

## MEASURING OF INNOVATION ACTIVITIES IN BULGARIAN INDUSTRY AND REACHING THE PARAMETERS OF THE STRATEGY 2020 OF EU

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### ABSTRACT

*The paper present main activities on the field of innovation based on the strategy 2020 of EU for reaching the sustainable growth, which EU members must strive to achieve in the next years. As a one of the most important business activities, the innovation development of the enterprises in the national industries will be a factor for reaching industrial growth. But these innovation activities depend of a lot of internal and external factors, which have influence over the years. That's why in the paper had examined the rate of change of innovation activity of Bulgarian Enterprises, as a young member of EU, for 10 years compared with average level in the union, and on this basis are made a forecast of their ability to achieve the requirements of the EU Strategy 2020.*

**Keywords:** Innovation; Industry; Growth; Strategy 2020

### 1. INTRODUCTION

The shortage of investment in R&D in the Bulgarian economy to the EU average level has remained constant in recent years. The low level of business R&D is particularly worrying and country lags significantly from the average levels of these investments in the Union. The structure of industry in the Bulgarian economy, compared with that of developed countries of EU and U.S. are the main reason for the low level of R&D in companies. Bulgaria has a very small industrial sector in the field of high technology, and this is a sector which usually has the highest level of R&D investment. Therefore, new measures and activities undertaken in Europe since 2005, in the context of the revised Lisbon strategy and the concept of the Strategy 2020 of EU, should be widely supported by concrete actions by the Bulgarian government and industrial sector, thus the country to successfully face this challenge.

After recent reports published in 2005, launched new initiatives at both EU and Member States to accelerate the creation of a "Europe of Knowledge" and "Knowledge Economy". Member States have made new and wide-ranging responsibilities within the renewed Lisbon strategy by setting future R&D intensity. High R&D intensity can be achieved, however, when strong private sector participation accompanies high levels of public funding. For those economies that are catching up, government funding of R&D is crucial for the establishment and development of scientific and technological capabilities.

Strategy 2020 of the European Union is a direct continuation and improvement of the Lisbon Strategy, which ended 10 years of unsuccessful attempts to transform the EU economy "the most dynamic and competitive global knowledge economy by 2010. It is believed that this is

achievable only by 2020 and by more specific indicators and serious work on their implementation by Member States [1].

## 2. WHAT IS THE SITUATION IN BULGARIA IN THE FIELD OF INNOVATION AND R&D AND CAN WE OVERCOME THE GAP?

In recent years, innovation has become a key factor in improving the competitiveness of national economies and established themselves as one of the cornerstones for building knowledge-based economy. They proved a successful tool to overcome the negative effects of the global economic crisis and for achieve dynamic growth of national economies.

It could be argued that countries with high levels of innovation costs can generate more growth to achieve requirements for the knowledge based economy, as enshrined in the EU's 2020 strategy. Comparing the costs of innovation per inhabitant made in the EU 27 and those in Bulgaria (Figure 1.), they indicate that all countries reported rising growth rate over the last decade. But this growth rate, however, is with varying intensity.

There is a lagging in rate of growth of spending on innovation in Bulgaria. Costs per capita are 20 to 30 times lower than the EU average. There is a huge gap in this indicator between countries with the highest potential for innovation (the old EU member states), such as Germany, France, Sweden and Finland and the new EU countries. Especially pronounced is the trend in costs that make businesses for research and development (Figure 2).

Under the influence of global economic crisis, all EU countries experienced a number of economic shocks, but yet their expenditure on innovation activities is many times higher than those of countries like Bulgaria. Based on this indicator can be concluded that the economies of these countries (with low innovativeness like the Bulgarian) would be a very high level brake on Europe's economy and its adaptation to the paradigms of the knowledge economy.

This would avoid only if in the coming years the growth rate of this type of expenditure and their efficiency significantly outpace the average growth rate in the EU. It will thus be overcome to some minimum degree huge disadvantages, which have the economies of these countries (including Bulgaria) for building knowledge-based economy.

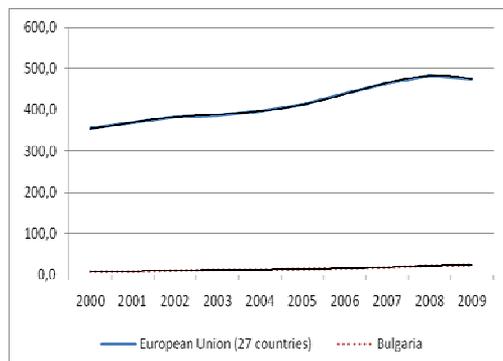


Figure 1. Total R&D expenditure by all sectors of performance in Euro per inhabitant

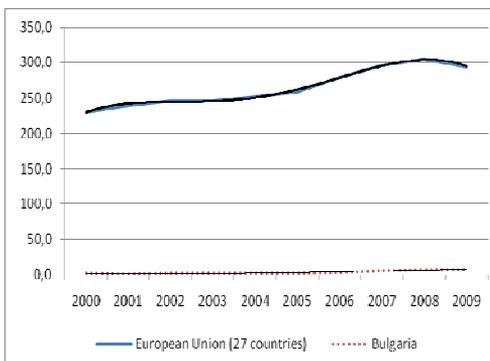


Figure 2. Total R&D expenditure by business enterprise sector in Euro per inhabitant

The high rate of expenditure on innovation in developed countries is a direct consequence of the sources used to finance these activities. World experience shows that in countries with the most highly innovative economies, the costs of innovation are made by firms, not by the state. This is the result of conscious needs of businesses to produce and offer products, services and technologies with high added value. They thus generate growth and higher profitability levels.

Comparison of costs incurred for innovation in countries like Bulgaria shows that rely primarily on public funds for R&D (Figure 3, Figure 4). Data on the average European levels of expenditure on R&D and innovation show that firms invest in times more in developing new products, services and technologies than they have separate public funds (Figure 4).

According to this indicator Bulgaria is lagging position again, it ranks among the last places in the EU 27. The country has the lowest percentage of GDP spending to finance innovation and R&D by business and costs incurred per inhabitant (Figure 5). Given that the country has the lowest levels of GDP per inhabitant can be argued that the underlying funds allocated to R&D are by the state (government) not by the companies, and innovation have not yet been adopted as a necessity and a factor for growth from companies.

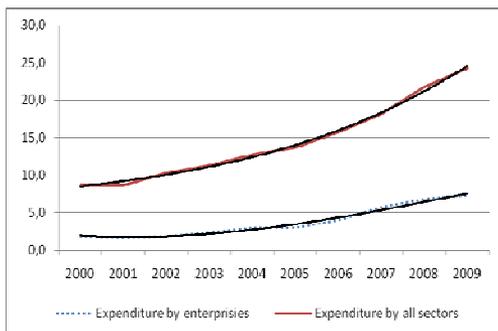


Figure 3. Total RD expenditure by enterprises and all sectors in Bulgaria (Euro per inhabitant)

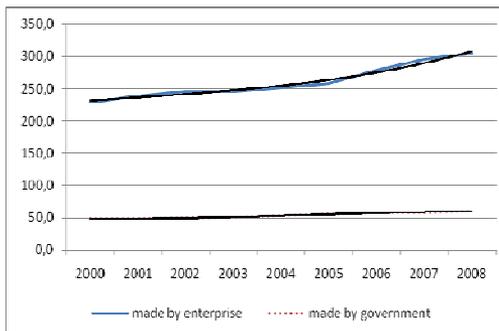


Figure 4. Expenditure for RD in EU 27 Countries

In times of crisis, natural defense mechanism of the companies and the state is reducing the cost, including innovation costs. This is well illustrated by the slight downward trend of the graphs for general R&D expenditures and those it does business in recent years at EU level 27 (Figure 1 and Figure 2). To provide better conditions for economic development, overcoming the negative effects of economic crisis and meet the requirements of EU Strategy 2020, the state is less inclined to reduce those costs.

At the end of 2008 and 2009, under the influence of global economic crisis, there is an increase in government expenditure on R&D and decrease of expenditure made by companies. A similar is situation in Bulgaria, but with a much lower rate of change. Overall, the Bulgarian economy is characterized by the highest level of government expenditure on R&D and the lowest corporate R&D spending.

Overall, the picture in the innovative development of the country is negative. Bulgarian economy, sectors and enterprises have very low potential for innovation. Production is mainly low value added and the competitive advantages of firms are very limited. Backwardness of the country compared to the average level in EU-27 is ubiquitous, and if not takes real actions to stimulate and motivate innovation, the country will not succeed in covering the parameters set out in Strategy 2020.

Bright spot in terms of R&D and innovation in the country is the fact that the indicator "number of staff employed in R&D" is close to the EU 27 average (Figure 6). Despite the lack of sufficient funding, Bulgaria has researchers who are highly motivated to work to create a highly innovative economy.

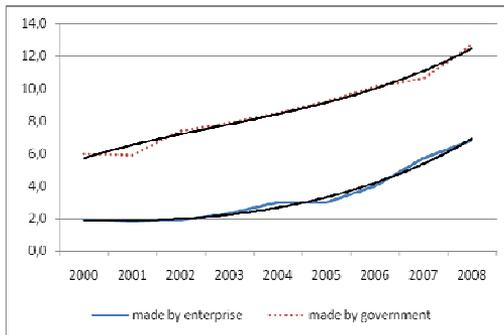


Figure 5. Expenditure for RD in Bulgaria by sectors of performance (Euro per inhabitant)

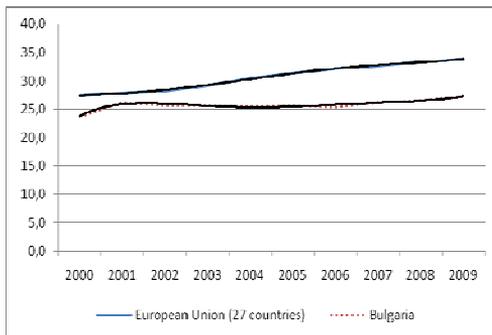


Figure 6. Human Resources in Science and Technology

From the available and analyzed data for the innovation activities of the economy (which in turn is a precondition for establishing a knowledge-based economy), it can be concluded that the Bulgarian economy is characterized by the lowest cost to innovation per capita. Much of the funding is made by the state. If this trend continues, it will have limited impact on the economy and will be very difficult to meet the criteria of the 2020 EU Strategy for building knowledge-based economy.

### 3. TASKS FOR BULGARIAN ECONOMY ARISING FROM THE 2020 EU STRATEGY

Europe is in the process of transformation and can meet the challenges of a rapidly changing world only through the realization of a well developed strategy. This strategy should make the European economy into a smart, sustainable and with high level of employment and productivity. Just such a strategy is "strategy 2020" for smart, sustainable and inclusive growth, developed by the EU.

The first and perhaps most important pillar that underlies this strategy is the achievement of smart growth by building an economy based on knowledge and innovation.

The main goal resulting from this priority of the strategy is achieving the level of investment and expenditure on R&D and Innovation in 3% of EU GDP. The majority of these costs for innovation must be made by enterprises rather than public funds.

Interdependence of goals and ensuring that each country will adjust this strategy to its own level of economic development is crucial to its success. To achieve the overall objectives of the strategy will require a wide range of actions at national and a European level.

One of the measures (actions) provided by the EU to support innovation in the member countries is the "Alliance for Innovation". This initiative aims to improve the framework conditions and access to funding of research and innovation. Thus ensuring the transformation of innovative ideas into new products and services and create jobs and achieve growth.

Of goals and tasks for building an economy based on knowledge enshrined in the EU strategy on innovation, resulting specific tasks which must be addressed for each Member State [3].

#### ***What commitments imposed for Bulgarian economy by the 2020 strategy of the EU?***

The analysis of innovation in the Bulgarian economy showed that in absolute terms (R&D expenditure per inhabitant), the Bulgarian economy lags significantly from an average European levels. Over the last decade on average in the country for R&D are allocated between 0.4% and 0.5% of GDP. This is well below average R & D expenditure as% of GDP for EU 27, which is about 1.7% in recent years even reach 2% of GDP (Figure 7).

Problem with meeting the criteria of the 2020 strategy of the EU would prove fact, that for entire period of observation, such costs are not with significant rate of increase, while the average level of the EU increased by about 0.2 percent points per year.

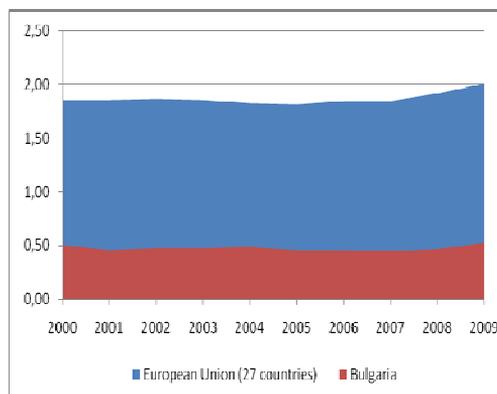


Figure 7. R&D expenditure in % of GDP

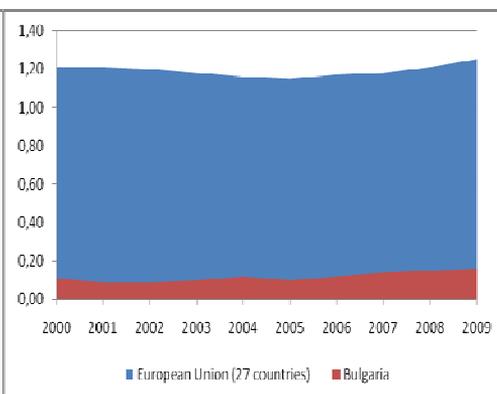


Figure 8. R&D business expenditure in % of GDP

On the other side to reach the 3% R & D expenditure of GDP, the EU relies primarily on cost increases made by companies, so the EU average show a larger share of the company over the state (government) R&D spending. This will largely be a limiting factor for the Bulgarian economy because R&D expenditures of firms are a minor part of total R&D spending in the economy, and they have a minimum growth rate in recent years (Figure 8).

The only area where the country is approaching the EU 27 average levels are public R&D expenditure as % of GDP (Figure 9).

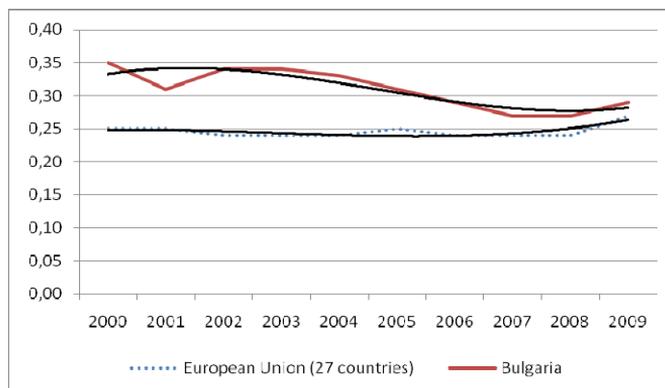


Figure 9. R&D government expenditure in % of GDP

The data presented thus show that if the country wants to cover in some degree the criteria of the EU in 2020, and not distort the financing structure (the ratio of government expenditure and private expenditure) should direct effort to stimulate business expenditure for R&D. The growth rate of business expenditure on R&D should be significantly higher than the average for EU-27 because currently they are at times lower than necessary.

Analyzed data on R&D expenditure in Bulgaria are calculated as % of GDP. EU countries have different levels of economic development and by different levels of generated GDP. To obtain a synergetic effect of R&D activities in Europe and unify the innovative development of the countries in the union needed R&D expenditure in the less innovative countries to have

a higher rate of growth. This will be achieved if R&D costs for these countries are calculated as % of average EU 27 GDP. Thus will reduce the yawning gap that exists between countries with the highest level of innovation and the countries with the lowest degree of innovativeness. Economies of Europe are increasingly interlinked. They are one of the most open economies in the world, but competition from developing countries and emerging economies is growing. Countries like China and India [4] invest more in scientific research and technologies to achieve prominence of their economies in the value chain. This has enormous pressure on the European economies to maintain competitiveness. We can prevent this only if Europe realize the tasks set out in "Strategy 2020" and its economy become entirely based on technology and innovation.

#### **4. CONCLUSIONS**

From analyzed data on innovation and R&D activities, can be summarized:

1. Globally, they are a factor to generate industrial growth, competitiveness and knowledge based economy;
2. Innovation activity of the new member States (Bulgaria and others) significantly lags behind that of the old members and high innovative economies (Germany, France, Finland and others);
3. The funding of innovation (as far as available) in Bulgaria and the new member countries in EU is mainly from public funds. Much less reliance on corporate R&D investment. This shows that many companies haven't separate departments for R&D. They have not cooperation with universities and other research units;
4. Investments in R&D activities were mainly in buying innovative fixed assets. They are low value-added and technology transferred on national level;
5. Spending on innovation and R&D as % of GDP in Bulgaria are well below the average cost of innovation in the EU;
6. If the Bulgarian economy wants to get closer to the economic parameters set out in Strategy 2020 of the EU must increase R&D expenditure, both by businesses and by public funds. This should be done with the active participation of the State (government) to create conditions for investment in research. To motivate companies to cooperate with R&D departments and universities to enable ideas to become fully into innovative products, services and technologies.

All this gives us grounds to conclude that Bulgaria, as part of Europe will be facing many challenges over the next decade. These challenges arise from the lagging position of Bulgaria in innovation, research and general economic development. This retardation can be overcome with the efforts of public authorities and the business sector.

It's all about desire, even in some cases need to go beyond the possibilities.

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