
Knowledge, Innovations and Economy: What is New in European Union From the Lisbon Strategy to The Europe 2020?

Mehmed Ganić^{1*+}

¹Associate Professor, International University of Sarajevo, Bosnia and Herzegovina,

*Corresponding author: mganic@ius.edu.ba

+Speaker: mganic@ius.edu.ba

Presentation/Paper Type: Oral/ Full Paper

Abstract- The purpose of this paper is to give a brief overview of the impact knowledge and innovation has had throughout the last two decades on the economic changes between new and old EU members from the Lisbon Strategy (2000-2010) to the Europe 2020 strategy. The research carry out a cross country comparative analysis of competitiveness and innovation by examining the ratio of R&D expenditure to gross domestic product (GDP) as well as R&D funded by government and private sector. In essence, we found that the economic gap between the old EU countries and the new EU member states is significantly correlated with investing in R&D and existence of R&D intensity gap.

Keywords- Knowledge, Innovations, the Europe 2020 strategy R&D, EU countries

I. Introduction

Knowledge-based economy has had a significant impact on the structural and economic changes in today's society. Not only do the technological innovations and advance impact the systems of labor, they also have a significant role in determining the demand of the workforce education, training and structures. As Park et. al. (2005) point out the knowledge based economy is not a given state, but remains operational as a driver of change. Thus, ever setting a new form of demand and challenge to the stakeholders involved in the network. Although knowledge was even before an important factor in economic growth, economists are now exploring new ways to connect directly knowledge and technology in their theories and models such as "New growth theory". This theory reflects the attempt to understand the role of knowledge and technology in driving productivity and economic growth. According to this view, investments in R&D, education and training and new managerial work structures are key (OECD ,1996). Furthermore, Brinkley (2006) discusses that there are those sectors of industry that demand an implementation of knowledge-based economy, mostly characterized as knowledge intensive industries based on ICT production. Having these industries in mind, there appears to be a distinction between high, medium and low-tech sectors. However, it is still arguable that workers in all sectors can have its benefits from ICT technologies equally. Thus, not only manufacturing industries have a significant benefit from technologies, but also finance and insurance industries, business services, education and health. Also, the latest trends in cultural and creative industries should also be pointed out as significant due to the fact that software designing, computer gaming and electronic publishing has particularly increased with the development ICT. In today's world information as well as its means of transfer has gained a significant importance in every aspect of a human being's life.

Looking at the technical and technological developments of the past decades it is more than clear that a shift in knowledge, skills and experiences is necessary to meet the challenges and demands our world faces every day. Particularly the economic development has been enormously influenced by the evolution of technological advancement and communication technologies, thus dictating, to a great extent, new approaches in every sphere of any company's life.

Today's world production is becoming more and more knowledge and technology intensive. Since 1980, exports and imports of high-tech goods have grown faster than exchange in other sectors of the manufacturing industry. More recently, successful global economies are based on the successful application of innovations as driving forces. They are crucial to a business being able to improve a wide range of business activities. For example, in Europe, the focus of innovation policy is oriented towards the need for scientific knowledge in the innovation process. The essence of innovation is the application and commercialization of knowledge. Therefore, innovation is understood as "an integral phenomenon that connects an application and commercial exploitation of knowledge. The promotion of growth and competitiveness for the purpose of economic development and the achievement of the objectives of the Europe 2020 Strategy is one of the most important priorities of the EU Member States in the post-crisis period. The Europa 2020 strategy focuses on addressing the structural weaknesses of existing growth models by creating the conditions for smart, sustainable and inclusive growth (The European Commission, 2010). Technological advancements and innovations are particularly important processes and activities of research and development, i.e. diffusion technologies.

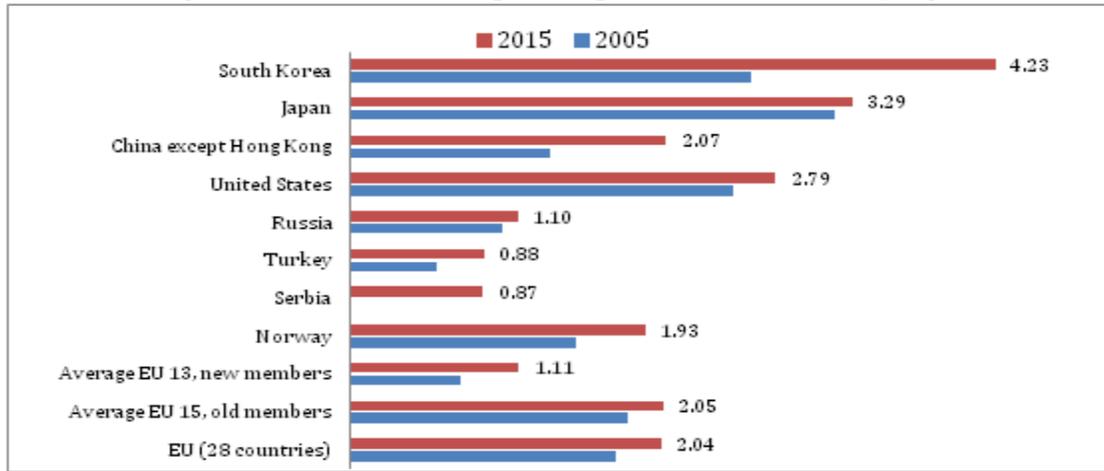
The aim of this paper is to examine the relationship between knowledge and the economy in the EU-28 countries with an emphasis on R&D, innovation, and structural change in economies From the Lisbon Strategy to The Europe 2020. Additionally, the aim is also to carry out a comparative analysis of competitiveness and innovation between the old and new European Union countries in order to indicate the progress of these countries in recent years towards the goals of the Europe 2020 Growth Strategy and to provide some future recommendations.

II. Developments in EU Relative to the Europe 2020 Strategy

For the competitiveness of the national economy, a closer ties and cooperation between science and economy is essential. The fact is that the most competitive economies are seen as the most innovative as well as the countries closest to the "knowledge society". Some countries (for example, Sweden, Denmark, Finland, Japan, South Korea) are seen as the leaders in innovations. The main characteristic of all of these countries is to have a strong (KBE) knowledge-based economy, with R&D funded by both the government and private sectors. In these countries, the private sector act as an important driver of R&D expenditure, and then follow universities and public institutions. Figure 1 shows the allocation of Gross domestic

expenditure on R&D by individual countries. It can be seen that there is divergence between spending on R&D targeting by EU 2020 strategy (3% of GDP) and the actual spending of old and new EU countries.

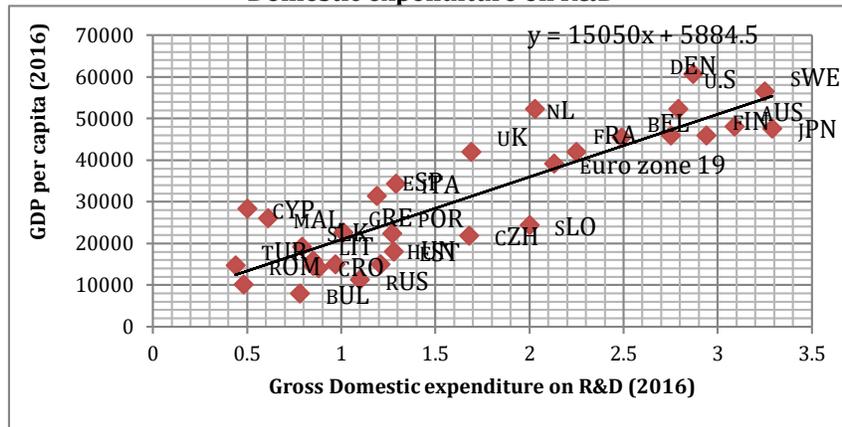
Figure 1 Research and development expenditure in % of GDP by regions



Source: Author's elaboration of EUROSTAT data

For example, between 2005 and 2015 EU 28 countries increase spending on R&D from 1.74 (2005) to 2.04 of GDP (2015) but it is far less than 3% of national GDP. As shown in Figure 1, South Korea (4.23%) and Japan (3.29%) are leaders in terms of spending on the R&D with more than 3 percent of GDP. In EU, Austria (3.09%) and Sweden (3.25%) are only two countries from the EU that achieved by the set target exceeded their own target and even the EU target. Germany with a share of the R&D's spending about 2.94% of GDP, Denmark (2.87% of GDP) and Finland (2.75% of GDP) are in the second group of countries that convergence towards set target of 3%. In the third group of countries with a share of less than one percent of GDP there are still Poland (0.97%), Slovakia (0.79%), Bulgaria (0.78%), Lithuania (0.74%), and Malta (0.61%), Latvia (0.44%), Romania (0.48%), and Cyprus (0.5%). So, among the key goals of the Europe 2020 Growth Strategy, is to increase the share of R&D spent on the EU level to 3% of national GDP. From the analysis of these indicators, there is a clear R&D's gap throughout the EU. First, the gap between east and west can be seen, whereby public systems of research and innovation are generally of lower quality in the countries of Eastern Europe than in other old EU Member States. Furthermore, although less pronounced, there is a gap and divergence between the north and the south as Greece, Portugal, Spain, Cyprus, Malta and Italy have share of R&D spent slightly below the EU average, which positions them between Eastern European countries and Northern European countries. The economies of the old EU countries are successful, among other things, because they make effective use of knowledge and technology faster and more efficiently than their competitors, as well as also invest more in R&D. Likewise, the new EU 13 countries innovativeness still lagging behind the old EU 15. It can be explained by the slowness in innovative technologies and smaller investments in R&D. Strengthening R&D activities on their own territory has a specific significance, since the countries that adopt them accomplish this with the gains. Given that according to economic growth theories of research and development play a key role in the economic growth of the country, innovation in our research is expressed as Gross Domestic expenditure on R&D (2016), and economic growth as GDP per capita (in constant 2010 \$) in 2016. On the basis of the selected data, simple linear regression was employed. The results shown in Figure 2 show that the countries that have invested more in R&D (Japan, Sweden, Austria, Finland, Denmark) as a share of their GDP grew faster than, countries that invest far less in R&D (Turkey, Bulgaria, Cyprus, Malta, Slovakia).

Figure 2 The results of a simple regression analysis of the ratio of GDP per capita and Gross Domestic expenditure on R&D

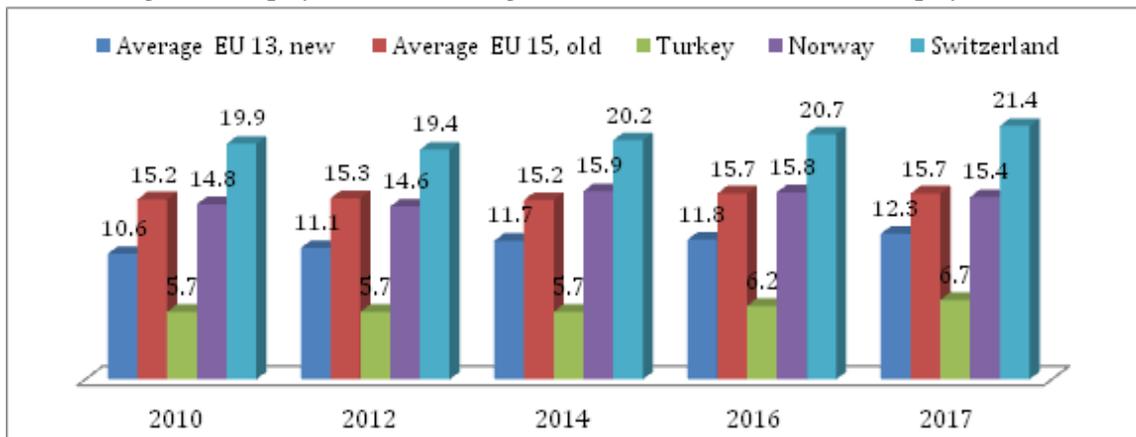


Source: Author's elaboration on EUROSTAT data and World bank data. Interestingly, as shown in Figure 2 many of the new EU Member States invest significantly less in R&D in relation to old EU countries and they are still diverging. The success of enterprises, and thus of national economies as a whole, is increasingly dependent on the efficiency of collecting and applied knowledge from research institutes. Employment in the KBE countries is marked by the increased demand for highly educated workers.

Changes in technologies, especially within the sphere of information, require educated and skilled workforce, which makes them particularly valuable. The share of high technologies in the total export production of the developed world countries in the last thirty years is generally increasing, as well as the number of employees in the knowledge-intensive service sectors.

In figure 3 we can find some data for selected countries across the EU.

Figure 3. Employment in knowledge-intensive activities (% of total employment)



Source: Author's elaboration on EIS 2018 database

Some disparities between countries are largely the result of a low level of public investment in R&D. However, even if we take into account the different levels of public investment in R&D, it remains visible that new EU 13 countries spend less in R&D. This points to potential problems in the way of allocating investment in R&D.

Figure 3 shows the number of employees in knowledge-intensive activities in percent of total employment. Also, it can be noticed that some countries, for example Switzerland (21.4% of total employment), Luxemburg (22% of total employment), Ireland (20.6% of total employment) are leaders in terms of the number of employees in knowledge-intensive activities and typically employ high skilled workers. Likewise, while the EU 15 countries, old members, employ 15.7% of the total number of employees in high knowledge-intensive service sectors, while EU-13 countries, employ 12.3% of total employment. Also, it is an interesting situation that there is a small percentage of employment in the most innovative sectors, in countries such as Lithuania (9.7%), Romania (7.7%), Turkey (6.7%).

III. What does this imply for The Lisbon Strategy?

Of the old and new EU member states have set the framework for research and innovation. The Lisbon Strategy sets a very ambitious plan achieving the goal of investing in R&D in the amount of 3% of GDP, as well as the ratio between private and public investment 2: 1 by 2010. These goals, however, have proven for setting and achieving of the Lisbon Strategy became too great a challenge for the most old EU members, as well as for new EU members, since in 2015 they remained well below the target (Figure 5). The achievements of targets set by the Lisbon Strategy 2010 have remained the goals outlined in the European Strategy by 2020.

Figure 4: Gross domestic expenditure on R&D by source of funds (2005)

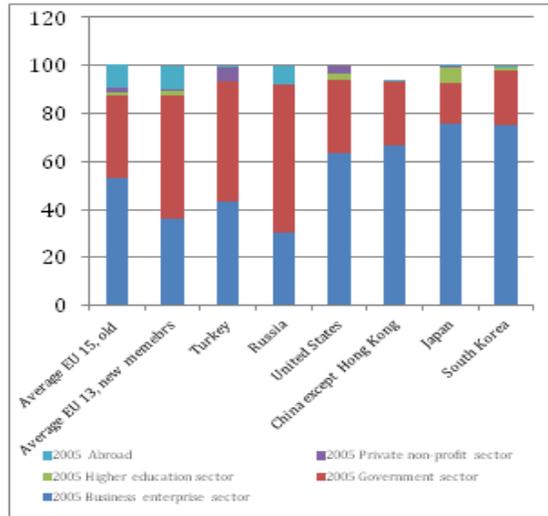
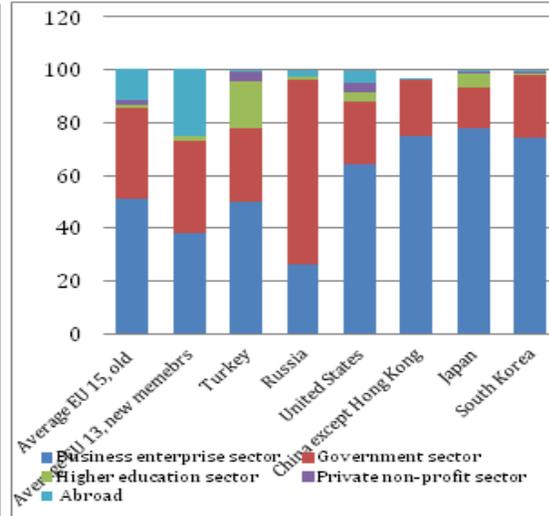


Figure 5: Gross domestic expenditure on R&D by source of funds (2015)



Source: Author's elaboration on EUROSTAT data

Despite the lack of goals defined by the Lisbon Strategy, it is important to note the continuity and perseverance of the EU to raise the competitiveness of its economy. Also, the growth of spending of Gross domestic expenditure on R&D among all the observed countries between 2005 and 2015.

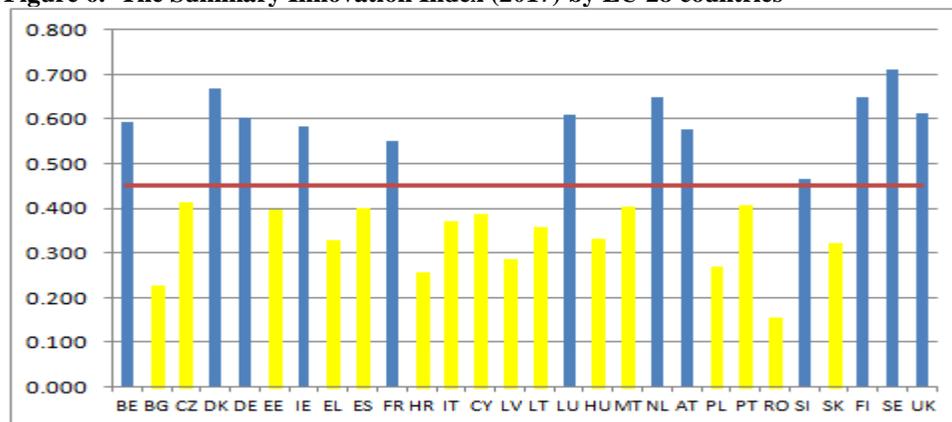
Furthermore, the Lisbon Strategy suggests, as a priority objective, a 2:1 ratio between allocations from the business enterprise sector and government sector for R&D.

Figure 4 and Figure 5 shows a comparison of investment in R&D by sources of funding between old and new EU members in 2005 and 2015. Other sources include the private non-profit sector and the higher education sector.

In 2015, there are some disparities between the observed countries in terms of allocation for the R&D between the business enterprise sector and government sector. Meanwhile,, between 2005 and 2015, R&D funded by business enterprise sector increased in some EU old countries Only countries such as Belgium, Germany, Denmark, Finland and Slovenia meet a setting target ratio of 2:1 between the business enterprise sector and government sector. At the same time, for example, South Korea, China, Japan and the United States stand out far beyond the 2: 1 ratio, with significant allocations from the business enterprise sector for R&D. It is also important to point out that on average, ratio of R&D funded by business and government sector is 1.47 for the old EU 15 members and 1.1 for the new EU 13 members.

The next in a series of innovative EU tools, developed under the Lisbon Strategy, was the European Innovation Scoreboard - EIS with the aim of providing a comparative assessment of the innovative performance of EU member states (European Innovation Scoreboard 2018). The tool aims to provide a comparative assessment of the innovative performance of EU Member States. According to the Summary Innovation Index (2017), individual EU countries are at the top of the list of the most innovative economies in the world (Figure 6). For example, behind Switzerland as the most innovative economy of 2017, some EU members such as Denmark, Sweden, Finland, Germany, the Netherland have also a high ranking on the sub-indexes (Research systems, Innovation-friendly environment and Human resources).

Figure 6. The Summary Innovation Index (2017) by EU 28 countries



Source: Author's elaboration on EIS 2018 database

Based on the calculated the Summary Innovation Index (2017) values for all EU 28 members, and the average values marked by red color we found that Denmark, Netherland, Finland, Sweden, Luxemburg and the UK are innovative leaders in the EU. Belgium, Ireland, France and Austria with somewhat lower values of Summary Innovation Index can be classified in the second group of countries as innovative followers, while the remaining EU-28 countries below average can be classified as moderate innovators. As can be seen from Figure 6, all new EU countries with the exception of Slovenia belong last group including Italy, Portugal, Spain and Greece.

IV. Conclusion

Although the European Union is gradually recovering from the economic and financial crisis, it continues to face numerous challenges that affect the competitiveness of its members. A further economic progress in EU is burdened by insufficient and the slowdown in productivity growth which restrain the stronger overall growth of the Union. The EU fall behind competitors in adopting new technologies and service sector's innovativeness. Given the global scale of the European countries today, productivity growth has generally lagged behind U.S, Japan and China. But enhanced integration, which is one of the prerequisites for fast closing the gap with the U.S in the sector's innovativeness, means a shift from national innovation systems to a common of European system. The economic gap between the old EU countries and the new EU member states is significantly correlated with investing in R&D. Reducing the technological lag of the new EU member states must go by encouraging the establishment of technology centers and development facilities. Also, the current structure of the industry of the new EU member states mostly uses medium and low technology, while the total number of employees in high knowledge- intensive service sectors is only 12.3% of total employment. Additional problems for the new EU member states are the significant lack of investment in R&D funded by the private sector. Namely, investments in R&D by the private sector are just over 1/3 of the total investment, and the government has remained a significant investor. Entrepreneurs as owners of small businesses can not bear the risk of investing in the research and development of new products, especially in the field of high technology. All conducted analyzes point to the great importance of allocation for R&D expenditure in the development of the economy. For new EU 13 members, as well as some old EU member states, much more should be devoted to these activities over the coming years in order to achieve significant economic growth and reach the set targets of the EU 2020 Lisbon Strategy.

References

- Brinkley, I. (2006), Defining the Knowledge Economy. Knowledge Economy Programme Report. The Work Foundation.
- European Commission (2010). EUROPE 2020 A European strategy for smart, sustainable and inclusive growth. Brussels, 3.3.2010 COM(2010) 2020.
- European Commission, European Innovation Scoreboard 2018, Luxembourg: Publications Office of the European Union.
- European Commission, Eurostat Data, Database
- European Commission, The European Innovation Scoreboard 2018 database
- Kanter, R. M. (1995). Managing the human side of change. In D. A. Kold, J. S. Osland & I. M. Rubin (Ed.), *The organizational behaviour reader* (pp. 676–682). NJ: Prentice Hall.
- OECD. (1996). *The knowledge-based economy*, Organization for Economic Cooperation and Development, Paris, France.
- Park et. al. (2005), A Comparison of the Knowledge-based Innovation Systems in the Economies of South Korea and the Netherlands Using Triple Helix Indicators, *Scientometrics*;
- Sheehan, P., & Grewal, B. (2000). Firms, Regions, and Strategy in a Diverging World: The Australian Case. In J. H. Dunning (Ed.), *Regions, Globalization and the Knowledge-Based Economy* (pp. 303–327). Oxford University Press, Oxford, UK.
- World Bank database