Routledge
Taylor & Francis Group

Economic Research-Ekonomska Istraživanja

ISSN: 1331-677X (Print) 1848-9664 (Online) Journal homepage: http://www.tandfonline.com/loi/rero20

Innovation policy measurement: analysis of Lithuania's case

Alvydas Baležentis & Kristina Balkienė

To cite this article: Alvydas Baležentis & Kristina Balkienė (2014) Innovation policy measurement: analysis of Lithuania's case, Economic Research-Ekonomska Istraživanja, 27:1, 1-14, DOI: 10.1080/1331677X.2014.947103

To link to this article: http://dx.doi.org/10.1080/1331677X.2014.947103

Published online: 01 Sep 2014.

Economic Research-Ekonomska Istraživanja, 2014
Vol. 27, No. 1, 1–14, http://dx.doi.org/10.1080/1331677X.2014.947103

Routledge
Taylor & Francis Group

Innovation policy measurement: analysis of Lithuania's case

Alvydas Baležentis* and Kristina Balkienė

Faculty of Politics and Management, Institute of Management, Mykolas Romeris University, Valakupiu 5, 10101 Vilnius, Lithuania

(*Received 26 September 2012; accepted 6 November 2012*)

The article seeks to justify a need and possibilities to form Lithuania's innovation performance measurement framework in terms of existing international practice. To do so different analytical tools, known worldwide in innovation fields, are discussed and the main categories of the assessment are summarised. Taking into account the various instances from the index practice, Lithuania's innovation performance results and their tendencies in comparison with other countries are analysed. To conclude, several suggestions are drawn for the measurement framework of the Lithuanian innovation policy.

Keywords: measurement; innovation performance; innovation policy; analytical tools

JEL classification: O31, O32

1. Introduction

An innovation policy able to respond in a timely manner to the existing socio-economic and industrial challenges creates a momentum to strong national competitiveness and persistent economic growth. In order to promote an innovation policy specifically with the aforementioned features, a comprehensive assessment of the initiatives implemented and results achieved is important. Accordingly, the innovation policies and processes are analysed at both micro (Yazdani-Chamzini et al., 2012; Ginevicius & Podviezko, 2013; Stankevice & Jucevicius, 2013) and macro (Brauers et al., 2012) levels.

Therefore, the European Commission and national governments put a lot of effort into creating and improving various systems of indicators aimed to better monitor and understand the progress resulting from innovation policy implementation. For instance, the following most commonly used tools in terms of innovation performance measurement at the European Union (EU) level can be enumerated: the Summary Innovation Index (European Commission, 2013), Global Innovation Index (GII) (INSEAD, WIPO, 2012), Global Competitiveness Index (GCI) (World Economic Forum, 2011), Innobarometer (European Commission, 2012a) among others.

The practice of such international comparisons, however, has certain benefits and drawbacks. On the one hand, international comparisons allow us to compare the innovation performance outcomes across different countries and thus help to identify the gaps where improvement is required. On the other hand, this practice does not necessarily match the national needs and targets. Therefore, innovation policy analyses should be

*Corresponding author. Email: a.balezentis@gmail.com

supplemented by sets of indicators representing the existing initiatives and targets declared at a national level.

Thus, the key scientific problem motivating this article is focused on the question of how to measure the implementation of Lithuanian innovation policy.

The growing scientific research in the field of innovation measurement gives support to the importance of this area and underlines the actions to be taken in order to achieve the results and effectiveness expected by innovation policy implementation. At the global context the innovation measurement was investigated and discussed by Rogers (1998), Edwards et al. (2007), Nauwelaers and Wintjes (2008), Milbergs and Vonortas (2006) and Schramm et al. (2011).

Lithuanian authors also analysed the innovation performance results alongside the implementation of priorities defined by innovation policy at the national and EU levels (Jakubavičius & Vilys, 2007; Dzemyda & Melnikas, 2009; Baležentis & Balkienė, 2011), explored the assessment of public innovation support (Vilys, 2011), described the methodological issues related to the innovations assessment (Dragan et al., 2011).

The purpose of this article is to establish a framework for the development of Lithuanian innovation performance measurement systems with respect to existing international practice.

Accordingly, the goals are defined as follows: (1) to analyse the existing European practice of innovation policy measurement; (2) to explore the Lithuanian innovation performance using different measurement tools; (3) to provide the guidelines for creation of Lithuanian innovation policy measurement framework.

The object of the research is the measurement of the innovation policy.

The used research methods are a systemic analysis and a comparative analysis of literature and statistical data.

2. Review of the innovation policy measurement practices

Due to the popularity of the innovation promotion area, there is an increasing amount of research in different innovation-related fields, including science, policy and business. However, a majority of this research is directed more to the analysis of separate facets of innovation phenomenon, rather than to the set of interrelated governmental actions influencing the innovation development in general and taking into account the broad innovation concept encompassing various fields. In this instance, the European Commission with various European institutions plays an important role in monitoring and assessing innovation performance in the EU including the global, national and region contexts.

In 1990, the European Commission initiated the European Innovation Monitoring System (EIMS) directed to providing the information, analysis and research on innovation at the enterprise level. Its activity was directed towards the following main fields: monitoring of innovation and diffusion; work on the conceptual framework of the innovation process; and innovation policy experience exchange (European Commission, 2002a).

In 1991, the European Commission, in cooperation with Eurostat, proposed the Community Innovation Survey under the aegis of EIMS. It was the instrument of collection for the information on innovation at the enterprise level across Europe and also contributed to high-quality empirical studies in the innovation field (European Commission, 2002b).

Another important tool which should be mentioned here is the European TrendChart on innovation policy, which was designed in 1999 to analyse and compare the trends of innovation policy as well as to provide thematic reports at national and European levels. It is the longest running policy benchmarking tool at European level. Moreover, in 2004 the ERAWATCH initiative closely related to the European TrendChart was developed. This is the European Commission's information platform on European, national and regional research systems and policies seeking to support policymaking in the research field in Europe and to contribute to the realisation of the European Research Area (European Commission, 2012b, 2012c).

Since 2007 a joint European Inventory of Research and Innovation Policy Measures has been launched by the European Commission with the aim of facilitating access to information on research and innovation policies within Europe and beyond, including the information collected by ERAWATCH and INNO-Policy TrendChart.

The next initiative is the Innobarometer launched in 2000 in order to provide the relevant innovation information obtained directly from the business sector or society and, at the same time, to complement the statistical data required for other innovation performance assessment tools such as the Innovation Union Scoreboard/European Innovation Scoreboard, etc. It covers the following topics: the factors encouraging companies to innovate (2001, 2002, 2003), public support measures/programmes to innovation from the business perspective (2004), innovation readiness (2005), clusters (2006), innovation transfer (2007), strategic trends in innovation field (2009), innovation in public administration (2010) (European Commission, 2012a).

Besides the instruments in the field of innovation analysis described here from different perspectives and in different contexts, the three most used tools for innovation performance measurement in the wide range of countries and comparison between them are now discussed.

One of the main assessment tools initiated by the European Commission in 2000 and still used today is the European Innovation Scoreboard (it was renamed to the Innovation Union Scoreboard in 2010), which provides a calculation of the Summary Innovation Index for each member state. Until 2010, this tool was used as a measure for coordinating the implementation of the Lisbon goals in the knowledge creation and innovation field. It was designed to capture the main drivers of a knowledge-based economy plus several measures of innovation outputs (Commission of the European Communities, 2000).

Today, the renewed Innovation Union Scoreboard helps to monitor the implementation of the Europe 2020 Innovation Union flagship by providing a comparative assessment of the innovation performance of the EU27 member states and the relative strengths and weaknesses of their research and innovation systems (European Commission, 2013). It facilitates analysis of the innovation data from 34 countries including the member states and also provides a comparison between EU27, the US, Japan and Brazil, Russia, India and China (BRIC countries).

This tool is being continually improved and currently comprises 25 indicators directed towards the measurement of changes in areas such as human resources, research systems, finance and support, firm investments, linkages and entrepreneurship, intellectual assets, innovators and economic effects.

At the same time, the tendencies of innovation promotion results at the global level are also measured by the GII launched in 2007 by Institut Européen d'Administration des Affaires (INSEAD) and knowledge partners. The latter methodology includes a number of complementary concepts aimed at providing a holistic framework for

measuring innovation (INSEAD, WIPO, 2012). In 2011, a framework of this tool consisted of seven main pillars with the variables divided by the two innovation sub-indexes of input and output and measured the innovation data of 125 countries.

Another instrument for innovation measurement is the GCI presented in 2005 together with the Global Competitiveness Report (GCR), oriented towards analysis of the key factors determining economic growth and competitiveness in 142 countries. The 12 pillars of competitiveness are defined, one of which is innovation (World Economic Forum, 2011). Moreover, the GCR assigns these pillars to the three stages of the economic development: the factor-driven economies, efficiency-driven economies and innovation-driven economies. This indicates innovation and business sophistication as key factors for innovation-driven economies.

One additional global measurement tool directed towards analysis of the innovation policies in 55 countries including the EU, Organisation for Economic Co-operation and Development (OECD), BRIC and other economies is the Global Innovation Policy Index (GIPI). It is calculated by the Information Technology and Innovation Foundation together with the Kauffman Foundation in the US (Kauffman Foundation and ITIF, 2012).

A more detailed description of the main innovation measurement tools oriented to the broader comparison among different countries is provided in Table 1.

Summarising a variety of the measurement tools mentioned above, Figure 1 provides the main categories necessary to be taken into account for the assessment of innovation performance. This figure reflects not only the existing basis for innovation policy measurement, but also gives a hint of the main factors to be considered and developed jointly in order to ensure effective innovation development.

On the one hand, all the international measurement tools discussed provide great opportunity to assess the national trends in terms of common goals and targets agreed at European level with the comparison between different countries. This often has an impact on formulating and improving of the strategic initiatives and actions at national level. On the other hand, there also remains a need to create and develop the national innovation policy monitoring system which seeks to observe and identify the current situation constantly, as well as enable us to react adequately to the constant economic, social or technological challenges.

3. Measurement of Lithuanian innovation policy: comparative analysis of the Baltic States

The indexing of countries on innovation parameters not only showcases the excellence of lead countries but also helps in finding the gaps for the laggards (INSEAD, WIPO, 2012). Therefore, this chapter discusses the ranking of Lithuania's innovation performance, comparing it with other countries by different kinds of indexing.

Considering the data provided below, Lithuania's position shows a need to strengthen its innovation capacities in order to ensure the state's competitiveness in the Baltic Sea Region. Estonia is a leader in this country group according to all the indexes provided. The innovation tendencies of Lithuania are lagging behind compared with Estonia, but are better than some of Latvia's [Summary Innovation Index (SII) and GCI Innovation pillar] and Poland's (GII and GCI Innovation pillar) data (Table 2 and Figure 2).

According to the innovation-related assessment provided by the GCR (Figure 3), Lithuania has better results than other Baltic countries in the field of collaboration

Table 1. The development of the innovation policy measurement tools.

Starting year	Source/author	Recent measurement basis
Summary Innovation Index (SII)		
2001	Innovation Union Scoreboard (IUS), European Commission (2013)	Ranges within 0 and 1 25 indicators Eight main categories: • Three Enablers: Human resources, Open, excellent and attractive research systems, Finance and support; • Three Firm activities: Firm investments, Linkages & entrepreneurship, Intellectual assets; • Two Outputs: Innovators, Economic effects.
Global Competitiveness Index (GCI)		
2005	The Global Competitiveness Report 2011–2012, World Economic Forum (2011)	Scores range from 1 to 7 111 variables 12 pillars, the one of which is the innovation consisted of such categories: Capacity for innovation; Quality of scientific research institutions; Company spending on R&D; University-industry collaboration in R&D; Government procurement of advanced technology products; Availability of scientists and engineers; Utility patents granted/million pop.
Global Innovation Index (GII)		
2007	IBSEAD, WIPO, 2012	Score range from 0 to 100 84 variables Seven pillars: • Five of Input Sub-Index: Institutions, Human capital and research, Infrastructure, Market sophistication, Business sophistication; • Two of Output Sub-Index: Knowledge and technology outputs, Creative outputs.
Global Innovation Policy Index (GIPI)		
2012	Kauffman Foundation, ITIF, 2012	84 indicators Seven main policy areas: Trade and foreign direct investment; Science and R&D; Domestic market competition; Intellectual property rights; Information and communications technology; Government procurement; High-skill immigration.

Source: Designed by authors.

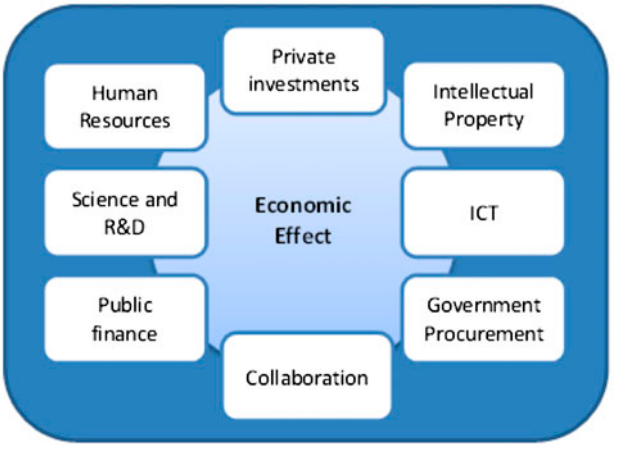

Figure 1. The main categories of innovation performance measurement.
Source: Designed by authors according to the data provided in Table 1.

Table 2. Ranking of the Baltic countries in terms of the innovation indexes.

	SII (2011)		GII (2011)		GCI (2011–12) Innovation pillar	
Index Country	Score (0–1)	Rank (27)	Score (0–100)	Rank (125)	Score (1–7)	Rank (142)
Estonia (EE)	0.496	14	49.18	23	3.81	30
Poland (PL)	0.296	23	38.02	43	3.23	58
Lithuania (LT)	0.255	25	38.49	40	3.43	48
Latvia (LV)	0.230	27	39.80	36	3.21	59

Source: Designed by authors

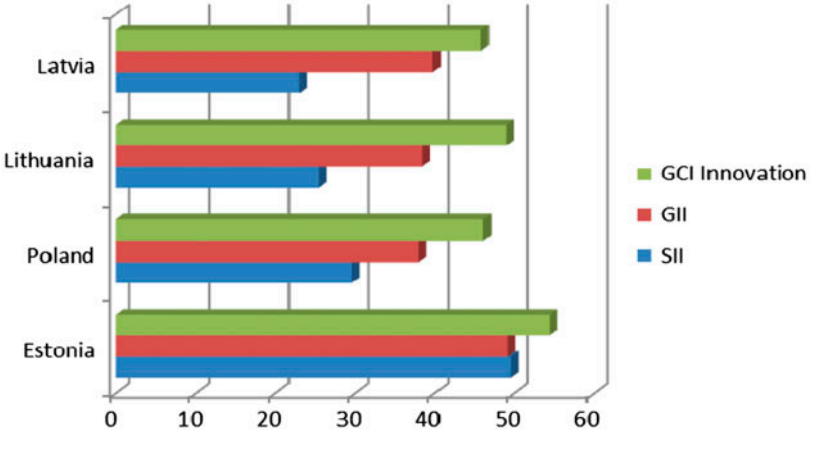

Figure 2. A comparison of Baltic countries by SII, GII, GCI.
Note: Data are provided as the maximum value of each index is equal to 100%.
Source: Designed by authors according to the data provided in Table 1.

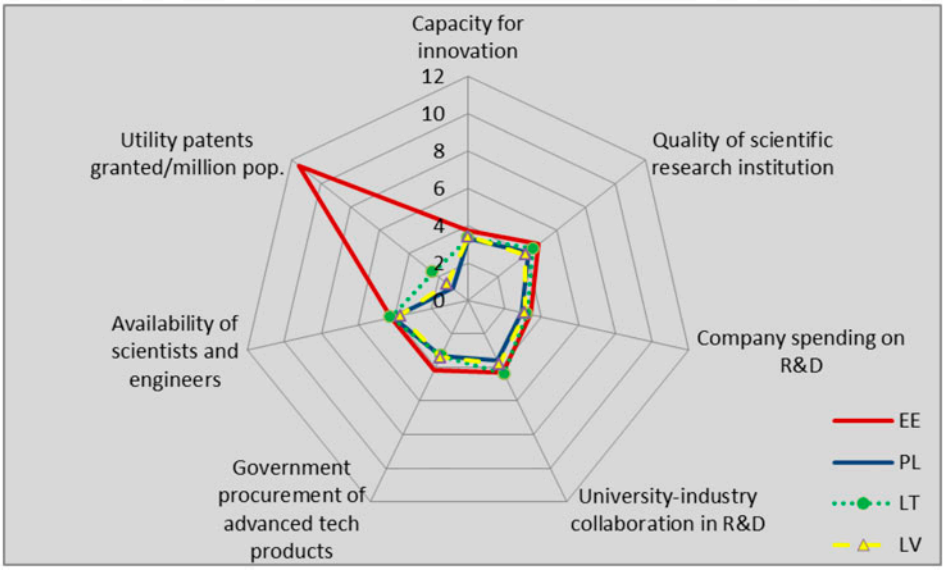

Figure 3. A comparison of Baltic countries by the indicators of GCI Innovation pillar 2011–2012.
Source: Designed by authors according to GCI 2011–2012.

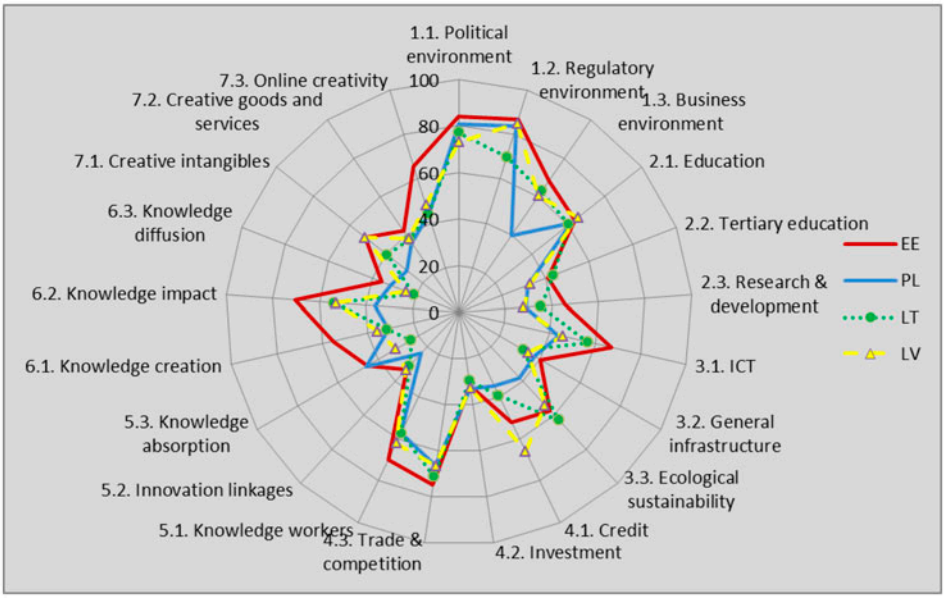

Figure 4. A comparison of Baltic countries by the categories of GII 2012.
Note: Main pillars of the GII framework: *Input sub- index*: 1 – Institutions; 2 – Human capital and research; 3 – Infrastructure; 4 – Market sophistication; 5 – Business sophistication; *Output sub- index*: 6 – Knowledge and technology outputs; 7 – Creative outputs.
Source: Designed by authors according to GII 2012.

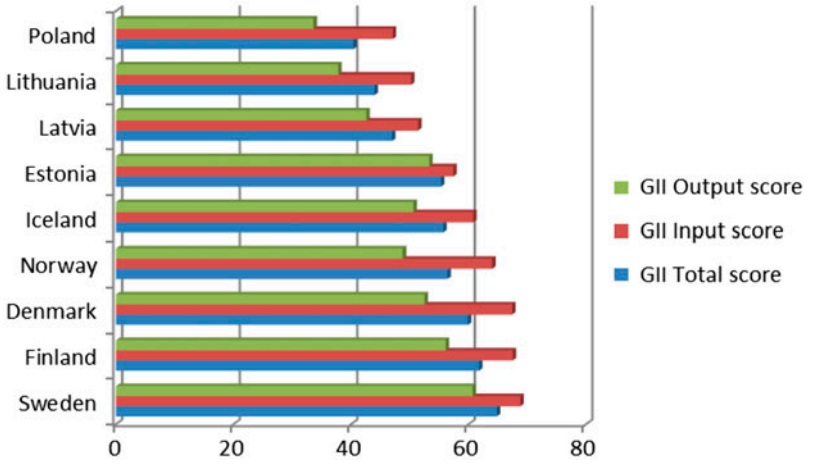

Figure 5. The Comparison of Baltic and Nordic countries by GII in 2012.
Source: Designed by authors according to GII 2012.

between the university and industry in research and development (R&D), while the indicators of capacity for innovation as well as public procurement have lower values in comparison with Estonia and Latvia.

Furthermore, Figure 4 provides the comparison of the Baltic countries by all the categories of the GII 2012 framework. In this country group, Lithuania holds the lead position by the assessment of ecological sustainability and, at the same time, lags behind its neighbours according to the results in the following fields: regulatory environment, general infrastructure, investment, knowledge absorption and knowledge diffusion.

Some of the national strategic documents (The Council for State Progress, 2011) highlight Lithuania's objective to become the innovation and high technology centre in the Nordic–Baltic region. According to the innovation performance results, this is a huge challenge for Lithuania. For example, Lithuania's assessment among Nordic countries in terms of the GII (Figure 5) shows a lack of national effort in both categories of ranking, including input and output sub-indexes.

Taking into account the ranking of Lithuania by the SII in analysing the country group, there is unquestionable requirement to strengthen the efforts in all fields of innovation performance. Lithuania is behind with its progress in the general EU27 ranking of the innovation activity and has the lowest SII (0.255) together with Latvia (0.230) and Bulgaria (0.239). Compared with other Baltic States, it is seen that Lithuania has a strong position only in the field of human resources, while the results from other categories of SII are well below the EU27 average (Figure 6).

4. Measurement of the Lithuanian innovation policy: strengths, weaknesses, and possibilities

Moreover, the measurement of Lithuanian innovation performance by the different indexes did not show the clear growing trends during recent years (Figure 7). Furthermore, the GII of Lithuania had a downward trend during the years 2009–2011.

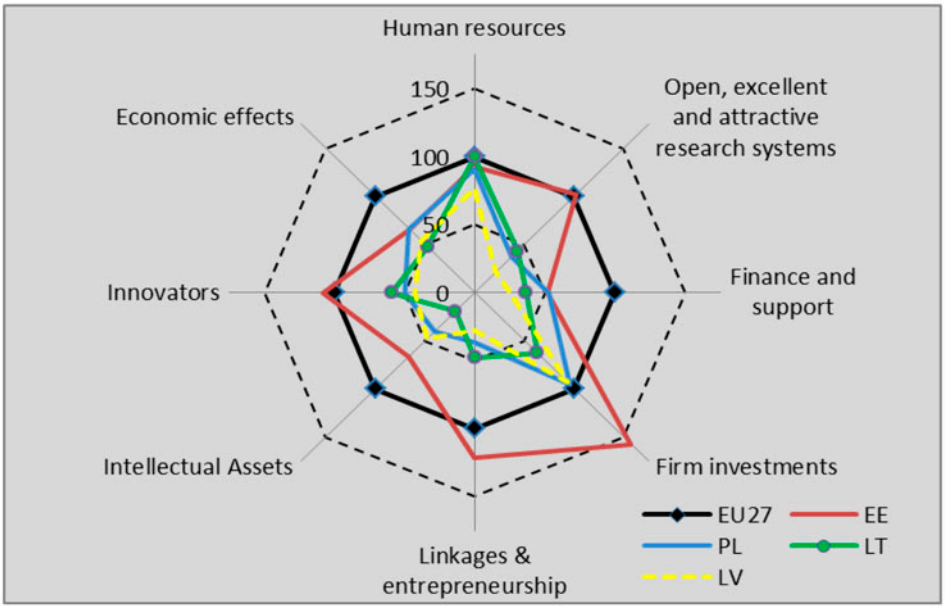

Figure 6. A comparison of Baltic countries by the categories of SII 2011.
Note: Data are provided as the EU27 average by each category is equal to 100%.
Source: Designed by authors according to data from Innovation Union Scoreboard 2011.

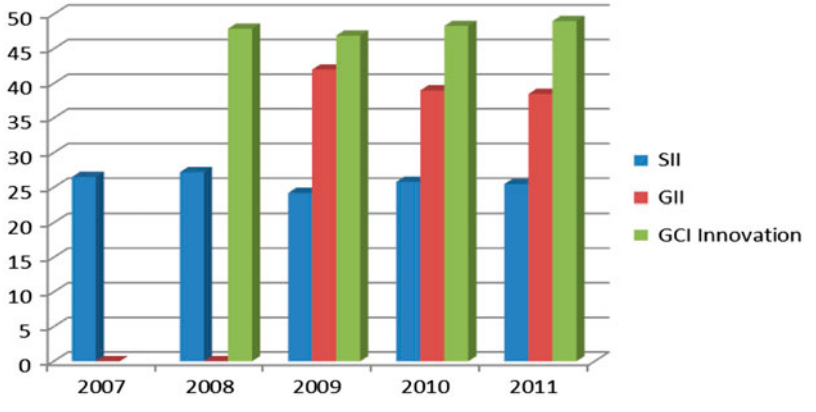

Figure 7. Lithuanian trends by SII (2007–2011), GII (2009–2011), GCI (2008–2011).
Note: Data are provided so that the maximum of each index equals 100%.
Source: Designed by authors according to data from SII, GII and GCI.

It is highlighted, that the Lithuanian economy's low level of innovation is a significant weakness. Especially the particularly low level of R&D spending and clearly underdeveloped demand-side measures for innovation. The European Commission distinctly indicates that this low R&D level is worrying because it has important repercussions on the wider economy, in which the scientific and technological performance and export structure are rather poor (European Commission, 2012d).

Table 3. Lithuania's strengths and weaknesses in field of innovation development.

	Strengths	Weaknesses
Human resources (education and skills)	GCI: • Secondary education enrollment; • Tertiary education enrollment; • Quality of math and science education	GCI: • Extent of staff training; • Quality of the educational system
	GII: • Tertiary enrolment; • Firms offering formal training	
	SII: • Completed tertiary education; • Upper secondary level education	SII: New doctorate graduates
Science and R&D	GCI: Quality of scientific research institutions GII: • Researchers headcount; • Quality research institutions	GCI: Availability of scientists and engineers GII: • R&D performed by business; • Scientific outputs in general
		SII: • Most cited scientific publications worldwide; • Non-EU doctorate students
Finance		GCI: • Affordability of financial services; • Ease of access to loans; • Venture capital availability
	GII: Gross expenditure on R&D; SII: R&D expenditure in the public sector	GII: Venture capital deals
Business investments		GCI: Company spending on R&D GII: R&D financed by business
	SII: Non-R&D innovation expenditures	SII: R&D expenditure in the business sector
Collaboration	GCI: University-industry collaboration in R&D GII: University/industry collaboration	GCI: State of cluster development GII: State of cluster development
		SII: • Innovative SMEs collaborating with others; • Public-private scientific co-publications

(*Continued*)

Table 3. (*Continued*).

	Strengths	Weaknesses
Intellectual property	GCI: Utility patents granted	GII: • Domestic resident patent; • PCT resident patent SII: • PCT patent applications; • Community trademarks; • Community designs
ICT	GCI: • Internet users; • Broadband Internet subscriptions; • Internet bandwidth; • Internet access in schools GII: • ICT access; • ICT use	
Government procurement for innovation		GCI: Government procurement of advanced tech products

Source: Designed by authors.

Agreeing with analysed indexes, Lithuania's major weaknesses remain in fields of intellectual property and business investments in innovation-related activities (Table 3). However, the efforts in other fields such as finance, science and R&D production, collaboration and government procurement for innovation should also be enhanced considerably.

Only the development of a highly educated society and information and communication technologies could be considered a real boost for innovation activity in Lithuania.

Additionally, the European Commission noted that the following actions should be taken into account when seeking to strengthen innovation development in Lithuania:

- to remove obstacles to, and support the growth of, innovative companies which would be beneficial to future economic growth as these companies can be a key engine of structural change;
- to develop a culture of entrepreneurship and innovation, skills in higher education and in the public research sector in order to improve the capacity of the country to exploit research results commercially as well as the right incentives and training for researchers in the public sector to engage in knowledge transfer and commercialisation activities. (European Commission, 2012d)

Summing up, the strong requirement to revise the existing national innovation policy initiatives or the way they are implemented should be acknowledged. The main

emphasis should be on the efficiency of implemented public policy measures, and the new initiatives to be introduced or accelerated in order to ensure faster economic growth, competitiveness and social prosperity.

According to Lithuanian Innovation Strategy for 2010–2020 (Government of the Republic of Lithuania, 2010), the national innovation development's results are currently assessed by the data from the European Innovation Scoreboard (since 2010 renewed and renamed the Innovation Union Scoreboard) and are annually announced by the European Commission. Lithuania seeks to reach the European average by SII in 2020. This seems a very ambitious goal in terms of current tendencies of Lithuanian statistical data.

However, it is very important not only to ensure an international comparability of results achieved, but to constantly monitor and assess the state of play of the national goals' implementation. Thus, the measurement of national innovation policy should be organised in a systemic way, covering the data from global, European and national sources. To do that, the following measurement structure could be proposed in order to have a comprehensive view on the effectiveness of national actions implemented in different fields of innovation development:

- Global level: to analyse the ranking and evaluation results provided in the different worldwide analytical studies and evaluation reports on issues concerned with Lithuania (e.g. produced by the OECD, World Economic Forum, World Bank, etc.). It is important to highlight the need for Lithuania to become a member of OECD in order to receive its high-value evaluation expertise.
- EU level: to collect all the innovation-related assessments' results from various analytical tools coordinated by the European Commission.
- National level: to improve and develop the national statistics with the aim of adequately reflecting the national priorities defined and actions implemented and at the same time, to ensure that each national priority would be linked to the factual quantitative indicator in order to ensure the persistent monitoring of its implementation's progress.

Furthermore, the impact's assessment of national innovation policy is necessary to measure when seeking to verify the effectiveness of various initiatives and actions undertaken, including the economic, business and society levels. For instance, an existing gap between the goals declared in the Lithuanian Innovation Strategy and their implementation results proven by different analytical tools discussed previously could be given as an argument to justify the need to estimate a link between the public efforts made (input) and the impact on the final results in the different fields achieved (output).

Additionally, the main categories of innovation performance assessment summarised in section 1 might serve as a foundation for the development of a national innovation policy monitoring framework.

In general, it is essential to form such a national innovation policy measurement framework, which would enable the policymakers to make the appropriate decisions in due time.

5. Conclusions

(1) Seeking to develop and effectively implement the national innovation policy, responding appropriately to the fast changing environment as well as to the economic, social, technological and other challenges, the persistent measurement of all the actions implemented and results achieved should be ensured.

(2) Considering a review of various international analytical tools in the innovation development field, the following main categories of analysis should be indicated: human resources (education and skills); science as well as R&D (systems and production); finance; business investments; collaboration activities; activities related to intellectual property rights; ICT (usage); government procurement for innovation. These categories could also serve as the foundation for the development of Lithuanian innovation policy measurement framework.

(3) The following tendencies of Lithuanian innovation development show a strong need to revise and strengthen the national efforts and their effectiveness in the innovation policy field:

- A national competitiveness in the Baltic Sea Region should be enhanced: Lithuania remains behind Estonia according to all the innovation-related indexes concerned with innovation performance rankings analysed in this article. Moreover, only a few of these rankings show the better Lithuanian innovation results compared with its neighbours Poland (GII and GCI Innovation pillar) and Latvia (SII and GCI Innovation pillar).
- In the last few years Lithuania has had one of the worst innovation performance results in common EU27 ranking: it has the lowest SII, together with Latvia and Bulgaria.
- Lithuania's objective to become the innovation and high technology centre in the Nordic–Baltic region is far from reality: Lithuania's ranking results by GII, including input and output sub-indexes, are considerably lower than the estimates of Finland, Sweden, Denmark, Norway and Iceland.
- Over recent years, Lithuania has not had the clear growing trends by the different indexes analysed in the field of innovation performance results.
- Major Lithuanian weaknesses remain in the fields of intellectual property and business investments in innovation-related activities, while results in other fields also should be strongly improved.

(4) In order to form a comprehensive Lithuanian innovation policy measurement framework, the following facets need to be considered: a systemic approach, covering the data from global, European and national sources; the factual quantitative indicators linked to respective national priorities; impact assessment of initiatives taken and actions implemented.

References

Baležentis, A., & Balkienė, K. (2011). Analysis of Lithuanian innovation policy priorities in the context of European Union initiatives. *Public Policy and Administration, 10*, 212–230.

Brauers, W. K. M., Baležentis, A., & Baležentis, T. (2012). Implementing the EU strategy in Baltic States: A multi-objective evaluation. *Actual Problems of Economics, 8*, 317–329.

Commission of the European Communities. (2000). *Innovation in a knowledge-driven economy.* COM(2000) 567 final. Retrieved from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2000:0567:FIN:EN:PDF

Dragan, N., Dzemyda, I., & Karčiauskas, A. (2011). An approach to evaluate influence of European Union innovation policy to increase the economic equality between member states. *Intellectual Economics, 1*, 22–36.

Dzemyda, I., & Melnikas, B. (2009). Innovations, research and development in European Union: Impact on regional economy. *Intellectual Economics 1,* 30–38.
Edwards, T., Delbridge, R., & Munday, M. (2007). A critical assessment of the evaluation of EU interventions for innovation in the SME sector in Wales. *Urban Studies, 44*, 2429–2448.
European Commission. (2002a). *The European innovation monitoring system*. Retrieved from http://cordis.europa.eu/eims/src/about.htm
European Commission. (2002b). *The beginning: The first community innovation survey*. Retrieved from http://cordis.europa.eu/eims/src/cis.htm
European Commission. (2012a). *Innobarometer*. Retrieved from http://ec.europa.eu/enterprise/policies/innovation/policy/innobarometer/index_en.htm
European Commission. (2012b). *European TrendChart*. Retrieved from http://www.proinno-europe.eu/inno-policy-trendchart/page/about
European Commission. (2012c). *Erawatch*. Retrieved from http://erawatch.jrc.ec.europa.eu/erawatch/opencms/about/
European Commission. (2012d). *Assessment of the 2012 national reform programme and convergence programme for Lithuania. Commission staff working document*. SWD(2012) 319 final. Retrieved from http://ec.europa.eu/europe2020/pdf/nd/swd2012_lithuania_en.pdf
European Commission. (2013). *The innovation union scoreboard 2013*. Retrieved from http://ec.europa.eu/enterprise/policies/innovation/facts-figures-analysis/innovation-scoreboard/index_en.htm
Ginevicius, R., & Podviezko, A. (2013). The evaluation of financial stability and soundness of Lithuanian banks. *Ekonomska Istrazivanja-Economic Research, 26*, 191–207.
Government of the Republic of Lithuania. (2010). *Lithuanian innovation strategy for 2010–2020*. Retrieved from http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=365849&p_query=&p_tr2=2
INSEAD, WIPO. (2012). *The global innovation index 2012: Stronger innovation linkages for Global growth*. Retrieved from http://www.globalinnovationindex.org/userfiles/file/GII-2012-Report.pdf
Jakubavičius, A., & Vilys, M. (2007). Innovation policy: Priorities of enterprises in the high-technology oriented sector. *Public Administration, 13*, 66–73.
Kauffman Foundation, ITIF. (2012). *The global innovation policy index*. Retrieved from http://www2.itif.org/2012-global-innovation-policy-index.pdf
Milbergs, E., & Vonortas, N. (2006). *Innovation metrics: Measurement to insight*. Retrieved from http://www.innovationtools.com/pdf/Innovation-Metrics-NII.pdf
Nauwelaers, C., & Wintjes, R. (2008). *Innovation policy in Europe: Measurement and strategy*. Cheltenham: Edward Elgar Publishing.
Rogers, M. (1998). *The definition and measurement of innovation*. Melbourne: The University of Melbourne.
Schramm, L. L., Nyirfa, W., Grismer, K., & Kramers, J. (2011). Research and development impact assessment for innovation-enabling organizations. *Canadian Public Administration, 54*, 567–581.
Stankevice, I., & Jucevicius, G. (2013). Institutional vs. sectoral dimension of innovation strategies of firms. *Technological and Economic Development of Economy, 19*, S360–S382.
The Council for State Progress. (2011). *Lithuania's progress strategy Lithuania 2030*. Retrieved from http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=412512&p_query=LIETUVOS%20PA%DEANGOS%20STRATEGIJA&p_tr2=2
Vilys, M. (2011). *Improvement of public innovation support effectiveness in European Union economic area* (Summary of doctoral dissertation). Retrieved from http://dspace.vgtu.lt/bitstream/1/904/1/1954_Vilys_Santrauka_WEB.pdf
World Economic Forum. (2011). *The Global competitiveness report 2011–2012*. Retrieved from http://www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf
Yazdani-Chamzini, A., Yakchali, S. H., & Zavadskas, E. K. (2012). Using a integrated MCDM model for mining method selection in presence of uncertainty. *Ekonomska Istrazivanja-Economic Research, 25*, 869–904.