

Backgrounds of Aggregated Assessment of SMEs Competitive Advantage Determinants

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Abstract - The study deals with the aggregated assessment of SMEs competitive advantage determinants in selected countries based on multiple criteria assessment methodology, in particular, Simple Additive Weighting (SAW), Complex Proportional Assessment (COPRAS) methods (applied on the basis of constructed models). At the first stage, it includes the identification and expert examination, also quantifiable assessment of essential primary determinants and their significance parameters. At second stage, the establishment of the global SMEs competitive advantage index was performed; the integrated evaluation system may include several scenarios by formation of determinant complex. Some evaluation results in 2011/2012 for Baltic countries (Lithuania as typical case) in transition stage are presented in the paper. The global index estimation was performed on basis of composed determinant complex using the SAW method; the parameters of determinant significance were defined by expert way.

Keywords - entrepreneurship competitive advantage, competitiveness indicators, multiple criteria evaluation, expert examination, Simple Additive Weighting method.

1. Introduction

The development of entrepreneurship in the newly EU countries, also state economic competitiveness, is an important priority of economic growth in general. The entrepreneurship strategy must be taken into account the expected new competitive advantage-oriented changes and effective determinants of growing competitiveness. Simultaneously the investigation of interconnections of country's economic development and entrepreneurship competitive advantage is relevant; especially important is to consider their impact on the strategic decisions. The approach to above processes may be defined as an important object of scientific research.

The entrepreneurship has been recognized as a major transferring channel for sustainable products and processes, and new ventures are being held up as a mean for solving of many social and environmental troubles. The so-called pillars of global country's competitiveness index according to the World

Economic Forum (WEF) [7] include significant primary and integral economic competitiveness indicators determining in particular the level of entrepreneurship development. It is insufficient to propose the comparison of these indicators; therefore a part of them reflects the entrepreneurship advantage/disadvantage.

The separate significant factors (goods or services, competitiveness, marketing strategy, diversification, innovations, production and export of high-tech goods, corporate social responsibility, etc.) mostly influencing the firm working effectiveness are analyzed. Therefore, it is important to identify and evaluate the influence of clusterization level on the competitiveness in the modern service-based economies. It must be emphasized that clusters, depending on the phase of their growth and development, exercise the increasing influence over the business organizations, as well as their competitive abilities. In recent years, the considerable debates on the role of marketing in competitive strategy were continuing. The researches contribute to strategic marketing theory and practice by developing, refining and validating the measures of entrepreneurship, marketing capabilities, organizational innovation and sustainable competitive advantage (SCA) constructs. Some papers were oriented to a study of the marketing capabilities role in innovation-based competitive strategy, also to the establishment and accumulation of dominant advantages, appliance of their totality [1], [3], [4], [8], [12], [13], [14], [18].

The purpose of the article below is to motivate the understanding both of competitive advantage and strategic marketing, to define their applicability for theory building and testing in the process of strategic management with account of the value priorities. The effective marketing strategy have to increase the efficiency of business value added creation, its downstream and upstream sources and, coherently, determine a wide spectrum of the factors to be analyzed and adequate methodological potential. Besides, there are only few researches dedicated to the complex evaluation of those essential advantages of entrepreneurship especially in the newly EU countries and to their assessment

revealing the priority aspects of the functioning of state institutions, business entities, also associative structures. It is importantly to integrate the small business group formation and concept of SCA as implementing the value-creating and resource-based management strategy not simultaneously duplicating its benefits [11].

This study deals with the comparative analysis of economic competitiveness indicators in Baltic States on basis of the WEF data and with the examination as well as complex (aggregated) evaluation of the SMEs competitive advantages in Lithuania applying the multiple criteria evaluation methods.

The research results consist in the constructing of complex assessment concept for the entrepreneurship competitive advantages by applying the multiple criteria assessment methods, their application for decision making also in the case evaluation. It is applicable first of all for countries - newly EU members in various possible conditions and solutions. The viability of the presented evaluation system is determined by the fact that this quantitative evaluation technique may be applied for determining the acceptance of main parameters of country entrepreneurship development strategy.

2. Selected Economic Competitiveness Indicators: Analysis of the Baltic Countries

The comparative ranking of selected economic competitiveness indicators for Baltic countries with different economic development level (Tables 1 and 2) shown both specific differences in their development and socioeconomic orientation. The so-called pillars of global country's competitiveness index according to the WEF were analyzed and those including the most significant primary and integral economic competitiveness indicators reflecting the entrepreneurship advantages were revealed in detail. The specific differences may be seen if to compare about all competitive indicators of Baltic countries selected by WEF experts, esp. some productivity factors (such as firm level technology absorption). The distance between some indicators specific for Baltic countries and Scandinavian countries amounts even 97 places for state of cluster development (between Sweden and Lithuania), 87 – for firm level technology absorption and intensity of local competition, 79 - for value chain breath (all between Sweden and Latvia), 69 – for extent of market dominance & sophistication (between Norway and Lithuania). The differences between countries are much less in the case of capacity for innovation (54 places) and reverse in case of pay and productivity in behaviour of Baltic States (75 places between Estonia and Sweden). All the mentioned differences are much narrow if to compare the expert evaluations expressed in weighed average indices.

Selected primary macro indicators included into the global country's competitiveness index pillars*	Lithuania		Latvia		Estonia	
	Rank	Score	Rank	Score	Rank	Score
Government debt	46	29.3	63	36.1	5	7.2
Government budget balance	124	-8.9	125	-8.9	29	-1.7
Burden of government regulation	115	22.7	88	3.1	7	4.4
Prevalence of trade barriers	64	4.7	29	5.2	14	5.6
National savings rate	93	15.9	25	30.2	47	24.1
Country credit rating	64	52.7	80	45.1	56	57.1
Interest rate spread	13	1.9	101	8.2	51	4,6
Ease of access to loans	112	2.2	125	2	50	3
Total tax rate	75	42.7	44	33	98	49.4
Extent and effect of taxation	126	2.7	117	2.9	18	4.3
Availability of financial services /	74	4.5	86	4.3	43	5.1

financial market sophistication						
Soundness of banks	87	4.8	127	3.9	72	5.2
FDI and technology transfer	105	2.9	103	2.9	92	3.1
Prevalence of foreign ownership	99	4.5	63	4.9	48	5.1
Extent of market dominance	45	4.5	69	4.1	61	4.3

Composed by the authors using WEF data [7]. *Rank between 134 states, score for non-dimensional indicators determined by WEF experts: 1- the worst; 7 points – the best possible. Other indicators are taken by their dimension or as % of GDP.

Table 1. The comparative ranking data of economic competitiveness of Baltic States in 2010/11 by selected macroeconomic indicators

The comparison of competitiveness indicators shows some substantial differences of competitiveness indicators: for government debt adequately Lithuania - 46, Latvia 63 and Estonia - 5 places. Extent and effect of taxation also differs Estonia from other

comparative states as having benevolent liberal influence on economic competitiveness: its distance from the Scandinavian countries ranks under review amounts up to 100 and more places.

Determinants of competitiveness indicators	Lithuania	Estonia	Latvia
Capacity for innovation	48/3.3	34/3.6	57/3.1
Extent of market dominance & sophistication	97/3.3	38/4.2	70/3.7
Value chain breath	34/4.2	58/3.7	82/3.3
Firm level technology absorption	56/5	42/5.3	89/4.5
Production process sophistication	51/4	41/4.3	72/3.5
Intensity of local competition	78/4.7	31/5.4	92/4.6
State of cluster development	105/2.9	92/3.1	103/2.9
Pay and productivity	18/4.7	8/5.0	42/4.3

* Place in the world and weighed average. Selected by the authors from: WEF, [7], tables 6.01, 6.02, 7.06, 9.02, 11.03, 11.05, 11.07, 12.01 a/o. Weighted average is indexed from 1(lower evaluation) to 7 (highest evaluation).

Table 2. The comparative ranking by WEF entrepreneurship competitiveness indicators: Baltic Countries in 2010/2011*

The main differences between comparable indicators of all Baltic States are clearly interconnected with differences in their macroeconomic situation especially last years and specific of previous development, but not directly with their ability to innovations (the differences in last case amount only 23 places). So, the differences between levels of local competition intensity amounts 61 place (between Estonia and Latvia), the value chain breath evaluations (between Lithuania and Latvia) differ at 48 places and 47 places – in firm level

technology absorption (difference between Estonia and Latvia). Between all selected countries, Estonia overruns all sample states by pay and productivity what shows mostly the backlog between growth of the productivity and remuneration specific for newly EU countries.

It is most important to formulate the complex assessment backgrounds by approach to evaluation of the comparable indicators totality and their differences as an indivisible system.

3. The complex assessment of competitive advantages: Main principles

The entrepreneurship of in the knowledge-oriented economy may be characterized by such essential features as its social responsibility, progressiveness, value added creation, formation & using of intellectual capital, competitiveness, ecologic sustainability and social responsibility. The principal approach to the complex evaluation of the country's entrepreneurship competitive advantages lies in formalization of the system of multitude of primary determinants determining the combined quantitative and qualitative dimensions.

The knowledge economy principles influence the modernization of entrepreneurship and its characteristics, such as progressiveness, knowledge generation and usage, innovativeness, competitiveness, dynamism and business benefits creating social value [10] a/o. The development of intellectual capital becomes especially important factor of the innovativeness of enterprises: such factors as applied innovations and investments into patents, new management solutions and similar have to be taken into account. Enterprises in Lithuania with innovative activity and the results showing their innovative actions are about at medium level between the EU countries; sometimes their significances are above the average. Besides, the corporate social responsibility (CSR) in the entrepreneurship strategy is revealed as a benefit of high priority. The globalization of the markets, as we concluded, requires of the management systems development quickly reacting to the changing situation in Lithuania.

The formation of the integrated enterprise competitive strategy, first of all under the conditions of oligopoly market, is determining its strategic position and influencing performance, as it was stressed by R. Ginevicius a/o [5], [6]. Those, the complex assessment of estimated impact of partial competitive strategies on the integrated enterprise performance criterion is suggested when applying the multiple criteria evaluation methods. The results of empirical application of the model are proposed to be employed to set up the long-term goals and the main directions of business strategy of an enterprise, to distribute the financial, human and other resources for strategic actions to be designed and implemented.

The authors provided a theoretical framework, first-of-all, for the solving of the problem to be defined on basis of the complex evaluation criteria and determined by a totality of primary competitive advantage determinants to be adapted for newly EU countries. The application of this principal concept

required of choosing the evaluation method with account of the different significance of those particular determinants in general dimension. For describing the investigated approach, it is necessary to evaluate the direct and indirect influence of primary determinants. Therefore, an all-round (general matrix) expression of the total competitive advantages' vector $\{A^{(M)}\}$ can like as follows:

$$\{A^{(M)}\} = \begin{bmatrix} g_{11} & g_{12} & \dots & g_{1n} \\ g_{21} & g_{22} & \dots & g_{2n} \\ \dots & \dots & \dots & \dots \\ g_{n1} & g_{n2} & \dots & g_{nm} \end{bmatrix} \begin{bmatrix} \{A_1\} \\ \{A_2\} \\ \dots \\ \{A_n\} \end{bmatrix}, \quad (1)$$

where $g_{11}, g_{12}, \dots, g_{nm}$ - the weights of the direct and indirect influence of identified determinants (vectors $\{A_1\}, \{A_2\}, \dots, \{A_n\}$) (constituted matrix of the significance parameters) determining a descriptive vector $\{A^{(M)}\}$; n - number of identified primary determinants.

Undoubtedly, the applicability of this model is linked with transformation according to the applicable evaluation method taking into account the identified determinants in a specific situation.

The main assessment principles we developed based on an integral approach to country's business competitive advantages as well as to entrepreneurship development level depending from many parameters and characteristics, and determined by multitude of determinants assigned to assessment of analogous social processes [19], [20]. Moreover, the provided quantitative assessment methodology (by applying the reasoned multiple criteria evaluation methods on the basis of adopted models) is oriented on the different influence of primary determinants (compatible with qualitative – SWOT - analysis also scenario method) as useful methodical tool is concerned by the theoretical background adaptation.

On the basis of conceptual solutions for the quantitative assessment of analogous integral development dimensions that are widely developed by the authors, as were indicated, it is purposeful to tackle a problem. First and foremost multiple criteria evaluation methods are suitable in essence by nature of raised tasks, actually SAW (Simple Additive Weighting), COPRAS (Complex Proportional Assessment) and TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) methods [2], [6], [15]. The application of the multiple criteria

evaluation methods requests to formulate the adequate valuation criteria system.

The COPRAS method may be employed in the case when research is oriented both towards maximising and minimising criteria within a systemic approach. The method presumes a direct and proportional dependence of the weight and utility degree of the investigated versions on a system of attributes adequately describing alternatives with the help of values and weights of the attributes. The method is primarily applicable when determining the complex criterion describing the object of evaluation and integrating several partial criteria.

Absolute and relative indices and criteria with different dimensions (both: maximized or minimized) may be integrated by these methods and recalculated as normalized or comparisons, p. ex., using such formula:

$$[R_{ij}] = \frac{R_{ij}}{\sum_{i=1}^n \sum_{j=1}^m R_{ij}}, \quad (2)$$

where $[R_{ij}]$ – normalized significance of j index from i - group.

The inversion of minimized indices ($\min_j R_{ij}$) usually is done such way that they achieve highest significance:

$$[R_{ij}] = \frac{\min_j R_{ij}}{R_{ij}}. \quad (3)$$

The SAW method is especially applicable for the compound evaluation of substantially different primary criteria (both having quantitative and qualitative parameters to be measured) and determining the integral measure (the last one can be used also as measure on different level). The choice is determined by the moment that this method is suitable in case of all factors being independent in the system and when their interaction with the integral measure is not important (as observed in the case study). By using the SAW method, the significance of every factor is measured, because the system must finally involve only these factors (criteria) that meet the essential level of significance [5], [16]. The choice of SAW method is grounded by the certitude that this method is suitable in case whereas both maximizing criteria are included.

Besides, the significance parameters of primary criteria are taken into account; also they may be differentiated according to potency of the influence to generalized measure. The sum of significance parameters of the essential factors, determining generalized criterion, must be equal to 1 (or 100%).

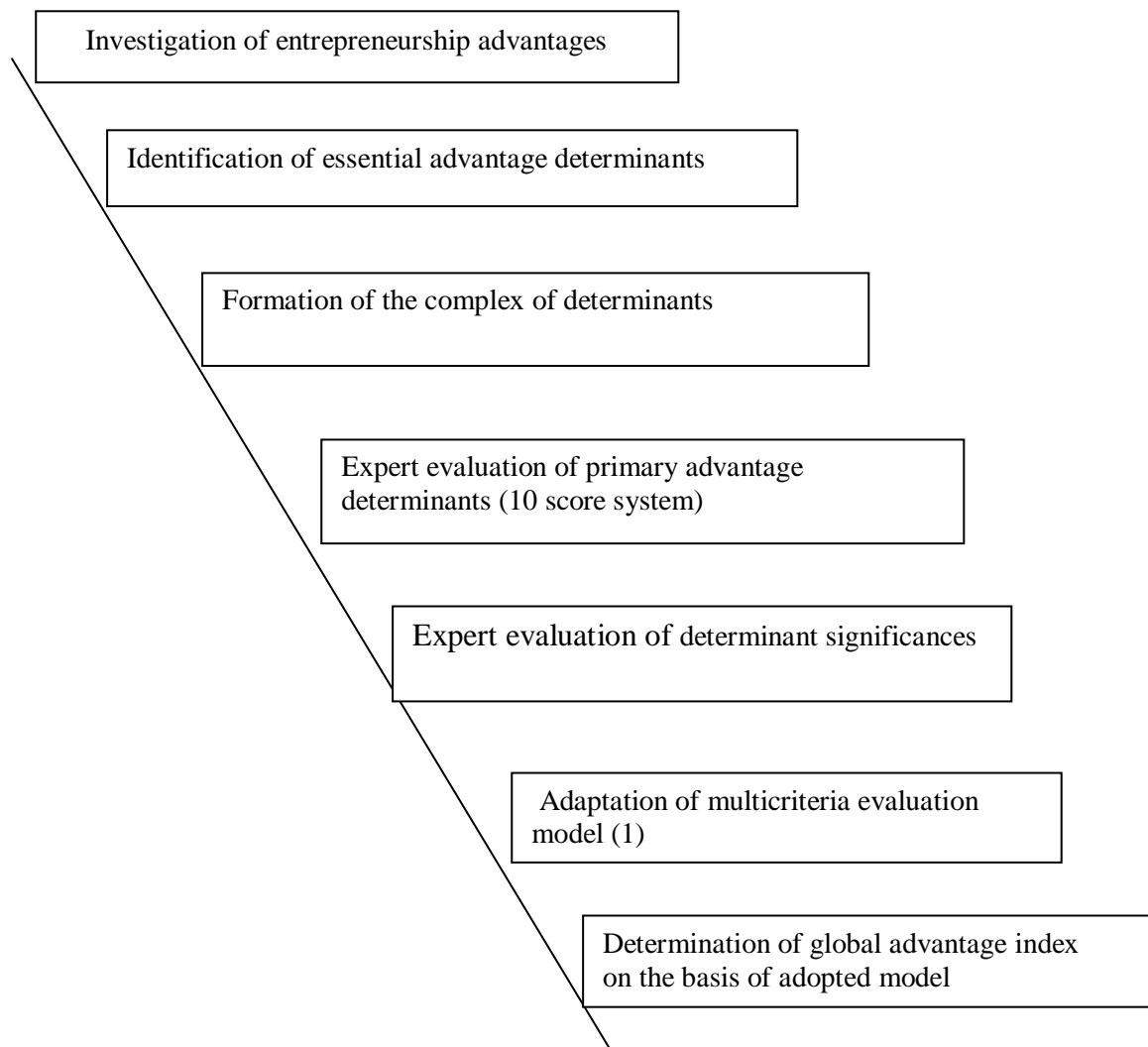
The prolonged perspective of the complex evaluation and application for strategic business development program validation suppose integrated application of mentioned *Multiple Criteria Decision Making (MCDM)* methods for alternative decisions a/o with account of multiple tasks and multiple criteria.

The SAW method was applied in this study for determining the value of the global SMEs competitive advantage index $A(I)$, which is determined in this case by summing the products of identified determinants values and their significances for each of them.

The suggested examination technique supposes the expert evaluation of primary determinants in 10 points system (5 point - medium evaluation, 7 point and more - good or very good, and 3 point or less – as satisfactory or poor). Their significance parameters could be established by experts determining the concordance coefficient and the Pearson's chi-square test - the concordance coefficient significance parameter χ^2 [9]. The multiple criteria evaluation process includes the following essential procedures (computer-generated process algorithm schematically is shown in Fig. 1):

- a) formation of the determinant complex;
- b) expert examination and determination values of determinants;
- c) establishment of significance parameters of determinants;
- d) estimation of general dimension (global index) of SMEs competitive advantages;

The modeling of alternative development variants can be fulfilled with account of composed scenarios [17].



Source: composed by the authors.

Figure1. Essential procedures of multiple criteria assessment process

4. Examination of SMEs competitive advantages in Lithuania

The complex examination was performed adequately to the Lithuania's situation in 2011/2012. At first stage the idiosyncratic advantage determinants (according to 10 points score) and their significance coefficients (non-dimensional) were estimated by the expert group. According to the expert method application methodology, the satisfactory accuracy of estimations of main factors was achieved by a research team consisting of 7 professional experts. The necessary reliability of expert examination is characterized by the main reliability parameters: the values of the concordance coefficient W and the significance parameter for concordance coefficient χ^2 (Pearson's chi-square test). They are also acceptable at the pre-selected level $\alpha= 0.05$ and at the pre-selected level $\alpha= 0.01$ so as they are better

than minimal permitted significances [9]. As a result, the assessed essential primary determinants, describing country's entrepreneurship advantage (adopted for newly EU countries) were identified and their significance coefficients were examined (Table 3).

On this basis (the complex of identified determinants is presented in table 3) and according to principles mentioned above the basic equation was obtained:

$$A(I) = a_1A_1 + a_2A_2 + \dots + aiAi; \sum_{i=1}^9 a_i = 1. \quad (4)$$

At the second stage, the global index of the SMEs competitive advantages was determined for Lithuania (4.7 point, i.e. comparatively unfavorable evaluation) according to the proposed equation (4).

Some primary indicators such as creating of value chain and breath, state of cluster development were evaluated poor (<4.0 point).

It was observed that an assessment process may integrate the scenarios interpreting the government policy for national entrepreneurship development and strategic perspectives (entrepreneurship development trends) in newly EU countries. This process is important when modeling

the changes with account of the perspective of the national entrepreneurship advantages. At the same time, it is important theoretical tool when revealing the reserves of enlarging the country's entrepreneurship potential and evaluating its perspective entrepreneurship development programs in most of newly EU countries. These results may be useful as well for the associated entrepreneurship structures.

Primary advantage determinants	Symbol	Assessment (in points)	Significance coefficients
Extent of marketing sophistication	A_1	4.7	$a=0.14$
Production process sophistication	A_2	4.5	$a=0.13$
Pay and productivity	A_3	4.4	$a=0.11$
Capacity for production/services export	A_4	5.3	$a= 0.11$
Capacity for innovation	A_5	4.9	$a=0.11$
Firm level technology absorption	A_6	4.7	$a=0.1$
Creating of value chain and breath	A_7	3.9	$a=0.1$
Corporate social responsibility	A_8	4.2	$a=0.1$
State of cluster development	A_9	3.9	$a=0.1$
Global index	$A(I)$	4.7	

Table composed by the authors with account of expert group evaluations.

Table 3. The expert examination of primary advantage determinants and estimation of global index by SAW method

5. Conclusion

It is not enough of studies dedicated to the complex assessment of national entrepreneurship advantages. The adequate quantitative evaluation methodology is still not adapted and not integrated with adequate expert evaluations. This may be seen if to compare the rankings of economic competitiveness indicators of Baltic countries (esp. some productivity factors - such as firm level technology absorption), by the WEF. All the differences are much narrow if to compare the expert evaluations expressed in weighed average indices. Between the countries selected in the paper, Estonia overruns other sample states by pay and productivity shows mostly the backlog between the growth of productivity and remuneration specific for newly EU countries.

The application of sophisticated multiple criteria system for the estimation of the SMEs competitive advantage level in the newly EU countries supposes two stage approach. The quantifiable expert evaluation of primary determinants and parameters of their comparative significance procedures are performed at the first stage. At the second stage, the global index of the country's SMEs competitive advantages may be determined by using adequate multiple criteria methods, including the Simple Additive Weighting. This algorithm allows to evaluate the significances of various constitutive advantage determinants in the common system and to model their changes. The determined global index of the Lithuania's SMEs competitive advantages at 4.7 point (in 10-grade evaluations) shows the comparatively unfavorable situation.

References

- [1]. Avlonitis, G. J.; Salavou, H. E. (2007). Entrepreneurial orientation of SMEs, product innovativeness, and performance. *Journal of Business Research*, 60 (5), pp. 566-575.
- [2]. Dombi, J.; Zsiros, A. (2005). Learning multicriteria classification models from examples: Decision rules in continuous space. *European Journal of Operational Research*, 160 (3), pp. 663-675.
- [3]. Fleisher, C. S. (2003). *Strategic and competitive analysis: methods and techniques for analyzing business competition*, New Jersey, Prentice Hall.
- [4]. Geoff, S.; Brychan, C. T.; Gary, P. (2009). Opportunity and innovation: Synergy within an entrepreneurial approach to marketing. *The International Journal of Entrepreneurship and Innovation*, 10 (1), pp. 63- 72.
- [5]. Ginevicius, R.; Podvezko, V., (2009). Evaluating the changes in economic and social development of Lithuanian counties by multiple criteria methods. *Technological and Economic Development of Economy*, 15 (3), pp. 418- 436.
- [6]. Ginevicius, R.; Podvezko, V.; Bruzge, Sh. (2008). Evaluating the effect of state aid to business by multi-criteria methods. *Journal of Business Economics and Management*, 9 (3), pp. 167- 180.
- [7]. *The Global Competitiveness Report 2010/2011*. World Economic Forum, 2011.
<http://www.weforum.org/en/media/publications/CompetitivenessReports/index.htm>.
- [8]. Gries, T., Naude, W. (2010). Entrepreneurship and structural economic transformation. *Small Business Economics*, 34(1), pp. 13-29.
- [9]. Kendall, M. (1979). *Rank correlation methods*. Griffin and Co, London.
- [10]. Krisciunas, K.; Greblikaite, J. (2007). Entrepreneurship in sustainable development: SMEs Innovativeness in Lithuania. *Engineering Economics*, 4 (54), pp. 20-26.
- [11]. Lechner, Ch.; Leyronas, Ch. (2009). Small-business group formation as an entrepreneurial development model. *Entrepreneurship: Theory and Practice*, 33 (3), pp. 645-667.
- [12]. Ma, H. (2000a). Of competitive advantage: kinetic and positional. *Business Horizons*, vol. 43(1), pp. 53-64.
- [13]. Ma, H. (2000b). Competitive advantage and firm performance. *Competitiveness Review*, vol. 10 (2),
- [14]. Man, T.; Lan, T.; Snape, E. (2008). Entrepreneurial Competencies and the Performance of Small and Medium Enterprises: An Investigation through a Framework of Competitiveness. *Journal of Small Business and Entrepreneurship*, 21(3), pp. 690-708.
- [15]. Peldschus, F. (2007). The effectiveness of assessment in multiple criteria decisions. *International Journal of Management and Decision Making*, 8(5 – 6), pp. 519-526.
- [16]. Podvezko, V. (2008). Comprehensive evaluation of complex quantities. *Business: Theory and Practice*, 9(3), pp. 160-168.
- [17]. Ratcliffe, J. (2002). Scenario planning: strategic interviews and conversations. *Foresight*, vol. 4(1), pp.19–30.
- [18]. Weerawardena, J. (2003). The role of marketing capability in innovation-based competitive strategy. *Journal of Strategic Marketing*, 11(1), pp. 15-35.
- [19]. Zvirblis, A., Buracas, A. (2009). Multiple criteria assessment of socioeconomic indicators influencing the company's marketing decisions. *Management of Organizations: Systematic Research*, 49, pp. 137-153.
- [20]. Zvirblis, A., Buracas, A. (2010). The consolidated measurement of the financial markets development: the case of transitional economies. *Technological and economic development of economy*, 16 (2), pp. 266-279.

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