

INNOVATION AND COMPETITIVENESS OF THE REPUBLIC OF BULGARIA DURING THE PERIOD 2007-2017

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Abstract

As a result of the deepening globalization processes of the late 20th and early 21st centuries, competitiveness is perceived as one of the main indicators determining whether a country will maintain its global economic position. The countries of Central and Eastern Europe, including Bulgaria, lagged significantly behind at the beginning of the century in terms of competitiveness compared to the highly developed Western European countries. Innovation is one of the main factors influencing competitiveness. The aim of the study is to analyze the change in the innovation activity and competitiveness of Bulgaria in the period 2007-2017. The study will be developed through empirical and DESK analysis.

Key words: competitiveness; innovation activity; european union; Bulgaria

JEL: O300

Introduction

At the beginning of the 21st century, as a result of deepening globalization processes, the competitiveness and innovation activity of the country are seen as an important factors determining whether a country will maintain, improve or worsen its economic and geopolitical positioning worldwide. The history shows that every industrial revolution so far has started with the development of an innovative product or service and has ended with changed global positioning of the countries because of their changed competitiveness. In 2020 the two indicators are widely used and monitored because of their high impact, therefore in this article the author analyzes their dynamics.

The aim of the article is to study the change in the innovation activity and competitiveness of the Republic of Bulgaria in the period 2007-2017. The following thesis will be checked - „In the period 2007-2017 the innovation activity and the competitiveness of the Republic of Bulgaria increases“. For the purposes of the study the following notions will be used:

- DESK analysis – research and analysis of Bulgarian and foreign literature;

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- Empirical analysis – using data from the National Statistical Institute (NSI), Eurostat, the Organization for Economic Co-operation and Development (OECD) and the World Bank (WB).

Limitations of the study:

- Temporal - only the period 2007-2017 is analyzed;
- Territorial - only data the Republic of Bulgaria is analyzed.

The choice of the period is not accidental, because in 2007 the Republic of Bulgaria officially became part of the European Union (EU). The duration of the chosen period is sufficient and allows concrete and representative conclusions to be drawn about the change in the innovation activity and competitiveness.

The following sources were used to develop the article:

- Scientific papers – articles; monographs; textbooks; books and publications;
- Regulatory documents – national strategies and directives;
- Statistical sources – the information database of national and international research organizations and statistical institutes was used.

The topic is relevant, because in 2007 the Republic of Bulgaria lags significantly behind the EU member states in terms of innovation activity and competitiveness. Despite the improvement of its performance in 2020 the country still lags significantly behind most of them. In this regard, it is necessary to conduct a study investigating the change of the innovation activity and competitiveness of the country in the chosen period.

Contrary to the popular use of the terms ‚innovation‘ and ‚competitiveness‘, there is a lack of consensus in the scientific community on their specific meaning. For the purposes of the study, the term:

- “innovation” will be considered as “a new or improved product or process (or combination thereof) that differs significantly from the unit’s previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)” (OECD, 2018);
- “Competitiveness” will be seen as “a set of institutions, policies and factors that determine the level of productivity of an economy, which in turn determines the level of prosperity that the economy can achieve” (World Economic Forum, 2017).

To measure the results achieved by the Republic of Bulgaria in terms of innovation in the period 2007-2017 the term “innovation activity” will be used, including all scientific, creative, technological, organizational, financial and commercial steps that lead to the creation and implementation of innovations. Research and development (R&D) are also included in innovation activity (Eurostat).

Innovation activity and competitiveness of Republic of Bulgaria in the period 2007-2017

According to J. Schumpeter and M. Porter, innovation is a major factor that has a positive impact on competitiveness at the macroeconomic level (Sledzik, 2013; Porter, 1990). In 2017, M. Marikina also analyzes national competitiveness and links it to innovation, productivity and two other factors (Marikina, 2017). Kr. Kerchev concludes that the awareness of the need to stimulate competitiveness through innovation has led the governments of the leading countries of the late twentieth century to devote significant resources building in-depth research and innovation potential and to take serious measures to build well-functioning innovation systems (Kerchev, 2011). The European Commission also pays attention to this issue, according to the Green Paper on Innovation “the competitiveness of a country, region or company depends primarily on its ability to invest in research, know-how, technology and skills that maximize its benefits in order to create new products or services” (European Commission, 1995).

The theoretical positive relationship between innovation and competitiveness has been repeatedly presented by leading economists and international research organizations, who conclude that innovation is one of the main factors influencing competitiveness at the national level. The connection is also proved by the way in which the two most widely accepted indices worldwide measuring innovation activity and competitiveness are formed - Global Innovation Index (GII) and the Global Competitiveness Index (GCI). The GCI is measured on the basis of twelve separate pillars, the last of which is called “Innovation”. In addition, while estimating the GII, one of the key results is called the “Competitiveness” pillar, therefore the positive relationship between the two indicators is unambiguously represented by the way they are measured. The difficulty in measuring the specific impact of innovation on competitiveness stems from the fact that innovation influences competitiveness not only through the twelfth pillar “Innovation”, but also through the other eleven pillars (“Institutions”, “Infrastructure”, “Macroeconomic Stability”, “Health and primary education”, “Higher education and further training”, “Commodity market efficiency”, “Labor market efficiency”, “Financial market development”, “Technological capability”, “Market size and Business excellence”), which innovation also has an influence on. Because of that the overall impact of innovation over competitiveness cannot be correctly measured. Also, it should be considered that the relation between innovation and competitiveness is not unilateral, because the same way that innovation activity impacts competitiveness, competitiveness impacts innovation activity. Therefore, a rise of innovation activity leads to a rise of competitiveness and vice versa, the rise of competitiveness leads to the rise of innovation activity. It is important that the relation between the two indicators is positive.

The competitiveness of a country is formed on the basis of the total competitiveness of the companies that operate within its borders. In this regard, the author associates the creation of a competitive advantage with:

- The introduction of innovative production technologies;
- The creation of innovative products and services;
- The introduction of innovative organizational and marketing methods;
- The implementation of innovative development activities, etc.

According to research conducted by the author, the main measures of innovation activity worldwide are:

- The Global Innovation Index.
- The main OECD Science and Technology Indicators with OECD Science, Technology and Industry Scoreboard;
- The International Innovation Index of the Boston Consulting Group and the American National Association of Manufacturers;
- The Bloomberg Global Innovation Index;
- The Global Innovation Index of the Economist Intelligence Unit;
- The General Innovation Index of the Innovation Union - Union Innovation Scoreboard;
- The Community Innovation Survey;
- The Innovation scoreboard of the regions;
- R&D expenditures;
- The number of filed patent applications;

For the purposes of the study, Bulgaria's performance in relation to innovation will be analyzed based on the Global Innovation Index (covering the largest number of countries and indicators of all listed indices), the R&D expenditures because it shows the country's administration willingness to stimulate innovation and the number of patent applications filed.

According to research conducted by the author, the main measures of the global competitiveness are:

- The Global Competitiveness Index;
- Gross domestic product;
- The Human Development Index.

For the purposes of this article, the competitiveness of the Republic of Bulgaria will be examined according to the Global Competitiveness Index and the dynamics of the Gross Domestic Product of the country in the period 2007-2017. The Human Development Index will not be analyzed as no data is available for each of the years analyzed.

According to official information from the Ministry of Economy of the Republic of Bulgaria, one of the main goals that the country has set before

joining the European Union (EU) is to increase its competitiveness. In this regard, the Innovation Strategy of the Republic of Bulgaria has been created and approved with approved measures that aim to create a competitive advantage through the creation, implementation and dissemination of innovations. With this specific initiative, the Ministry of Economy unequivocally confirms the positive relationship between innovation and competitiveness. In order to determine the change in the innovation activity of the Republic of Bulgaria in the period 2007-2017, the expenditures of the Republic of Bulgaria for R&D, the number of filed patent applications and the positioning of the country according to the Global Innovation Index will be considered in sequence.

Table 1: R&D expenditures of the Republic of Bulgaria in the period 2007-2017

Year	R&D expenditures in thousands BGN
2007	273 047
2008	325 855
2009	361 060
2010	421 612
2011	429 566
2012	496 176
2013	521 682
2014	664 829
2015	850 457
2016	734 274
2017	760 234

Source: based on data from NSI

In the period 2007-2017, R&D expenditures have increased by almost BGN 487.2 million, which is an increase of 2.8 times compared to the initial period. In 2016 alone, R&D expenditures were lower than in the previous year, and in all other cases they were constantly increasing. The increase in the expenditures for these activities is a clear sign of the government's desire to stimulate the innovation activity of the Republic of Bulgaria during the period under review. As a result of this increase, innovation capacity is created and the creation, implementation and dissemination of innovations is stimulated. As a result of its EU membership, the country gained access to European funding under programs with priority axis "Competitiveness", and the link between innovations and competitiveness is represented also by the operational program on Innovation and Competitiveness 2014 – 2020.

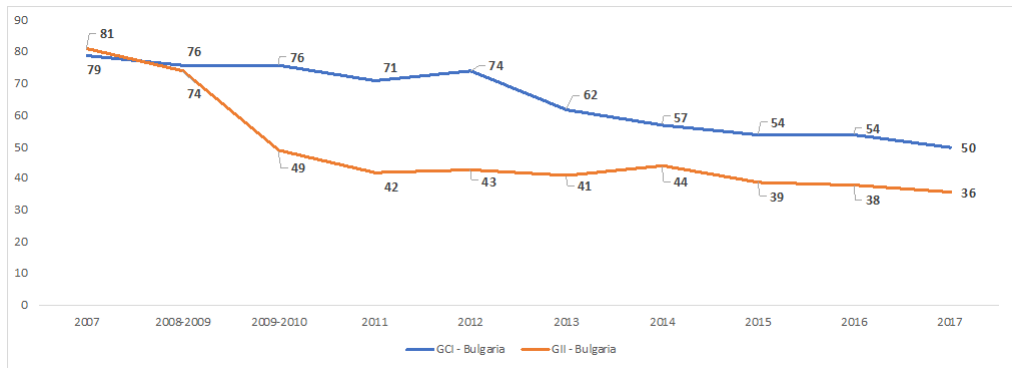
Table 2: Dynamics in the number of filed applications for patent protection in the Republic of Bulgaria by Bulgarian and foreign citizens in the period 2007-2017

Year	Bulgarian citizen	Foreign citizen
2007	211	28
2008	249	22
2009	242	24
2010	243	17
2011	262	21
2012	245	14
2013	282	15
2014	218	16
2015	280	11
2016	230	11
2017	202	23

Source: based on that from the World Bank

The dynamics in the number of filed applications for patent protection in the Republic of Bulgaria does not have a clear trend – both in the applications filed by Bulgarian citizens and in applications by foreign ones. Despite the significant dynamics in the number of submitted applications, only in the last analyzed year their total number is lower than the base one in 2007, when the Republic of Bulgaria joined the EU. In all other periods, the number of submitted applications is higher, which corresponds to the increased innovation activity of the Republic of Bulgaria. It should be noted that the number of applications continued to grow during the global financial crisis. The highest number of requests submitted by Bulgarian citizens, as well as by Bulgarian and foreign citizens was realized in 2013, and the lowest number in 2017. The highest number is associated with the sixth anniversary of the country’s EU accession, as well as with the end of the first programming period, during which the country had an equal access to European funds.

The reviewed and analyzed data about R&D expenditures and the number of filed patent applications by Bulgarian and foreign citizens represent the positive basis for increasing the country’s innovation activity during the period under review.



Source: author's, based on data from GII and GCI

Figure 1: Positioning of the Republic of Bulgaria in the period 2007-2017 according to the Global Innovation Index and the Global Competitiveness Index

In 2007 the Republic of Bulgaria ranks 81st according to GII, and respectively 79th, according to GCI. Ten years later, the country ranks 36th according to the GII and 50th according to the GCI. Back in 2007, the country is the lowest ranked EU member state according to GII and GCI, and by 2017 the Republic of Bulgaria achieved the highest positive change (forty-three positions compared to GII and thirty-one positions compared to GCI) in the ranking compared to all other EU countries. The main reasons for this are:

- the purposeful state policy for stimulating the innovation activity and competitiveness;
- EU membership;
- political stability;
- the constant increase in R&D;
- the creation of a National Innovation Strategy, etc.

The long-term trend is the same for both indices, shortening the distance from the highly developed Western European countries. During the considered ten-year period there is only one case when the GCI curve shows a negative change compared to the previous year, and in the GII this happens twice. The GCI curve is more sloping than the one depicting the GII, but the direction is the same almost every year. The GCI curve is flatter and the change is slower. The trend shown in the graph symbolizes the positive relationship between innovation activity and competitiveness, and it can be argued that GII has an anticipatory and restraining effect on the GCI, because too many factors except innovation affect the GCI.

Table 3: GDP of the Republic of Bulgaria in the period 2007-2017

Year	GDP per year based on constant prices with base 2015 in thousands BGN
2007	79 403
2008	84 235
2009	81 351
2010	81 815
2011	83 739
2012	84 040
2013	84 308
2014	85 906
2015	89 333
2016	92 738
2017	95 990

Source: based on data from NSI

The dynamics of the country’s GDP in the period 2007-2017 is presented in Table. 3, because as already commented, according to a number of economists, productivity is the main measure of competitiveness at the national level. During the period of ten years which is under review, the GDP of the Republic of Bulgaria increased by more than BGN 16.5 billion, which is an increase of 17%. In 2009 alone there was a negative change compared to the previous year, due to the negative effects caused by the global financial crisis. In all other years, the GDP is constantly growing, which is a clear sign of the increasing competitiveness of the country in the period 2007-2017.

Conclusion

During the ten-year period under review, the Republic of Bulgaria improved its performance both in terms of innovation activity and in terms of competitiveness based on the following measurements:

- the Global innovation index (measures innovation activity);
- R&D expenditures (measures innovation activity);
- The Number of filed applications for patent protection (measures innovation activity);
- The GDP (measures competitiveness);
- The Global Competitiveness index (measures competitiveness)

The country achieved the highest positive change in the period 2007-2017, compared to all other EU member states according to the Global Innovation Index and the Global Competitiveness Index. In addition, all other indicators presented and analyzed also improved during the period considered. The

increased expenditures for research and development directly stimulate the country's innovation activity during the period under review, which in turn has a positive impact on the country's competitiveness. The creation of an Innovation Strategy of the Republic of Bulgaria and its implementation in practice leads to an increase in innovation activity during the period under review, as well as the in the country's competitiveness. The increase of the competitiveness is also considered through the growth of the GDP in the period 2007-2017, as the indicator is perceived as the main tool to be used while measuring the national competitiveness. The analyzed data prove that in the period 2007-2017 the country's innovation activity and competitiveness have both increased. The positive correlation between innovation activity and competitiveness ensures good prospects for the implementation of an in-depth future research to measure the impact of innovation activity on the competitiveness of the Republic of Bulgaria in the period 2007-2017.

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