Innovation in sustainable development: an investigation of the EU context using 2030 agenda indicators

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ABSTRACT

In the literature of field innovations, it has always been presented as the most important factor to achieve both the economic growth and the employment growth. Supporting innovations is also one of the aims of the 2030 Agenda for Sustainable Development (Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation). The measurement of the innovation level of world economies has been of interest for several years for both economic theoreticians and practitioners. However, the real innovation level of world economies can be evaluated on the basis of a much more limited set of diagnostic features available in official statistics. That is why the main objective of the work is to assess the level of innovation of the European Union Member States based on the composite index which was proposed by authors using variables indicated in the 2030 Agenda for Sustainable Development strategy. The following specific objectives have been formulated as part of the main objective: (i) comparing the level of innovation of EU Member States based on the results of the ranking constructed by the authors; (ii) simplifying the tools for assessing activities undertaken under the 2030 Agenda strategy; (iii) building a tool that will allow for a long-term assessment of the effectiveness of measures to strengthen innovation within the framework of the sustainable development policy indicated in the 2030 Agenda; (iv) comparison of the results of the conducted research with the Summary Innovation Index (SII) published in the European Innovation Scoreboard (EIS), which in the literature on the subject is one of the most frequently used rankings for assessing the level of innovation in European countries. The comparative analysis carried out here is intended to highlight that the level of innovation of European Union member states can be described equally well on the basis of a limited set of diagnostic features. The taxonomic measure of development based on the Weber median vector was used in the paper to assess the innovation level of the EU Member States. The research was conducted based on the indicators applied by Eurostat to monitor the implementation of Goal 9 of the 2030 Agenda. The applied method and the results obtained can be used in subsequent years to examine the direction of changes observed also from the point of view of the particular EU Member States in the area of the application of innovations for the implementation of sustainable development policy.

1. Introduction

Innovations are the key to achieve the economic growth and employment growth, which means that they are at the same time an important factor of a sustainable improvement of the standard of living in the world (Cimoli and Dosi, 1995; Despotović et al., 2014; Ioppolo et al., 2016; Szopik-Depczyńska et al., 2018). Implementing innovations in many countries, innovators support the processes, develop the exchange of information, knowledge and other resources (Lundvall, 1992; Edquist, 1997). What is more, taking into consideration the most efficient ways of recovery from the recent economic crisis which took place in the USA and Europe, Foray and Phelps (2010) emphasize, that promoting innovations is one of the main methods of returning to a path of a long-lasting and sustainable growth. Referring to the 2009 Panel on

Table 1

Goals of the 2030 Agenda for Sustainable Development.

Source: author's elaboration on the basis of: http://www.un.org/sustainabledevelopment/sustainable-development-goals/, access: 02.06.2017.

1. No poverty	2. Zero hunger	3. Good health and well-being	4. Quality education	5. Gender equality	6. Clean water and sanitation
7. Affordable and clean Energy	8. Decent work and economic growth	9. Industry, innovation and infrastructure	10. Reduced inequalities	11. Sustainable cities and communities	12. Responsible consumption and production
13. Climate action	14. Life below water	15. Life on land	16. Peace, justice and strong institution	17. Partnerships for the goals	SUSTAINABLE DEVELOPMENT

Future EU Innovation Policy, the government's policy plays an important role in increasing the innovation in economy. It should be designed in such a way as to support the particular economic entities in developing new skills, knowledge and channels of demand for products and services (OECD, 2010). A similar approach can be observed in the United States, where the strategy to improve innovation levels assumes the existence of a consensus between a private and public sector in the scope of responsibility for research and technological development and much bigger involvement of small and medium enterprises in this process (Porter and Rivkin, 2012). Therefore, the new American strategy connected with innovations aims at restoring the leader position of the United States in the area of fundamental research through investing in human capital and stimulating the entrepreneurship based on innovations (Despotović et al., 2016).

In September 2015, the General Assembly of the UN (United Nations Organization) adopted a Resolution determining the sustainable development plan till the year 2030 (UN, 2015a, 2015b). The main goals of the 2030 Agenda include, inter alia (see: Table 1): Promote inclusive and sustainable economic growth, employment and decent work for all (Goal 8) and Build resilient infrastructure, promote sustainable industrialization and foster innovation (Goal 9) (Villeneuve et al., 2017). It proves that innovations play a significant role in building a sustainable economic prosperity for the society all over the world. Thanks to promoting the sustainable development much has been achieved so far, and more specifically: children and young people have a wide access to education at various levels, the awareness of the respect for the natural environment increases, and also the potential for development grows owing to the expansion of information technologies and communication technologies. The use of new technologies supports the development of the knowledge society and the creation of subsequent inventions which contribute to the improvement of living conditions connected with such domains as medicine, transportation, production or the use of energy.

In the context of the 2030 Agenda, the sustainable development should be understood as creating innovative economies focused on people, taking into account their skills, needs and expectations with regard to the dynamically changing world. Taking into consideration the knowledge, experience and merit of the older generations, prominence should be given to the creation of convenient jobs for young people, the enhancement of the position of women in public life, also a proper care should be taken to ensure decent living conditions, working and leisure conditions for all, as well as it is necessary to protect natural environment, as in the case when it is not protected, other development objectives cannot be achieved.

The accomplishment of the above-mentioned goals requires that a series of activities are taken up and adequate funds are involved. The measures should focus most of all on increasing the economic efficiency (especially in states characterized by a low and average development level), modernizing the industry, expanding the range and improving the quality of services, stimulating continuously advances in technologies as well as innovations, by focusing inter alia on sectors that generate a high added value or laborious workload. The public authorities and economic organizations should support the policies aiming at the initiation of production activities, creating dignified jobs, developing entrepreneurship, creativity and innovations, especially in microsize and SME sectors. While doing so, one should take into

consideration the actions to support the expanded availability of financial services for the newly created start-ups. It was indicated in the 2030 Agenda that the sustainable industrialization of the global economy should lead, in the period till 2030, to doubling the share of industry in the job market and the product in the least developed countries. At the same time, along with the previously mentioned phenomena, the modernization of the infrastructure and the improvement of industry should be effected taking into account the sustainable impact of the latter on the environment and the economy, and hence the improvement of the efficiency of utilizing the material resources and energy, applying "clean" and environmentally friendly technological solutions, adjusted in an adequate way to the needs and possibilities of particular states. For the innovations to contribute in real terms to the sustainable development of the economy, there must be a systematic extension of the scope of scientific research and the increase in the number of staff involved in research and development, and also the increase of public and private sector expenditures dedicated to research and development. It is also important that the private sector is involved in the implementation of inventions which are transformed into the innovations generating the added value in manufacturing and non-financial services.

The interest of researchers has been for years directing them to look for empirical proofs that the innovations and the results of research and development works (R&D) can affect the productivity, market structure and industry structure, and most of all can be a catalyst for the economic growth of a country (Kim et al., 2017; Scherer, 1982; Lanjouw and Schankerman, 2004). This article presents the results of activities of an international team of scientists which conducted research with regard to the measurement of innovations of the EU Member States. The innovation performance of a state consists of many factors. The measurement tools assessing the innovation level of world economies which have been applied so far used considerably extended sets of indicators measuring various areas of innovations of these economies. Due to the specific manner of collecting data (e.g. surveys carried out in innovative enterprises) the indicators obtained in this way were very strongly interrelated, which means that these features could have been strongly linked with one another, and consequently each feature could be the carrier of the same information not differentiating the countries under study in terms of their level of innovation. Due to the time-consuming nature of collecting data and the extended number of indicators utilized in the evaluation of the innovation level, the approaches to evaluation suggested in the literature of the domain are difficult to be applied for the purpose of monitoring e.g. various types of strategies considering more and more frequently the innovation level of national economies.

To assess the innovation level in an efficient and fast way, hypothetically for the purpose of monitoring the implementation of the 2030 Agenda, simple and understandable measures should be adopted.

The paper aims mainly at assessing the innovation level of national economies carried out based on a composite indicator proposed by the authors, consisting in its structure of data from public statistics which describe the innovation level of these economies.

The innovation of economy is a significant constituent of a sustainable development policy. This is proved by the fact of inserting this factor among the goals of the 2030 Agenda. The increase in innovations of countries is triggered by expenditures incurred for research and