INTERNATIONAL JOURNAL OF INTERDISCIPLINARITY IN THEORY AND PRACTICE
ITPB - NR.: 9, YEAR: 2016 – (ISSN 2344 - 2409)

RESEARCH AND DEVELOPMENT IN SLOVAKIA FROM THE PERCPECTIVE OF THE STRATEGY EUROPE 2020

Emília Duľová Spišáková[1]

Abstract: *Considering the failure of the target of Lisbon Strategy up to the year 2010, it was necessary to develop a new strategy Europe 2020, which extended the time period to achieve the fundamental objectives up to the year 2020. One of the objectives of the strategy is focused on research and development, namely: increasing investment in research and development to 3% of gross domestic product. Therefore, in the article is analysed and compared the indicator expressing the share of gross domestic expenditure on research and development on country's GDP in Slovakia, the structure of this indicator and also there is simulated and propose how should grow the expenditure on research and development in Slovakia so that this country will converge or achieve its own target, i.e. 1,2 % GDP.*

Keywords: Research and development; GERD; funding; target; Strategy Europe 2020.

1 INTRODUCTION

Legislation of the Slovak Republic in the area of research and development (R&D) support is represented by Law 172/2005 about the organization of state support for research and development. According to this low, research is a systematic creative activity taking place in science and technology to societal needs and for development of knowledge. It consists of basic and applied research. Development is a systematic creative activity in the field of science and technology, which uses patterns and knowledge gained through research or based on practical experience in developing new materials, products, equipment, systems, methods and processes, including construction and prototype development [6].

Expenditure on R&D includes total expenses incurred in the organization on R&D activities, i.e. internal expenditure. They consist of capital and current expenditure. The expenses incurred outside the organization include only those, which serve to support internal R&D. The current expenditure includes costs for organization's own activities and their R&D departments and also includes costs for tasks solved by its own organization and work capacity. In addition to its own corporate resources to support R&D activities, they use funds obtained from government sector, from higher educational sector, from private and non-profit organizations and from abroad. Expenditure on R&D can be measured by [8]:

- Gross domestic expenditure on R&D – GERD – which represents domestic and foreign expenses to conduct R&D within the country over a period of time (with the exception of expenses on R&D that are carried out abroad).
- Gross national expenditure on R&D – GNERD – which includes the country's total expenditure on R&D carried out abroad.

The article will analyse the development of R&D funding in Slovakia with comparison to the European Union average, the structure of GERD and their possible development in next years, so that the country achieved target of strategy Europe 2020 until the year 2020.

2 RESEARCH AND DEVELOPMENT FUNDING IN SLOVAKIA

Until recently, the issue of economy competitiveness was deal with Lisbon Strategy for growth and jobs, whose primary target was, that the EU should become (by the year 2010) most competitive and most dynamic knowledge-based economy in the world, capable of sustainable economic growth in which will be more and better jobs and greater social cohesion [7]. Mentioned document, adopted also by Slovakia, was also focused on improving living standards of citizens of the EU, through the support of R&D funding.

Up to the original Lisbon Strategy, which expired in 2010, has followed a new strategy developed by the European Commission called Europe 2020. As in the Lisbon Strategy, also in Europe 2020, the European Commission identified key objectives to which the fulfilment would occur by 2020 to achieve desired growth and progress in individual Member States, as well as in the European Union.

For the purpose of this article is major the second target about investment into R&D, i.e. GERD, according to which expenditure should growth by 2020 to 3 % of GDP (average value for European Union) because the promotion of basic and applied R&D creates a strong presumption for building the knowledge economy, contributes to employment growth, improves quality of life, solves social problems and also contributes to the economic growth of the euro area. From mentioned 3 %, at least 2/3 should come from business enterprise sector and 1/3 of funds from government sector.

From the EU Member States Denmark achieved its target (3 % GDP) in 2014 (Figure 1). Near the target value were Cyprus, Germany, Italy and even Slovakia. In 2014 the value of GERD increased in our country to 0,89 % GDP and the target value is 1,2 %. On the other hand, from EU countries most leg behind the target Romania (1,62 %), Estonia (1,54 %) and Portugal [3].

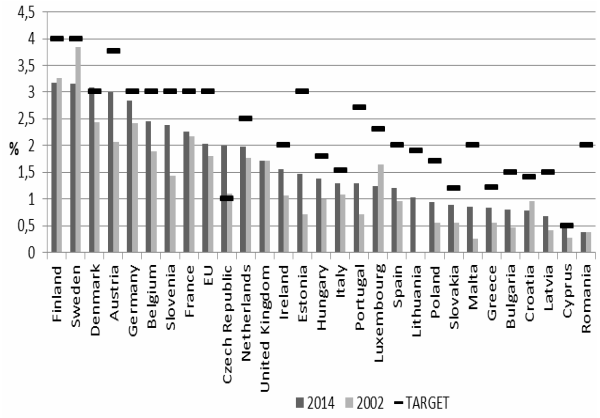

Fig. 1 The share of expenditure on R&D to GDP in EU Member states and their target values
Source: Self elaboration according to the data from Eurostat

In Figure 2, we can observe the development of the share of expenditure invested in R&D to GDP over the years 2002 – 2014 for European Union and Slovakia, as well as targets that should be reached by 2020. Slovakia, as well as the European Union as a whole is well below the set target. The Union should increase the share of expenditure on R&D to GDP by 0,97 %.

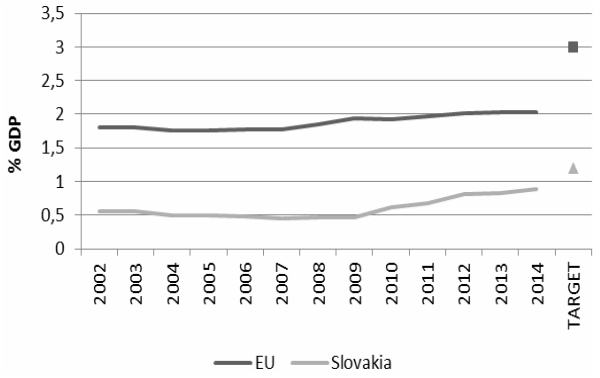

Fig. 2 The share of expenditure on R&D to GDP (in %)
Source: Self elaboration according to the data from Eurostat

Not a very positive trend in funding of R&D can be seen in the EU, where in recent years, there is a decrease, respectively stagnation. In 2010 GERD was only 2,00 % of GDP and in 2014 only 2,03 %. The cause was and always is a number of Member States, especially from a group called catching up countries, which display a lack of activity in this area, and thereby hinder the fulfilment of the target of the Europe 2020.

Despite the fact that GERD in Slovakia have long been below the EU average value, their share of GDP in recent years growing slightly. The situation is still very unfavourable, because significant economic growth in the pre-crisis period did not contribute to increase the share of expenditure on R&D in relation to GDP. In 2002, the value of the indicator was 0,57 % of GDP, to the year 2009 gradually declining to 0,48% of GDP. Since 2009, the value of indicator grow slowly to 0,89 % of GDP in 2014.

3 THE STRUCTURE OF GERD BY SOURCE OF FUNDS IN SLOVAKIA

GERD comes from three main sources: business enterprise sector, government sector and funds received from abroad and from two secondary sources, i.e. the resources from higher education sector and private non-profit sector. In this part of the article we will therefore follow, how Slovakia met the intermediate target of Europe 2020, concerning the structure of expenditure on R&D, i.e. 2/3 of resources should come from business enterprise sector and 1/3 from government sector.

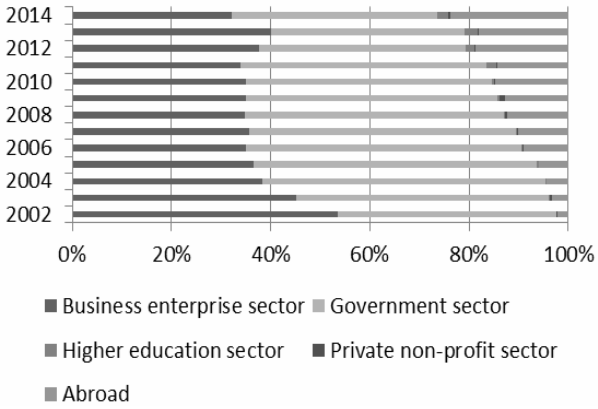

Fig. 3 GERD by source of funds
Source: Self elaboration according to the data from Eurostat

During recent years, the proportion of expenditure on R&D of its own corporate resources (business enterprise sector) in total GERD significantly decreasing, i.e. decrease of 53,6 % in 2002 to 32,2 % in 2014 (Figure 3). For the comparison, the average value for European Union is 55 %. On the other hand, government spending and also resources from abroad on R&D in the period increased. Expenditure of private non-profit sector and the higher education sector in this period were only a small proportion of total GERD, i.e. higher education sector 2,2 % and non-profit sector only 0,5 % of total expenditure invested to R&D in 2014.

The structure of expenditure in this area develops in the opposite direction, as it is required by Europe 2020. Business resources were only one third (32,2 % of total expenditure in 2014). In most cases Slovak enterprises are unable to compete with foreign companies or enterprises which dispose of new

technologies and sufficient equity to finance research, development and thus innovation. Entry of Slovakia to the European Union positively affected the flow of foreign resources into the country to support R&D, which increased from the year 2002 by 21,6 %. The share of total abroad expenditure on GERD in 2014 was 23,7%.

4 THE SIMULATION OF THE DEVELOPMENT OF GERD UNTIL THE YEAR 2020

If the Slovakia would like to fulfil target value of 1,2 % of GED until the year 2020, it is essential that the growth rate of R&D expenditure in the next few years rose considerably. It is difficult to assume major changes in this area, so after extensive analysis, in our view it seems to be the best to choose for the simulation of expenditure growth in relation to GDP the polynomial functions of 3rd range:

$$y = -0{,}0005\,x^3 + 0{,}0173\,x^2 - 0{,}131x + 0{,}7342$$

$$R^2 = 0{,}9702$$

Its graphic interpretation is shown on figure (Figure 4).

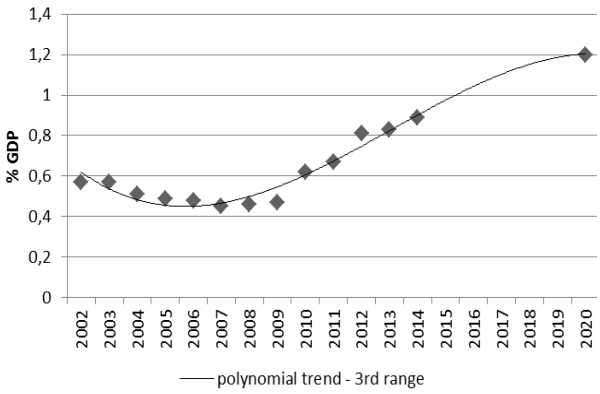

Fig. 4 Simulation of required growth of the indicator in Slovakia until 2020
Source: Self elaboration

If the share of expenditure on R&D on GDP should be 1,2 % until the year 2020, their development should have the values listed in the table below (Table 1). We presume that in following years due to persistence of the negative impacts of economic and financial crisis the funding of R&D will be limited. Gradually the share of R&D expenditure in relation to GDP should grow faster [9]. This objective draws attention to the need to increase the amount of funds invested in R&D, not only by the public but also the private sector. These expenditure support innovation activities in enterprises and industries by creation new product and service, or by improvement product and service quality, which will contribute to an increase in innovation performance across the country.

Table 1. Expected growth of expenditure on R&D in Slovakia (% of GDP)

Year	2015	2016	2017	2018	2019	2020
Expenditure on R&D (% of GDP)	0,92	1,05	1,14	1,17	1,19	1,20

Source: Self elaboration

5 CONCLUSION

Continuing negative impacts of economic crisis and also current global crisis influenced all sectors of the economy. This resulted in a lack of financial resources in support of improving the situation in sectors and their return to pre-crisis period. The lack of financial resources has been also in the area of research and development which is the basis of innovation activities and technology transfer. These activities can positively contribute to improve the situation in enterprises and in whole economy, to increasing their competitiveness and thus to support the economic development. Therefore, in following years, it will be important to increase emphasize on the financing of R&D so that their share on GDP will rise and it will converge to the target values (1,2% of GDP) of the strategy Europe 2020.

One of the reasons for lagging Slovakia behind the developed countries is that the major Slovak companies are more like "assembling" businesses that don't realize their own engineering. In Slovakia are automobile factories such as Volkswagen Slovakia, Slovakia PSA Peugeot Citroen and KIA Motors Slovakia Ltd. as manufacturing and assembling factories, but where is no realization of its´ own research, development and innovation activities. These factories produce cars, respectively components for cars under the strict regulatory requirements and standards from parent companies resident abroad.

Generally, in the current period are innovation in Slovakia realized by business sector based on the use of existing technologies from abroad, not to use the knowledge of their own research [5]. Firms innovate mostly by purchases of machinery and equipment from abroad and they suit them to production process or completely replaced this process by new technologies. Innovation based on the use of their own R&D and results of R&D developed by domestic research institutions are made only in limited extent.

REFERENCES

[1] EUROPEAN COMMISSION, 2010. Communication from the Commission, Europe 2020, A strategy for smart, sustainable and inclusive growth. Brussels: European Commission, from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:SK:PDF

[2] EUROPEAN COMMISSION, 2010a. Review of the Lisabon Strategy. Brussels: European Commission, from http://www.euroinfo.gov.sk/data/files/1381_lisbon_strategy_evaluation_sk.pdf

[3] EUROPEAN COMMISSION, 2014. Europe 2020 indicators. [online], from http://epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators

[4] EUROPEAN COMMISSION, 2015. Eurostat [online], from http://ec.europa.eu/eurostat/web/europe-2020-indicators/europe-2020-strategy/main-tables

[5] GONTKOVIČOVÁ, B. - RUČINSKÝ, R., 2014. Konkurencieschopnosť regiónov a priame zahraničné investície. In XVII. mezinárodní kolokvium o regionálních vědách: sborník příspěvků, Hustopeče, 18. - 20. června 2014. Brno: Masarykova univerzita, ISBN 978-80-210-6840-7. s. 143-149.

[6] LAW 172/2005 - Zákon č. 172/2005 Z.z. o organizácii štátnej podpory výskumu a vývoja a o doplnení zákona č. 575/2001 Z. z. o organizácii činnosti vlády a organizácii ústrednej štátnej správy v znení neskorších predpisov

[7] MINISTRY OF FINANCE SR. 2005. Stratégia konkurencieschopnosti Slovenska do roku 2010, Národná lisabonská stratégia, 2005, from http://www.rokovania.sk/appl/material.nsf/0/94ECDFEF0E61564AC1256FA50033DFB9/$FILE/Zdroj.html

[8] OECD. 2002. Frascati Manual, Paris, 2002. 423 p., from http://stats.oecd.org/glossary/detail.asp?ID=1162

[9] SPIŠÁKOVÁ, E., 2013. Influence of the economic crisis on the fulfillment of the target of Strategy Europe 2020 in the area of research and development. In: R. Mirdala, ed. 2013. Financial aspects of recent trends in the global economy. ASERS Publishing. Ch.2. pp. 34-53.

AUTHORS ADDRESSES

[1] Ing. Emília Duľová Spišáková, PhD.

University of Economics in Bratislava
Faculty of Business Economy with seat in Košice,
Tajovského 13, 041 30 Košice, Slovakia

E-mail: emilia.spisakova@euke.sk