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Measurement of Lithuanian Regions by Regional Competitiveness Index

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The theoretical and practical aspects of the measurement of regional competitiveness by a composite index are analyzed in this article. While the concept of regional competitiveness is not formed yet at the academic level and the method of competitiveness measurement, which is grounded methodologically and accepted generally, is still missing, the competitiveness of a region can be measured in different ways: analyzing one or several factors of competitiveness, using theoretical models of competitiveness, creating composite indices, etc. Every method has its advantages and disadvantages. Each of them can be useful in the measurement of regional competitiveness, because they emphasize different aspects of the concept of competitiveness. The justification of identification of the factors of competitiveness and the test of results for robustness and sensitivity are requested for the transparency of each method. The summarized scheme of the measurement of regional competitiveness by regional competitiveness index (RCI) is presented in the article.

The measurement of regional competitiveness is based on the factors of competitiveness. To identify the factors of competitiveness, the following traditional models of competitiveness can be used as methodological foundations: the "National Diamond" model, "Double Diamond" model, "Nine factors" model, "Regional competitiveness hat" model, "Pyramid model of Regional Competitiveness", "Regional competitiveness tree" model. Every model distinguishes in different techniques of the selection and grouping the factors of competitiveness into a general system. It is important to find out the factors, which create the complex competitive advantage of the region, but not only positive presuppositions for its achievement. The main factors of regional competitiveness are presented in this article. In order to measure the competitiveness in quantitative dimension, the indicators of factors of regional competitiveness are also presented.

The regional competitiveness index can be constructed in various scenarios: by using and combining different techniques of the selection and weighting the factors, methods of data normalization, etc. Every technique has its advantages and disadvantages. Different techniques are possible for calculating the index, if the choice is methodologically based and the results are statistically justified. The stages and the main aspects on a sound methodology of the calculation of RCI are identified in this article.

Rapidly developing processes of globalization throw new challenges for the means of economic analysis and strategic planning. Different techniques can be used for analyzing and creating strategies for increasing the competitiveness of the region. Each of them has its advantages and disadvantages. In order to find out the strengths and weaknesses of the measurement of competitiveness by RCI, the new created index was empirically tested on the basis of the data of 10 Lithuanian districts during the period of 2001-2007. The results of the measurement and advantages and disadvantages of the use of RCI are presented in the article.

The new created RCI, presented in the article, is one of the ambitions for having a convenient tool, which can be used in the economic analysis, strategic planning and justification of solutions for the increase of competitiveness of a region.

Keywords: *measurement of regional competitiveness, regional competitiveness index.*

Introduction

The attention to competitiveness of a region has not decreased for recent decades. The aspects of competitiveness gradually become one of the main parts in regional development strategies. A lot of regions are looking for perspective niches where they should or could increase their competitiveness and develop themselves economically and socially contemporaneous. One of the most important stages in strategic planning as well as presumption of the improvement of regional competitiveness are the measurement of present competitive position and potential of a region.

Despite the increasing number of scientific works on regional competitiveness issues, the researches about the techniques of measurement of regional competitiveness are still lacking, especially in Lithuania. Though, the composite indices are considered to be one of the methods to analyze the problem in a complex way, the methodological aspects of the measurement of regional competitiveness by a composite index have been analyzed very little in scientific literature. The indices of national competitiveness *(Growth and Business Competitiveness Indices of World Economic Forum, World Competitiveness Index of International Institute for Management Development)* have been formed and widely applied in the world, but they are generally intended for the measurement of the competitiveness of a country. There is the lack of the researches about theirs' possibilities of application in the measurement of competitiveness within a country. Hence, a regional competitiveness index (RCI), which would be grounded methodologically and would enable to measure the competitiveness of regions within a country is still missing. Lack of a means of complex measurement of competitiveness is becoming one of the obstacles which prevents from measuring a competitive potential of a

region and forming effective strategies of increase in competitiveness.

The aim of the article is to analyze the advantages and disadvantages of measurement of the regional competitiveness within the country by regional competitiveness index (RCI).

Methods of the research: a systemic, comparative and logical analysis of the concepts, methodologies and conclusions, published in scientific literature; methods of mathematical and statistical analysis, with the help of software packages (SPSS, MS Excel).

Scientific literature suggests many definitions of a region, as it is used in a different context: geographic, cultural, political, economic, social etc. spheres. A wide interpretation of the concept emphasizes the specification of regional definition, used in the context of measurement of competitiveness. A region is defined as a composite part of a larger economic social space, which differs from other surrounding territories in economic, social, demographic, cultural, natural, and infrastructure systems connected by material and informational relations. In this article a region is understood as a part of the country. A particular number *(n)* of regions compose the country. Analyzing the regional competitiveness within county an assumption is made, that the impact of central authorities of the country on the development of regions is equal and there is no purposive regulation. Such viewpoint allows analyzing the region as a complex, open and alive system, makes uniform initial conditions for competing and lets separating the factors of national and regional competitiveness.

The theory of competitiveness is one of the most confused and difficult summarized fields of research, because of complexity of the concept, plenty and variety of factors, complication of competitiveness process. A wide interpretation of the concept of competitiveness emphasizes the specification of definition of regional competitiveness, used in the context of competitiveness measurement. In this article a regional competitiveness is defined as an ability to use factors of competitiveness in order to make a competitive position and maintain it among other regions. Such viewpoint allows treating the competitiveness as a self reinforcing process, where present factors of competitiveness (inputs) create future factors of competitiveness (outputs) and after that outputs become inputs for a new cycle of competitiveness process. Of course, the whole process can operate in the opposite direction. This issue is fundamental for strategic planning, as the process of improving regional competitiveness is a continual and cyclical. The strategic decisions should be based on the up to date results of the measurement of competitive position and potential of a region.

Measurement by a composite index: advantages and disadvantages

The competitiveness of a region can be measured in different ways: analyzing one or several factors of competitiveness, using theoretical models of competitiveness, creating composite indices, etc. The analysis of the main problems of regional competitiveness measurement (Simanaviciene, et al., 2007, Kitson et al., 2004, de Vet, et al. 2004, Huggins, 2003, Lengyel, 2003) showed, that competitiveness cannot be completely defined by one or several economic and social indicators. Thus, complex measurement of competitiveness is a must. The researches proved that the measurement by a composite index helps to solve the problem of complexity. A group of scientists (Giovannini et al., 2005, Saisana et al., 2005, Wignaraja et al., 2004, IMD, 2004, Freudenberg, 2003, Huggins, 2003) defines a composite index as an artificially made-up instrument of quantitative and qualitative measurement of a particular sphere. The index consists of sub-indicators; hence, the objects under examination can be ranked on the ground of it. It is emphasized that multi-criteria conceptions (e.g. competitiveness, industrialization, coherence, the integration of markets, the development of knowledge society, etc.) are measured by the index most accurately as they cannot be measured by a single index only. The critical analysis of the measurement by the index has induced to distinguish its advantages and drawbacks (see Table 1). The authors of the article doubt that scientific discussions about the measurement of particular spheres by the index will end up, however, they envisage more advantages than drawbacks of it. It is predicted that indices will continue to be widely applied in the future in the measurement of multi-criteria conceptions because of the benefit which indices provide as a means of conveyance and analysis.

The analysis of scientific literature (Bowen et al., 2005, WEF, 2005, Giovannini et al., 2005, Wignaraja et al., 2004, IMD, 2004, Huggins 2003, Booysen, 2002, Lall, 2001 a, b, Huovari et al., 2000, 2001) let summarize the stages of index calculation: forming the theoretical model of a problem, normalizing, grouping and weighting the indicators, calculating the index and analyzing the uncertainty and sensitivity of the index.

In scientific literature the formation of a theoretical model of a problem was not attributed to the stages of the formation of the index, hence, a number of scientists do not mark it at all. The authors of the article are of the opinion that a theoretical model is the basis of the formation of the methodology for index calculation as well as for the grounding of its clarity. Thus, it is considered to be a separate stage.

In pursuance of the comparison of data expressed by different units of measure, indicators are normalized. In the calculation of indices different methods of data normalization are applied. The most frequent methods are the following ones: a standard deviation from the mean, a distance from a minimum and a maximum value and a distance from a group leader or an average.

The biggest number of discussions among scientists was caused by the stage of the determination of weight coefficients.

Some authors (Houvari et al. 2001, 2000, Sachs et al. 2001) have emphasised the fact that it is difficult to form the substantiation of the measurement of weight coefficients or all variables are provided with the same weight coefficients with no reason (IMD, 2004). Other authors (Saisana et al., 2005, Freudenberg, 2003, Booysen, 2002) point out that different weight coefficients enable to calculate competitiveness index more precisely as well as provide indicators with weight coefficients of different value (WEF, 2005).

Table 1

Advantages and disadvantages of the measurement by the index

Advantages	Disadvantages
A problem under consideration is variously estimated.	If the calculation methodology is formed incorrectly or its result is interpreted in a wrong way, the index may distort the situation presented (in order to eliminate the disadvantage the analysis of reliability and sensibility is proposed).
Multi-criteria aspects of the problem under consideration and a complex of indices defining it are included.	A versatile measurement expressed by a single index may induce a too simple interpretation of the problem under consideration (in order to eliminate the drawback a thorough examination of sub-indices is used).
It is more convenient to use one value than to search for a tendency among a number of different indicators.	Due to the absence of clarity and validity of calculation methodology, variance of political priorities and shortage of qualitative data, the index may not be usable in practice (in order to eliminate the disadvantage all stages of index calculation are proposed to be supported by clear and reasonable principles as well as by mathematical-statistical methods).
There is a possibility of ranking objects according to multi-criteria aspects.	The number of data used in the calculation is relatively big.
A problem under consideration may be estimated in point of time according to multi-criteria aspects.	Due to the exclusion of particular aspects (which define a problem and which are difficult to measure by statistical data) in the calculation of the index, the information about the problem under consideration may be inappropriate.
Attention of the society and the authorities is drawn to a problem under consideration and to its change with regard to time.	Complex measurement by the index may conceal the weakness of a particular sphere or the inefficiency of a system (in order to eliminate the disadvantage a thorough examination of factors or sub-indices is used).
Efficiency of the activity of the authorities may be estimated when tackling a problem under consideration.	The value of the index may depend on an indicator used in the calculation imprudently (in order to eliminate the drawback a thorough examination of factors as well as of the indicators defining them is used).
Qualitative data and new methods of analysis are prompted to be searched.	The complexity of calculation methodology allows manipulating a desirable value of the index (in order to eliminate the disadvantage all stages of index calculation are proposed to be supported by clear and reasonable principles as well as by mathematical-statistical methods).

In scientific literature the provision of weight coefficients of the same value for indicators is usually criticized due to the fact that a particular aspect of the problem under consideration may be measured twice in case it is defined by more than one index. The provision of weight coefficients of different values for indicators is criticized due to a possible factor of subjectivity and a wider freedom of manipulation aiming at favorable results of calculation.

In pursuance of a compromise over the measurement of weight coefficients in the calculation of regional competitiveness, the authors of the article emphasize the necessity of the substantiation of weight coefficients measurement methodology. Due to the subjectivity and a different effect of dissimilar methods for weight measurement, none of the methods of weight index measurement and provision is supposed to be false by the authors, in case it is reasoned. However, the measurement of the same value of weight coefficients is considered a standard one. The authors of the article regard the analysis of the reliability of the index as a necessary stage of index calculation.

Research has proved that robustness and sensitivity methods of analysis are mostly used to substantiate the transparency of index calculation. The analysis of robustness shows if potential sources of uncertainty bring an influence on the structure of the index and on the very result. The analysis of sensitivity measures the strength of the influence brought on the results of the index by sources of uncertainty, i.e. what is the change of the index result after the abolition or variation of one of possible sources of uncertainty. Research has proved that the accuracy of the measurement of a problem by a composite index depends on: a) techniques of the selection of factors and indicators; b) techniques of grouping the factors; c) strength of the correlation among factors; d) methods of data acquisition necessary for calculation; e) methods of data normalizing; f) techniques of factors weighting; g) expression of a mathematical function of the index. Correlation, cluster and factorial analyses are the most frequent in the analysis of index reliability.

The carried out research of the index calculation methodology will form a methodological basis in the formation of the index of regional competitiveness as well as in a complex measurement of regional competitiveness.

Methodology of regional competitiveness index

The analysis of the main problems of regional competitiveness measurement (Simanaviciene et al., 2007) has enabled to determine that the method of regional competitiveness measurement has to meet the following requirements:

- The requirement of complexity, i.e. competitiveness has to be analysed in a number of different aspects by the method which is being used. In addition, a group of competitiveness factors as well as indicators defining them has to be also included into the process of measurement.

- The requirement of reliability, i.e. the method which is being used has to be founded both methodologically and statistically.
- The requirement of comparability, i.e. the comparison of competitiveness among different regions and with regard to time has to be possible.
- The requirement of simplicity, i.e. results acquired have to be clear and easy for interpretation.

The authors of the article are of the opinion that the method of competitiveness measurement chosen before, i.e. measurement by the index, meets all the requirements mentioned above. The principle of complexity is assured by the fact that competitiveness is measured not by a single or several economic and social indicators, but by a number of them included in the structure of the index. The principle of reliability is assured by the fact that the stage of the formation of regional competitiveness model is included in the calculation of the index when a model grounded methodologically as well as the stage of a robustness and sensitivity analysis are formed. The principle of comparability is assured by the fact that indices are calculated both for separate regions and for different years. The principle of simplicity is assured by the fact that competitiveness is measured by a single value which reveals a number of different indicators. Hence, it provides an opportunity to rank regions both according to a group of indicators and separate indicators.

The research carried out by the authors of the article has proved that in scientific literature competitiveness is analysed in a number of ways: according to separate macro-economic indicators, indicators of activity of firms or separate sectors, policies carried out by the authorities, conditions which make firms be competitive or combine several aspects under discussion at the same time. Some authors (Snieška, Šliburytė, 2000) measure the competitiveness of the territory by the competition intensity level in a different market, others (Kvainauskaitė, Snieška (2002), Kvainauskaitė et al., 2003) - by business structure or market demand, still others (Maksvytienė, Urbonas, 2001) – by the course of exchange, norms of interests, balance of foreign trade, technological innovations, some authors (Snieška, Drakštaitė, 2007) – by outsourcing of knowledge process. Snieška et al. (2002) proved that the cluster based approach in the implementing policy can increase regional competitiveness and speed up economic development. Startienė and Genytė (2004) were evaluating the competitiveness of milk processing sector by two levels: macro environment (distant, general or social environment) and by factors excluded in Porter‘s model. Rutkauskas (2008) defined the competitiveness of a region as a three-dimensional indicator, which depends on the fields of activity, dominating in the country, international economic relations and legal, financial, ecological, natural resources and geographical location environment competitiveness. The research carried has proved that the selection of competitiveness factors depends on the methodology chosen previously.

Aiming to measure the regional competitiveness within the country by RCI, the authors of the article have formed two models which supplement each other: “Rindex” and “Regional Diamond”. The “Rindex” model (see Figure 1) defines a fundamental scheme of RCI calculation and the measurement of regional competitiveness within the country by RCI.

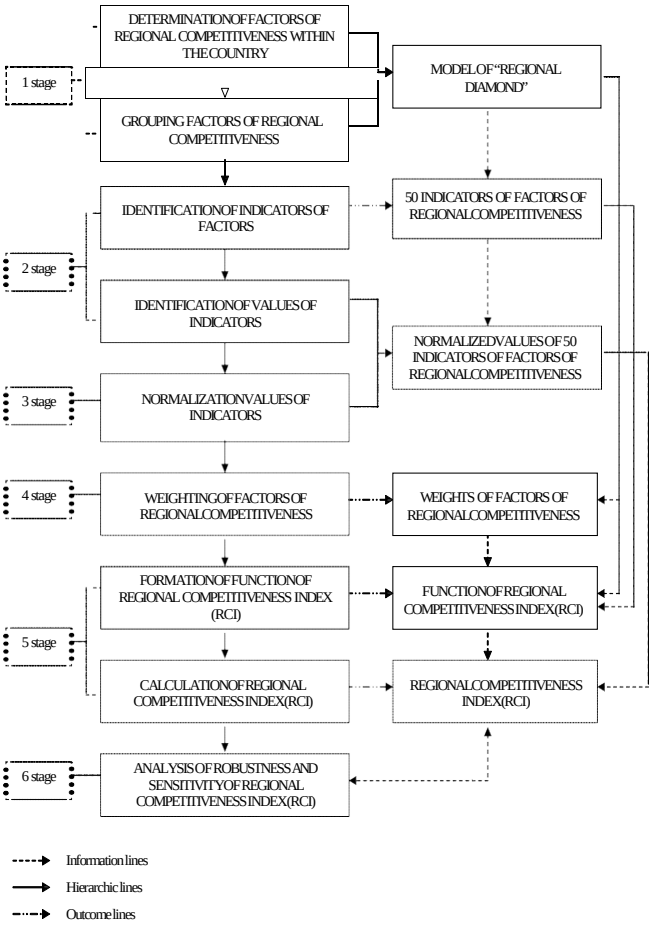

Figure 1. “Rindex” model

Stage 1 determines and groups the main factors of regional competitiveness within the country into a general system of competitiveness, i.e. the model of “Regional Diamond” is formed (See Figure 2). In the selection of factors it was aimed to disassociate them from the ones which are positive assumptions for the achievement of strategic competitiveness only. Factors which are developed on a national level are not included either (for instance, the stability of the supply of energetic resources) or the influence they make is the same on all regions within the country (for example, the policy of export or taxes carried out by the government). The model was a means to evaluate the ability of regions to use factors of competitiveness for the formation of a competitive position and for its retention among other regions as well. In the formation of the model the analysis of application possibilities of theoretical competitiveness models, while estimating regional competitiveness was used (Simanaviciene et al., 2007). It has proved that the “Double Diamond” as well as “National Diamond” differentiates in a methodological arrangement of factors of competitiveness. It fits well to measure the competitiveness of small countries and regions due to the distinction of the influence of global power on general competitiveness. This model has formed a methodological basis for the formation of the “Regional Diamond” model.

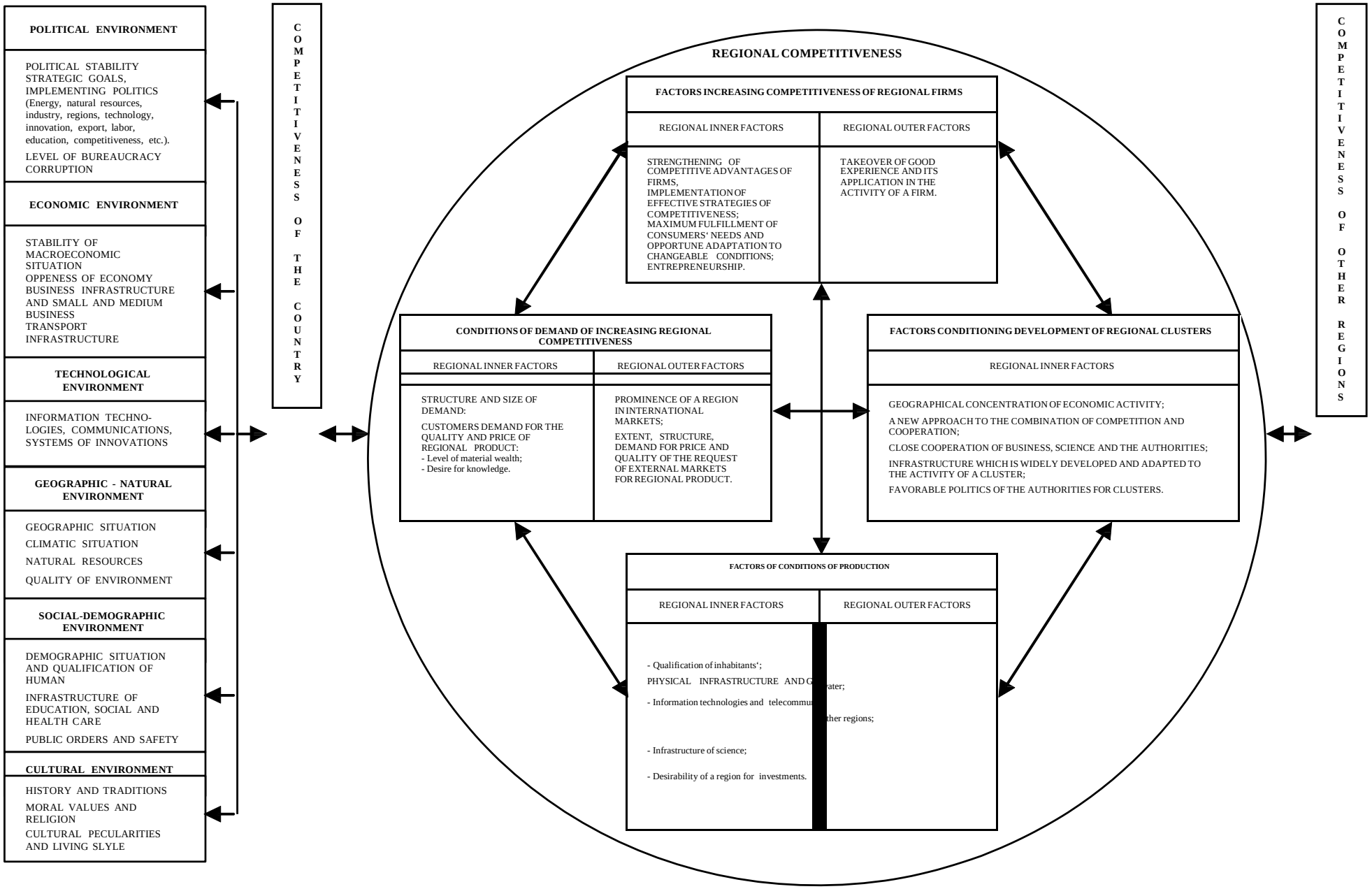

Figure 2. "Regional Diamond" model

While identifying factors of regional competitiveness, peculiarities of regional competitiveness (Porter (1990), Cho (1994), Cho, Moon (1998)) and competitiveness within the country (Martin et al. (2003), Lengyel (2003), de Vet et al. (2004)) were also considered which could be applied in the measurement of regional competitiveness.

With reference to Rugman et al. (1998) model of "Double Diamond", the authors of the article have divided factors of regional competitiveness into four groups: factors of conditions of production, demand conditions, factors increasing competitiveness of regional firms and factors conditioning the development of regional clusters. With regard to the fact that a region is an open and lively system, factors of competitiveness are also analysed in inner and outer aspects of a region. A reciprocal effect on regional competitiveness made by both external environments (such as political, economic, geographical-natural, social-demographic, cultural and technological) and general competitiveness within the country and other regions is also distinguished in the model of "Regional Diamond". Despite the fact that these aspects are not included in the measurement of regional competitiveness by RCI, their influence is estimated indirectly via factors of regional competitiveness and its capability to use opportunities provided by these factors to strengthen its own competitiveness. Inclusion of external environments, common competitiveness within the country and competitiveness among other regions of the country shows a complex view to the measurement of competitiveness.

Stage 2 determines indicators, which define factors of regional competitiveness within the country, and their values too. With regard to the model of "Regional Diamond", indicators which define competitiveness are most often used in literature, requirements for indicators, difficulty in getting information on a regional level and absence of information on a inter-regional level. 50 indicators have been distinguished, 26 of which define conditions of production factors, 15 identify conditions of demand and 9 of them outline factors increasing competitiveness of firms (Table 2-4).

It is difficult to identify the indicators of definite factors increasing competitiveness of regional firms. All these factors influence the activities of firms. It is assumed that the indicators of activities of firms represent the indicators of factors increasing competitiveness of regional firms (Table 4).

The selection of indicators of factors of regional competitiveness let affirm that qualitative methods are more favorable for the analysis of factors which determine the development of clusters because they enable to estimate the situation in a region better than quantitative ones. That is why the indicators of factors conditioning the development of regional clusters are not included in the function of RCI.

Stage 3 deals with the normalization of values of indicators defining factors of regional competitiveness with the country.

A function of RCI is formed and the index counted at *stage 5*. Considering the model of "Regional Diamond" and the fact that factors which condition development of clusters are measured in a qualitative aspect, RCI is put in a linear equation:

$$\boldsymbol{RCI} = (w_1)\,\boldsymbol{CF} + (w_2)\,\boldsymbol{DC} + (w_3)\,\boldsymbol{FC} \quad (1)$$

$$\boldsymbol{CF} = (w_4)\,\boldsymbol{HR} + (w_5)\,\boldsymbol{PhI} + (w_6)\,\boldsymbol{KnR} + (w_7)\,\boldsymbol{C} \quad (2)$$

$$\boldsymbol{DC} = (w_8)\,\boldsymbol{SSD} + (w_9)\,\boldsymbol{LCD} + (w_{10})\,\boldsymbol{ESSD} \quad (3)$$

$$\boldsymbol{FC} = (w_{11})\,\boldsymbol{SCA} + (w_{12})\,\boldsymbol{TGE} \quad (4)$$

$$\boldsymbol{HR} = (w_{13})\,SIA + (w_{14})\,QI + (w_{15})\,MI \quad (5)$$

$$\boldsymbol{PhI} = (w_{16})\,ICT + (w_{17})\,ITT + (w_{18})\,NBRE + (w_{19}) + ORRL + (w_{20})ORRAW \quad (6)$$

$$\boldsymbol{KnR} = (w_{21})\,IS + (w_{22})\,ISc + (w_{23})\,CSB \quad (7)$$

$$\boldsymbol{C} = (w_{24})\,DRI + (w_{25})\,DRIA \quad (8)$$

$$\boldsymbol{SSD} = (w_{26})\,NCRP + + (w_{27})\,SD \quad (9)$$

$$\boldsymbol{CDQPRP} = (w_{28})\,LMW + (w_{29})\,DKn \quad (10)$$

$$\boldsymbol{ESSD} = (w_{30})\,ExM + (w_{31})\,PR \quad (11)$$

Table 2

Indicators of factors of production conditions

FACTORS		Indicators
HUMAN RESOURCES	Structure of inhabitants' age	Working age population
	Qualification of inhabitants	Population with higher education Level of life-long learning (Individuals aged 25-64, who are studying, per 1000 inhabitants)
	Migration of inhabitants	Net national migration per 1000 inhabitants Net international migration per 1000 inhabitants
PHYSICAL INFRASTRUCTURE AND GEOGRAPHIC SITUATION	Infrastructure of car transport	Density of public roads Share of public national roads of total roads Length of local roads with improved pavement
	ITT	Households possessing a personal computer Households having access to the Internet at home
	Newly built real estate	Number of residential buildings whose construction was authorized Useful floor area of non-residential buildings completed per 1000 inhabitants
	Outer reach of a region by land	Share of "E" category roads of total roads
	Outer reach of a region by air and water	Passengers carried by air transport Goods carried by maritime transport
KNOWLEDGE RESOURCES	Infrastructure of studies	University students per 1000 inhabitants College students per 1000 inhabitants
	Infrastructure of science	Science contracts implemented in universities Production of technology science in universities Applications for the State Patent Bureau
	Cooperation with science institutions of other regions	The number of bilateral agreement for cooperation between universities Participation of universities in the international programs of science
CAPITAL	Desirability of a region for investments	Index of attraction of investment in tangible fixed assets Investment in tangible fixed assets per capita
	Desirability of region for investments from abroad	Foreign direct investment per capita Index of attraction of foreign direct investment

Where: RCI – regional competitiveness index; CF- conditions of production factors; DC - conditions of demand of increasing regional competitiveness; FC - factors increasing competitiveness of regional firms; HR – human resources; PhI - physical infrastructure and geographic situation; KnR – knowledge resources; C – capital; SSD - size and structure of local demand; LCD – local customers demand for quality and price of regional product; ESSD - size and structure of demand for price and quality of external markets for regional product, prominence of region in international markets; SCA - strengthening of competitive advantages of firms, formation of effective strategies of

competitiveness; maximum fulfillment of consumers' needs and opportunity adaptation to changeable conditions; entrepreneurship; TGE - takeover of good experience and its application in the activity of a firm; SIA - structure of inhabitants' age; QI - qualification of inhabitants; MI - migration of inhabitants; ICT - infrastructure of car transport; ITT - information technologies and telecommunications; NBRE - newly built real estate; ORRL - outer reach of a region by land; ORRAW - outer reach of a region by air and water; IS - infrastructure of studies; ISc - infrastructure of science; CSB - cooperation with science institutions of other regions; DRI - desirability of a region for investments; DRIA - desirability of region for investments from abroad; NCRP - number of consumers of regional product and structure of demand; SD - size of demand; LMW - level of material wealth; DKn - desire for knowledge; ExM - size of export markets; PR - prominence of a region in international markets; w_i *- weight coefficient of i factor*.

Table 3

Indicators of demand conditions

FACTORS		Indicators
SIZE AND STRUCTURE OF LOCAL DEMAND	Size of demand	Population density per 1 sq. kilometers Turnover (VAT excl.) of retail trade and catering enterprises per capita
	Structure of demand	Level of urbanization (proportion of urban areas)
LOCAL CUSTOMERS DEMAND FOR QUALITY AND PRICE OF REGIONAL PRODUCT	Level of material wealth	Average gross monthly earnings per capita Average consumption expenditure per capita per month Persons entitled to pensions per 1000 population at working age Number of families at social risk per 1000 population Registered criminal offences per 100 000 population
	Desire for knowledge	Individuals aged 16–74 who used a computer in the last 3 months Share of average consumption expenditure for recreation and culture
SIZE AND STRUCTURE OF DEMAND FOR PRICE AND QUALITY OF EXTERNAL MARKETS FOR REG. PRODUCT, PROMINENCE OF REG. IN INTERN. MARKETS	Size of export markets	Share of export of goods produced in the country in GNP of a region Revenue from export of goods produced in the country per capita
	Prominence of a region in international markets	Number of accommodation establishments Number of accommodated guests per 1000 population Occupation rate of hotels

Weight coefficients are provided to factors and groups of factors of regional competitiveness at *stage 4.*

Stage 6 deals with the analysis of robustness and sensitivity of RCI which enables to substantiate the robustness of the index and the transparency of calculation.

The pursuance of the principle of methodological reliability, which is essential for the method of competitiveness measurement by RCI, is grounded by the analysis of the choice of competitiveness factors of scientific literature and their combination into a common system as well as a methodological analysis of competitiveness measurement by the index. The fulfillment of the principle of empirical reliability of this model will be founded by the measurement of the competitiveness of Lithuanian counties and by statistical reliability of the calculations made.

Table 4

Indicators of factors increasing competitiveness of regional firms

FACTORS	Indicators
STRENGTHENING OF COMPETITIVE ADVANTAGES OF FIRMS, FORMATION OF EFFECTIVE STRATEGIES; MAXIMUM FULFILLMENT OF CONSUMERS' NEEDS AND OPPORTUNITY ADAPTATION TO CHANGEABLE CONDITIONS; ENTREPRENEURSHIP; TAKEOVER OF GOOD EXPERIENCE AND ITS APPLICATION IN THE ACTIVITY OF A FIRM	Gross domestic product (GDP) per capita Share of GDP created by region of the country Number of economic entities in operation per 1000 population Instituted and completed bankruptcy procedures per 1000 economic entities in operation Income (including natural persons which carry out economic activity) by economic activity per employee Productivity of employee in manufacturing Employment rate Unemployment rate Affiliates of multinational companies per 1000 economic entities in operation

Main assumptions and principles of competitiveness measurement of Lithuanian regions by RCI

According to NUTS, a system of territorial distribution into regions unified by the European Union, Lithuania consists of 10 third level NUTS regions. NUTS III territorial formations consist of regions, which are inhabited by 150 thousand people at minimum and 800 thousand people at maximum, and the territory of which covers from 10 to 83.5 thousand sq. km. Considering the fact that Lithuanian counties are equated with regions, data from Lithuanian counties will be used in the measurement of competitiveness. With reference to the chapter 5 of the law on territorial administrative units and their boundaries in the Republic of Lithuania (Žin., 1994, Nr. 60-1183), Lithuania consists of 10 counties: Alytus, Kaunas Klaipėda, Marijampolė, Panevėžys, Šiauliai, Tauragė, Telšiai, Utena and Vilnius.

Both mathematical-statistical methods and these of expert-like evaluation, which complement each other, are applied in the measurement of regional competitiveness within Lithuania. Their application is determined by possibilities to gain information. An expert-like evaluation is used to determine weight coefficients of competitiveness factors among Lithuanian regions, whereas mathematical-statistical methods are applied in the analysis of competitiveness factors, also in the calculation of RCI and ranks.

Promptitude of results of the measurement of regional competitiveness by RCI is limited by the slippage of the introduction of particular regional data used in the calculation by almost two years dating from the current period of time or by the difficulty in getting the data or even the absence of the data. In the calculation of the reliability of the results of competitiveness measurement among Lithuanian counties by RCI, data of the years 2001-2007 are used.

Aiming at the determination of eight coefficients of Lithuanian competitiveness factors, an expert-like evaluation has been carried out. In fact, 34 people, whose activities are connected with strategic planning, regional development and the inducement of social-economic development of territories, have been questioned. The individuals who took part in the survey might be regarded as the experts of the measurement of regional competitiveness factors due to their qualification and practical experience. People, representing institutions of science, business and authorities took part in the expert-like evaluation. The respondents of scientific sphere appeared to be representatives of Lithuanian institutions of higher education, the respondents among the authorities belonged to the government of the Republic of Lithuania as well as to administrations and municipalities of Lithuanian counties, and members of business associations and individual firms appeared to be representatives of a business sphere. An expert-like evaluation has covered all Lithuanian counties from a geographical point of view.

The experts were surveyed by a questionnaire in the period of September-January 2007. The data of the questionnaire was processed and analyzed by the use of the Statistical Package for Data Analysis (SPSS) and the Programme Package of Microsoft Excel. The coefficient of the questionnaire Cronbach alpha used in the experiment-like evaluation is 0.63 that proves an acceptable inter-homogeneity of expert-like evaluation and the reliability of the questionnaire.

The main source of the data used in the calculation appears to be the Department of Statistics of the Government of the Republic of Lithuania. The following difficulties were faced while collecting information about indicators of regional competitiveness factors:

- Department of Statistics of the Government of the Republic of Lithuania started to calculate some indicators only since 2005 (for example, level of life-long learning) or even since 2006 (passengers carried by air transport).
- Some indicators were not calculated for the years of 2001, 2002 and 2003 (occupation rate of hotels).
- In the period of the collection of indicators necessary for the calculation of indicators were not calculated for the year of 2006 (Turnover (VAT excl.)) of retail trade and catering enterprises per capita) because of the slippage of information provision.
- Some indicators of factors of regional competitiveness are not calculated or provided by the Department of Statistics to the Government of the Republic of Lithuania at all (Applications for the State Patent Bureau).

By means of the analysis of various methodologies for competitiveness indices calculation of the problems, which concerned information gaining and data lacking, mentioned above, was tackled in the following way:

- Lacking data (for the period of 2001-2004 or for the year 2005) of the indicators which have been calculated only since 2005 or 2006, were identified with the data of the next year. If the data of the year 1005 or 2006 was present, then the data of the period of 2001-2004 was identified with the data of 2005.
- If data of some two years was missing, it was envisaged according to the functions of regression. If data of some three years was absent, the missing data of that period was identified with the data of the nearest years.
- The data which is not provided or calculated at all by the Department of Statistics of the Government of the Republic of Lithuania was obtained from other official sources.

The research proved that various methodologies (for instance, the methodology of data normalization, the determination of weight coefficients, the selection of competitiveness factors, etc.), which were applied in calculation, influence the result of competitiveness measurement. Thus, the influence they make on the result should be measured at the stage of the analysis of RCI robustness and sensitivity. Because of the space limitation in the article, the RCI of Lithuanian counties will be calculated by the method of the normalization of the distance from the minimum and maximum values. Moreover, the same weight coefficients will be provided for all factors of competitiveness distinguished in the model of "Regional Diamond". The influence of different methodologies brought on the accuracy of the measurement of regional competitiveness within the country by RCI is going to be analyzed in other article.

Empirical application of RCI in Lithuanian regions

The empirical application of RCI in Lithuanian regions reveals the change of competitive positions of Lithuanian counties during 2001-2007 (see Picture 3). According to the RCI of Lithuanian regions, the most competitive regions were Vilnius (1st rank), Klaipeda (2nd rank) and Kaunas (3rd rank). Siauliai and Telsiai regions took the fourth and fifth rank respectively. Utena, Panevezys, Marijampole and Alytus regions shared the sixth - ninth ranks. The least competitive region of Lithuania is Taurage (10th rank).

In order to verify the assumption, that regional competitiveness cannot be completely defined by one or several economic social indicators and a complex measurement of competitiveness is a must, the comparison of competitiveness ranks, gained by RCI and GDP per capita was made (see Table 5). The selection of GDP per capita determined the fact, that this indicator is most frequently identified as the indicator of competitiveness of geographic territory in scientific literature. The results, presented in Table 5 proved that regional competitiveness cannot be completely measured by GDP per capita. This indicator should be defined as one of the indicators of factors of regional competitiveness. The comparison of competitiveness ranks, gained by RCI and GDP per capita, also proved that the results of measurement of the medium competitive regions are more sensitive to the techniques of the selection of factors than the one of stronger or slighter competitive regions.

It is difficult to identify the main reasons of the annual change of competitiveness of Lithuanian regions (see Figure 3) because of the change of the situation not only in the analyzed region, but also in comparative ones. However the analysis of competitiveness of Lithuanian regions according to factors and their groups let identify the main reasons of the change.

Table 5

Compatibility of competitiveness ranks, gained by RCI and GDP per capita

Regions to be compared	2007 (n= 10)		2001-2007 (n = 70)	
	Kendall's W[a]	Asymp. Sig.	Kendall's W[a]	Asymp. Sig.
All Lithuanian regions	0.907	0.00 (<0.05)	0.912	0 (<0.05)
Kaunas, Alytus, Klaipeda, Utena, Marijampole, Panevezys, Šiauliai, Telsiai regions	0.419	0.15 (>0.05)	0.652	0 (<0.05)
Vilnius and Taurage regions	1	0,00 (<0.05)	1	0 (<0.05)

The analysis let affirm that RCI is mostly correlated with conditions of production factors (coefficient of Pirson correlation 0.985). The coefficients of Pirson correlation between conditions of demand and factors increasing competitiveness of regional firms with RCI are respectively 0.897 and 0.900. These coefficients of correlation were treated as indicators of causality.

The results of the expert evaluation and coefficients of Pirson correlation between factors of competitiveness (identified in "Regional Diamond" model) and RCI let identify the main factors of competitiveness of Lithuanian regions during the period of 2001 – 2007 in the order of the influence (see Table 6).

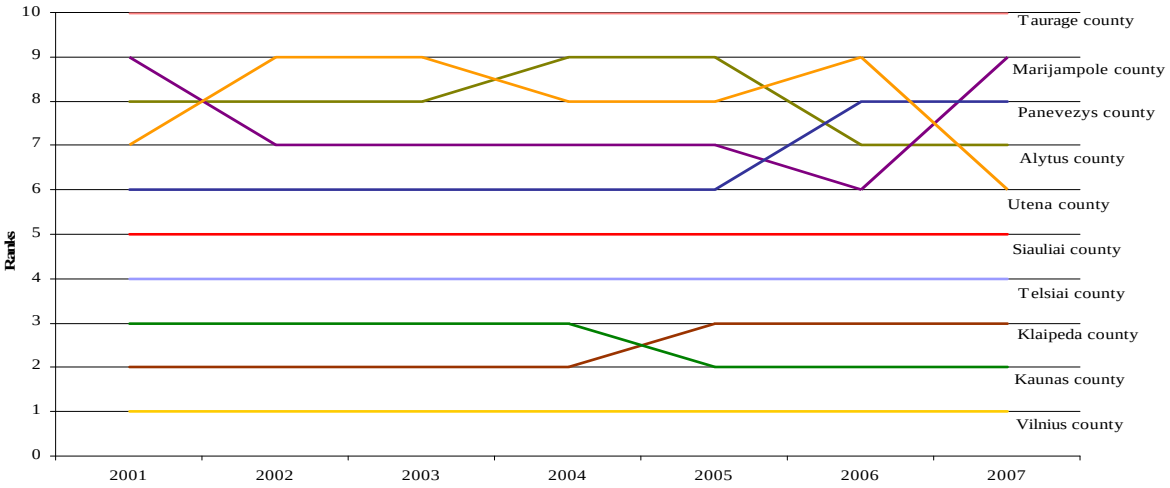

Figure 3. Change of competitiveness of Lithuanian regions during 2001-2007

Table 6

The main factors of competitiveness of Lithuanian regions

Only 2 factors, which influence most the competitiveness of Lithuanian regions, were identified from each group of factors

According to the expert evaluation	Weight coeff.	**According to correlation between factors of regional competitiveness and RCI**	Coeff. of Pirson correlation (p=0,00)	Coincidence of evaluation
1. Conditions of production factors	**0.317**	**1. Conditions of production factors**	**0.985**	+
1.1. Human resources	0.290	1.1. Physical infrastructure, geographic situation	0.831	-
1.1.1. Qualification of inhabitants	0.402	*1.1.1. Information technologies and telecommunications*	0.837	-
1.1.2. Structure of inhabitants' age	0.314	*1.1.2. Outer reach of a region by air and water*	0.728	-
1.2. Knowledge resources	0.247	1.2. Knowledge resources	0.819	+
1.2.1. Infrastructure of studies	0.377	*1.2.1. Infrastructure of studies*	0.817	+
1.2.2. Infrastructure of science	0.377	*1.2.2. Infrastructure of science*	0.803	+
2. Factors increasing competitiveness of regional firms	**0.261**	**2. Factors increasing competitiveness of regional firms**	**0.900**	+
2.1. Strengthening firms competitive advantages	0.313	2.1. GDP per capita	0.897	
2.2. Maximum fulfillment of consumers' needs, opportune adaptation to changeable conditions	0.260	2.2. Number of economic entities in operation	0.845	
3. Conditions of demand of increasing regional competitiveness	**0.214**	**3. Conditions of demand of increasing regional competitiveness**	**0.897**	+
3.1. Size of export markets	0.283	3.1. Local customers demand for quality and price of regional product (*Desire for knowledge*)	0.864	-
3.2. Prominence of region in intern. markets	0.264	3.2. Prominence of region in intern. markets	0.727	+
4. Factors conditioning the development of regional clusters	**0.208**			
4.1. Close cooperation of business, science and the authorities	0.253			
4.2. Infrastructure, which is widely developed and adapted to the activity of a cluster	0.197			

The data, presented in Table 6 shows, that the results of the expert evaluation and correlation between factors of regional competitiveness and RCI do not contradict, but specify each other.

RCI is able to show the change of competitiveness of a region during the period and provide the information about the factors of competitiveness. Also, the analysis of competitiveness of Lithuanian regions according to RCI allows to identify the strengths and weaknesses of each region in comparison with the whole country, which should be incorporated into the competitive strategies of each region. If the value of competitiveness factor exceeds the average of the country, it is identified as the strengths of a region. If it is below the average, it is identified as the weaknesses of a region. If the value of competitiveness factor corresponds to the average of the country, it is not identified neither as strengths nor weaknesses and are not included into the competitive strategies. According to the fact, that the formation of competitive strategies of Lithuanian regions are not related with the aim of the article, the strategic directions for increasing the competitiveness of each county, proposed by the authors in the Table 7, are based only on the analysis of RCI (not on the scientific analysis of this problem).

Table 7

Strategic directions for increasing the competitiveness of Lithuanian regions

Region	The principles of competitive strategy	The main strategic directions
Vilnius	The strategy should be oriented to creation and implementation of innovations. The main principles: - Aggressive and outwards orientated strategy.	- The participation in organizations of cooperation among the subjects of public and private sectors of the Baltic sea region. - The strengthening of infrastructure of science. - The development of cooperation of business, science and the authorities; - The improvement of the quality of activities of the public institutions; - The dissemination of information about the region.
Kaunas	The strategy should be oriented to creation and implementation of innovations. The main principles: - The enhancement of competitive strengths and elimination of weaknesses.	- The strengthening of infrastructure of science. - The development of cooperation of business and science; - The development of human resources; - The development of outer reach of a region; - The attraction of investments.
Klaipeda	The strategy should be oriented to implementation of innovations; The main principles: The enhancement of competitive strengths.	- The development of human resources; - The development of outer reach of a region; - The development of cooperation of business and science.
Telsiai	The strategy should be oriented to development the export. The main principles: The elimination of competitive weaknesses.	- The development of human resources; - The improvement of competitiveness of firms; - The development of diversity of business; - The development of infrastructure of ITT.
Siauliai Panevezys Alytus Marijampole	The strategy should be oriented to development the productivity of production and export. The main principles: - The enhancement of competitive strengths and elimination of weaknesses.	- The development of human resources; - The development of entrepreneurship of firms and regional clusters; - The enlargement of export market; - The attraction of investments; - The development of infrastructure of ITT; - The strengthening the cooperation with neighbor regions.
Utena	The strategy should be oriented to development the productivity of production and export. The main principles: - The elimination of competitive weaknesses.	- The development of human resources; - The improvement of competitiveness of firms and export markets; - The attraction of investments; - The development of diversity of business;.
Taurage	The strategy should be oriented to development the productivity of production. The main principles: - The elimination of competitive weaknesses.	- The development of human resources and infrastructure of studies; - The improvement of competitiveness of firms and export markets; - The attraction of investments; - The development of infrastructure of ITT.

There are no common competitive strategies which could be applicable for all types of regions, thus each region should form the unique strategy for increasing its competitiveness. The analysis has indicated that in order to keep and increase the current level of competitiveness of Lithuanian regions, the sustainable development of all factors, which are excluded in the "Rindex" model is necessary. The region is not isolated, so the competitive strategies should be harmonized and not to come into conflict with the strategies of larger economic social spaces surrounding the region.

The results, which have been acquired during theoretical and empirical researches, proved the RCI to be a convenient tool of economic social analysis, strategic planning and information of a region. With the help of the RCI, the regional competitiveness can be measured, the competitive position with regard to other regions can be ascertained, the change of competitive position and the reasons of its change can be identified, a regional competitiveness according to definite factor can be evaluated, and the main strategic directions for increasing competitiveness can be identified. Also, by using RCI, the further solutions for the increase of competitiveness of regions can be justified.

Conclusions

1. Regional competitiveness cannot be completely defined by one or several economic social indicators, thus complex measurement of competitiveness is a must.

2. The researches proved, that the measurement by an index helps to solve the problem of a complex measurement of regional competitiveness. RCI is calculated via the following stages: the determination and grouping of the factors of regional competitiveness (the formation of "Regional Diamond" model), the identification of indicators, the identification and normalizing values of indicators, the weighting of factors, the formation of RCI function, the calculation of RCI and the analysis of its uncertainty and sensitivity.

3. The analysis of scientific literature showed, that the techniques of the selection and grouping of the factors of regional competitiveness into a general system of competitiveness allow to differentiate the main factors of competitiveness and group them according to their interrelationship. The "Regional Diamond" model, which excludes the main factors of regional competitiveness within the country, is appropriate only for the analysis of competitiveness at the regional level.

4. The measurement of competitiveness of Lithuanian regions proved, that RCI is appropriate means of economic social analysis, strategic planning, information and advertisement of a region.

5. The empirical application of RCI let identify the main advantages and disadvantages of new created index. The main advantages of using RCI are connected with:

- RCI let treat the competitiveness of a region in a complex way. The inclusion of multi-criteria aspects into the measurement process, prevent the domination of one aspect of the analyzed problem.

- RCI measures the competitiveness in one value. The analysis of competitiveness in one indicator is more convenient when searching for a tendency among a number of different indicators.

- RCI let analyze the competitiveness of a region according to total competitiveness, according to groups of competitive factors or definite factors. The analysis of regional competitiveness at different layers let specify the gained information, according to the purpose of the research, which make the analysis more simple and oriented to the target.

- RCI shows the change of regional competitiveness in a period of time and among other competitors. The comprehensive and timely information about the competitive position and other competitors is the main presumption of forming the effective strategy of improving the regional competitiveness.

The main disadvantages of using RCI are connected with the following aspects:

- RCI includes only the factors of competitiveness, which can be expressed in the quantitative indicators. The exclusion of particular aspects (which define the problem and which are difficult to measure by statistical data) from the calculation of RCI, the information about the regional competitiveness under consideration may be inappropriate.

- RCI is a static way of measurement of competitiveness. It does not let identify precisely the impact of the change of one or several factors to total competitiveness of the region. The unknown impacts of different factors of competitiveness to total regional competitiveness burden the formation of strategies of competitiveness improvement and forecast the competitive situation of the region with regard to other regions.

Although the RCI have advantages and disadvantages, the authors of the article give more advantages and forecast the increase of usage of indices in the measurement of multidimensional issues.

6. GDP per capita, which is most frequently identified with the indicator of competitiveness of geographic territory in scientific literature, should be defined as one of the indicators of factors of regional competitiveness. The comparison of competitiveness ranks, gained by RCI and GDP per capita, proved that the results of measurement of the medium competitive regions are more sensitive to the techniques of the selection of factors than the one of stronger or slighter competitive regions.

7. On the basis of the empirical research, in the period of 2001-2007, the most competitive regions were Vilnius (1st rank), Klaipeda (2nd rank) and Kaunas (3rd rank). Siauliai and Telsiai regions took the fourth and fifth rank respectively. Utena, Panevezys, Marijampole and Alytus regions shared the sixth - ninth ranks. The least competitive region of Lithuania is Taurage (10th rank).

8. The results of the expert evaluation and calculation of RCI according to the factors of Lithuanian regions largely coincide and specify each other. It is identified, that the structure of inhabitants' age and qualification, infrastructure of studies and science, ITT, the desire for knowledge of local consumers, the extent of export markets and prominence of region in international markets make the biggest influence on competitiveness of Lithuanian regions. The strengthening of competitive advantages of firms and maximum fulfillment of consumers' needs and opportunity adaptation to changeable conditions are the main factors of competitiveness of regional firms. GDP per capita and the number of economic entities in operation per 1000 population have the biggest influence on the results of measurement of factors increasing competitiveness of firms by RCI. Close cooperation of business, science and the authorities, infrastructure which is widely developed and adapted to the activity of a cluster are the main factors conditioning the development of regional clusters in Lithuania.

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Lietuvos regionų įvertinimas regionų konkurencingumo indeksu

Santrauka

Ūkio konkurencingumas tampa esmine priežastimi, lemiančia regiono ekonominio-socialinio plėtojimosi tempus ir rezultatus. Dėl šios priežasties daugelis regionų naujai vertina plėtros strategijas ir raidos scenarijus, ieško perspektyvių nišų, kuriose turėtų ar galėtų plėtoti savo konkurencinį pranašumą. Atsižvelgdami į gautus rezultatus, daugelis regionų taip pat atnaujina ar kuria savo konkuravimo strategijas.

Formuojant konkuravimo strategiją, pirmiausia reikėtų įvertinti esamą regiono konkurencingumą ir išskirti veiksnius, sukuriančius konkurencinį regiono pranašumą. Regiono konkurencinei pozicijai ir potencialui nustatyti tikslinga taikyti kompleksinį vertinimą, kadangi vienas ar keli ekonominiai socialiniai rodikliai nevisapusiškai atspindi esamą situaciją. Dėl šių priežasčių kompleksinis regionų konkurencingumo įvertinimas tampa vienu iš svarbiausiu strateginio planavimo etapu ir regionų konkurencingumo didinimo prielaida.

Nepaisant didėjančio susidomėjimo regionų konkurencingumo koncepcija pasaulio mokslinėje literatūroje (Lietuvoje ji mažai nagrinėta), regionų konkurencingumo vertinimo problematika nagrinėta nepakankamai. Pasigendama metodologiškai pagrįsto ir konkurencingumą kompleksiškai vertinančio metodo, kuris galėtų būti pritaikytas regioniniu lygmeniu. Nors mokslinėje literatūroje vertinimas indeksu pripažįstamas kaip vienas iš kompleksiškai problemą analizuojančių metodų, tačiau pasaulyje sukurti ir plačiai taikomi konkurencingumo indeksai daugiausia skirti šalių, o ne regionų konkurencingumui vertinti. Pasigendama metodologiškai pagrįsto regionų konkurencingumo indekso (RKI), leidžiančio pagal nustatytus konkurencingumo veiksnius įvertinti šalies regionų konkurencingumą. Kompleksinio regionų konkurencingumo vertinimo priemonės nebuvimas tampa viena iš kliūčių, trukdančių įvertinti šalies regionų konkurencinį potencialą ir formuoti efektyvias konkuravimo strategijas.

Mokslinio darbo tikslas – išanalizuoti šalies regionų konkurencingumo vertinimo regionų konkurencingumo indeksu (RKI) pranašumus ir trūkumus.

Tyrimo metodai: sisteminė, lyginamoji ir loginė mokslinėje literatūroje paskelbtų koncepcijų, metodologijų ir išvadų analizė; matematinio ir statistinio apdorojimo metodai, naudojant programinius paketus (SPSS, MS Excel).

Mokslinėje literatūroje regionas nagrinėtas įvairiais aspektais: geografiniu, kultūriniu, istoriniu, politiniu, ekonominiu-socialiniu aspektais. Siekiant sumažinti didelę regiono sampratos interpretacijų galimybę, kiekvienuose tyrimuose turėtų būti paaiškinta regiono samprata. Šiame straipsnyje regionas suprantamas kaip valstybės integrali dalis, mažesnė už pačią valstybę. Šalį sudaro tam tikras (n) regionų kiekis. Toks požiūris regioną leidžia traktuoti kaip į kompleksinę, atvirą ir gyvą socialinę ekonominę sistemą didesnėje erdvėje ir išsamiau nagrinėti konkurencingumo veiksnius regioniniu lygmeniu.

Mokslinėje literatūroje konkurencingumo koncepcija įvardyta kaip viena iš sudėtingiausių ir sunkiausiai apibendrinamų tyrimo sričių dėl pačios sampratos kompleksiškumo, konkurencingumo veiksnių gausos ir įvairovės, konkurencingumo proceso sudėtingumo. Siekiant sumažinti didelę konkurencingumo koncepcijos interpretacijų galimybę, kiekvienuose tyrimuose turėtų būti pateikta konkurencingumo samprata. Šiame straipsnyje regionų konkurencingumas apibrėžiamas kaip gebėjimas pasinaudoti konkurencingumo veiksniais konkurencinei

pozicijai kurti ir išlaikyti tarp kitų regionų. Šio apibrėžimo taikymas leidžia į konkurencingumą žiūrėti kaip į ciklinį procesą, kurio metu rezultatas virsta indėliu, vėliau lemiančiu rezultatą.

Mokslinėje literatūroje sutinkami įvairūs konkurencingumo vertinimo metodai: atsižvelgiant į vieną ar kelis konkurencingumo veiksnius, naudojant konkurencingumo modelius, kuriant konkurencingumo indeksus. Tyrimai parodė, kad regiono konkurencingumo negali pakankamai išsamiai apibūdinti vienas ar keli ekonominiai-socialiniai rodikliai, todėl būtinas kompleksinis konkurencingumo vertinimas. Atlikti tyrimai pagrindė, kad kompleksinio regionų konkurencingumo vertinimo problemą padeda išspręsti vertinimas indeksu. Indeksas apibrėžiamas kaip tam tikros srities kiekybinio ar kokybinio vertinimo dirbtinai sukurtas instrumentas, kurį sudaro subindikatoriai ir kuriuo remiantis nagrinėjami objektai gali būti ranguojami. Pabrėžiama, kad indeksu tikslingiausia vertinti daugiakriterijines koncepcijas, kurios negali būti įvertintos vienu rodikliu. Atsižvelgiant į regionų specifiką ir regionų konkurencingumo vertinimo ypatumus, sukurtas regionų konkurencingumo indeksas (RKI). RKI sudaromas „Rindekso“ modelyje išskirtais etapais: šalies regionų konkurencingumo veiksnių nustatymu ir grupavimu („Regioninio deimanto“ modelio sudarymu), veiksnių rodiklių identifikavimu, rodiklių reikšmių nustatymu ir normavimu, svorio koeficientų veiksniams suteikimu, RKI funkcijos sudarymu, RKI skaičiavimu ir jo tvirtumo bei jautrumo (patikimumo) analize.

Siekiant nustatyti pagrindinius šalies regionų konkurencingumą lemiančius veiksnius, sudarytas „Regioninio deimanto“ modelis, kuriame veiksniai sujungti į bendrą konkurencingumo sistemą ir sugrupuoti į keturias grupes: veiklos sąlygas šalies regione, šalies regiono konkurencingumą didinančias paklausos sąlygas, regiono įmonių konkurencingumą didinimo veiksnius, klasterių plėtrą regione lemiančius veiksnius. Atsižvelgiant į „Regioninio deimanto“ modelį, literatūroje dažniausiai naudojamus konkurencingumą apibūdinančius rodiklius, regioniniu lygiu informacijos gavimo sudėtingumą, o tarpregioniniu lygiu jos nebuvimą, išskirti 50 šalies regiono konkurencingumo veiksnius apibūdinantys rodikliai: veiklos sąlygas apibūdina 26 rodikliai, paklausos sąlygas – 15 rodiklių ir įmonių konkurencingumą didinančius veiksnius – 9 rodikliai. Visų šių rodiklių suma sudaro RKI funkciją. Tyrimams parodžius, kad klasterių veiklą lemiančių veiksnių analizei regioniniu lygmeniu labiau tinka kokybiniai metodai, leidžiantys tiksliau įvertinti situaciją regione nei kiekybiniai, į RKI skaičiavimą klasterių plėtrą lemiantys veiksniai neįtraukti.

Pabrėžtina konkurencingumo modelio formavimo ir indekso patikimumo analizės etapų svarba metodologiškai ir statistiškai RKI skaičiavimui pagrįsti.

RKI taikomumo tyrimas atliktas vertinant Lietuvos apskričių konkurencingumą ir jo kitimą 2001–2007 metais. Pagal Europos Sąjungos unifikuotą teritorijos skirstymo į regionus sistemą NUTS (Teritorinių statistinių vienetų nomenklatūra), Lietuvą sudaro 10 NUTS III lygmens regionų, kurie prilyginti Lietuvos apskritims: Alytaus, Kauno, Klaipėdos, Marijampolės, Panevėžio, Šiaulių, Tauragės, Telšių, Utenos ir Vilniaus. Lietuvos apskričių RKI skaičiavime taikytas atstumo nuo minimalios ir maksimalios reikšmės duomenų normavimo metodas ir visiems konkurencingumo veiksniams suteikiant vienodo dydžio svorio koeficientus. Remiantis atlikto tyrimo duomenimis, konkurencingiausios Lietuvos apskritys analizuotu laikotarpiu – Vilniaus apskritis (1 vieta pagal RKI rangą), Klaipėdos ir Kauno apskritys (2 ir 3 vieta pagal RKI rangą). Telšių ir Šiaulių apskritys užėmė atitinkamai 4 ir 5 vietas. Marijampolės, Alytaus, Panevėžio, Utenos apskritys dalijosi 6–9 vietas. Mažiausiai konkurencinga – Tauragės apskritis (10 vieta).

Siekiant patikrinti prielaidos pagrįstumą Lietuvos apskrityse, kad regiono konkurencingumo negali pakankamai išsamiai apibūdinti vienas ar keli ekonominiai socialiniai rodikliai ir būtinas kompleksinis jo vertinimas, atliktas Lietuvos apskričių konkurencingumo pagal RKI ir BVP/gyv. ranginio vertinimo palyginimas. BVP/gyv. pasirinkimą lėmė tai, kad mokslinėje literatūroje jį dažniausiai sutapatina su geografinės vietovės konkurencingumo rodikliu. Analizė parodė, kad regiono konkurencingumas negali būti vertinamas pagal BVP/gyv. Šis ekonominis socialinis rodiklis yra vienas iš konkurencingumo veiksnių rodiklių. Konkurencingumo ranginio vertinimo pagal RKI ir BVP/gyv. suderinamumo analizė pagrindė prielaidos, kad vidutiniškai konkurencingų regionų RKI labiau jautrus konkurencingumo veiksnių parinkimo metodikai nei stipriau ar silpniau konkurencingų, pagrįstumą Lietuvos apskrityse.

Atliktas tyrimas leido nustatyti, kad didžiausią įtaką Lietuvos apskričių konkurencingumo vertinimo RKI rezultatams daro regiono gyventojų amžiaus struktūra, kvalifikacija, studijų ir mokslo infrastruktūra, ITT infrastruktūra, vietinės rinkos vartotojų smalsumas, eksporto rinkų dydis ir regiono žinomumas tarptautinėse rinkose. Didžiausią įtaką įmonių konkurencingumui daro įmonių konkurencinių pranašumų stiprinimas, maksimalus vartotojų poreikių tenkinimas ir prisitaikymas prie kintančių sąlygų savo laiku. Regiono BVP, tenkančio vienam gyventojui, ir veikiančių ūkio subjektų skaičius 1000-iui gyventojų, turi didžiausią įtaką įmonių konkurencingumo veiksnių vertinimo RKI rezultatui. Svarbiausi klasterių plėtrą lemiantys veiksniai: glaudus verslo, mokslo ir valdžios bendradarbiavimas ir išplėtota bei klasterio veiklai pritaikyta infrastruktūra.

2001–2007 metų Lietuvos apskričių konkurencingumo įvertinimas patvirtino RKI kaip tinkamą ekonominės-socialinės analizės, strateginio planavimo, informavimo ir regiono reklamavimo priemonę.

Raktažodžiai: *šalies regionų konkurencingumo vertinimas, regionų konkurencingumo indeksas.*

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