TRANSPORT
2008
23(3): 266–272

THE INTEGRATED EVALUATION OF THE MACRO ENVIRONMENT OF COMPANIES PROVIDING TRANSPORT SERVICES

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Received 16 October 2007; accepted 12 June 2008

Abstract. The article presents the main principles of the integrated evaluation of macro environment components and factors influencing the performance of transport companies as well as providing the validated quantitative evaluation models and results obtained in evaluating the macro environment of Lithuanian companies providing transport services. Since quantitative evaluation is growing in importance, the process of developing the principles and methods of business macro environment quantitative evaluation is becoming relevant from both theoretical and practical perspectives. The created methodology is based on the concept of macro environment as an integrated whole of components, formalization and the principle of three-stage quantitative evaluation. The methodology suggested involves the quantitative evaluation of primary factors and macro environment components as an integral dimension (expressed in points). On the basis of this principle, an integrated macro environment evaluation parameter is established as its level index. The methodology integrates the identification of significant factors, building scenarios, a primary analysis of factors, expert evaluation, the quantitative evaluation of macro environment components and their whole. The application of the multi-criteria Simple Additive Weighting (SAW) method is validated. The integrated evaluation of the macro environment of Lithuanian freight transportation companies was conducted. As a result, the level indices of all components as well as the level index of macro environment considered as a whole of components were identified. The latter reflects the extent of deviation from an average level of a favourable macro environment. This is important for developing strategic marketing decisions and expanding a strategic area.

Keywords: business environment, macro environment, factors, components, scenario method, multi-criteria evaluation, Simple Additive Weighting (SAW) method.

1. Introduction

Under the conditions of intense competition between the EU and Eastern Europe companies providing freight transportation services, effective marketing decisions are being sought. To ground them, complex research is required. In order to implement the concept of sustainable development under the conditions of dynamic environmental changes, investigation into business environment also appears as an important issue. Therefore, business environment evaluation enabling us to reduce an unfavourable impact of environmental changes and to use the newly revealed possibilities in acquiring (or preserving) competitive advantage is also relevant (Hao 2000; Kotler 2003; Fleisher 2003; Hair *et al.* 2003; Verdu, Gomez-Gras 2006; Kozlinskis, Guseva 2006). There are some works focusing on macro and micro environments as well as the analyses and evaluation of a particular sector in the context of complex research of business environment.

The analysis of the above introduced and other works shows that a qualitative business environment evaluation of macro and micro environment is mainly applied. However, it should be considered to be only one particular stage of evaluation. The following qualitative methods can be used for a particular analysis of macro environment: PEST analysis, PESTEL analysis, Environment Dynamics analysis and Scenario analysis (Kotler 2003; Smith 2003; Walsh 2005). These methods make an important constituent part of marketing research program aimed at increasing the value added creation efficiency (Porter 1998; Moffett *et al.* 2002; Fleisher 2003; Žvirblis 2005, 2007).

In the analysis performed, the factors having predictive favourable and predictive unfavourable impact are usually distinguished (on the basis of expert evaluation) and the impact of macro environment factors on company's strategy is anticipated. Moreover, this analysis combined with the performed environment dynamics

ISSN 1648-4142 print / ISSN 1648-3480 online
www.transport.vgtu.lt
DOI: 10.3846/1648-4142.2008.23.266-272

and scenarios analyses (this method is analyzed at length and enhanced by Ratcliffe 2000, 2002, Flowers 2003 and Walsh 2005), i.e. methodically developed but rarely applied) allows us to foresee the comparative intensity of the impact of the distinguished factors (e.g. strongly favourable (+ +), favourable (+), unfavourable (–), strongly unfavourable (– –) etc.) and the tendencies (and trends) of their alteration as revealed in the works of Hair *et al.* (2003), Verdu and Gomez-Gras (2006).

Recently, emphasizing the prospects of quantitative evaluation development, the problems of a theoretical treatment of quantitative business macro environment evaluation have been raised. One of the applications of the quantitative method could be the prognosis of the transport service area based on regressive analysis i.e. span dependence on the main macro economic indicators (GDP dynamics, export-import scope, changes in production structure).

Analyzing the principles of macro environment quantitative evaluation, a focus should be placed on one of the most perspective quantitative methods i.e. multicriteria evaluation allowing us to analyze decision suitability for business subjects taking into account a wide range of factors. After performing the analysis of multicriteria evaluation methods and systems, the attention was given to the evaluation of the set of methods closest to the raised problems and corresponding to the investigation object. Analytical Hierarchy Process (AHP) and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) (mostly used in identifying the priorities of alternatives) as well as Complex Proportional Assessment (COPRAS) and Simple Additive Weighting (SAW) were analyzed in this group. Their applicability and theoretical background were investigated by Ginevičius, Podvezko (2001), Zhang, Yang (2001), Saaty (2001) and Zapounidis, Doumpos (2002). Hereby, the application of the Simple Additive Weighting (SAW) method is validated allowing us to integrate the primary factors of a very different character into one generalizing dimension. In this case, the essential point is that this method is suitable only when all factors are independent in the system and when their interaction with the integral dimension is not significant (as observed in the case study). This method uses a sufficiently flexible software program (for this purpose, *MS Excel* software package can be easily adapted).

However, the application of the SAW method in evaluating business macro environment components and factors must be theoretically grounded, implying that their formalization must be performed i.e. the models should be developed to serve as a basis for creating the integrated evaluation methodology. Eventually, they have to be adapted for the specific macro environment evaluation of companies providing freight transportation services.

The aim of this research is to develop the formalization principles and methods of business macro environment components and factors including their quantitative evaluation, design integrated evaluation methodology and perform the evaluation of the macro environment of Lithuanian companies providing transport services.

The research object is business macro environment of transport companies embracing the exterior forces and the factors influencing the company's marketing system.

Research methods include a systemic analysis of scientific resources, the methods of analyzing quantitative evaluation, the formalized creation of scenarios and the Simple Additive Weighting (SAW) method.

2. The main principles and models of integrated macro environment evaluation

It is emphasized that business macro environment evaluation should be based on the principle that macro environment perceived as the united exterior forces and factors influencing the company's marketing system should be firstly assessed from the perspective of how it provides favourable conditions for business as well as taking into account threats it causes for business development. The second approach takes into consideration the fact that in making strategic decisions it is important to rely on versatile, comprehensive and reliable evaluation principles. Therefore, the whole range of primary factors should be reflected. This can be achieved by using the above offered three-stage qualitative evaluation system including the evaluation of primary factors, identification of integral dimensions (macro environment component indices) and setting of an integrated macro environment measure i.e. its level index. The third approach relies on formalization of separate macro environment components and environment as a whole on the basis of the sets of primary factors which should reflect the influence of any significant factor on the level measure or level index of integrated macro environment.

With reference to the main approaches, a basic model was designed for a quantitative evaluation of integrated macro environment perceived as an aggregate of components, according to the Simple Additive Weighting (SAW) multicriteria evaluation method. It helps with determining the significance and weights of every identified factor. Their values (expressed quantitatively) were obtained by expert evaluation (quantitative rendering) and the significance parameters showing the influence of the considered factors on the integrated macro environment level dimension (index) were identified. Macro environment level index M is expressed as follows:

$$M = \sum_{i=1}^{n} h_i \sum_{j=1}^{k} \omega_j R_j = h_p \sum_{j=1}^{k_p} \omega_{pj} R_{pj} + h_e \sum_{j=1}^{k_e} \omega_{ej} R_{ej} + h_s \sum_{j=1}^{k_s} \omega_{sj} R_{sj} + h_t \sum_{j=1}^{k_t} \omega_{tj} R_{tj} + h_n \sum_{j=1}^{k_n} \omega_{nj} R_{nj} + h_l \sum_{j=1}^{k_l} \omega_{lj} R_{lj}, \quad (1)$$

where h_p, h_e, h_s, h_t, h_n, h_l are significance parameters of the appropriate components (i = 1, 2, ..., n, where n is their number showing the influence on macro environment level; ω_p, ω_e, ω_s, ω_t, ω_n, ω_l, are the weights of factors conditioning the influence of factors on the appropriate integral component value; R_{pj} denotes factors influencing

political environment (P),(j = 1, 2, ..., k_p, where k_p is their number); R_{ej} denotes factors influencing economical environment (E) (j = 1, 2, ..., k_e, where k_e is their number); R_{sj} denotes factors influencing social environment (S) (j = 1, 2, ..., k_s, where k_s is their number); R_{tj} denotes factors influencing technological environment (T) (j = 1, 2, ..., k_t, where k_t is their number); R_{nj} denotes factors influencing natural environment (N) (j = 1, 2, ..., k_n, where k_n is their number); R_{lj} denotes factors influencing legal environment (L) (j = 1, 2, ..., k_l, where k_l is their number).

The application of the considered basic evaluation model (formalized rendering) in a specific business situation is connected with the identification of significant factors adequate to the situation, their choice from the available set of factors as well as their primary quantitative analysis. With no detailed focus on identification peculiarities, it may be noted that it is an important step of evaluation (Zapounidis, Doumpos 2002a, b; Zinkevičiūtė 2006). Performing factors' identification based on the suggested methodology, the factors should be ranked according to their significance. It may be stated that the significance is characterized by the following main features: the degree of influence, situation adequacy and the occurrence of new possibilities or threats. The respective methods helping to rank the factors according to their significance may be applied e.g. T. L. Saaty's (2001) method. Nevertheless, only the factors corresponding to the chosen significance level should remain in the set.

Significant factors were identified by a group of experts and based on the macro environment component analysis of Lithuanian freight transportation companies conducted at the first stage and on the analysis of the mix of potential factors. The factors were also qualitatively evaluated and the significance of their individual impact was determined. The compatibility of expert opinions was reached employing the method of consensus.

The next important stage is building the scenarios of every macro environment component as well as scheming general macro environment scenarios (Zinkevičiūtė 2006, 2007). The scenarios of macro environment components were composed by evaluating the possible impact of every factor and their combinations on the companies working in the sector of transport services and drafting a possible variation of impact. Two scenarios were designed for each component ("1" and "2", respectively). Based on their composition, two general macro environment scenarios were created. A perspective of 2 or 3 years was considered and the principle that one of the scenarios should be more oriented towards status quo situation (from the perspective of the impact on the company's marketing strategy) was observed.

Table 1 presents three designed general macro environment scenarios (M I, M II and M III respectively reflecting the appropriate scenarios of every component) called *Status Quo*, *Bright Time* and *Hard Situation*.

As a result of the identification and qualitative expert evaluation of the considered primary factors, the appropriate sets of factors according to every macro environment component (and also corresponding to the designed scenarios of the components) were defined. They make the basis for the quantitative evaluation of the macro environment of Lithuanian companies providing transport services. The equations adapted to evaluating the components of macro environment (in points) were formed and based on the terms of equation (1):

$$R_p = \sum_{j=1}^{4} \omega_{pj} R_{pj} = \omega_{p1} R_{p1} + \omega_{p2} R_{p2} + \omega_{p3} R_{p3} + \omega_{p4} R_{p4}, \quad \sum_{j=1}^{4} \omega_{pj} = 1; \tag{2}$$

$$R_e = \sum_{j=1}^{5} \omega_{ej} R_{ej} = \omega_{e1} R_{e1} + \omega_{e2} R_{e2} + \omega_{e3} R_{e3} + \omega_{e4} R_{e4} + \omega_{e5} R_{e5}, \quad \sum_{j=1}^{5} \omega_{ej} = 1; \tag{3}$$

$$R_s = \sum_{j=1}^{4} \omega_{sj} R_{sj} = \omega_{s1} R_{s1} + \omega_{s2} R_{s2} + \omega_{s3} R_{s3} + \omega_{s4} R_{s4}, \quad \sum_{j=1}^{4} \omega_{sj} = 1; \tag{4}$$

$$R_t = \sum_{j=1}^{3} \omega_{tj} R_{tj} = \omega_{t1} R_{t1} + \omega_{t2} R_{t2} + \omega_{t3} R_{t3}, \quad \sum_{j=1}^{3} \omega_{tj} = 1; \tag{5}$$

$$R_n = \sum_{j=1}^{4} \omega_{nj} R_{nj} = \omega_{n1} R_{n1} + \omega_{n2} R_{n2} + \omega_{n3} R_{n3} + \omega_{n4} R_{n4}, \quad \sum_{j=1}^{4} \omega_{nj} = 1; \tag{6}$$

$$R_l = \sum_{j=1}^{4} \omega_{lj} R_{lj} = \omega_{l1} R_{l1} + \omega_{l2} R_{l2} + \omega_{l3} R_{l3} = \omega_{l4} R_{l4}, \quad \sum_{j=1}^{4} \omega_{lj} = 1. \tag{7}$$

For integrated macro environment evaluation (i.e. an assessment of the macro environment level index in points) in the given case we have:

$$M = \sum_{i=1}^{6} h_i R_i = h_p R_p + h_e R_e + h_s R_s + h_t R_t + h_n R_n + h_l R_l, \sum_{i=1}^{6} h_i = 1. \tag{8}$$

Hereby, we have a real model corresponding to the specific conditions of macro environment evaluation.

The system of 100 points was chosen for the quantitative expert evaluation of the identified primary factors (100 points mean that the factor has an absolutely positive impact). Accordingly, 70–80 points correspond to a very favourable effect, 60–70 points reflect favourable influence, 50–60 points correspond to the average favourable effect, 40–50 points mean unfavourable influence, 30–40

Table 1. The scenarios of separate components and general scenarios of the macro environment of transport services sector companies

Scenario title: component compositions	Scenario content (according to factor combinations and component compositions)
*M*I (Status Quo) P1+E1+S1+T1+N1+L1	**(P1)** Being a part of the EU and NATO will remain a positive factor in the future; a position of Lithuania as a transit country will strengthen; the relationship with neighbouring countries will remain problematic taking into account the frontier problems (Eastern neighbours and the Republic of Latvia). Corruption level will decrease and will not have a strong negative impact; the policy of the Ministry of Transport and Communication will not change. **(E1)** The development of free economic areas will have a positive impact in the future; investment conditions will also have a positive impact; tax system (including excise and customs duties) will still be a negative factor; variation in fuel costs and situation in labour market will remain negative factors. **(S1)** Demographic situation, attitude towards foreign entrepreneurs, the influence of traditions and subcultures will remain the factors of a negative impact, emigrational processes will remain negative. **(T1)** The policy of the Government on science and technologies and possibilities of applying innovations will have both a negative and positive impact; the level of technological development on a national scale will not alter and will result in a negative impact. **(N1)** The infrastructure will remain positive; climate conditions may become better or worse (depending on the route of transportation), while environment protection standards and regulation of specific requirements from the point of view of a company will have a negative impact. **(L1)** Legal regulation of competition will remain positive in the future; laws regulating transportation will have positive and negative features (from the point of view of the company); institutional decisions of state organizations will be more favourable for companies; the customs law will remain rather unfavourable.
*M*II(Bright Time) P2+E1+S1+T2+N2+L2	**(P2)** Being a part of the EU and NATO will remain a positive factor in the future; a position of Lithuania as a transit country will strengthen considerably; the relationship with neighbouring countries will improve (Eastern neighbours and the Republic of Latvia); anti-corruption laws and the control of their observation in Lithuania will bring about positive changes; the policy of the Ministry of Transport and Communication will change in favour of business. **(E1)** The development of free economic areas will have a positive impact in the future; investment conditions will also have a positive impact; tax system (including excise and customs duties) will remain more of a negative factor; variation in fuel costs and situation in labour market will still be negative factors causing negative effects. **(S1)** Demographic situation, attitude towards foreign entrepreneurs, the influence of traditions and subcultures will remain factors of a negative impact; emigrational processes will remain negative. **(T2)** The policy on science and technologies of the Government and possibilities of applying innovations will have a positive impact; the level of technological development on a national scale will improve and will have a positive impact on company's work. **(N2)** The infrastructure will increase and become an extremely positive factor; climate conditions may become better or worse (depending on the route of transportation); environment protection standards and regulation of specific requirements from the point of view of the company will have a negative impact. **(L2)** Legal regulation of competition will remain positive in the future; laws regulating transportation will have more positive than negative effects (from the point of view of the company); institutional decisions of state organizations will be favourable for companies; the customs law will become more favourable for business.
*M*III (Hard Situation) P1+E2+S2+T1+N1+L1	**(P1)** Being a part of the EU and NATO will remain a positive factor in the future; a position of Lithuania as a transit country will strengthen; the relationship with neighbouring countries will remain problematic i.e. the frontier problems (Eastern neighbours and the Republic of Latvia). Corruption level will decrease and will not have a strong negative impact; the policy of the Ministry of Transport and Communication will not change. **(E2)** The development of free economic areas will have a greater positive impact in the future; investment conditions will also have an extremely positive impact; tax system (including excise and customs duties) after the considered alterations will not produce a strong negative impact; variation in fuel costs and situation in labour market will still remain extremely negative factors. **(S2)** Demographic situation, attitude towards foreign entrepreneurs, the influence of traditions and subcultures will change for the better; emigrational processes will increase and have an extremely negative impact; shortage in cheap labour force will be causing more problems. **(T1)** The policy on science and technologies of the Government and possibilities of applying innovations will have both a negative and positive impact; the level of technological development on a national scale will not alter and will cause a negative effect. **(N1)** The infrastructure will remain positive; climate conditions may change for the better or worse (depending on the route of transportation); environment protection standards and regulation of specific requirements from the point of view of the company will have a negative impact. **(L1)** Legal regulation of competition will remain positive in the future; laws regulating transport will have positive and negative effects (from the point of view of the company); institutional decisions of state organizations will be more favourable for companies; the customs law will remain rather unfavourable.

points correspond to very unfavourable influence and 0–30 points show extremely unfavourable effect. This system allows us to avoid the normalization procedure of factors (distinguishing maximizing and minimizing factors) and, in this case, it is not necessary to introduce an impact direction sign as the impact of all factors is one-sided.

The results of this evaluation (together with the data on the qualitative evaluation of factors and impact weights) are presented in Table 2 according to the two developed component scenarios ("1" and "2" respectively). The calculation results of concordance coefficient W show that W varies from 0.63 to 0.78 (acceptable) (Kendall 1970).

The values of the parameters of separate components influencing macro environment level significance were also determined by the means of expertise: $h_p = 0.2$; $h_e = 0.25$; $h_s = 0.2$; $h_t = 0.1$; $h_n = 0.15$; $h_l = 0.1$. Concordance coefficient $W = 0.76$ (acceptable).

3. The main results of research and their interpretation

Based on the above-mentioned theoretical tools, according to three general scenarios of macro environment, multivariant calculations were made (using the adapted *MS Excel program*) (Table 1).

The level indices of the components included into each of these scenarios were estimated (according to component scenarios "1" or "2"). Hereby, the impact of the inherent primary factor combinations as well as the impact of the compositions of macro environment components on the level (its index) of macro environment was analyzed.

Besides, the calculations of macro environment level index according to the compositions of its components (*MIV, MV, MVI*) including only three most significant components i.e. political environment, economical environment and social environment were made. As a result, the parameters of the significance of these components were reallocated (maintaining the condition that their

Table 2. The results of the qualitative and quantitative evaluation of the identified factors of macro environment according to scenarios "1" and "2" and determination of their weights

Macro environment components and identified factors	Marking	Qualitative evaluation	Evaluation in points		Weights
			"1"	"2"	
Political environment	R_p				
Membership in the EU and NATO	R_{p1}	(+ +)	75	75	$\omega_{p1} = 0.4$
Relationship with neighbouring countries, frontier problem	R_{p2}	(+ –)	50	60	$\omega_{p2} = 0.2$
Transit country, the policy of the Ministry of Transport and Communication	R_{p3}	(+)	50	60	$\omega_{p3} = 0.2$
Corruption	R_{p4}	(– –)	35	45	$\omega_{p4} = 0.2$
Economical environment	R_e				
Development of free economic areas	R_{e1}	(+)	50	60	$\omega_{e1} = 0.15$
Investment conditions	R_{e2}	(+ +)	60	70	$\omega_{e2} = 0.1$
Tax system	R_{e3}	(+ –)	45	55	$\omega_{e3} = 0.2$
Situation in labor market	R_{e4}	(– –)	45	20	$\omega_{e4} = 0.3$
Fuel costs	R_{e5}	(– –)	40	20	$\omega_{e5} = 0.25$
Social environment	R_s				
Demographic situation	R_{s1}	(–)	40	40	$\omega_{s1} = 0.25$
Attitude towards foreign entrepreneurs	R_{s2}	(+ –)	45	50	$\omega_{s2} = 0.3$
Traditions and influence of subcultures	R_{s3}	(+ –)	50	60	$\omega_{s3} = 0.15$
Emigration processes	R_{s4}	(– –)	40	10	$\omega_{s4} = 0.3$
Technological environment	R_t				
Government policy on science	R_{t1}	(+)	50	60	$\omega_{t1} = 0.3$
Technological development	R_{t2}	(–)	40	50	$\omega_{t2} = 0.4$
Applicability of innovations	R_{t3}	(+ –)	50	60	$\omega_{t3} = 0.3$
Natural environment	R_n				
Climate conditions, natural factors	R_{n1}	(+ –)	50	50	$\omega_{n1} = 0.2$
State of infrastructure and roads	R_{n2}	(+)	60	70	$\omega_{n2} = 0.3$
Implementation of EURO-2 standards	R_{n3}	(–)	45	45	$\omega_{n3} = 0.2$
Specific requirements	R_{n4}	(–)	45	45	$\omega_{n4} = 0.3$
Legal environment	R_l				
Legal regulation of competition	R_{l1}	(+)	60	60	$\omega_{l1} = 0.25$
Laws regulating transport	R_{l2}	(+ –)	50	50	$\omega_{l2} = 0.3$
Institutional decisions	R_{l3}	(–)	50	60	$\omega_{l3} = 0.25$
Customs law	R_{l4}	(–)	40	45	$\omega_{l4} = 0.2$

sum will be equal to 1) in the following way: $h_p = 0.25$; $h_e = 0.4$; $h_s = 0.35$.

The calculation results are presented in Tables 3 and 4.

Table 3. The results of evaluating macro environment component level indices

Macro environment components	Evaluation (in points) according to scenarios	
	"1"	"2"
Political environment	$R_p = 57$	$R_p = 63$
Economical environment	$R_e = 46$	$R_e = 38$
Social environment	$R_s = 43$	$R_s = 37$
Technological environment	$R_t = 46$	$R_t = 56$
Natural environment	$R_n = 50.5$	$R_n = 53.5$
Legal environment	$R_l = 50.5$	$R_l = 54$

Table 4. Macro environment level index according to general scenarios

Macro environment component compositions		Macro environment level index (in points)		
		Status Quo	Bright Time	Hard Situation
$R_{p1} + R_{e1} + R_{s1} + R_{t1} + R_{n1} + R_{l1}$	*M*I	48.8		
$R_{p2} + R_{e1} + R_{s1} + R_{t2} + R_{n2} + R_{l2}$	*M*II		51.7	
$R_{p1} + R_{e2} + R_{s2} + R_{t1} + R_{n1} + R_{l1}$	*M*III			45.6
$R_{p1} + R_{e1} + R_{s1}$	*M*IV	47.7		
$R_{p2} + R_{e1} + R_{s1}$	*M*V		49.2	
$R_{p1} + R_{e2} + R_{s2}$	*M*VI			42.5

The results of research and the quantitative evaluation of the macro environment of Lithuanian companies in the sector of freight transportation services allows us to make the following general remarks:

- political factors have the most favourable effect (according to different scenarios, this environment is awarded 57–63 points). In this case, an extremely unfavourable corruption factor is distinguished;
- social factors have the strongest negative effect (according to different scenarios, this environment is given 43–37 points). The factors having the most unfavourable effect are as follows: emigration processes causing shortage of cheap labor force; in general, according to *M*III scenario, these factors were estimated as the most unfavourable to macro environment;
- considering the other sets of component factors, the following factors having favourable effect can be distinguished: legal regulation of competition (60 points), state of infrastructure (60–70 points), investment conditions (60–70 points). Some factors having unfavourable effect such as the situation in labor market including rapidly growing salaries (pessimistic variant awarded 20 points) and fuel costs (pessimistic variant also given 20 points) can also be specified;
- the calculation of macro environment level index according to the respective macro environment component compositions of the created scenarios shows that the macro environment of the companies analyzed can be evaluated as follows:
  - ✧ According to *Status Quo* scenario, it is close to the average level (index 48.8 points) in the proximate three-year period;
  - ✧ According to *Bright Time* scenario, it is assessed to be slightly higher than the average level (index 51.7 points). However, it may manifest itself only in 3 or 5 years;
  - ✧ According to the scenario *Hard Situation*, the environment is estimated as being lower than the average level (even in the unfavourable macro environment zone) and is given 45.6 points; however, the unfavourable state of macro environment could be found in the case when several extremely unfavourable factors are acting simultaneously (in the period of 3 or 5 years). These factors are as follows: emigration processes, the situation in labor market and fuel costs;
- macro environment level index decreased in all scenarios when the environment was evaluated according to three most significant components (its value decreased by 1.1; 2.5; 3.1 points respectively). Therefore, it can be stated that technological, natural and legal environment increases macro environment level index by these values.

It is worth noticing that it is advisable to review the scenarios and update the prognosis based on new calculations allowing us to consider the company's threats and possibilities in cases of even slight alterations in macro environment components or if new significant factors are found.

4. Conclusions

1. The practice of marketing research associated with the companies of freight transportation services shows that qualitative analysis (PEST, PESTEL or Environment Dynamics analysis) is mainly applied in conducting macro environment evaluation. It is advisable to conceptually solve the problems of quantitative macro environment evaluation, while developing the theoretical principles of making business decisions as well as the main approaches to research and evaluation of the macro environment components.
2. The principles of the integrated evaluation of business macro environment were developed and the methodology integrating the qualitative analysis methods of macro environment factors, scenarios analysis and complex quantitative evaluation was offered. Quantitative evaluation is based on the concept of macro environment as an aggregate of components and the use of a model created by applying formalization and multicriteria evaluation

methods. This serves as an important theoretical tool for developing strategic decisions and, especially, for implementing environmental management strategy.

3. A three-stage quantitative evaluation system involving both primary factors and evaluation of integral dimensions (macro environment component level indices) and finally, the assessment of the integrated macro environment level index using the Simple Additive Weighting (SAW) method, which provides for the summation of multiplying the significance of the appropriate criteria and their weights was created.
4. The conducted integrated evaluation of the macro environment factors and components of the companies providing freight transportation services according to three scenarios created shows that the political environment has (and might have in the future) the most favourable influence (63 points). The social environment is considered to be the most unfavourable (*Status Quo* variant was awarded 43 points whereas a perspective unfavourable variant hardly obtained 37 points which is lower than the average macro environment level). Considering influence degree, two groups of primary factors were distinguished: the first group involves the most favourable factors in legal regulation of competition and the state of infrastructure and investment conditions; the second one embraces the most unfavourable factors such as corruption, variation in fuel costs, situation in labor market and some extremely unfavourable factors including emigration processes (shortage of consumers included).
5. The index of the macro environment level of Lithuanian companies providing freight transportation services according to *Status Quo* scenario is 48.8 points. According to *Bright Time* scenario it reaches 51.7 points since the position of *Hard Situation* scenario is the most pessimistic as it makes 45.6 points. Therefore, macro environment is assessed as reaching the average level (though according to the pessimistic scenario of 3-5 years length period, the index is in the unfavourable macro environment zone).
6. The good prospects of applying the created macro environment evaluation system are determined by the fact that this quantitative evaluation system enables us to use the emerging new possibilities to expand the strategic area (or to avoid the anticipated threats). It can be incorporated into the system of the quantitative evaluation of business decisions and into the business management computer-aided systems.

References

Fleisher, C. S. 2003. *Strategic and competitive analysis: methods and techniques for analyzing business competition*. New Jersey: Prentice Hall. 457 p.

Flowers, B. S. 2003. The art and strategy of scenario writing, *Strategy & Leadership* 31(2): 29–33.

Ginevičius, R.; Podvezko, V. 2001. Complex evaluation of economical – social development of Lithuanian regions, *Civil Engineering* [Statyba] 7(4): 304–309.

Hair, J. F.; Bush, R. P.; Ortinau, O. J. 2003. *Marketing research: within a changing information environment*. Mc Graw – Hill, Higher Education. 720 p.

Hao, Ma. 2000. Competitive advantage and firm performance, *Competitiveness Review* 10(2): 16–20.

Kendall, M. 1970. *Rank correlation methods*. Griffin and Co, London.

Kotler, Ph. 2003. *Marketing management*. Eleventh edition. New Jersey: Pearson Education, Inc. 706 p.

Kozlinskis, V.; Guseva, K. 2006. Evaluation of some business macro environment forecasting methods, *Journal of Business Economics and Management* 7(3): 111–117.

Moffett, S.; McAdam, R.; Parkinson, S. 2002. Developing a model for technology and cultural factors in knowledge management: a factor analysis, *Knowledge and Process Management* 9(4): 237–255.

Porter, M. 1998. Clusters and the new economics of competition, *Harvard Business Review* 76(6): 77–91.

Ratcliffe, J. 2000. Scenario building: a suitable method for strategic property planning, *Property Management* 18(2):127–144.

Ratcliffe, J. 2002. Scenario planning: strategic interviews and conversations, *Foresight* 4(1): 19–30.

Saaty, T. L. 2001. *Fundamentals of the analytical hierarchy process*. Pittsburgh: RWS Publications. 412 p.

Smith, B. 2003. The effectiveness of marketing strategy making processes: A critical literature review and a research agenda, *Journal of Targeting, Measurement and Analysis for Marketing* 11(3): 273–290.

Verdu, J. A.; Gomez-Gras, J. M. 2006. Managers environmental perceptions: an institutional perspective, *International Journal of Business Environment* 1(1): 5–23.

Walsh, P. R. 2005. Dealing with the uncertainties of environmental change by adding scenario planning to the strategy reformulation equation, *Management Decisions* 43(1): 113–122.

Zapounidis, C.; Doumpos, M. 2002 a. Multicriteria classification and sorting methods: A literature review, *European Journal of Operational Research* 138(2): 229–246.

Zapounidis, C.; Doumpos, M. 2002 b. Multi-criteria decision aid in financial decision making: methodologies and literature review, *Journal of Multi-Criteria Decision Analysis* 11: 167–186.

Zhang, W.; Yang, H. 2001. A study of the weighting method for a certain type of multicriteria optimization problem, *Computers & Structures* 79(31): 2741–2749.

Zinkevičiūtė, V. 2006–2007. Business strategic decisions evaluation model, *Management and Education,* Bourgas: University "Prof. Dr Assen Zlatarov" 2: 32–55.

Zinkevičiūtė, V. 2006. Methods' Combination for Strategic Decisions Evaluation, in *Proceedings of the 14th International Scientific Conference "Enterprise Management: Diagnosis, Strategy, Efficiency"*, 237–239 (full paper on CD-ROM).

Žvirblis, A. 2005. *Rinkovados analizės principai ir metodologija*: monografija [The principles and methodology of marketing analysis: monograph]. Vilnius: Technika. 208 p.

Žvirblis, A. 2007. *Paslaugų bendrojo vertingumo ir jų konkurencingumo vertinimo principai* [The principles of assessment of the total value of specific services and its competitiveness] *Business: Theory and Practice* 8(2): 82–86.