Yearbook of the Institute of East-Central Europe
(Rocznik Instytutu Europy Środkowo-Wschodniej)

Publication details, including instructions for authors:
http://www.iesw.lublin.pl/rocznik/index.php

ISSN 1732-1395

Implementing Innovation in Poland with EU Funds: Progress or Hindrance

Agnieszka Kłos[a]

[a] Warsaw School of Economics

Published online: 4 Dec 2017

To cite this article: A. Kłos, 'Implementing Innovation in Poland with EU Funds: Progress or Hindrance', *Yearbook of the Institute of East-Central Europe*, Vol. 15, No. 4, 2017, pp. 141-160.

Yearbook of the Institute of East-Central Europe, 2017, Vol. 15, No. 4

Agnieszka Kłos

Implementing Innovation in Poland with EU Funds: Progress or Hindrance

Abstract: The paper discusses the actual development of innovation in Poland as financed by the European Union (EU) according to the targets of the Europe 2020 Strategy. It reviews the systemic model of introducing innovation in Poland, the complexity of defining innovation and evaluates Poland's innovation performance, in particular at the voivodeship level, compared to other member states.
Keywords: innovation, economic growth, innovation performance, innovation policy, structural funds

Introduction

EU member states are in the midst of implementing the Union's 10-year strategy for employment and economic growth, whose goals are to be accomplished by 2020. One of them is improvement of research and development (R&D) and promoting innovation. Each part of the strategy obligates the countries to develop certain reforms at the national level to enable the achievement of the goals as set out by the EU.

Innovation is an important aspect of every economy and is key to the development of businesses, the position of enterprises, and thus the image of a country, all of which contribute to sustaining an upward trajectory of economic growth, foreign investment, job creation and reducing unemployment. Poland, like any other member state, takes advantage of financial backing from EU structural funds.

The aim of this paper is to discuss the actual development of innovation in Poland as financed by the EU. It also notes the targets of the Europe 2020 Strategy and the systemic model of introducing innova-

tion in Poland, presents the complexity in defining innovation, and evaluates the country's innovation performance compared to other member states, in particular at the voivodeship level.

The research method consisted of alternately applied analysis and synthesis. The research was based on selected literature, reports and analyses by the European Commission, the Polish Agency for Enterprise Development, the Institute for Structural Research, reports commissioned by the Mazowieckie Voivodeship and other resources.

Due to the vastness and complexity of the issue, the research was not exhaustive. Rather, it emphasized the need for further research.

1. Europe 2020 Targets and Tools for Growth and Jobs

Europe 2020 is the EU's 10-year strategy for employment and economic growth. The agenda was initiated in 2010 to promote smart, sustainable and inclusive economic growth. It outlined five main initiatives for the EU to meet by 2020. These include employment, R&D, climate change and energy, education, and poverty and social exclusion. The progress in achieving the strategy targets is supported and monitored though a process known as the European Semester, used to coordinate economic governance. The EU is determined to emerge from the crisis and lay the foundation for a more competitive economy with higher employment. The crisis exposed fundamental problems and economic imbalances with which a lot of European countries struggle. It also revealed just how interdependent the economies of the member states are. It is the view that more coordinated economic policy for the whole EU will help address these issues and foster economic growth and employment.

Combating the crisis: The European Vision

The strategy focuses on five long-term targets in the areas of employment, innovation, education, climate change, and energy.[1]

Meeting the targets requires more effective deployment of EU measures and instruments, including cross-section ones, such as:

- the single market,

1 http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/index_pl.htm [2017-07-20].

- the EU budget (including regional social, cohesion and development funds),
- external policy instruments.

The starting point for economic growth and job creation are well functioning, well-connected competitive markets accessible to consumers that nurture entrepreneurship and innovation. However, to ensure that basis, the following obstacles need to be overcome first:

- bottlenecks in cross-border activity,
- insufficiently interconnected networks,
- uneven enforcement of single market rules,
- legal complications stemming from the coexistence of 27 different legal systems for some transactions.

Access to the single market must be improved for Small and Medium-Sized Enterprises (SMEs) and entrepreneurship should be encouraged through:

- simplification of corporate law (bankruptcy procedures, private company statutes, etc.,
- initiatives allowing entrepreneurs to restart after failed businesses.[2]

The financial crisis has had a major impact on the capacity of European businesses and governments to finance investment and innovation projects. To accomplish its objectives for Europe 2020, key changes need to be implemented in the following areas:

- a regulatory environment that renders financial markets effective and secure,
- innovative instruments to finance the needed investments, including public-private partnerships.

The Commission included these long-term development priorities in its review of the next EU multiannual financial framework (MAF 2014-2020). Currently, over a third of the EU budget is dedicated to the European Regional Development Fund, the European Social Fund and the Cohesion Fund. The funds target investment towards effi-

2 http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/eu-tools-for-growth-and-jobs/index_pl.htm [2017-07-20].

ciency gains and contribute to smart, sustainable and inclusive economic growth.[3]

The EU needs to deploy all external policy instruments of within the rules-based international framework to support trade in open and fair markets worldwide. The EU activities in this respect should concentrate on:

- external aspects of various internal policies (e.g., energy, transport, agriculture, R&D),
- trade and international macroeconomic policy coordination,
- firm and effective participation in international forums, such as the G20, and playing a leading role in shaping the future global economic order.

In November 2010, the Commission presented a new trade strategy, which means the EU is planning to build strategic relationships with countries boasting dynamic economies to support cooperation on regulations and in solving bilateral problems. The EU has managed to successfully build an actual partnership with developing countries, the premises of which entail fighting poverty, boosting economic growth and meeting the millennium development goals.[4]

2. Implementation of the Europe 2020 Strategy by Member States

The Europeanisation of Poland as a result of its membership in the EU, along with its own innovation, has been geared towards the Western European model, a result of similar models of division between the public and private spheres (the European model fits in between the social market model (e.g., Scandinavia) and the market-driven model (e.g., the US). What is more, innovation in Poland has been built from EU support through priorities proposed by the European Commission. Funds dedicated to the development of specific fields came along with the transfer of regulations and methods of management of the received funds.[5]

3 Ibid.
4 Ibid.
5 M. Bukowski, A. Szpor, A. Śniegocki (eds), *Potencjał i bariery polskiej innowacyjności* [Potential and Barriers to Polish Innovation], Warszawa: Instytut Badań Strukturalnych, 2012, pp. 19-20.

The success of the Europe 2020 Strategy depends to a large extent on the ability of member states to meet the scheduled targets with regards to the implementation of necessary reforms at the national level to stimulate economic growth, e.g., increasing investment in research and ensuring a high level of employment. Each year in April, the governments of the member states are obligated to present two reports setting out what measures have been taken to achieve the national targets of Europe 2020. Stability and convergence programs are presented before the governments accept the draft budget for the upcoming year and should constitute the basis for a substantial discussion on public finances and budgetary policy.[6]

National reform programs, presented together with stability/convergence programs, include elements necessary to monitor the progress of individual countries in achieving the Europe 2020 strategic goals with regard to smart, sustainable and inclusive growth. Despite significant budgetary constraints, the governments are obligated to ensure continuity of the investment in economic growth, *inter alia* through education, research and innovation or energy efficiency. Thanks to establishing a dialogue between national – regional and local – authorities, the EU priorities have become more relatable to citizens, which translates into greater involvement, necessary for the successful implementation of Europe 2020. The target to increase investment in R&D is adapted to the capabilities of individual member states. The target for Poland is to allocate 1.7% of its GDP to R&D by 2020.

Poland's challenges and development objectives, including those in the scope of increasing competitiveness and innovation in the economy, were defined in national strategic documents and implementation programs. The National Development Strategy 2020 (NDS), indicates the need to support innovative enterprises, finance scientific R&D, as well as develop business environment institutions through the implementation of the following strategy-specific objectives:

- II.2 Growth of the efficiency of the economy,
- II.3 Increasing the innovativeness of the economy.

6 http://ec.europa.eu/europe2020/who-does-what/member-states/index_pl.htm [2017-07-20]; http://ec.europa.eu/europe2020/making-it-happen/index_pl.htm [2017-07-20].

Intervention provided for under Operational Program Smart Growth (OP SG) will consider the territorial conditions presented in detail in the National Strategy of Regional Development 2010-2020: Regions, Cities, Rural Areas (NSRD). It is a comprehensive medium-term strategic document concerning the socio-economic development policy of the country from the territorial perspective. One of nine integrated sectoral strategies intended to ensure the objectives defined in the NDS are met at the national level is the Strategy for Innovation and Efficiency of the Economy "Dynamic Poland 2020" (SIEG).

The Council recommendation on the National Reform Program of Poland of 2013 noted that the innovation of Polish enterprises is highly imitative and based on the absorption of technology through investment in fixed assets that apply existing technologies.[7]

3. Definitions of "Innovation"

The objective of OP SG is to support the whole innovation process, from idea, through R&D, including prototype development, to commercialization. When considering the diverse level of project implementation risk at each of the above-mentioned stages, subsidies and financial instruments are provided:

> "The support involves product and process innovations, as well as innovations of an organizational or marketing nature. This means that apart from technological innovations, financing will be granted to non-technological innovations, allowing the increase of effectiveness of organizational or management activities in enterprises."[8]

Innovation, simply speaking, is any change that brings about an improvement, a new quality or enables the development of a new product or service.

Joseph A. Schumpeter, in his definition of "innovation", focuses on new combinations of production factors. According to him, "inno-

7 Smart Growth Operational Programme 2014-2020, Ministry of Economic Development, Warsaw, 23 February 2015, pp. 18-19.

8 Ibid., p. 21.

vation" is the launch of new goods and new methods of production, opening a new market, acquiring a new source of raw materials, or reorganizing an economic process.

Peter F. Drucker[9], on the other hand, argues that "innovation is a specific tool of entrepreneurship, the means by which they exploit change as an opportunity for a different business or a different service." He further contends that "innovation [...] does not have to be technical, does not indeed have to be a 'thing' altogether."[10]

Yet another definition of "innovation" is found in Operational Program Innovative Economy, in which "innovation" is understood to be the implementation of a new or significantly improved product (good or service), a process, a new marketing method or a new organizational method in a workplace.

"Innovation" is a buzzword. For instance, it could be defined as part of the knowledge-based economy or information society. The common definition implies that it might well be any change in an enterprise implemented to produce a new product, service or quality. It could be a radical change that results in a brand-new product, or a partial change leading to an improvement of an existing product. Innovation can be analyzed at the enterprise, national or global levels. Following from this, the expectations for how innovative a given change is are increasingly higher. The definition of the word is clearly very broad. These days, innovative processes happen dynamically. The changes began with innovation in products and processes but have extended to organizational innovation. Attempts at labelling some technologies as innovative or not in fact contradict the very idea of innovation. The concept of innovation itself should be perceived as a change.[11]

The definition by the Organization for Economic Cooperation and Development (OECD) accounts for a number of key features of innovation. According to this definition, first, it cannot be assumed that any new solution constitutes an innovation since it needs to have a practical

9 P. Drucker, *Innowacja i przedsiebiorczość. Praktyka i zasady* [Innovation and Entrepreneurship: Practice and Principles], Warszawa: Państwowe Wydawnictwo Ekonomiczne, 1992.

10 http://www.pi.gov.pl/Firma/chapter_95851.asp [2017-07-20]. See also K. Śledzik, *Teoria innowacyjności Josepha A. Schumpetera a trolle patentowe* [Joseph A. Schumpeter's Innovation Theory Versus Patent Trolls], Faculty of Management, University of Gdańsk, pp. 303-310, http://jmf.wzr.pl/pim/2013_4_4_21.pdf [2017-07-20].

11 http://www.pi.gov.pl/Firma/chapter_95851.asp [2017-07-20].

application as well. Second, not every innovation has to be a novelty *per se*. The OECD does not specify whether the solutions must be new to the world, a market or a given company. It must be remembered that the impact of innovation on the economy as a whole or on its flexibility and competitiveness does not depend only on their novelty but also on the level and speed of diffusion, i.e., how innovations spread through individual companies or economic entities. Third, not every innovation is technical, which means that any process, marketing or organizational change constitutes innovation as long as it redefines the methods of work or the company's relationship with its environment. The literature on the subject outlines two approaches to describing the process of innovation. The first approach adopts a linear perspective, whereby entities invest in the consecutive stages of research, development and implementation of new innovations. This perspective is linked to classical economics in which investment in innovation is synonymous with investment in improving the productivity of enterprises, which is especially useful in analyzing barriers to financing respective stages of development and diffusion.[12] The second approach to describing the process of innovation emphasizes both its systemic as well as institutional and regulatory aspects. This approach is represented mainly by the concept of the National Innovation System, which is particularly useful when analyzing barriers to the development, distribution and diffusion of innovation within companies and economies. We used this system to analyze the Polish model.

Precise classification of an innovation is not an easy or clear-cut process. When implementing financial projects with the help of EU funds at both the national and regional levels, project initiators are expected to specify the level, lifespan and diffusion rate of the innovation. Often, experts have to be engaged to help evaluate and categorize the planned implementation of an innovation to the best of their knowledge and based on available publications. The common

12 OECD, Oslo Manual. Guidelines for Collecting and Interpreting Technological Innovation Data, 3rd Edition, OECD/Eurostat, Paris 2005. See also M.E. Porter, *The Competitive Advantage of Nations*, London: The Macmillan Press Ltd, 1990; J.A. Schumpeter, *Teoria rozwoju gospodarczego* [The Theory of Economic Development], Warszawa: PWN, 1960; E. Stawasz, *Innowacje a mała firma* [Innovation Versus Small Enterprise], Łódź: Wyd. Uniwersytetu Łódzkiego, 1999, http://www.pi.gov.pl/parp/chapter_96055.asp?soid=677964766D394262AB915FB61187C008 [2017-07-20].

denominator of all the definitions of "innovation" describes it as an activity of companies for implementing novel solutions in various fields of operation.[13]

The above overview of the definitions raises a question about how innovation is perceived and understood by entrepreneurs from the SME sector. Research conducted by the Polish Agency for Enterprise Development indicates that among SMEs, 60% reported involvement in innovative activity in the last three years. These entrepreneurs identified the expression "innovative company" with modernity, the future and being up to date (23%), while other respondents (22.5%) pointed to the use of new technologies, and still others (17%) described it as the development and improvement of an enterprise. Fewer than 10% named new products, services and solutions as indicators of innovation. Thus, an entrepreneur might be convinced that their business is innovative while the external perception or the actual activity of the enterprise and its results are otherwise.[14]

3. Poland's Innovation Performance

The Regional Innovation Scoreboard (RIS) is prepared by the European Commission and provides an analysis of the innovation performance of EU member states.

Since regions are important engines of economic development, innovation performance deserves particular attention at that level. Regional Innovation Systems have therefore become the focus of many academic studies and policy reports. Economics literature has identified three general facts:

- innovation is not evenly distributed across the regions,
- innovation tends to be spatially concentrated over time,
- even regions with similar innovation capacity have different economic growth patterns.

13 Ibid.

14 P. Zadura-Lichota (ed.), *Innowacyjna przedsiębiorczość w Polsce. Odkryty i ukryty potencjał polskiej innowacyjności* [Innovative Entrepreneurship in Poland. Overt and Covert Potential of Polish Innovativeness], Warszawa: Wydawnictwo Naukowe Instytutu Technologii Eksploatacji, 2015, pp. 6-7.

The RIS covers 220 regions across 22 EU countries, Norway, Serbia and Switzerland at various levels of NUTS (Nomenclature of Territorial Units for Statistics). Unfortunately, attempts to monitor Regional Innovation Systems and region innovation performance are severely hindered by the lack of regional innovation data. The RIS addresses this gap and provides statistical facts on a region's innovation performance. Regional innovation performance is measured using a composite indicator – the Regional Innovation Index (RII).[15]

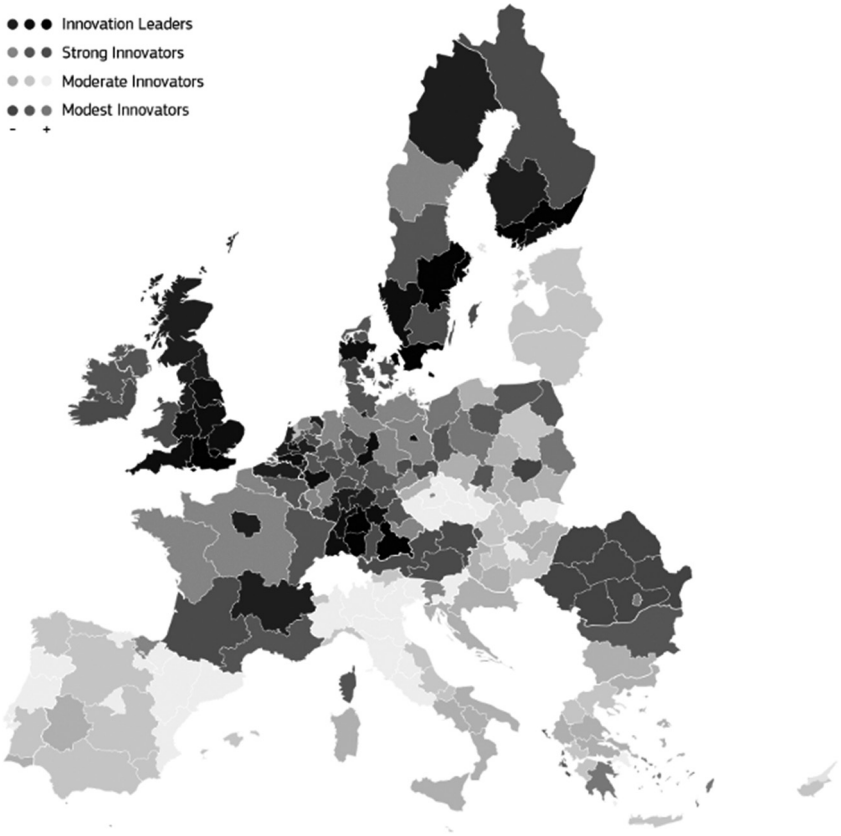
Europe's regions have been classified as follows:

- Innovation Leaders (53 regions),
- Strong Innovators (60 regions),
- Moderate Innovators (85 regions),
- Modest Innovators (22 regions).

A more detailed breakdown of these groups is obtained by splitting each one into a top third ("+"), middle third, and bottom third ("-") regions. The most innovative regions are "Innovation Leaders +", and the least innovative regions are "Modest Innovators -". Only one country has regions in more than two different groups. Twelve countries have regions in four or more different sub-groups, as shown in the figures below.

15 European Commission, Regional Innovation Scoreboard 2017, Internal Market Industry, Entrepreneurship and SME, European Union 2017, p. 6.

Figure 1: EU RIS Map

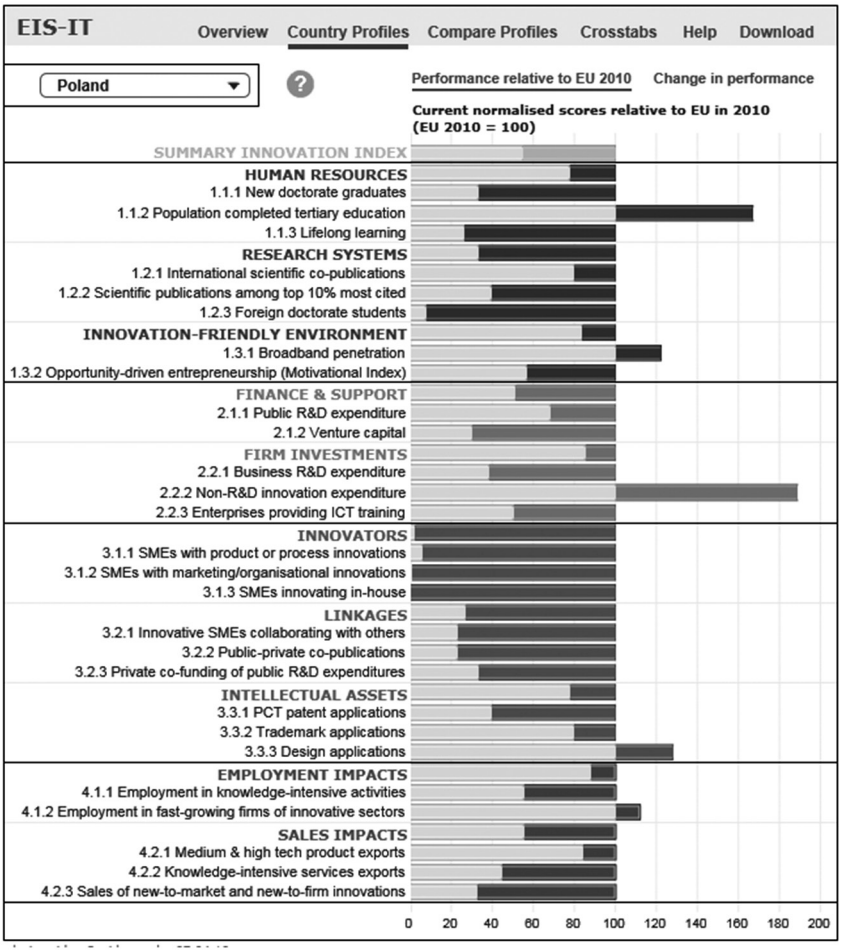


Source: https://ec.europa.eu/growth/sites/growth/files/infographic-regional-innovation-scoreboard-2017-full-size.png [2017-07-20].

The most innovative region in the EU is the one that includes Stockholm, Sweden, followed closely by the Capital Region of Denmark, and then the southeast UK. The most innovative region in Europe is the one including Zurich, Switzerland.

In a comparison of the results in a 2017 European Commission report on regional competitiveness, it transpires that there is a marked and positive link between regional innovation performance and regional competitiveness. Poland is among the Moderate Innovators.

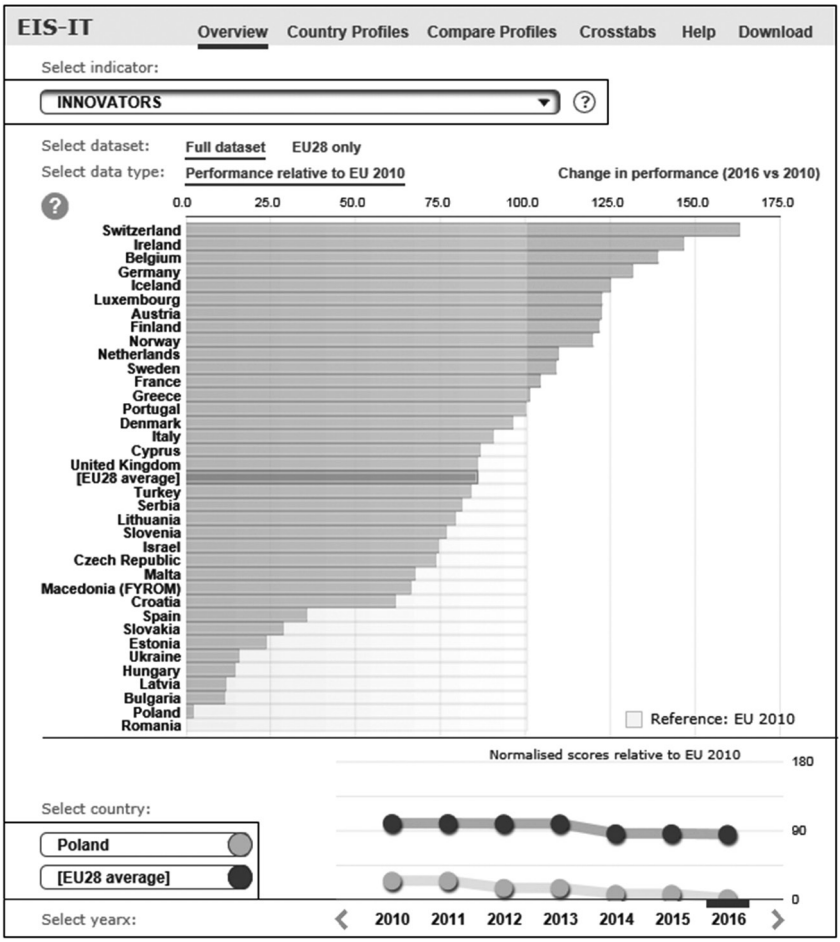
Figure 2: Poland's Innovation Performance, by Indicator.



Source: http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_pl [2017-07-20].

An analysis of the indicators shown in Fig. 2 demonstrates that Poland is above average in the areas of employment in fast-growing firms in innovative sectors, non-R&D innovation expenditures, broadband penetration and portion of the population that has completed tertiary education. A closer inspection of the Commission data reveals that Poland is doing fairly well in the human capital department. However, it is doing poorly in research systems, the number of innovators and level of entrepreneurship, and linkages (in the latter, the performance is actually deteriorating consistently). In the area of innovation, Poland holds one of the lowest positions in the ranking, as presented in Fig. 3.

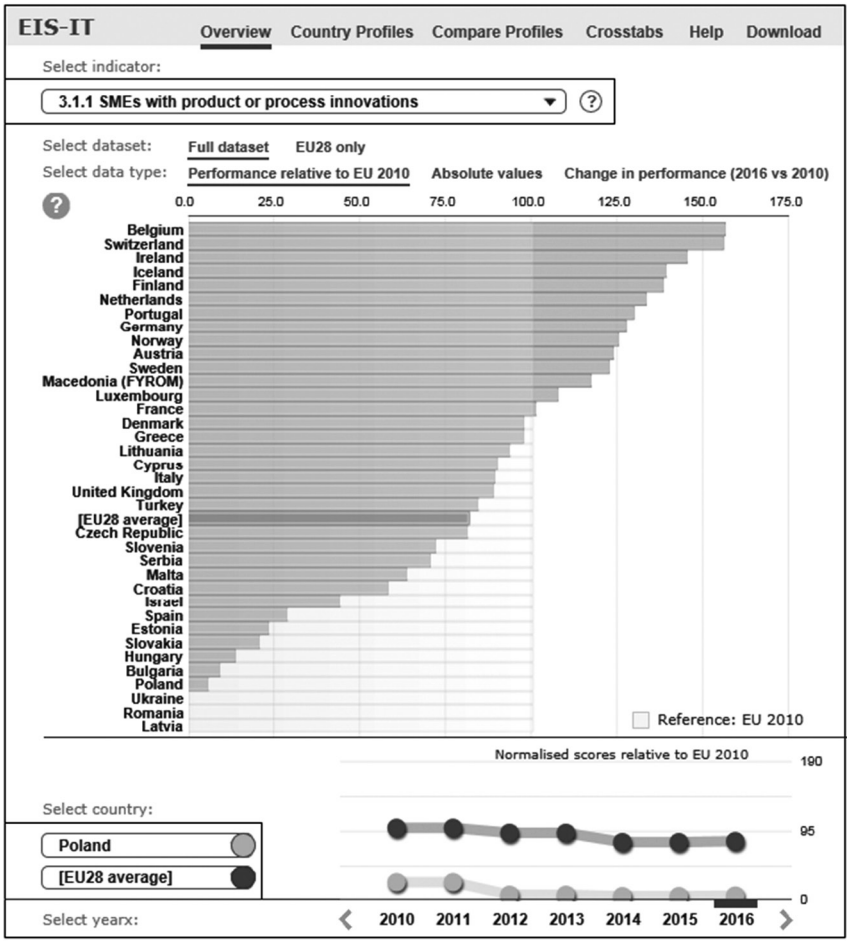
Figure 3: Performance of EU Member States, by "Innovators" Indicator



Source: http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_pl [2017-07-20].

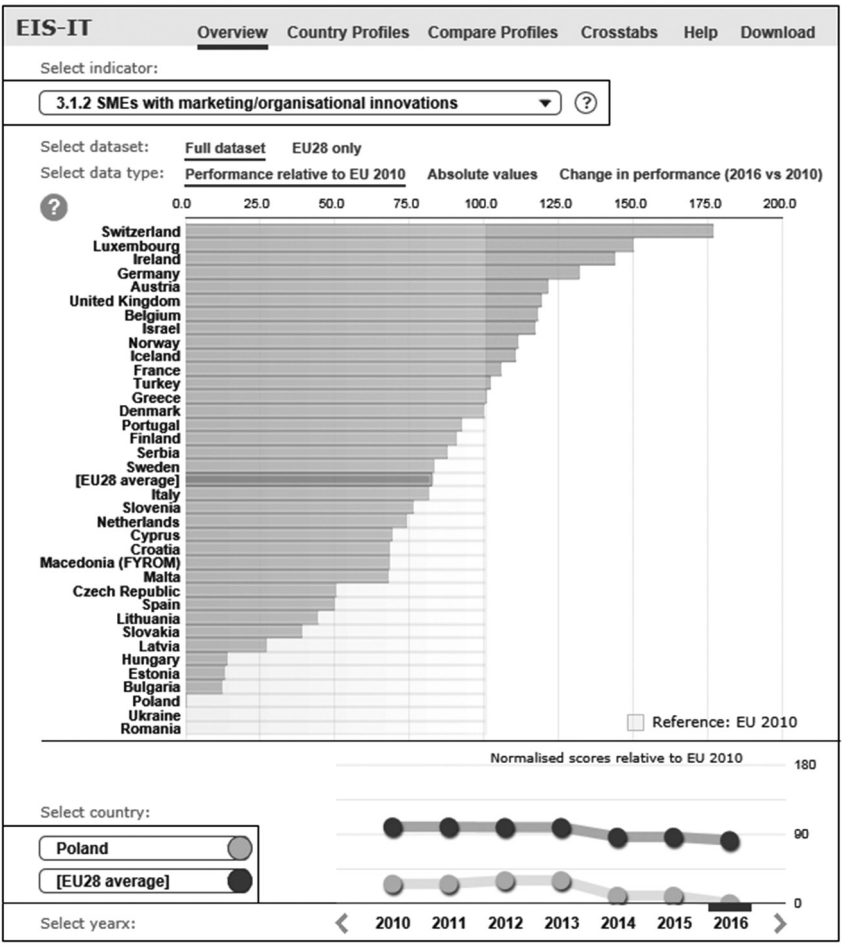
It also worth noting Poland's position in the ranking of innovators with regard to performance in the area of product, process, marketing or organizational innovations, as well as innovative solutions adopted by SMEs in general. Poland's performance according to the listed indicators its position in the ranking are illustrated below in Figs. 4, 5 and 6.

Figure 4: SMEs with Product or Process Innovations



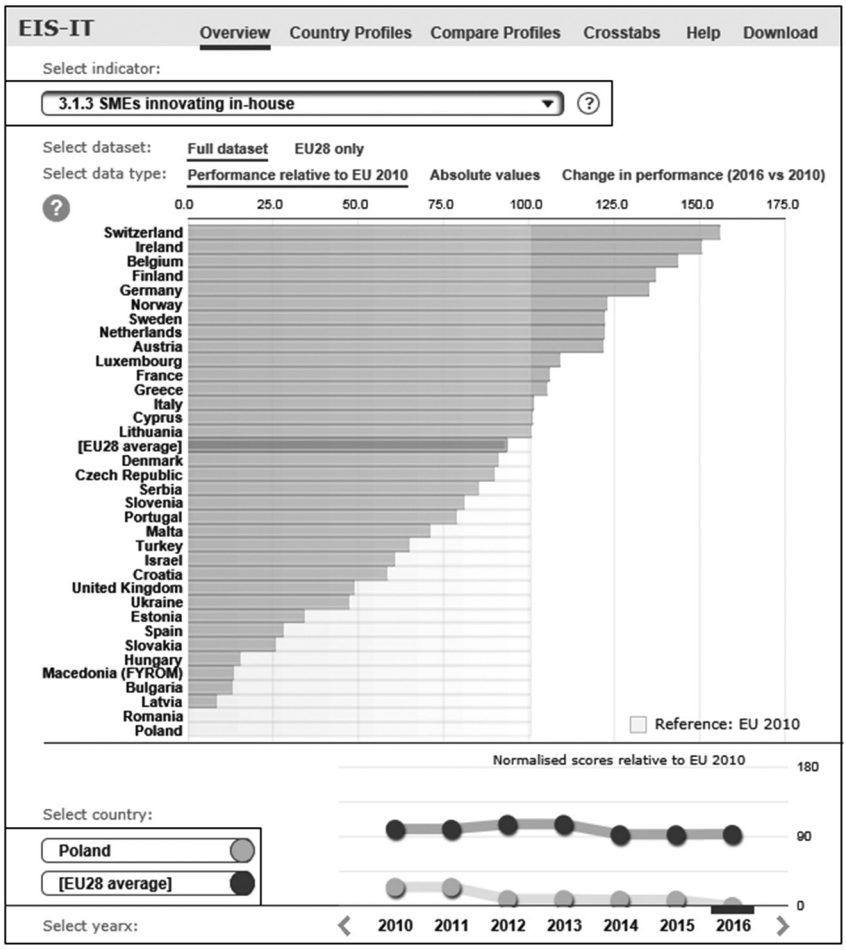
Source: http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_pl [2017-07-20].

Figure 5: SMEs with Marketing or Organizational Innovations



Source: http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_pl [2017-07-20].

Figure 6: SMEs Innovating In-House



Source: http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_pl [2017-07-20].

Analysis of the above rankings do not offer reasons for optimism. In the discussed areas, Poland comes up nearly last. How to interpret the fact then that when it comes to implementing innovative projects, Poland defines innovation in very general terms? On the one hand, one may hazard an explanation that since it has had very poor performance in innovation as such, perhaps it is worth supporting any SMEs willing to implement innovation, be it organizational, process, product or marketing. On the other hand, is financing marketing activities or the purchase of new equipment (that will no doubt improve the organizational activities within the enterprise) the type of investment that

will contribute to an increase in innovation that will be reflected in higher GDP in the future? Analysis of the presented rankings should prompt a search for factors that render Poland incapable or unfit of taking advantage of the opportunity of EU funds for innovation. Perhaps the structure of the economy is at fault? Might it be advisable to look at the problem more globally and scrutinize legal solutions applied in Poland that facilitate or hinder the development of innovation in other areas? Perhaps those where, for instance, Sweden takes the lead. Sadly, even if that review is conducted, there is no guarantee that changes to laws in Poland will suddenly change its innovation performance. The changes would be long-lasting and require relevant and consistent policies to achieve innovation and economic growth, which would require all succeeding authorities to cooperate without fail to ensure continuity. This challenge, however, might be the toughest yet given Poland's current political circumstances.

Table 1: The Innovation Performance of Polish Regions in 2008-2017

Regions	2008	2010	2012	2014	2016	2017
Lodzkie	M	L	L	L	M	M
Mazowieckie	M	M	M	M	M	M
Malopolskie	M	M	M	M	M	M
Slaskie	M	M	M	M	M	M
Lubelskie	M	M	L	L	L	L
Podkarpackie	M	M	M	M	M	M
Swietokrzyskie	M	M	L	L	L	L
Podlaskie	M	M	L	L	M	L
Wielkopolskie	M	L	M	M	L	L
Zachodniopomorskie	L	M	L	M	M	L
Lubuskie	L	L	L	L	L	L
Dolnoslaskie	M	M	M	M	M	M
Opolskie	M	M	L	L	L	L
Kujawsko-Pomorskie	M	L	M	L	L	L
Warminsko-Mazurskie	L	L	L	L	L	L
Pomorskie	M	M	M	M	M	M

M – moderate
L – low

Source: European Commission, Regional Innovation Scoreboard 2016, Internal Market Industry, Entrepreneurship and SME, European Commission 2016, p. 51, European Commission, Regional Innovation Scoreboard 2017, Internal Market Industry, Entrepreneurship and SME, EU 2017, p. 67.

The problems outlined above to some extent concern also voivodeships, including the most developed one – Mazowieckie. Although Mazowieckie is the most innovative voivodeship in Poland, compared to other regions in Europe, its performance is marginal. Admittedly, it has been classified as a "Moderate Innovator", but in terms of the EU average, the voivodeship is regressing (as are most regions of Poland).[16] What is more, in accordance with the "paradox of regional innovation", the more European funds are granted, the lower the level of innovation (see Table 1). When executing operational programs at the national and regional levels, much of the focus is on how best to take advantage of structural funds. Naturally, for every member state, spending the allocation fully rather than returning financial resources back to the European Commission is a priority. However, continued concentration on implementing regional innovation policy through spending European funds, even those dedicated to innovation, may pose a huge risk for regions in the future. In the author's view, there exists a dire need to look for ways to improve innovation status other than the use of European funds. Consequently, the model applied thus far to regional innovation policy, based largely on European funds, should be redefined.

Conclusion

Poland's membership in the EU has presented an opportunity for economic and social development, especially through funding for innovation, to position the country towards sustainable development. Investments in innovation, in the very broad sense of the word, aim to give impulse to and build an economy that maintains economic growth. Interpreting innovation solely through entrepreneurship in the SME sector is oversimplification. As a result, the entrepreneurs' perception of innovative practices and results is far from that of those on the outside. Analyses and research on the subject indicate that innovation performance in regions of Poland, despite the use of structural

16 More on Mazowsze's performance: *Pozycja innowacyjna Mazowsza na tle innych regionów kraju i Europy – raport okresowy za 2014 rok* [Innovation Performance of Mazowsze Compared to Other Regions of the Country and Europe – Periodic Report for 2014], Warszawa: Instytut Wiedzy i Innowacji, 2015.

funds towards innovation, has not changed or has even dropped. The author finds that mere access to EU funds for this particular purpose is insufficient. Hence, there is a need to redefine innovation policy based solely on the use of EU funds.

References

Bukowski, M., Szpor, A., Śniegocki, A. (eds), *Potencjał i bariery polskiej innowacyjności* [Potential and Barriers to Polish Innovation], Warszawa: Instytut Badań Strukturalnych, 2012.

European Commission, Regional Innovation Scoreboard 2016, Internal Market Industry, Entrepreneurship and SME, European Commission 2016.

European Commission, Regional Innovation Scoreboard 2017, Internal Market Industry, Entrepreneurship and SME, European Union 2017.

http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/index_pl.htm [2017-07-20].

http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/eu-tools-for-growth-and-jobs/index_pl.htm [2017-07-20].

http://ec.europa.eu/europe2020/who-does-what/member-states/index_pl.htm; [2017-07-20].

http://ec.europa.eu/europe2020/making-it-happen/index_pl.htm [2017-07-20].

https://ec.europa.eu/growth/sites/growth/files/infographic-regional-innovation-scoreboard-2017-full-size.png [2017-07-20].

http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_pl [2017-07-20].

http://www.pi.gov.pl/Firma/chapter_95851.asp [2017-07-20].

http://www.pi.gov.pl/parp/chapter_96055.asp?soid=677964766D394262AB915FB61187C008 [2017-07-20].

Instytut Wiedzy i Innowacji [Institute of Knowledge and Innovation], *Pozycja innowacyjna Mazowsza na tle innych regionów kraju i Europy – raport okresowy za 2014 rok* [Innovation Performance of Mazowsze Compared to Other Regions of the Country and Europe – Periodic Report for 2014], Warszawa: Instytut Wiedzy i Innowacji, 2015.

OECD, Oslo Manual. Guidelines for Collecting and Interpreting Technological Innovation Data, 3rd Edition, OECD/Eurostat, Paris 2005.

Porter, M.E., *The Competitive Advantage of Nations*, London: The Macmillan Press Ltd, 1990.

Schumpeter, J.A., *Teoria rozwoju gospodarczego* [The Theory of Economic Development], Warsaw: PWN, 1960.

Smart Growth Operational Programme, 2014-2020, Ministry of Economic Development, Warsaw, 23.02.2015.

Stawasz, E., *Innowacje a mała firma* [Innovation Versus Small Enterprise], Łódź: Wyd. Uniwersytetu Łódzkiego, 1999.

Śledzik, K., *Teoria innowacyjności Josepha A. Schumpetera a trolle patentowe* [Joseph A. Schumpeter's Innovation Theory Versus Patent Trolls], Wydział Zarządzania Uniwersytetu Gdańskiego [Faculty of Management, University of Gdańsk], http://jmf.wzr.pl/pim/2013_4_4_21.pdf [2017-07-20].

Zadura-Lichota, P. (ed.), *Innowacyjna przedsiębiorczość w Polsce. Odkryty i ukryty potencjał polskiej innowacyjności* [Innovative Entrepreneurship in Poland. Overt and Covert Potential of Polish Innovativeness], Warszawa: Wydawnictwo Naukowe Instytutu Technologii Eksploatacji, 2015.