INNOVATIVE ACTIVITY OPPORTUNITIES FOR THE DEVELOPMENT OF LITHUANIA'S REGIONS: METHODOLOGICAL APPROACH

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ABSTRACT

Innovations and innovative activities are becoming the most important feature of a country or region development. For this reason a great amount of literature highlights this topic. There are a lot of documents, strategies and programs signed which try to enhance business competitiveness and productivity. Formation of regional policy should make that this development will ensure a high quality of life throughout the country. Economic growth of countries in encouraging to look for more efficieny, which is directly related with innovative entities. The significance of innovations is the focus of EU regional policy. Although the innovation phenomenon is widely analyzed, consistent and specified concept is not formulated. Thus, this paper will primarily discuss the diversity of innovation concept and interface with the regional concept. Another part of the work aims to reveal the determinants of the regional development influencing innovation activities by different author's approaches. The final section of this paper is to present adopted methodological matrix for innovativeness evaluation for regions in Lithuania. In Lithuania innovativeness is counted just on a country's level, no territorial importance is emphasised. Even though innovations are closely related with regional policy. So the main purpose of this paper is to make methodological basis for more detailed (in a territorial contex) analysis of innovativeness in Lithuania's regions.
KEY WORDS: *innovation, region development, economical development, indicators, methodology.*

JEL CODES: O10, O31, O32, R11, R58.

Introduction

World we are living now is changing in a really high rates and those changes are seen as inevitable and necessary process in order to survive in this speed machine. To explain this process more clearly R. Strazdas, A. Jakubavičius and K. Gečas (Strazdas and etc., 2003) used Ch. Darwin statement (later paraphrased by L. C. Megginson) – survive not the strongest and not the smartest species, but those, which adapt to the changes best.

In a broad sense, renewal can be described as replacement of the old things to a new or newer – fostering innovative activities. However, innovations can be found everywhere, even households are innovative in order to be more efficient. Therefore, there is a need to define a more specific object of this research.

In this case, in order to assess the impact of innovation on regional development in the country, the more detailed analysis will be done of innovation activities in the business segment.

Innovative activity differences in Europe are rated by Innovation Union Scoreboard (European Commission, 2012) by innovative index. Importance of the regional policy and regional innovation research is emphasized by European Union. Lithuania by The Nomenclature of Territorial Units for Statistics is counted as second level territory (NUTS 2), so in Europe regional policy Lithuania is seen as one region.

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Regional Innovation Scoreboard (European Commission, 2012) emphasized that there are significant differences between regions in the country – innovations developed in various degrees, thus achieving sustainable development importance of regional policy. Although in Europe context we are considered as one region, however, even in Lithuania emerges uneven innovative activity traces. So it becomes more important to monitor Lithuania's innovative activities in EU context not just like one of Europe's region, but evaluate innovation activities in a lower regional level (NUTS 3) from local perspectives.

By innovation index Lithuania in Europe context is seen as a very modest innovator and remains among the last in the rank (European Commission, 2012). Although the economic revitalization, improving competitiveness, strengthening innovation culture is legimated in strategies and programs of national interests (Long Term Strategy of National Development [Government of (...), 2002]; National Lisbon Strategy Implementation Program for 2008–2010 [Government of (…), 2008]; Lithuanian Regional Policy Strategic Goals by the Year 2013 Program [Government of (...), 2005]; For Long-Term Research and Development Strategy and the Lithuanian Science and White Technology Book Implementation Program [Government of (...), 2003]; Business Innovation 2009–2013 Program [Government of (...), 2009]; Lithuanian Innovation 2010–2020 Strategy [Government of (...), 2010]; High Technology Development 2011–2013 Program [Government of (...), 2011]).

A solid legal framework raises the need to activate innovation policy in the context of regional policy, because the formation of an economically strong regions (concidering specific regional characteristics) forms stronger national positions. In this paper formed problem includes a methodological valuation of innovation activities in regions gap – reason why it is hard to evaluate innovativeness differences in territory of Lithuania.

The aim of this paper is to create a methodological matrix for measuring innovation performance opportunities in Lithuania's regions (NUTS 3 level). This would contribute to a more efficient regional policy and evaluation of innovation activities. It must be remembered that by Regional Innovation Scoreboard Lithuania is regarded as one region, so in order to evaluate innovativeness of Lithuania's regions it is not objective to rely on Regional Innovation Scoreboard or Innovation Union Scoreboard methodological data. The aim of this research is to create a methodological matrix for evaluation of regions innovativeness in Lithuania.

Tasks:
1. Present concept of innovation and region by the context of analyzed problem.
2. On the basis of analyzed literature indicate factors influencing the development of the regions.
3. Form methodological matrix for innovativeness evaluation of the regions.

Since this work is focused on a theoretical formation of methodology, there were used data analysis methods, the analytic – conceptual modeling. Quantitative data is not analyzed in this work.

1. Definitions of innovation and region and interaction between it

Despite the broad concept of innovation, there is a line seperating innovative activities from other activities. First of all, the difference between innovation and research, which are essentially related to the new knowledge creations process. Secondly, the difference between innovation and entrepreneurship, which is associated with the ability to identify and exploit market for actualize ideas. On the state level, the central axis of innovation policy is business and private enterprises, which present both – technological and non-technological innovations.

Oslo Manual (Organisation for (…), 2005) includes the following (most often seen and understood) concept of innovation – it is installation (or) development of a new technological products or processes to a business activities. So called innovation father (or originator) J. Schumpeter approached idea that to talk just about technological concept, it's not correct. According to him, innovations should be seen more as an economic rather than a technologic phenomenon – innovativeness of firms increasing efficiency, adds higher value to economics (Croitoru, 2012).

Christopher JS. Hodges combines these two different approaches and put innovation concept in a slighty different way. According to him, innovation is not just an economic mechanism or technical process, it is a social phenomenon in which individuals express their needs and creativity (Hodges, 2012). Also notes, that according to innovation ideological nature, it is a collective process and it requires continuous presence of partners.

Meanwhile, P. F. Drucker (Drucker, 1998) identifies innovations as an instrument, in order to help improve the current situation. The instrument used by innovative operators – companies. In the narrow sense, innovative companies can be seen as a companies forming and installing innovations into their activities.

At the same time, innovations can be seen as a process of transformation – during researches (investment) knowledge is received which later is transformed into innovations (profit) (Strazdas and etc., 2003) (figure 1).
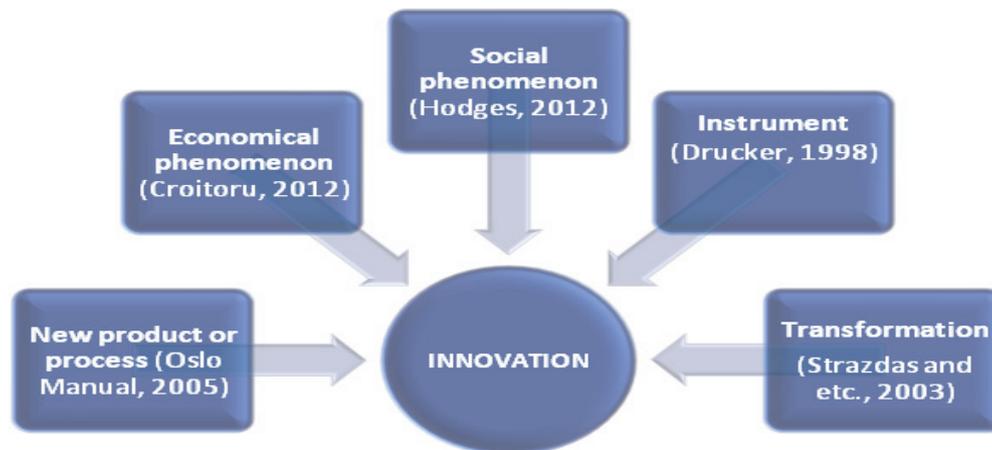

Figure 1. Diversity of innovation concept

Source: created by the author

Since the concept of innovation is characterized by complexity, it's definition should reflect that as well. Summarizing, innovation activities can be seen as a dynamic development of production technology, management and organization, investing in human resourses, improving the sale – oriented product or service. Innovations can be defined as a new way of thinking on how to do business.

Another aspect – innovation activities can not be separated from territory. Regions creates a special framework for research and innovation players associations, clusters, which are the main engines of regional development. Region as a geographical entity serves an essential point of reference for knowledge and innovation – based development (Dapkus, 2006).

Diversity of regional concept requires to summarize and apply one, which will be used in this paper. It is important, because regions can be seen in a variety of aspects – natural, economic, political, cultural, historical and other.

EU regional statistics uses a five-level classification system of territorial units – NUTS – The Nomenclature of Territorial Units for Statistics. In 2001 Lithuania legitimized regional classification by NUTS nomenclature principles. Therefore, the current implementation of national regional policy and regional planning of development is performed at the county level.

Lithuania by EU regional policy is described as NUTS 1 and NUTS 2 territory. By this EU policy whole territory of Lithuania is seen as one region. Lithuania's regions – counties – by EU point of view are not important. Empirical data collection and analysis is on countries determination. Just as the national implementation of regional policy due to equipoise regional differences of development – is Lithuania's domestic concern. Currently, elected regional statistics is not yet eligible for national regional policy to analize Lithuania's internal regional disparities.

Due to this paper's methodological aim, regional concept meets the administrative division basis, which in turn enables a more appropriate empirical data availability for further analizes.

2. Exclusion of the factors influencing innovative activity and regional development

Fagerberg, Mowery and Nelson (Fagerberg and etc., 2005) raised the idea that innovations explains the corporate, regional and country differences in economic results. And innovations can be seen as one of the main factors in increasing economic productivity (Jatulevičienė, Kučinskienė, 2010). By Regional Innovation Scoreboard (as and in general EU policy of innovation) (European Commission, 2012) innovations are also identified as a *key factor* to ensure productivity growth. In this case innovations becomes really important engine for economic growth.

By the logic synthesis then it can be said that in order to create an economically growing state economy, it is necessary to start from the lowest level – to invest in innovation activities in the main innovative operating segment – companies. Those companies will create innovative regions, as a result of that – will be formed innovative country. Therefore, in order effectively follow the spiral principle (from the smallest segment of the system to the biggest) it is important to identify factors that may have the greatest impact on regional development. Regional development can be seen mostly by the economical development, which is based on innovative revitalization.

M. Keršys notes that, empirical research authors underestimate complexity of innovations, concentrating only on certain aspects of it (Keršys, 2008). So in order to assess a complex variety of phenomena, it is necessary to evaluate all possible factors that influence regional development (as economical – innovational development). Different authors put priority importance to the different factors of development process.

Regional differences in the formation and evolution are determined by various internal and external factors. Regional development used to depend mainly on a natural causes –geographical location or natural resources. In today's world territory development depends not that much on the natural factors, it depend more on outside conditions. Regional development in general is understood as a social, economic, environmental, health, technology, culture and recreation aspects of the development of the region. Economic development is seen as an essential component of the development, because it is influenced by the economic resources of other development activities.

R. Bagdzevičienė, J. Rimas, A. Venckus (Bagdzevičienė and etc., 2002) distinguishes human resources as a basis for regional development (as the foundation of a house in construction). B. Melnikas (Melnikas, 2010) knowledge based society as well distinguishes as a driving force, which changes all the other spheres. According to him, it is possible to generate ideas and create new knowledge only if there is a critical mass. This process requires highly educated people with essential knowledge due to be able to think critically and strategically. Therefore, great attention should be paid to quality of human resources and knowledge customization, which later can be effectively included in the knowledge based economy and different markets.

Knowledge based society and knowledge based economic growth directly depends on investment in research and development (R&D) (Valentinavičius, 2005). Innovation and R&D impact on regional development is widely studied by A. Kleinknecht (Kleinknecht, 1996). Important is not only direct investment in R&D activities, but also important is direct foreign investment (FDI) in a regions according to G. Binkauskas (Binkauskas, 2009) and Valodkienė, Snieška, Gaidelis (Valodkienė and etc., 2011).

S. Pogosian and I. Dzemyda (Pogosian and etc., 2012) emphasizes a slightly different priority – according to the authors it is important to explore not only the latest innovations, but also the factors that most affect those innovation. First of all, emphasis should be put on technological factors, according to S. Pogosian and I. Dzemyda, the second stage – human resourses, third stage – a financial factor, which can be described as an economic effect. It can be said that the concept of innovations is preceived through the prism of technology because in this case technological factor is bringing as priority.

C. Freeman (Freeman, 1995) puts different country patterns of economic activity through the historical point of view and raises the presumption that there is no universal model of how to become economically the strongest ones. Each country is unique with existing factors influencing development and success. But even though, author emits that certain basic elements are predominant. As essential element for development

distinguishes regional networks with well-developed local infrastructure, local labor force and population capacity. Technological factor emphasis and S. Valentinavičius (Valentinavičius, 2006), which states that in the modern economy's competitiveness and attraction of investment is determined by such a factors as modern communication infrastructure, highly qualified and modern workforce, research institutes, researchers. According to R. Dapkus (Dapkus, 2006) innovation policy is treated as a region resources which stimulates corporate innovation. A very imporatnat factor is the technical infrastructure and technology parks in the region – a tool to facilitate innovation activities.

Regional innovation potencial covers a lot of area characteristics. One of those characteristics is isolated regional innovative subjects – innovative companies of the region. Important is not only the characteristics of the companies, but also the interaction between them (Sternberg, 2000). Therefore, many authors distinguishes small and medium-sized (SMEs) enterprises as very important factor for innovative activities. So according to that, country's economic engine should revolve around them and for that reasoning it is really important for those SMEs to be efficient and productive (Enterprise Europe Network, 2010). B. Melnikas, A. Jakubavičius and R. Strazdas (Melnikas and etc., 2000) also supports innovative policy to promote SMEs importance in regions development.

Greater attention should be given to SMEs due to the fact that they influence such important social issues, such as employment and income growth, economic growth (Štreimikienė, Dapkus, 2007). Regional competitiveness issue analyzed Ž. Simanavičienė and I. Šimberova, emphasizing that it is now easier to analize regional competitiveness of enterprises than of the regions, because regions are more difficult to define and measure (Simanavičienė, Šimberova, 2007). Therefore, evaluation of SMEs innovative activities in the region is seen as important issue.

G. Panne, C. Beers and A. Kleinknecht (Panne and etc., 2003), analyzing literature about performance of successful and unseccessful innovativeness identifies the next group of indicators – company culture, innovation strategy, experience level of R&D team, the organization, the expenditure of R&D, innovation managment, technology leadership, innovativeness. However, this approach is also a non-complex, low assesses the factors influencing companies. Just organizational factors can not be seen as the main factors.

Meanwhile, B. Melnikas (Melnikas, 2003) identifies the highest impact factors, focusing not just on the one priority, but on the factor groups. He points out the following actions, which can be taken for activating a business, increasing employment and competitiveness in local and international markets, increase the export potentialy of high-tech development. As well mentions the importance of a knowledge-based society and a knowledge-based economy, which can only be integrated to improve the social and economic environment, technological progress and environmental protection as well as more modern way of life, which enables the formation of a knowledge-based society (Melnikas, 2005; 2010).

Summarizing, regional environment is influencing business activities and development of the region itself. Economic success is increasingly dependent on how the region will be able to use technological innovation, entrepreneurship, education, expertise, organization, learning networks (Jucevičius and etc., 2007). Only all the factors and the system of it can accurately reveal the most objective diversity. However, most of the authors marks mainly following essential elements of the development of the region – information and knowledge and the effective use of these elements ensures a qualified workforce and SMEs.

3. Formation of adapted methodology for evaluating innovative activities

Recently, idea for optimal state of regions is growing rapidly, but there is no consensus on the variables. However, in order to assess the region's development process requires to follow a variety of scientific point of views (Dokumevič, Bagdzevičienė, 2002).

P. F. Drucker (one of the pioneers of innovative analysis of the phenomena) mentioned that companies and the counties have the biggest responsibility to find opportunities to become innovative and hence superior. At the same time author identified a number of opportunity fields where it might lie the key to success – the possibilities contained within the company and the opportunities that are beyond the company

boundaries (demographic changes, new knowledge and market changes and etc.). So according to this author, innovative activities begin from the suitable opportunity analysis (Drucker, 1998). Under this approach, the methodology and the formation of ideological axes – to review opportunities for innovative activities of Lithuania's regions (how much of itself has the potential to be innovative). Since all regions are distinguished by different strengths and weaknesses, and pursued innovative assessment at regional level in Lithuania – the results might be used for more effective regional policy.

In most cases as a primary tool for measuring innovativeness in the Europe context, in regional studies there are used the innovation index and the Regional Innovation Scoreboard data. However, in order to assess the Lithunian regional innovativeness, follow these indicators are not appropriate. The strongest argument for that is lack of the empirical data. As it was mentioned before, Lithuania is seen as one region, so a more detailed analysis of Lithuania regional innovation does not take place.
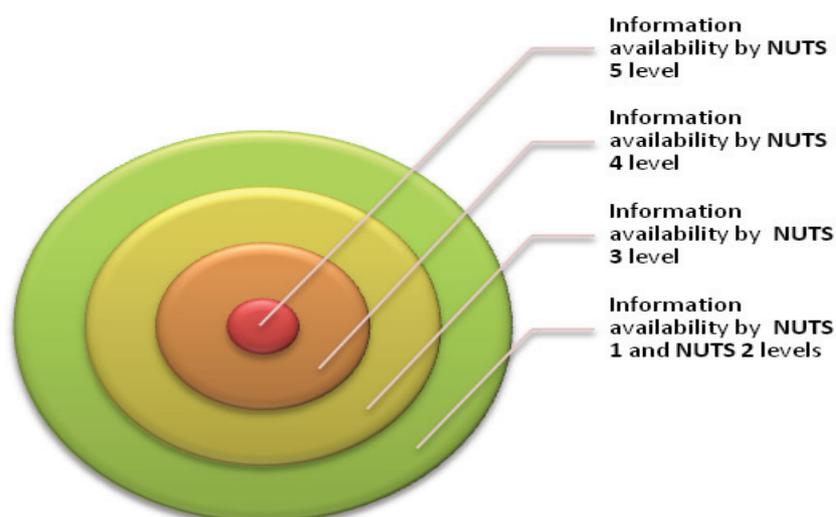

Figure 2. Empirical data availability for indicator of innovativeness by territorial units

Explanation: NUTS 1 and 2 – the whole country, NUTS 3 – counties, NUTS 4 – municipalities, NUTS 5 – elderships

Source: created by the author

Thus, the lack of statistics in shaping the assessment methodological matrix, has been one of the main reason why it has not been included a number of important indicators (figure 2). In general, statistical data on innovative activities in Lithuania is missing (because some aspect of the innovative activities are hard-measured or companies do not provide that kind of data). And if some of the data is available, the data, showing regional differences, mostly is missing. Therefore, it can be stated that in Lithuania innovative business concept and actuality by Europe context is limited by the point of view that Lithuania is just a one of the region of Europe, without any deeper analysis of regional itself needed.

For creating methodological matrix frame – innovative activities influencing factors, was mostly based by other author's approach. A. Jakubavičius, R. Jucevičius, G. Jucevičius, M. Kriaučionienė, M. Keršys (Jakubavičius and etc., 2008) as essential elements of innovation system distinguished innovative firms (I), education (II), vocational training system (III), workforce focused on innovative activities (IV), system favorable for business innovation, technology and transfer system (V).

Meanwhile, the First Action Plan (European Commission, 1996) identifies three factor groups – culture of innovation (education, researchers, business segment, management of business innovation in public and privat sectors) (I), innovation friendly environment (II) (improving the business environment, financial support, friendly tax system), those two-way integration (III) (forcing networking, SMEs innovation enhancement, increasing number of innovative companies).

Innovation Union Scoreboard uses innovation index, which is split into three groups of indicators – innovation ensure factors (enablers), business activity factors (result outputs). These groups are divided

into eight dimensions, covering 25 disaggregated indicators. Regional Innovation Scoreboard takes over the assessment methodology and applies it into a regional match. According to previous analysis of different author's approaches and availability of empirical data adapted methodological matrix was based on 5 dimensions (figure 3).
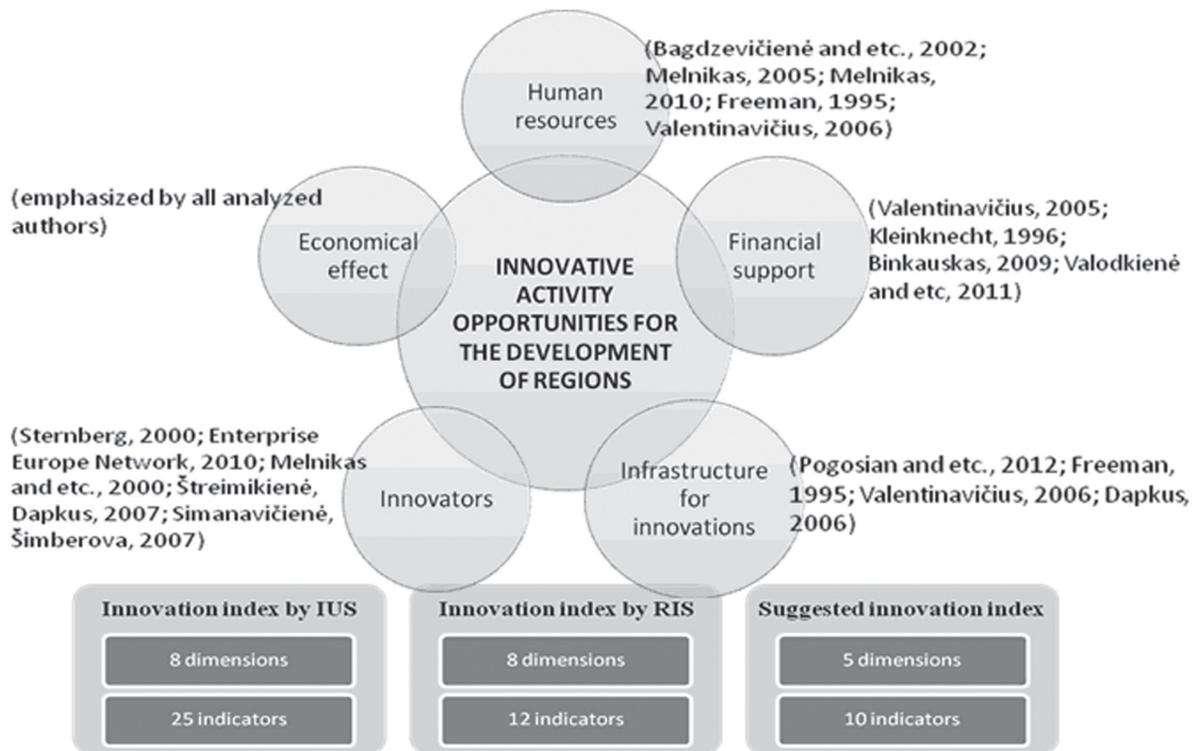

Figure 3. Basis of methodological matrix

Source: created by the author

Compared with a Innovation Union Scoreboard's and Regional Innovation Scoreboard's used methodology most of the distinguished indicators were not relevant for Lithuania's regions evaluation. However, a similar problem was encountered in the previous methodologies as well.

Table 1. Dimensions and Indicators of methodological matrix

Dimensions	Indicators
Human Resources	Part of of population with higher education (per 1000 inhabitants)
Financial Support	Govermental expeditures on R&D of GDP (%)
	Material investment in business entities (per 1 inhabitant)
	Foreign direct investment (per 1 inhabitant)
Innovators	Percentage of enterprises introducing innovations (%)
	Percentage of small and medium-sized business entities of all business entities (%)
Economical Effect	Employees engaged in the R&D activities of all employees (%)
	Share of high-tech product export (%)
Infrastructure for Innovations	Percentage of IT users (%)
	Part of entities for innovation startups* (units)

Explanation: entity for innovation startups* – universities, colleges, science and technology parks, business incubators, business support centers.

Source: created by the author

So in the mentioned methodologies were emphasised that because of the majority of the regions does not reflect the appropriate indicators (lack of empirical data) there is necessary to exclude from evaluation regions where most empirical data is missing or add missing empirical data to a logicaly close statistics (choose new indicators). The first way is unacceptable due to the fact that in Lithuania there are just 10 regions and removal part of them – methodological relevance would lose it's meaning. Therefore, in accordance with the second option, effort was made to reflect most of the authors distinguished factors affecting regional development (table 1).

Conclusions

Nowadays there are plenty of literature and information about innovations and innovative activities, which at the same time is really diverse. But it is natural that the concept has gained a wide range of meaning. In this paper innovations are seen as forms of business activities, which increase the competitiveness of enterprises, economic development and is directly related to the area where the company is formed. In turn, territory affects the innovative business activities so interaction between innovative bussines and regions is clearly seen. Due to the innovative activities of territorial assessment, the regions are considered in this paper by administrative divisions.

In Lithuania innovativeness is counted just on a country's level, no territorial importance is emphasised. Even though innovations are closely related with regional policy. Relevance of innovative activities and regional policy requires emphasize territorial importance in innovation policy in Lithuania. In a local level, Lithuania can not be seen as one homogenious territory.

Increasing competitiveness in economic terms is associated with innovations, countries and economic growth. Most authors sees innovation concept as one – sided option, focusing just on certain aspects, but to do so is not an option, because the process of innovative activities involves complexity of indicators, so in order to evaluate the real innovativeness (innovative environment) it is necessary to use many authors attempts to develop models that explains the basic aspects of innovation activities. So according to those distinguished factors there were formed complexity of the criteria and set of indicators (with available empirical data) for methodological matrix in order to evaluate regional innovativeness of Lithuania's regions.

In order effectively carry out innovation policy in Lithuania it is necessary to improve accounting system for important and required statistical basis for further analysis. In the absence of data it is not possible to assess the situation objectively. There are more issues of trying to assess regional innovativeness empirical data. Therefore, it is important to make suggestions to the innovative companies to include to their accountings results of their innovative activities. Importance of the topic and lack of empirical data raises need to form methodological matrix for evaluating innovative business opportunities in Lithuania's regions.

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LIETUVOS REGIONŲ INOVATYVIOS VEIKLOS GALIMYBIŲ VERTINIMAS: METODOLOGINĖ PRIEIGA

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Vilniaus universitetas (Lietuva)

Santrauka

Šiandieniniame pasaulyje vyksta dideli pokyčiai, kurie labiausiai pastebimi vertinant ekonominio išsivystymo lygį. Šalies ekonominis augimas yra pagrindinis variklis, galintis užtikrinti šalies gyventojų gerovę. Todėl nenuostabu, kad įvairių sričių specialistai domisi tokiomis temomis kaip tolygi teritorijų plėtra, ekonomikos augimas, bandydami surasti raktą į sėkmingą vystymąsi. Ypač svarbi yra inovacinė veikla. Jos pagrindiniai veikėjai (žvelgiant į šį procesą per ekonomikos prizmę) yra verslo įmonės, diegiančios naujoves. Dėl Europos Sąjungos vykdomos regioninės politikos labai svarbu užtikrinti tolygią teritorijos plėtrą. Todėl analizuojant inovacijų procesą negalima to atsieti nuo teritorijos – būtina įvertinti poveikį teritorijos plėtrai. Pastebimas glaudus regioninės politikos ir inovacinės plėtros politikos ryšys. Atsižvelgiant į temos aktualumą, svarbu įvertinti teritorijų inovatyvumo lygį: objektyvus vertinimas leidžia efektyviau vykdyti tolesnę plėtros politiką. Europos kontekste Lietuva traktuojama kaip vienas regionas, todėl visa inovacinės veiklos analizė sutelkta šalies lygiu. Tačiau net ir šalies teritorijoje pastebima teritorinių socialinių bei ekonominių netolygumų. Todėl aktualu pradėti vertinti inovatyvumo aplinką Lietuvos regionų mastu. Šiuo straipsniu siekta pristatyti svarbiausias inovacinės veiklos sampratas, remiantis skirtingų autorių pozicijomis, išskirti veiksnius, kurie daro įtaką regioninei plėtrai bei, atsižvelgiant į tinkamų rodiklių duomenų prieinamumą, suformuoti regionų inovacinės aplinkos vertinimo metodologinę matricą.

PAGRINDINIAI ŽODŽIAI: *inovacijos, regioninis vystymasis, ekonominė plėtra, rodikliai, metodologija.*

JEL KLASIFIKACIJA: O10, O31, O32, R11, R58.