

ROLE OF INNOVATIONS IN THE INCREASING OF REGIONAL COMPETITIVENESS IN LATVIA

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Abstract

The global economy becomes more dependent on knowledge, on growth of production effectiveness and on harmonized interaction of all components of innovation system. It is necessary to develop smart specialization strategies for regions to increase innovation potential of regions and the whole country. In the innovation sector Riga region is the most competitive region of Latvia. In Latvia only 20% of enterprises are involved into innovative activities. The financing from state budget for science and research is less than in developed EU countries. One of the essential problems in the development of innovations in Latvia is insufficient cooperation between entrepreneurs and scientists. To promote and develop innovations in Latvia and its regions, it is necessary to increase government and private investments in the research and development; to develop innovation incubators, centres of competences in the regions.

Key words: innovations, regional competitiveness, smart specialization, centres of competences.

JEL: R110; R500; O310; O380.

1. Introduction

For Latvia as an open economy, the growth of economy and increase of social welfare depends on ability to create and sell goods and services in the world market.

The goal of the research is to evaluate innovation potential of regions in Latvia.

The main tasks are to analyse and summarize different definitions of innovations; to calculate the Innovation sub index of Regional Competitiveness Index and to evaluate innovation potential of regions in Latvia.

The methods used are analysis, synthesis, statistical (quantitative and qualitative) analysis, mathematical methods - calculation of index, correlation.

The leading economists of the world have a view that nowadays there is going on transition from postindustrial (knowledge based) economy to creative economy [1]. The main motive force of knowledge based economy is innovative activity, which promotes the use of the newest science and technology achievements. The final results of innovation are competitive products in world market and services with high value added. It means important increase of gross domestic product, more work places for qualified specialists, increase of social welfare [2].

The global economy becomes more dependent on knowledge, on growth of production effectiveness and ability of new products to meet the market requirements, on harmonized interaction of all components of innovation system: education – science – production – legislation – financing, as well as on many other factors, that can increase competitiveness of regions and can help them to be ready to the challenges in future.

2. Concept of innovation

The academic literature contains a number of definitions of innovation, each revealing important aspects of it.

The term “innovation” first was mentioned by Joseph Shumpeter in his work *“Business cycles”*. Here innovation is explained as possibility to work differently in the kingdom of economy. J.Shumpeter also said, that innovation is ideas applied successfully in practice and he identified as areas where innovations can be applied the introduction of new goods, new methods of production, the opening of new markets, the conquest of new sources of supply and the carrying out of a new organization of any industry [3].

There are different approaches how to define innovations (Fig. 1.)

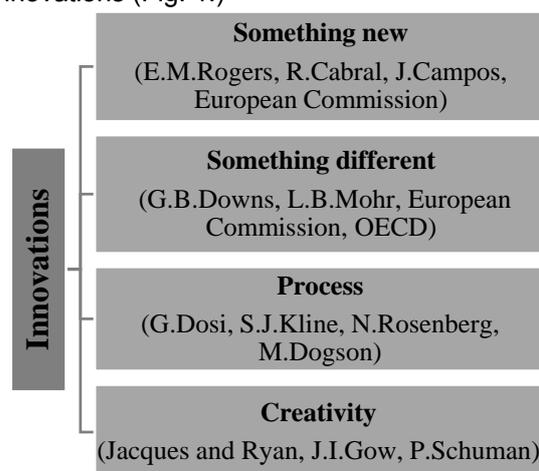


Fig. 1. Approaches to define innovations. Made by authors after [4 – 13]

Innovation does not relate just to a new product that would come into the marketplace. Innovation can occur also in processes [14].

OECD/Eurostat definition of innovation contains 4 types of innovation identified in the *Oslo Manual for measuring innovation*:

- product innovation involves a good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, incorporate software, user friendliness or other functional characteristics. In the education sector, a product innovation can be a new or significantly improved curriculum, a new educational software, etc.;
- process innovation involves a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software. In education, this can for example be a new or significantly improved pedagogy;
- marketing innovation involves a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing. In education, this can for example be a new way of pricing the education service or a new admission strategy;
- organizational innovation involves introducing a new organizational method in the firm's business practices, workplace organization or external relations. In education, this can for example be a new way organization of work between teachers, or organizational changes in the administrative area [15].

In every explanation or definition of innovation the word "innovation" is used to describe process or activity in the result of which society needs for new products or services are satisfied, and in which all intellectual potential of the country is involved, in such way providing continuous interaction during all the process: education – professional training – science – research – producing and its organization – market research and realization of the finished products.

There is difference between traditional and modern approach to innovation conception. The traditional idea is that innovation is based on research (theory of "speeding-up" technologies) and interaction between enterprises and other market participants. But nowadays there is the innovation theory of social cooperation net, where the main role is given to the knowledge and skills to put them into practice to promote innovation [12].

Innovation is not a word that characterizes some definite object, thing, activity or service, but it is a word, that characterizes conception. This conception includes all activities that must be done to create, produce and realize new product or service in the market. Innovation includes also all activities in the society starting with education, then comes scientific research, protection of intellectual property,

organization of production, market research and realization of production in the market. We must also put attention to the activities related with putting in order the business environment and creating of innovation promotion structures.

The term innovation has been defined in many different ways. However, these definitions can be broadly classified in two categories:

1) those that see innovation as the final event - the idea, practice, or material artifact that has been invented or that is regarded as novel independent of its adoption;

2) those who see innovation as a process which proceeds from the conceptualization of a new idea to a solution of the problem and then to the actual utilization of a new item of economic or social value [16].

Nowadays very important question is also about innovations and smart specialization of regions. Smart specialization is a new innovation policy concept designed to promote the efficient and effective use of public investment in research. Its goal is to boost regional innovation in order to achieve economic growth and prosperity, by enabling regions to focus on their strengths. A smart specialization strategy needs to be built on a sound analysis of regional assets and technology [17].

On December 17, 2013 the Cabinet of Ministers of Latvia adopted the informative report *On the development of smart specialization strategies*, which sets out directions, priorities and areas of specialization of the Latvia's economy transformation. Seven growth priorities are:

- production of products with higher value-added, including non-technological innovation, such as the creative industries;
- effective innovation system;
- improving of energy efficiency;
- development of ICT systems;
- improvement of the education system and skills, creativity in all levels of education;
- Knowledge Base (fundamental science and scientific infrastructure) and human capital development;
- identification of existing resources and specialization.

The strategy also puts forward five areas of smart specialization for Latvia – 1) knowledge intensive bio-economy; 2) biomedicine, medical technology and biotechnology, biopharmaceuticals; 3) smart materials, technology, and engineering; 4) smart energy; 5) ICT [18]. To reach the goals of *Smart Specialization Strategy* it is necessary to develop smart specialization strategies for each region.

3. Innovations in the regional competitiveness models

Innovation is a very important aspect of competitiveness. If the enterprise is innovative, it will be competitive. If it is competitive, it will produce more and it will be able to allocate more finances to develop new innovations [19].

There are many competitiveness models (B. Gardiner, M. Porter, M. Kitson, R. Martin, P. Tyler, F. Kronthaler, ECORYS, OESD), that include innovations as one of the factors on which regional competitiveness depends [20], [21], [22], [23], [24], [25]. On the basis of the research, which was done by the authors, the regional competitiveness model was worked out (Fig. 4.).

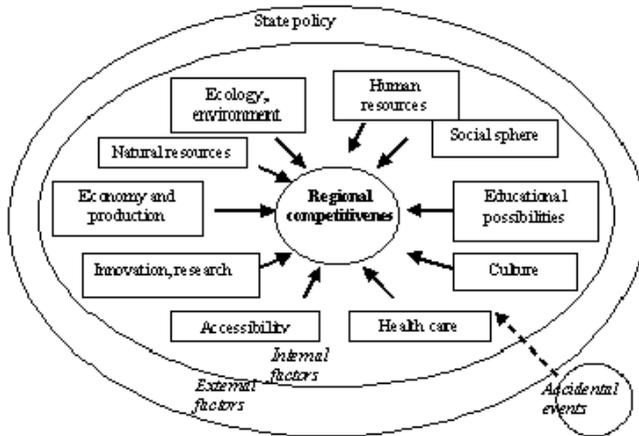


Fig. 4. Factors affecting the competitiveness of the region [26]

The regional competitiveness is mainly influenced by the quality of life, productivity and employ-

$$F_n = \frac{1}{N} \left(2 * \frac{f_1 - f_{\min_1}}{f_{\max_1} - f_{\min_1}} - 1 \right) + \left(2 * \frac{f_2 - f_{\min_2}}{f_{\max_2} - f_{\min_2}} - 1 \right) + \dots + \left(2 * \frac{f_n - f_{\min_n}}{f_{\max_n} - f_{\min_n}} - 1 \right) \quad (1)$$

where:

F_n – Innovation sub index

$f_1 \dots f_n$ – the real values of indicators

f_{\min}, f_{\max} v the minimum and maximum values of indicators

N – the number of indicators

The region's innovation capital analysis is important in the context of smart specialization. Therefore, the authors offer to apply the innovation model that includes 5 lines of analysis for economic and environmental assessment of the innovation potential [27]:

- 1) **Scientific research**
 - ESE – Share of employees in science and engineering (%)
- 2) **Productivity**
 - IAE – Share of innovative active enterprises (%)
- 3) **Technologies**
 - P – Patents (number per million population)
 - I – Internet access in households (%)
- 4) **Investment**
 - R&D – R&D expenditures (million EUR)
- 5) **Labour**
 - CC – Share of creative class (%)

ment rate in the region. While these factors are dependent on the regional competitiveness influencing internal factors, that is the interaction result of human resources, social sphere, culture, sport, infrastructure, research, innovation and production development. Likewise, the external factors, that are the state political stability, developed strategies, state's participation in different international organizations, state unions etc., have significant role in the evaluation of the regional competitiveness. The regional competitiveness can also be significantly influenced by accidental events – natural disasters (floods, storms, earthquakes) etc.

It is possible to conclude, that most of the regional competitiveness models include innovations as one of the boosting factors of competitiveness.

4. Calculation of Innovation sub index

The Regional Competitiveness Index was developed by I. Judrupa [26], but, to reach the goal of the next study, it is necessary to put main attention to one of sub-indexes – Innovation sub index F_n . It is calculated by taking into account the characterizing indicators of innovation performance of the region, applying min-max normalization [-1;1]. In order to maintain the value of the sub index in the interval from -1 to 1 the arithmetic average of certain factor group influencing indicators is calculated using Formula 1.

- PHE – Share of population with higher education (%)

The values of the selected indicators and Innovation sub index are shown in the Table 1.

Table 1. Values of indicators and Innovation sub index in the regions of Latvia

	Rīga	Pļerīga	Vidzeme	Kurzeme	Zemgale	Latgale
VALUES OF INDICATORS						
CC (2011)	37.9	35.4	27.2	26.7	27.3	25.5
PHE (2011)	31.4	24.2	16.1	16.6	17.1	16.9
ESE (2011)	5.9	5	3.3	4.7	3.9	3.6
R&D (2012)	113	13,8	1,4	3,3	10,9	2,9
IAE (2008-2010)	11.1	11.7	10.8	10.7	7.6	6.5
I (2013)	76	75	68	68	69	65
P (2006-2010)	83.5	20.9	0.47	1.4	4.18	2
INNOVATION SUB INDEX - INDICATORS						
CC (2011)	1.00	0.60	0.73	0.81	-0.71	1.00
PHE (2011)	1.00	0.06	1.00	0.93	-0.87	0.90

	Rīga	Pierīga	Vidzeme	Kurzeme	Zemgale	Latgale
VALUES OF INDICATORS						
ESE (2011)	1.00	0.31	-	0.08	-0.54	0.77
R&D (2012)	1.00	0.78	-	0.96	-0.83	0.97
IAE (2008-2010)	0.77	1.00	0.65	0.62	-0.58	1.00
I (2013)	1.00	0.82	0.45	0.45	-0.27	1.00
P (2006-2010)	1.00	0.51	1.00	0.98	-0.91	0.96

Made and calculated by authors after [28–30]

Using data from Table 1 (Innovation sub index – indicators) and Formula 1 the total Innovation sub index was calculated (Fig. 5).

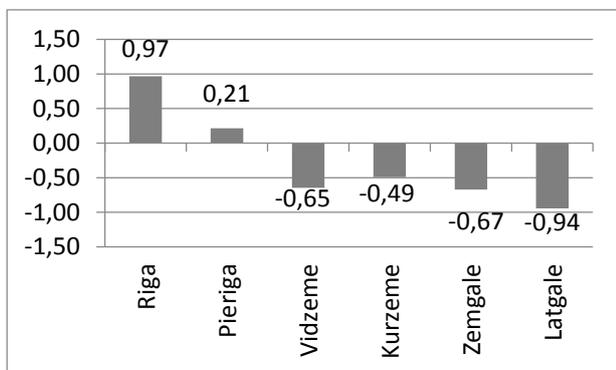


Fig. 5. Innovation sub index in regions of Latvia. Made and calculated by authors

From Table 1 and Figure 5 it is possible to see, that the most competitive region in innovations is Rīga region, it ranks the 1st place almost in all indicators, except share of innovative active enterprises. In this indicator Pierīga takes the 1st place. The less competitive is Latgale region, which takes the last place in 3 indicators, and other values are also relatively low.

5. Conclusions

In Latvia only 20 % of enterprises are involved into innovative activities. The financing from state budget for science and research is less than in developed EU countries. One of the essential problems in the development of innovations in Latvia is insufficient cooperation between entrepreneurs and scientists. The businessmen in Latvia have a lack of information about possible cooperation with scientists and introduction of innovative products. Most of scientists, in their turn, make fundamental researches, which promote their academic career, not promote development of innovative products. There have worked out various documents and action plans in Latvia, but the practical realization of them is weak and situation improves very slowly [31].

So the main problems in innovation sphere in Latvia and its regions are:

- lack of understanding the role of innovations in development of enterprises, increasing of national competitiveness and social welfare;
- low level of private investments in research and development;
- not sufficient development of dedicated innovation infrastructure (innovation incubators, centres of competences);
- not sufficient access to finance resources, especially, start and risk capital;
- not sufficient cooperation among education, research and industry sectors;
- low amount of patents;
- low amount of innovative enterprises;
- low developed cooperation between businessmen in local and international level [32].

To stimulate innovations in future it is necessary:

- to increase financing from state and private resources for innovations and research;
- to promote transfer of knowledge and technologies to production;
- to increase capacity of innovations, to develop legislative environment favorable for innovations;
- to promote cooperation between researchers and private sector;
- to support development of new products and technologies, taking into consideration understanding about intellectual property and its protection;
- to increase e-commerce and use of modern IT solutions.

References

1. Pink D.H. (2006). *A whole new mind: why right – brainers will rule the future*, USA, New York: Riverhead Books, 275 p.
2. *Latvian Innovation Portal*, <http://www.innovation.lv/ino2/eng/>.
3. И. Шумпетер. (2007). *Теория экономического развития. Капитализм, социализм и демократия*. Москва: Эксмо, 862 с.
4. Reavis D., *Innovation definition – four requirements for innovation*, <http://ezinearticles.com/?Innovation-Definition---The-Four-Requirements-For-Innovation&id=2687046>.
5. Rogers E. M. (2003). *Diffusion of innovations*, 5th edition. USA, New York: Free Press, 553 p.
6. Downs G.W. Jr, L. B.Moh. (1976). *Conceptual issues in the study of innovation*, Administrative Science Quarterly, Volume 21. USA: Sage Publications Inc. USA, pp. 700–714.
7. <http://www.jstor.org/discover/10.2307/2391725?sid=21105623002371&uid=3738496&uid=67&uid=3&uid=62&uid=2&uid=366934201&uid=366934051>.
8. Jacques J., Ryan E. J. (1978). *Does management by objectives stifle organizational innovation in the public sector?*, Canadian Public Administration, Institute of

- Public Administration of Canada, pp. 16–25. DOI: 10.1111/j.1754-7121.1978.tb01750.x.
9. Cabral R. (1998). *Refining the Cabral-Dahab Science Park Management Paradigm*, International Journal of Technology Management, Volume 16, Issue 8. UK: Inderscience Publishers, pp. 813–818.
 10. European Commission. (2004). *Innovation Management and the Knowledge Driven Economy*. Brussels, Luxembourg: Directorate – General for Enterprise, 164 p.
 11. National Audit Office. (2009). *Innovation across central government*, TSO (The Stationery Office), 47 p.
 12. European Commission. *Green Paper on Innovation*, December (2005). http://europa.eu/documents/comm/green_papers/pdf/com95_688_en.pdf.
 13. Derksen U. *Inovāciju veidi*, Inno Support, http://www.ltp.lv/cd/LV/lv/wso/index.cfm@fuseaction=learnl_id5307pl_id5304.htm.
 14. Gow J. I. (2014). *Public Sector Innovation Theory Revisited*, The Innovation Journal: The Public Sector Innovation Journal, volume 19 (2), article 1, 2014.
 15. *Innovation Zen*, <http://innovationzen.com/blog/2006/11/17/the-definition-of-innovation/>.
 16. OECD. *Innovation Strategy for Education and Training. Innovation: the OECD Definition*, http://www.oecd.org/document/10/0,3746,en_2649_35845581_40898954_1_1_1_1,00.html.
 17. Amidon D.M. *Sample Definitions of Innovation*, http://www.providersedge.com/docs/km_articles/sample_definitions_of_innovation.pdf.
 18. *Smart specialization*, European Commission, http://ec.europa.eu/research/regions/index_en.cfm?pg=smart_specialisation
 19. Informatīvais ziņojums, *Par Viedās specializācijas stratēģijas izstrādi*, 2013, <http://www.ris3.lv/>.
 20. Berzina I. (2011). *Inovāciju būtība un iespējas Latvijā*, Radošums, inovācijas: realitāte un iespējas Latvijā. 2011.gada 20. aprīļa Zinātniskā semināra materiāli, Rīga, RTU Izdevniecība, 5–7 pp.
 21. Gardiner B., Martin R., Tyler P. (2004). *Competitiveness, Productivity and Economic Growth across the European Regions*, Regional Studies, Volume 38, Issue 9. UK: Regional Studies Association, Routledge. Taylor and Francis Group, pp.1045–1067. DOI: 10.1080/0034340042000292638
 22. Porter M. (1990). *The Competitive advantage of nations*, New York: The Free Press. A Division of Macmillan, Inc., 855 p.
 23. Kitson M., Martin R., Tyler P. (2004). *Regional Competitiveness: An Elusive yet Key Concept*, Regional Studies, Volume 38, Issue 9. UK: Regional Studies Association, Routledge. Taylor and Francis Group, p. 991–999, DOI:10.1080/0034340042000320816
 24. Kronthaler F. *A Study of the Competitiveness of Regions based on a Cluster Analysis: The Example of East Germany*, <http://d-nb.info/1027402232/34>.
 25. *ECORYS Competitiveness Tree*.
 26. <http://english.ecorys.nl/images/dossierCompetitiveness/ecorys%20competitiveness%20tree.pdf>.
 27. *A strategic monitoring and evaluation framework for Latvia*, Second draft document for discussion. OECD, LEED programme, 2008, 72 p.
 28. Judrupa I. (2011). *Latvijas reģionu konkurētspējas novērtēšana*, Promocijas darbs, 172 p.
 29. *Vidzemes plānošanas reģiona viedās specializācijas iespējas*, Latvija: SIA “Safege Baltia”, 2014. http://issuu.com/vidzemesplanosanasreģions/docs/zinojums_vpr_260814.
 30. *Central Statistical Bureau*, www.csb.gov.lv.
 31. *Patent applications to the EPO by priority year by NUTS 3 regions*. Eurostat, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=pat_ep_rtot&lang=en
 32. *Informācijas un komunikācijas tehnoloģiju lietošana mājsaimniecībās 2013.gadā*, Latvijas Sentrālā Statistikas Pārvalde, 2013 http://www.csb.gov.lv/sites/default/files/publikacija/nr_36_informacija_un_komunikacija_tehnologiju_lietosana_majsaimniecibas_2013_13_00_lv.pdf.
 33. Derksen U. *Inovāciju veidi*, Inno Support. http://www.ltp.lv/cd/LV/lv/wso/index.cfm@fuseaction=learnl_id5307pl_id5304.htm.
 34. *Valsts atbalsts inovācijām*, LR Ministry of Economy. <http://www.em.gov.lv/em/2nd/?cat=30255>.