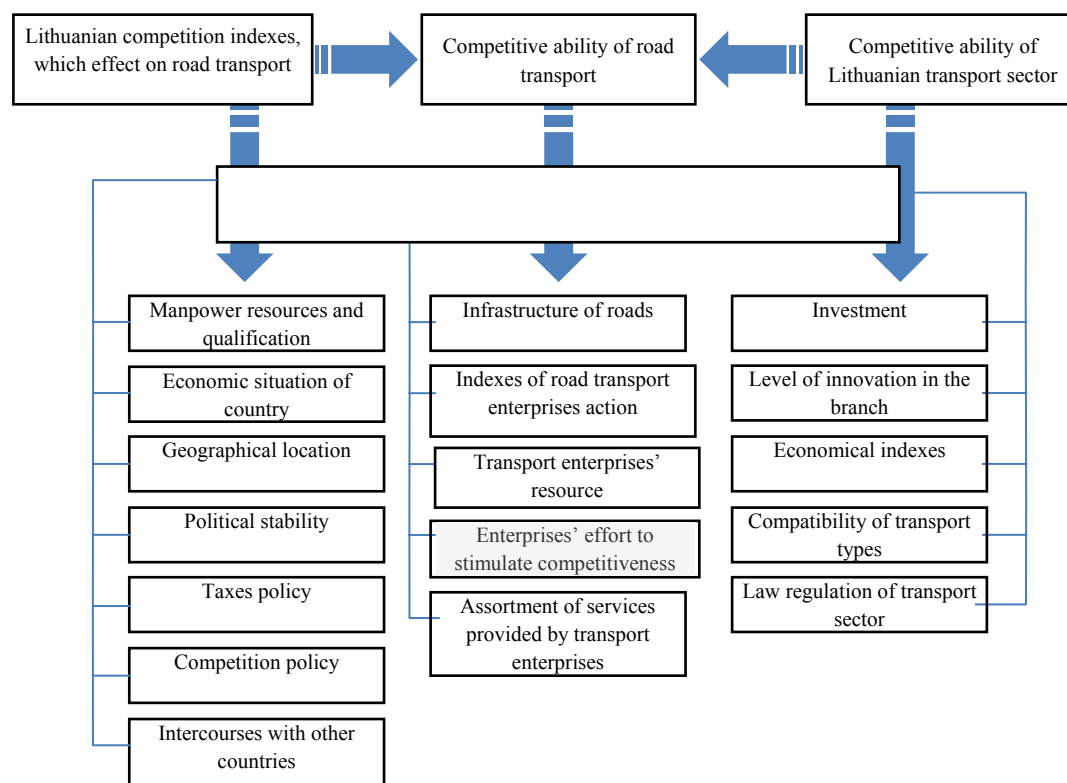


Figure 4. A model for assessing the competitiveness of road transport

It is shown by the coefficient of concordance that is computed on the base of ranking of comparable objects. The highest level of consensus is obtained when the direct ranking method is applied by Podvezko [6].

The definition of dispersive coefficient of concordance was provided by Kendall [10]:

$$W = \frac{12 \cdot S}{r \cdot m \cdot (m - 1)}; \quad (3)$$

where S – the sum of standard (square) deviations; r – the number of experts; m – the number of indicators.

If the opinions of the experts coincide, the value of the coefficient of concordance W is close to one; if the opinions are very different, the value of W is close to zero. In assessing the impact of each factor on the competitiveness in the present research, the value of coefficient of concordance $W = 0.81$, and in assessing the existing situation – $W = 0.64$. These figures confirm a good level of consensus of opinion between experts.

The survey of experts shows the economic situation, political stability, tax policy, relations with other states, investments, economic indicators of the branch, compatibility of various kinds of transport and legal regulation of transport to be the key factors predetermining competitiveness of road transport, while the indicators of the activities of road transport enterprises and the assortment of services provided by them are of a less importance.

Table 5. The results of assessment of the competitiveness of road transport by the experts

Factor	Notation	Impact coefficient, $k_{1,2,3,...,17}$	Assessment of impact	Assessment, in scores
Manpower and its qualification	D_q	0.07	Neutral	60
Economic situation of the state	E_c	0.08	Negative	33
Geographic situation	G	0.04	Positive	69
Political stability	P_s	0.08	Negative	32
Tax policy	T	0.08	Negative	20
Competition policy	K_p	0.07	Neutral	44
Relations with other states	S	0.08	Positive	63
Investments	I	0.08	Positive	40
The level of innovations in the branch	I_{in}	0.04	Positive	34
Economical indicators of the branch	E_t	0.08	Positive	55
Compatibility of various kinds of transport	T_s	0.08	Positive	68
Legal regulation of transport	T_l	0.08	Neutral	61
Road infrastructure	K_i	0.05	Positive	70
Indicators of the activities of road transport enterprises	R_r	0.02	Neutral	49
Resources of enterprises	E_r	0.04	Positive	43
The activities of enterprises for promoting their competitiveness	E_{ks}	0.04	Neutral	56
The assortment of services offered by enterprises	S_a	0.02	Positive	67

Upon application of the formula (2) to the results provided, the following mathematical expression of competitiveness K is obtained:

$$\begin{aligned}
 K = & D_q \cdot k_1 + E_c \cdot k_2 + G \cdot k_3 + P_s \cdot k_4 + T \cdot k_5 + \\
 & + K_p \cdot k_6 + S \cdot k_7 + I \cdot k_8 + I_{in} \cdot k_9 + E_t \cdot k_{10} + \\
 & + T_s \cdot k_{11} + T_l \cdot k_{12} + K_i \cdot k_{13} + R_r \cdot k_{14} + E_r \cdot k_{15} + \\
 & + E_{ks} \cdot k_{16} + S_a \cdot k_{17}.
 \end{aligned} \quad (4)$$

The value of assessment of competitiveness K of road transport calculated according to the formula (4) is $K = 50.94$. So, it means that competitiveness of road transport in Lithuania is of a middling level. This indicator is mostly worsened by the political and economic situation of the state, its tax policy and a low level of investments in the branch. According to the experts, there are no highly favourable factors. Some factors, such as manpower and its qualification, geographical situation of the state, relations with other states, compatibility of various kinds of transport, legal regulation of transport, road infrastructure and the assortment of services offered by enterprises, were assessed as the ones of a higher than a middling level.

5. Conclusions

1. Upon applying the methodology for assessing competitiveness of Lithuanian road transport offered by the authors, it was found that: competitiveness of road transport is of a middling level (50.94); competitiveness is mostly worsened by the political and economic situation of the state, its tax policy and a low level of investments in the branch.
2. Wide-ranging and detailed assessments of enterprise competitiveness methods are usually time-intensive. This reduces the flexibility and effectiveness of the competitiveness evaluation: not always possible to obtain quickly the latest information and fidelity respond to changes therein.

3. Clients consider the price and the delivery time AS the most important criteria for choosing an operator, while road transport enterprises singles out the quality of servicing and safety of transportation as the most important ones. The opinions of clients and service providers on an exclusivity of the service were quite opposite: transport enterprises pay a great attention to it, while clients consider it to be out of importance.
4. Enterprises increasingly carry out analysis of pricing and prices, search for way of attracting new potential consumers, make efforts for concluding contracts as efficiently as possible, optimising their vehicle fleet and logistics systems.
5. According to the data of this survey of clients of Lithuanian road transport enterprise, they usually choose an operator following recommendations of their colleagues, not the marketing strategy of the operator.
6. Striving to preserve their competitive advantage, transport enterprises two times per year should carry out an analysis of the needs of the clients on a regular basis and adapt the properties (peculiarities) of the service to the needs of the clients.
7. Providers of international freight transportation services should use more competently the support from EU Structural Funds for renewing and updating the fleet of vehicles.
8. Striving for attracting a larger number of clients, enterprises involved in rendering transport services should, first of all, care about improvement of a reliability of the service and the reputation of the enterprise.

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