Innovation Potential of the Bulgarian Economy During the Period 2007–2015

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Keywords: innovation, R&D expenditure, technology transfer

ABSTRACT

One of the main strategic goals Bulgaria has set in the process of its accession to the European Union is improving its ability to withstand competitive pressure of the European and world markets. An important factor for this is development of the innovation potential, which is often identified with scientific and technical activity. The article assesses the innovation system of Bulgaria during the period 2007–2015, using a set of indicators aimed at revealing the national potential for creating and acquiring technological knowledge.

INTRODUCTION

Innovation potential is of particular importance to any economy contributing to its growth and competitiveness. Most often it is identified with scientific and technical activity and is interpreted as “a system of factors and conditions necessary to perform innovation activity” [1]. Their impact strength depends on the sector, enterprises structure, market where they operate, intensity of competition, etc. The influence of the so-called “transformation factors” [2] such as economic crisis, economic restructuring etc., which have a major negative impact on innovations, should not be eliminated. Innovation potential formation is in the focus of a series of measures aimed at the relevant scientific and industrial areas development, stimulation of the links between scientific research and business, attraction and retaining quality human resources in the relevant areas and favorable innovation environment functioning.

RESEARCH BACKGROUND

For the assessment of the Bulgaria’s innovation system a set of indicators aimed at revealing the national potential for creating or acquiring technological knowledge such as R & D expenditure; personnel involved in R & D; development of high-tech industries, technology transfer, etc., were used [2], [3], [4].

According to Eurostat data, “R & D expenditure” in Bulgaria shows an upward trend over the period 2007–2015. In 2014 their relative share of GDP reaches a value of 0,8%, which, however, is too far from the EU average—2,03% and much below the target level for 2020—1,5% [5]. By this indicator Bulgaria is ahead only of Romania, Cyprus, Latvia and Croatia.

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Sectorial analysis shows that businesses are becoming more proactive in terms of R & D expenditure. While in 2007, in this indicator, the Government sector is ahead of the Enterprise one; in 2014 the ratio is changed. Detailed on economic activities, R & D expenditure is most significant in sector С - Manufacturing, where, according to National Statistical Institute (NSI) data for the period 2007–2015 there is an upward trend and in 2015 it amounts to BGN 181162 thousand.

Data on the R & D personnel indicator, which is directly related to the previous one, are unsatisfactory, too. In 2015 it is 25,484, which is less than 1% of the total number of the personnel in Bulgaria. Although an upward trend has been observed for the period surveyed, Bulgaria is in a position of non-respect vis-à-vis the other EU member states.

From the graphics presented (see Figure 2) it is clear that the share of researchers is also rising but it is many times smaller than the total number of R & D personnel. In 2014 their number is 3969, which is more than twice as great as that in 2007–1591 [6]. Here, it should be noted and positively assessed that nearly half of these researchers hold a PhD.

By share of the innovative companies, Bulgaria ranks last among the EU member states. Our country lags behind both in the introduction of innovative products and innovation processes. The highest innovation activity is in the industrial sector, where the enterprises with technological innovations prevail, while in other sectors the enterprises with non-technological innovations prevail.
Table 1. Innovative companies share of the total number of enterprises in the industry—sectors B–E.

| Industry: Sectors B-E, including: | 2008 | 2010 | 2012 | 2014 |
|----------------------------------|------|------|------|------|
| from 10 to 49 employed           | 36.6%| 31.1%| 31.0%| 29.7%|
| from 50 to 249 employed          | 25.5%| 21.8%| 22.7%| 20.6%|
| 250 or more employed             | 69.1%| 63.2%| 59.0%| 78.3%|

Source: National Statistical Institute

Data in Table 1 show that innovative enterprises share is declining, which is understandable given the rising economic crisis after 2008. The largest is the number of innovative companies among the large and medium-sized enterprises, while for micro and small ones it is much smaller. It is understandable as it is the large enterprises that have the necessary adequate facilities to conduct research and development. What is striking is the fact that in large companies with more than 250 employees, in 2014 the share of innovators outpaced that of 2008. Small and medium-sized enterprises do not perform independent innovation activity. They work together with foreign or Bulgarian innovation leaders or use technologies or innovations developed by such.

According to Eurostat, the number of high-tech companies in Bulgaria has been steadily increasing from 5957 in 2008, in 2014 their number reached 10333 [6]. From the same source it is also evident that for Bulgaria the high-tech production export share to total export remains comparatively low and with fluctuating values, which at no time for the period 2007–2014 do not exceed 10%.

Patents as well as trademarks are one of the forms of technology transfer. It represents “a complex, iterative process of deliberate, purposeful, simple and contractual interaction between two or more organizations for transfer and application of new and useful information and knowledge, methods and processes, documentation, patents, software products, design, physical objects (products, machinery and equipment, components, facilities, plants, etc.) in the host organization, leading to an increase of its knowledge base and/or implementing innovations to achieve its corporate goals“[7]. Due to the high costs, the existence of corruption practices and loopholes in legislation the patent activity in Bulgaria is weak. With the admission of our country as an EU member state and the requirements for high competitiveness of the Bulgarian production, after 2007 there is some movement in this direction (a trend of upward development for the period 2007–2015—Figure 3), but these results are too unsatisfactory and are far behind the leading world powers.

Figure 3. Number of patent applications for the period 2007—2015 submitted by Bulgarian enterprises to the European Patent Office— in number [6].
RESULTS AND DISCUSSION

Analysis of patent activity through the patent applications filed with the European Patent Office (EPO) compared to some former socialist countries and currently EU member states also shows a drastic lagging behind of Bulgaria—Table 2. In the first years of the period surveyed, only Lithuania, Latvia and Estonia are behind Bulgaria, but as of 2014 it is already lagging behind them. Eurostat data for high-tech patents applications are insignificant or almost missing (in 2007—barely 1,75, and in 2014—0,43).

Table 2. Patent applications number and high-tech patent applications for some of the former socialist countries in the EU.

|                  | 2007   | 2010   | 2013   |
|------------------|--------|--------|--------|
|                  | Patent applications with EPO | High-tech patent applications with EPO | Patent applications with EPO | High-tech patent applications with EPO |
| EU (28 member states) | 58494,03 | 10558,26 | 56601,60 | 9687,04 |
| Bulgaria         | 12,18  | 1,75   | 16,97  | 0,50   |
| Czech Republic   | 188,61 | 16,45  | 192,59 | 15,65  |
| Estonia          | 28,22  | 14,30  | 38,93  | 13,38  |
| Latvia           | 15,67  | 3,33   | 15,78  | 1,75   |
| Lithuania        | 9,80   | 3,33   | 15,90  | 2,00   |
| Hungary          | 191,11 | 39,17  | 195,14 | 49,60  |
| Poland           | 202,02 | 38,65  | 360,52 | 64,37  |
| Romania          | 32,57  | 16,18  | 34,38  | 6,92   |
| Slovenia         | 120,11 | 18,00  | 105,93 | 9,32   |
| Slovakia         | 38,55  | 4,17   | 46,50  | 4,30   |

Source: [6].

In sectors related to ICT patent activity is also very low—between 4 and 7 patents per year, which is negligible compared to the figures of Germany, France, Sweden, etc. [6]. For the period studied zero patent activity is reported in industries such as biotechnology, nanotechnology, nuclear physics, etc., which are characterized by high investment interest in Western countries. Patent activity in Bulgaria is concentrated mainly on several technological areas related to lighting, heating motors and pumps, pharmacy and medical technology/equipment [8].

Registered by Bulgarian enterprises trademarks are incomparably small on the background of most of the European countries. For example, Poland, which is a former socialist country, has registered five times more trademarks than Bulgaria. The positive point here is that compared to 2007, in 2015 the native companies interest in them is obviously larger and their number is significantly growing—Figure 4.
The lack of innovation practice in technology transfer is supported also by the lack of corporative partnerships in the area of trademarks. It is only in the last two years that timid attempts at such initiatives are observed but they are far from enough. Examples in this regard can be drawn from Germany, France, Italy, Netherlands, etc.

CONCLUSIONS

The presented analysis of indicators related to innovations and innovation activity gives grounds to state that the Bulgaria has the necessary potential for the realization and development of innovation activity. Despite the data-poor stock for the surveyed country, as well as the lack of information for some years considered in dynamics, the data show positive trends in most of the studied values. Furthermore, in most of them two-, even threefold increase is observed, which for the studied period 2007–2015 coinciding with the global financial crisis, is difficult to be achieved even for industrially developed countries. It is obvious that the country will be in the position of catching-up the leading European countries but the analysis presented gives optimism and hope that in a relatively short time Bulgaria will be a significant factor for the innovation development of the European Union.

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