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Zvirblis, Algis; Buracas, Antanas

**Article**

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# Multicriteria Evaluation of National Entrepreneurship In Newly EU Countries

**Algis Zvirblis[1], Antanas Buracas[2]**

**Abstract**

*When evaluating entrepreneurship at the national level, the influence of small and medium-sized enterprises (SMEs) on the state economic development is analyzed. Also, the impact of significant factors (goods and services competitiveness, innovations,* diversification, clusterization*, creating social value, etc.) on SMEs working effectiveness (respectively improving the entrepreneurial efficiency) is investigated. When focused on the national economic competitiveness as a general criterion, the principles and models for consolidated quantitative estimation of national entrepreneurship development level are applicable for newly admitted EU countries (on account of some of their specific factors). The results of assessing the entrepreneurship level in 2009-2010 and the nearest future are presented in this study using Lithuania's data as a typical case. The multicriteria estimation process includes the identification and expert examination, in addition to quantifiable assessment of essential primary indicators. Moreover, the pillar indexes underlying them and entrepreneurship development index using the significance parameters of primary indicators are determined by the authors. The relative impact of the different primary and partial criteria is taken into account by calculation of the integrated criterion–level index, which allows us to evaluate more adequate differences in newly EU countries. To improve the (World Economic Forum) WEF methodology, the authors are using various, not predetermined, weights of primary indicators, also indexes of performance and propose a more adequate differentiation of significances for the pillars. The complex evaluation of the primary indicators influencing business may be used for the strategic solutions reasoning.*

**Keywords*:*** Competitive Advantage, Entrepreneurship Level, Primary Indicators, Competitive Pillars, Quantitative Assessment, Multicriteria Methods

**JEL Classification**: C82, L52, O22

## 1. Introduction

The increase in competitive advantage is the strategic priority of the economic development in the newly EU member countries. The transformation processes in general are an important part of the economic development of a country with a small open

[1] Professor, Economics and Finance Management Faculty, Mykolas Romeris University, Vilnius, Lithuania. email: *bik@mruni.eu*
[2] Professor, International Business School at Vilnius University. email: *antanas@buracas.com*.



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economy, also of business macroenvironment as well as enhancing entrepreneurship development oriented to the advanced growth. The significance of the investigation and estimation of the indigenous entrepreneurship development level as well as the predicting future trends in different developing countries - EU members may be emphasized in few aspects. The expanding of the state economic competitiveness is one of its strategic tasks when designing and evaluating acceptability of the national entrepreneurship development strategy. The favourable factors of business macro surrounding, on the one side, substantially influences the growth of national economy. On the other side, the research of these factors is important for the business entities so as to reveal premises to avoid the threat of growing environmental dynamism and new competitive abilities of particular business. The formalization of the macro surrounding components is the basis for the complex quantitative evaluation.

The entrepreneurship development has also to be analysed in the context of a country's integrated competitive advantage, in particular, on basis of the country's competitiveness index according to the World Economic Forum (WEF), which determines the so-called competitiveness pillars (The Global Competitiveness Report, 2009). They include many significant primary and integral advantage indicators which determine the level of state entrepreneurship development. Especially important accents are the establishment and accumulation of dominant advantages and application of their totality (Hao, 1999). They can be interconnected with competitiveness of the goods and services what is one of the most important of SMEs marketing functions and the significant stage in enterprise marketing research (Smith, 2003; Porter, 2008). In this case, important are the interconnections between the competitiveness level and financial stability of the sectoral enterprises (Allen, Gale, 2004).

The researchers accented mostly the entrepreneurship development at the state level in view of SME activities' impact on the country's economy. SMEs working effectiveness (with a view to activating integrative processes and dynamic changes of entrepreneurship development) is important since they create the significant part of the GDP in the newly EU states. The investigations of the corruption impact and other institutional factors on the national economic growth were also performed for some selected transitional economies (Yusuf, Ngomori, 2002; Gries, Naude, 2010). Other papers deal with aspects of entrepreneurship and SMEs development in the context of the key factors affecting countries in the specific region (Fairbairn, 2006).

Nonetheless, much entrepreneurship studies are fragmentary and focused narrowly on the essential aspects of entrepreneurship, according to our opinion and opinion of some other authors (Anderson, Starnawska, 2008). The published research investigated how the SMEs were integrated into the holding structure, the processes of related diversification and internationalization, also the integration of activities as well as the separation of closely linked activities that improve the entrepreneurial efficacy (Lechner, Leyronas, 2009; McGee et al., 2009). The latter studies analysed the impact of clusterization on the development of SMEs in order to employ its advantages (Capello, 1999).

The various theoretical aspects of SMEs innovations were also analysed in the empirical studies (Avlonitis, Salavou, 2007). The growing attention has to be attributed to



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the influence of intellectual property (Buracas, 2007), to the efficiency of social capital employment and risk management. The corporate social responsibility (CSR) in business (entrepreneurship) strategy is revealed as of high priority when measuring the created social value (in Lithuania - Krisciunas, Greblikaite, 2007).

To summarize, it is insufficient to focus the empirical research on the problem of complex investigation and the assessment of entrepreneurship development at national level, revealing its priority aspects. It is important to evaluate more adequately the differences in the newly EU countries, to apply estimated rather than predetermined weights of primary indicators, and the more adequate differentiation of significances levels for the (Primary Indicators) PI and their pillars. The same opinion is expressed by other researchers: "Most competitiveness indicators aggregate primitive data using predetermined fixed weight values that are applied uniformly to all countries. The use of fixed and uniform weights may bias inferences of relative performance since it ignores that countries can have different policy priorities or lack inherent capabilities on some dimensions" (Bowen, Moesen, 2009).

The theoretical framework and empirical point of view, first of all for solving the problem were defined on basis of the general evaluation criteria and determined by a totality of essential PIs (Zvirblis, Buracas, 2009). Besides, this totality of PIs has to be structured by specific attributes, adopted for the particular newly EU countries and formalized for the quantitative evaluation oriented towards development of public management systems, also in other EU economies. This study is focusing on the principles of the consolidated multicriteria estimation of the national entrepreneurship development in the newly EU economies and the comprehensive approach to influence on the economic competitiveness (by applying the reasoned multicriteria evaluation methods on the basis of the models designed for this particular task).

## 2. Conceptual Provisions of Entrepreneurship Level Estimation

### 2.1 Basic Conceptual Provisions

The conceptual theoretical principles of the state's entrepreneurship development and the estimation models are determined by such general parameters as a dynamism, progressivity, and efficiency of the activity, potential. More importantly, the new value-added creation and competitive magnitude of goods and services are proposed to be included into the investigation of the various entrepreneurial characteristics affecting the behavioural efficiency of SMEs. The competitive entrepreneurship is considered to be a totality of the components characterized by a great multitude of quantitative indexes and qualitative indicators as variables which have to be included into the complex evaluation of the economic competitiveness. It is important to measure its influence on multiaspect balancing between the entrepreneurship efficiency and its social aspects. The estimation principles are designed for this purpose on the basis of modern management theories, also continuing examination methods.



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The applicability of complex quantitative assessment methods, the conceptual principles for evaluation of socioeconomic impact on the enterprising and the basic models of the complex quantitative evaluation were developed, compared with the previous publications. The consolidated estimation of entrepreneurship level index must also follow these general principles: PI may be analogically grouped (5-7 indicators) for these purposes and the indices of every group have to be determined. The variety of these components (groups, pillars) describing the essential PI (enhancing or minimizing the competitive priorities) also determines the required quantitative evaluation methods (Zhang, Yang, 2001; Ginevicius, Podvezko, 2008). An assessment may comprise the scenarios interpreting the government macroeconomic policy trends, also the variants of perspective national economic development. After all, only this evaluation (with applying quantitative methods and algorithms) may be incorporated into the computerized system of public sector management which is just formed for the purposes of strategic decisions in newly EU countries.

The groups (pillars) of PI determining the level of entrepreneurship may be composed according to the so-called global competitiveness pillars used by the WEF and integrating the institutional, goods' market efficiency, business sophistication and innovation indicators. However, the analysis of the entrepreneurship development level in transitional economies suggested to include additionally many other important indicators according to their different impact on resumptive measure of its expanding, at last for some newly countries - members of the EU. So, e.g., the important indicators not accounted by the WEF experts are as follows: the procedures and time for starting business, the activity of associated structures, the procedures of the controlling institutions and the sufficiency of competitive financial facilities. The reasonable idiosyncratic pillars of PI determining level of the entrepreneurship as a totality are also the competitive advantage indicators for goods and services, the transformation indicators for goods and services' markets and SMEs working effectiveness indicators; they were selected by the expert way. Besides, it is possible to include the additional primary indicators for those pillars of PI what would be actual for different countries as well as to add some additional pillars. It is expected that a given quantitative evaluation methodology (compatible with qualitative (SWOT) analysis, also with scenario method) will be a useful methodical tool. The importance of the research is in the using of *different*, not predetermined, weights of primary indicators and in the adequate differentiation of pillars' significances.

## 2.2 Promising Multicriteria Evaluation Methods

The quantitative evaluation of the entrepreneurship development level may be based on principles of the conceptual solution of analogous social tasks. The perspective multicriteria methods of the quantitative evaluation are suggested to be reviewed in the first place as best applicable to the tasks solved below and by character of those tasks. In particular, it is preferred to apply SAW (Simple Additive Weighting), COPRAS



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(COmplex PRoportional ASsessment) and TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) methods as the most widespread (Hwang, Yoon, 1981; Parkan, Wu, 2000; Zhang, Yang, 2001; Saaty, 2001; Zapounidis, Doumpos, 2002a, 2002b; Dombi, Zsiros, 2005; Ginevicius et al., 2008; Turskis, 2008; Ginevicius, Podvezko, 2009). The application of the multicriteria evaluation methods requests to formulate the adequate valuation criteria system.

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 subcriterial measure on different level). The choice is determined by the moment that this method is suitable in case all factors are 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 (Ginevičius, Podvezko, 2009). The sum of significance coefficients of all factors (criteria) in the group must be equal to 1 (or 100%), therefore, it is permitted to differentiate them by significance (however, the system of unvaried significance criteria can also be applied) and use the adapted software. The SAW method in this investigation (when evaluating entrepreneurship as a system) is applied to estimate the PI pillars mentioned above (as some partial criteria) and to determine the generalized value (the entrepreneurship development level).

### 2.3 Technique of Quantitative Assessment

The calculated indexes (in points) of indicator pillars and estimated entrepreneurship development level were evaluated within 100 point system. The essence of the suggested assessment technique is the quantifiable expert examination of all essential PI: 50 point corresponds to medium evaluation, higher levels – to good or very good (more than 70 points) evaluation, and lower levels – to weak or bad (less than 30 points) evaluation. PI, the impact of which enhances the competitive disadvantage, are evaluated below 40 points and do not have negative values. The indicator significance parameter (in the non-dimensional expression) values was determined by the expert's way. Expert examination procedure must be implemented applying the widely known concordance methods (including coefficients *W,* their significance parameters $\chi^2$ a/o) and *W,* $\chi^2$ formulas (Kendall, 1979). As a result of the identification, the PI with determined significance levels in the outcome was listed according to every pillar. The procedure evaluating the PI values and their significances is a *first* (of three) stage quantitative assessment. In summary, the process of the consolidated estimation of the entrepreneurship development level using justified multicriteria SAW method (on basis developed backgrounds models) included the *following* stages:

quantifiable (in points) expert examination of identified PI (as primary criteria) significances and listing the determinative PI according to the underlying pillars on this basis;



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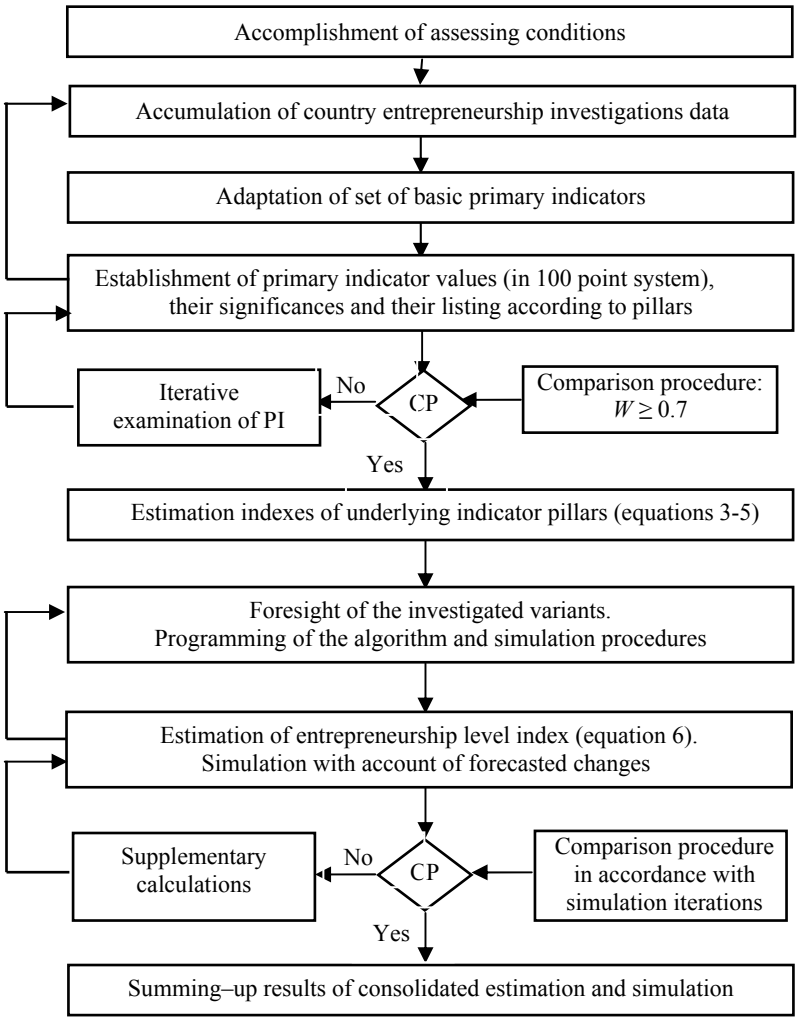
quantitative (multicriteria) assessment of determinative indicator pillars (as a partial criteria in evaluation system) and determination of the pillar weights (according to their influence on generalized measure);

estimation of generalized measure – the entrepreneurship level index (as an integrated criterion) on basis of the determined partial criteria and their weights.

As it is shown, the reliability of multicriteria method application is limited by the results of expert evaluations of the primary indicators.

**Figure 1: Principal Scheme of the Estimation Algorithm of Entrepreneurship Level**



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So, the computer-generated multicriteria estimation process (schematically shown in Fig. 1) reveals that the various significance parameters (weights) of the primary and partial criteria are taken into account by the calculation of integrated criterion. Its main features are as follows: the appliance of national entrepreneurship data, the algorithmisation of estimation procedures (on basis of special means), the presentation of resulting findings. Every procedure of estimation process is adequate to scheme 1: expert examination of PI (presented in detail in 3.1), determination of the pillar indexes (equations (3-5) below), and, later, estimation of entrepreneurship level index (according to the equation (6) as below). According to the various scenarios and entrepreneurship development parameters, the consecutive simulation is applied by iteration procedures.

This algorithm is rather universe and it allows to choose the different (by stages mentioned above) conditions not only in the newly EU countries but also in other countries of different level of the development using the adequate data bases.

The viability of the presented evaluation system is determined also by the fact that this quantitative evaluation technique may be applied even for the establishment of main parameters of business development strategy.

## 2.4 Background Models

The background models applicable for the countries of different economic development level were developed by the authors with orientation to the conceptual provisions approved above. Their adaptation is presented in the case of Lithuania (see in the section 3.2). In general, the PI pillar level index $T_i(I)$ (as partial criterion for estimation of the generalized measure - entrepreneurship level index) may be calculated by using the formula:

$$T_i(I) = \sum_{j=1}^{m} p_{ij} R_{ij}; \sum_{j=1}^{m} p_{ij} = 1, \tag{1}$$

where $p_{ij}$ – significance parameter of $j$-th PI at $i$-th selected pillar, $R_{ij}$ – value (in points) of $j$-th listed determinative PI ($m$– number of listed PI at $i$-th group).
The consolidated entrepreneurship level index $L_a(I)$ may be estimated after determining the indexes (values) of all partial criteria and their weights as follow:

$$L_a(I) = \sum_{i=1}^{n} ki \sum_{j=1}^{m} p_{ij} R_{ij}; \sum_{j=1}^{m} p_{ij} = 1, \quad \sum_{i=1}^{i=n} k_i = 1, \tag{2}$$

where $k_i$ – weight (determined by expert way) of partial criterion $T_i(I)$ according to their direct impact on the entrepreneurship level $L_a(I)$; $n$- number of PI pillars.

The total amount of PI (their $m$ groups) ir $n$ pillars in particular is determined by the complexity of the evaluation according to the formulated tasks and conditions of the valuation. The alternative directions of enterprising development and the monitoring of



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their development programs are simulated taking into account the forecasted changes. The pillars mentioned before are presented in detail below.

### 2.5 Typical Primary Indicators Selected by Underlying Pillars

The expanded set of typical PI is selected preliminary (on basis of accomplished analytical investigation and SWOT analysis) and arranged according to the previous approach. The indicators of the *first* pillar of competitive advantage for goods and services (as level of their competitiveness) are such as their quality, up-to-date (to high-tech criteria), also suitability to export, and capacity for innovations. The indicators of *second* pillar of transformation for goods and services markets indicators include PI, as transparency of competition, means of government promotion, level of legal regulation, level of markets infrastructure. The *third* pillar of SMEs working effectiveness indicators is focusing on export share, marketing sophistication, diversification parameter, and appliance of social and intellectual capital. The set of typical PI is presented in the Table 1, however only the identified PI would be included, those with sufficient significance, by establishing the partial criteria. Some of them, such as diversification level, export share, outsourcing spread, may be measured quantifiable besides the qualitative evaluation, however their integrated measurement is preferred within a unified point system.

## 3. Estimating Lithuania's Entrepreneurship Development Level

### 3.1 Expert Examination of Determinative Primary Indicators

Lithuania's entrepreneurship development level assessment presented below permits the investigation (as well as using SWOT analysis and derivative quantifiable indices, corresponding to the assessed PI) of the typical PI (Table 1) determining the underlying pillars. Adequate to Lithuania's situation in 2009-2010 elaboration measurement system provided taking into account to results of quantifiable expert examination (as were indicated, according to 100 points evaluating system) of the identified PI and their significance coefficients by the competent professional expert group (7 experts: 3 –from business research and 4 - bank macroeconomics analytics). The significance of the identified PI in the preliminary investigation was evaluated in the task of establishment of determinative PI by every pillar; in the outcome, they were listed (as the number of the determinative primary criteria by pillars $n \leq 7$ can be seen in Table 3) and the average significances for listed PI were established. Later, the determinative PI were valuated (in points) concerning both 2009-2010 (I) and the nearest future (II) in Lithuania entrepreneurship development. It was pursued that the null hypothesis would be correct in the case under review for the any PI values and significance tests exceptionally performed by experts. The procedure of rejection of the best and worst evaluations of every indicator was also applied, for the elimination of any possible inadequate influence of any extreme expert opinion to the final evaluation results.



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**Table 1: The underlying pillars of the typical primary indicators (not ranked)***

| The name of a pillar | The essential indicators of a pillar |
|---|---|
| *1. Competitive advantage indicators for goods and services* | 1.1.Level of goods and services competitiveness<br>1.2.Production of high-tech goods<br>1.3.New value-added creation<br>1.4.Export of high-tech goods<br>1.5.Capacity for goods and services innovation<br>1.6.Innovations in production<br>1.7.Value chain breadth<br>1.8.Development of competitive derivative services<br>1.9.Sufficiency of competitive financial facilities<br>1.10.Other indicators (by the situation) |
| *2. Transformation indicators for goods and services markets* | 2.1.Level of legal regulation<br>2.2.Means of government promotion<br>2.3.Transparency of the competition<br>2.4.Tariff barriers<br>2.5. Impact of bureaucracy spread<br>2.6.Level of markets infrastructure<br>2.7.Procedures and time necessary for starting business<br>2.8.Procedures of the controlling institutions<br>2.9.Spread of shadow economy<br>2.10.Spread of e-commerce<br>2.11.Other indicators (by the situation) |
| *3. SMEs working effectiveness indicators* | 3.1.Diversification level<br>3.2.Marketing sophistication<br>3.3.Activity of associated structures<br>3.4.Corporate social responsibility<br>3.5.Export share<br>3.6.Cluster formation breath<br>3.7.Appliance of social and intellectual capital<br>3.8.Spread of lobbyism<br>3.9.Outsourcing spread<br>3.10.Business expenses resulting from racket<br>3.11.Legal rights of shareholders<br>3.12.Other indicators (by the situation) |

The Table was composed by the authors.
*Additional pillars can be added in the following research stages depending on the particular tasks of the expert examination.



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The consensus and the necessary reliability of evaluation (taking into account the calculations of the applied expert opinion compatibility) is usually achieved when the statistical values of main reliability parameters $W$=0.65-0.8 and concordance coefficient significance $\chi^2$ related to pre-selected significance level α determining the confidence interval. The $\chi^2$ test statistic is basically the sum of the squares of the differences between the observed and expected frequencies, with each squared difference divided by the corresponding expected frequency. In our case the values of the concordance coefficient $W$ amounted to 0.66 –0.74 (for PI values - 70 percent of $W$>0.7*;* for PI significance - 60 percent of $W$>0.7) so they did not exceed the marginal values in the tables (Kendall, 1979). The concordance coefficient significance parameter $\chi^2$ is acceptable (taking into account the widely accepted marginal values) by the pre-selected level α= 0.05 and by α= 0.01 (in detail it is shown in Table 2).

**Table 2**: **Expert Examination Reliability Parameters for Determinative Primary Indicators by Pillars**

| **Pillar and number of primary indicators** | **Concordance coefficient *W*** | | **The values *W* significance $\chi^2$ and min [$\chi^2$]** | | |
|---|---|---|---|---|---|
| | **For primary indicators** | **For significance coefficients** | De facto | [$\chi^2$] as α= 0.01 | [$\chi^2$] as α= 0.05 |
| Pillar (*F*); *n*=6 | 0.74 | 0.70 | 24.50 > | 15.086 | 11.071 |
| Pillar(*E*); *n*=6 | 0.72 | 0.68 | 23.80 > | 15.086 | 11.071 |
| Pillar (*S*); *n*=7 | 0.69 | 0.66 | 27.72 > | 16.812 | 12.592 |

The results of evaluation of the determinative PI and their significance as well as the weights of partial criteria are given in Table 3.

### 3.2 The Equations to Be Applied

For the case of Lithuania and other newly EU countries, the background model (1) can be adopted for the measurement of indexes of established pillars mentioned before (taking into account the determinative PI and their significance coefficients). The pillar indexes were calculated (Table 3) on the basis of equations below for 2009-2010 and in the nearest future.

To estimate the level index *F(I)* of competitive advantage indicators for the goods and services (as the first partial criterion), the equation (3) was applied:

$$F(I) = \sum_{i=1}^{i=p} a_i F_i ; \sum_{i=1}^{i=p} a_i = 1, \qquad p=6, \tag{3}$$



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Where $a_i$ − the significance coefficient of direct impact of primary indicators $F_i$ (level of goods and services competitiveness, production of high-tech goods, new value-added creation, capacity for goods and services innovation, etc.) on the level index *F(I)*.

To estimate the level index *E(I)* of the transformation indicators for goods and services markets (as the second partial criterion), the following equation (4) was applied:

$$E(I) = \sum_{i=1}^{i=n} b_i E_i ; \sum_{i=1}^{i=n} b_i = 1, \qquad n=6, \tag{4}$$

Where $b_i$ − the significance coefficient of direct impact of primary indicators $E_i$ (means of government promotion, level of legal regulation, level of market infrastructure, impact of bureaucracy, transparency of the competition, etc.) on level index *E(I)*.

To estimate the level index *S(I)* of SMEs working effectiveness indicator (the third partial criterion), the equation (5) was applied:

$$S(I) = \sum_{i=1}^{i=m} c_i S_i ; \sum_{i=1}^{i=m} c_i = 1, \; m=7, \tag{5}$$

where $c_i$ − the significance coefficient of direct impact of primary indicators $S_i$ (innovations in production, export share, diversification parameter, marketing sophistication, activity of associated structures, appliance of social and intellectual capital, etc.) on level index *S(I)*.

On the basis of common expression (2) the equation for establishment Lithuania's entrepreneurship development level $L_a(I)$ is detailed:

$$L_a(I) = k_1 F(I) + k_2 E(I) + k_3 S(I); \; \sum_{i=1}^{3} k_i = 1; \tag{6}$$

where $k_1$, $k_2$ and $k_3$ − the weights of direct impact of partial criteria *F(I)*, $E(I), S(I)$ on level index $L_a(I)$.

When applying the similar equation system for other newly EU countries, the peculiar determinative PI and their number have to be taken into account on the basis of additional expert evaluations.



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**Table 3: The Results of Assessment of Lithuania Entrepreneurship Level Index**

| ***Indicator pillars and determinative indicators*** | ***Conditional marking*** | ***Assessment*** (in points) | | ***Averaged significances and weights*** |
|---|---|---|---|---|
| | | I | II | |
| *Pillar of competitive advantage indicators (of goods and services)* | ***F*** | | | *k*= 0.4 |
| Level of goods and services competitiveness | $F_1$ | 42 | 52 | *a*= 0.22 |
| Capacity for goods and services innovation | $F_2$ | 45 | 49 | *a*= 0.18 |
| Production of high-tech goods | $F_3$ | 33 | 43 | *a*= 0.16 |
| New value-added creation | $F_4$ | 43 | 54 | *a*= 0.16 |
| Sufficiency of competitive financial facilities | $F_5$ | 39 | 46 | *a*= 0.15 |
| Export of high-tech goods | $F_6$ | 36 | 49 | *a*= 0.13 |
| *Level index* | ***F (I)*** | 40 | 49 | |
| *Pillar of transformation indicators for goods and services markets* | ***E*** | | | *k*= 0.3 |
| Means of government promotion | $E_1$ | 52 | 46 | *b*= 0.24 |
| Level of legal regulation | $E_2$ | 45 | 53 | *b*= 0.19 |
| Level of market infrastructure | $E_3$ | 41 | 44 | *b*= 0.15 |
| Impact of bureaucracy | $E_4$ | 39 | 46 | *b*= 0.15 |
| Transparency of the competition | $E_5$ | 41 | 45 | *b*= 0.14 |
| Procedures and time necessary for starting business | $E_6$ | 43 | 48 | *b*= 0.13 |
| *Level index* | ***E (I)*** | 43 | 47 | |
| *Pillar of SMEs working effectiveness indicators* | | | | *k*= 0.3 |
| Innovations in production | $S_1$ | 42 | 48 | *c*=0.19 |
| Export share | $S_2$ | 48 | 52 | *c*=0.17 |
| Marketing sophistication | $S_3$ | 48 | 57 | *c*= 0.16 |
| Diversification parameter | $S_4$ | 42 | 51 | *c*= 0.15 |
| Appliance of social and intellectual capital | $S_5$ | 38 | 47 | *c*=0.13 |
| Activity of associated structures | $S_6$ | 51 | 58 | *c*=0.10 |
| Cluster formation breadth | $S_7$ | 39 | 42 | *c*=0.10 |
| *Level index* | ***S(I)*** | 44 | 51 | |
| ***Consolidated entrepreneurship level index*** | ***La(I)*** | 42 | 49 | |



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### 3.3 Results of Estimation of Lithuania Entrepreneurship Level

The final results of calculations of partial criteria indexes, on the one side, Lithuania's entrepreneurship development level for 2009-2010 (I) and its nearest future (II) values, on the other (Table 3), may be interpreted in the following way. The values of indexes for all pillars were at comparable medium levels: for the pillar of SMEs working effectiveness indicators– 44-51 points, the pillar of transformation indicators for goods and services markets - 43-47 points and pillar of competitive advantage indicators for goods and services - 40–49 points.

The problematic primary indicators are production and export of high-tech goods, appliance of social and intellectual capital, impact of bureaucracy. The amelioration of some low scored primary indicators (excluding means of government promotion) is expected in the future. At the same time, the activity of associated structures valuated as good, the procedures and time for starting business and the sufficiency of competitive financial facilities are at lower level.

At last, Lithuania's entrepreneurship development level can be evaluated respectively 42 (I) and 49 (II) points (irretentive evaluation) and that means its level is lower than middle in newly EU countries. These results are some additive marks for the directed sustainable development of national entrepreneurship system by growing competitive advantage in the context of macroeconomic country's development perspectives; they may be useful as well for the associated business structures interested in evaluation forecasting the surrounding factors.

The amelioration of some low scored primary indicators as the production and export of high-tech goods and the appliance of social and intellectual capital (excluding means of government promotion) are expected in the future. When simulating the effects of challenges, these results may be used for determining some indicators of the entrepreneurship development strategy and/or for *ex-post* multivariate analysis. The computer simulation is possible according to the process presented in Fig. 1 when evaluating the real changes monitored, for evaluation of the consequences of the financial crisis, also the alternative scenarios of the entrepreneurship development at national level.

## 4. Conclusions and Suggestions

1. The investigations and estimation of the entrepreneurial transformations processes in the newly EU members are important when validating the strategic economic development decisions determining the country's integrated competitive advantages. However, the previous theoretical publications mostly concerned the specific problemic aspects of entrepreneurship development, not complex approach to its evaluation. The important indicators for newly EU countries not included by the WEF are as follows: the procedures of the controlling institutions, the activity of associated structures, and the sufficiency of competitive financial facilities.



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2. According to the comprehensive approach to the different impact of multiple factors on the presumptive measure of the entrepreneurship development, its consolidated assessment is preferred for analysis of newly EU members based on various indicators, on adaptable theoretical basis and sophisticated methodological tools. The principles of the quantitative multicriteria evaluation on basis of background models applicable to consolidated estimation of a generalized criterion – the level index were designed by the authors and adapted for these countries.

3. The core of the reviewed sophisticated estimation principles is the three-stage evaluation system: the joint application of quantifiable expert examination of the primary indicators, quantitative evaluation of the underlying pillars' level and consolidated assessment of the national entrepreneurship development level. The pillars of competitive advantage indicators of goods and services, of transformation indicators for goods and services markets, indicators of SMEs' working effectiveness are named as most appropriate. The assessment algorithm of entrepreneurship level is rather universal and allows us to select different conditions not only in the newly EU countries but also in other countries of different development level using adequate data-bases, to review the plausible scenarios of its development.

4. The promising quantitative multicriteria evaluation methods may be expediently applied to those tasks. The Simple Additive Weighting method is suitable for measurement of every primary indicator pillars and for determining the integrated entrepreneurship development level index that accounts for the significance of both the primary and partial criteria. The authors are using different, not predetermined, weights of primary indicators and propose a more adequate differentiation of significances for the pillars. However, the reliability of multicriteria method application is limited by the results of expert evaluations of the primary indicators.

5. The results of consolidated estimation of the entrepreneurship level in Lithuania (in 2009-2010 and in the nearest future) show that its index is equal 42 to 49 points, i.e. medium significance. The level indices of underlying pillars vary from 40 to 51 points (e. g., the goods and services' competitiveness pillar have comparatively less favorable level index: it scored respectively 40 points for 2009-2010, and 49 points for the nearest future; the pillar of transformation indicators for goods and services markets scored similarly 43 and 47 points). The activity of associated structures are valuated as good, but the procedures and time for starting business and the sufficiency of competitive financial facilities are at lower level.

The research methodology is also applicable to a wider assessment of the entrepreneurship development strategies in the newly EU countries, more particularly the evaluation of the consequences of the financial crisis.

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