СЕКЦІЯ 3

«ІННОВАЦІЙНА ЕКОНОМІКА ТА ІННОВАЦІЙНИЙ МЕНЕДЖМЕНТ: СУЧАСНІ ТЕНДЕНЦІЇ ТА ВЗАЄМОВПЛИВ»

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RESEARCH WORK AS A FACTOR OF SUCCESSFUL DEVELOPMENT

ABSTRACT. Efficient innovation policy and adequate investment in scientific research are a starting point for the sustainable development of a country. A prerequisite for sustainable development in any country is the development of indigenous scientific and technological capacity, as well as investment in innovation, research and development.

KEY WORDS: Science, Research, Development

Introduction

Innovation, research and development are a key factor in industrial competitiveness, along with the knowledge and entrepreneurship. In this sense, innovation is perceived as a foundation for the transition to a society based on knowledge, and innovation policy is the most important strategic tool in achieving industrial competitiveness and the factor in the maintenance and stimulation of the economic growth. The Lisbon Agenda, respectively the EU strategy on becoming «the most dynamic knowledge economy by 2010» (European Council, 2000) is based on this very idea that innovation is a system that involves the interaction of science, education and the economy, so-called. «Research Triangle».

Research and Discussion

Science and technology play an important role in the development of the world economy because they are integral elements of the

productive forces, and a long-term commitment of the society towards the development of technology is one of the most important areas of economic policy. Modern technological advances are a powerful means of competition in developed countries, the basis of their monopoly position in many areas of international relations and the basis for the division of countries within the world economy on a highly developed and underdeveloped1. The role of the socio-economic and institutional context is key, because it supports or stops, speeds up or slows down the realization of the research triangle, or the operation of the innovation system.

EU, among other things, defined two priorities in 2000. as a part of a series of strategic development reforms expressed through a joint document of the Lisbon strategy2 for science, technology development and innovation:

1) the total investment in this area by 2010. is brought to the level of 3 % of GDP and 2) 2/3 of these investments come from the industry.

The European Council issued a call for the countries of the old continent to increase investment in research and development to 3 % of GDP in 2005. Two years later, the Action Plan which was related to an increased level of investment in research and development, was adopted in Barcelona. As a result, the budget for research and development in many countries has rapidly increased, and this was one of the reasons why, in the crisis period 2007-2010. when many countries have recorded a decline in GDP, expenditures on scientific-research work remained at approximately the same level and did not accompany decrease in GDP.

Table 1 shows that in 2010., only Sweden spent more than 3 % of GDP for scientific research, while Germany and Denmark achieved approximatelly that percentage. The EU average is slightly below 2 % of GDP, and apart from the already mentioned countries, only France, Belgium and Slovenia spent for the scientific research above the average in 2010.

The high growth rate of expenditures for scientific research from 10.7 % in Slovenia and 8.6 % in the Czech Republic from 2002-2008. influenced the recovery of the economy from the effects of the economic crisis in 2008, so the significant increase in the rate of GDP

[1] Kokeza G. Transfer of technology as a factor of social and economic development –The Faculty of Technology and Metallurgy, Belgrade, 2008, p.52.

[2] Report from the High Level Group chaired by Wim Kok, Facing the challenge, The Lisbon strategy for growth and employment, November 2004., ISBN 92-894-7054-2 (20.07.2015.)

growth was recorded in 2010., compared to 2009. Serbia allocated for science and research about 0.3 % of GDP, which is far below the European average, but also far below the average of its nearest neighbors, Croatian, Slovenian and Hungarian, and the growth rate of these expenditures of 1 % in the period of 2002-2008., is among the lowest in the EU.

Table 1

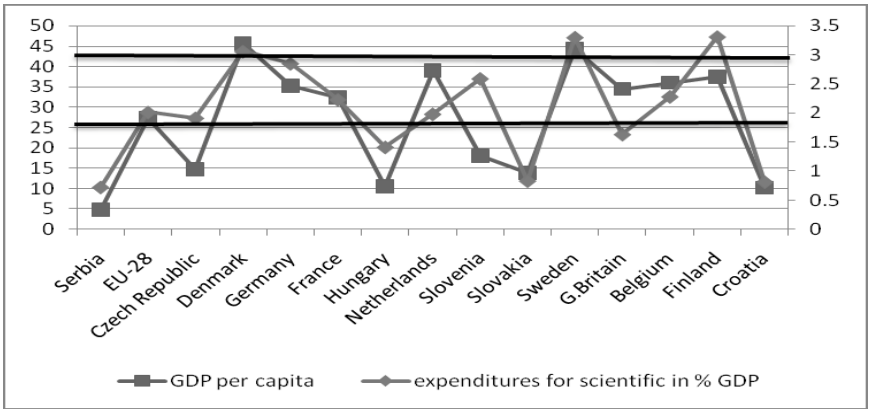
GROWTH RATE OF GDP AND SCIENTIFIC RESEARCH EXPENDITURES, IN % OF GDP, THE GROWTH RATE OF EXPENDITURES FOR SCIENTIFIC RESEARCH IN SELECTED EU COUNTRIES AND SERBIA, IN THE PERIOD 2007—2010.

Country	Growth rate of GDP				Growth rate of expenditures	Growth rate of expenditures for scientific research (in % GDP)			
	2007	2008	2009	2010	2002-08	2007	2008	2009	2010
EU-27 average	3,2	0,3	–4,3	2,0	3,3	1,85	1,85	1,92	1,93
Czech Republic	5,7	3,1	–4,7	2,7	8,6	1,48	1,41	1,48	1,34
Denmark	1,6	–0,8	–5,8	1,3	2,9	2,58	2,85	3,06	2,94
Germany	3,3	1,1	–5,1	3,7	2,6	2,53	2,69	2,82	2,72
France	3,0	–0,2	–3,3	–3,5	0,5	2,08	2,12	2,26	2,18
Hungary	0,1	0,9	–6,8	1,3	4,3	0,98	1,0	1,17	1,15
Netherlands	3,9	1,8	–3,5	1,7	1,5	1,81	1,77	1,82	1,72
Slovenia	6,9	3,6	–8,0	1,4	10,7	1,45	1,65	1,86	2,06
Slovakia	10,5	5,9	–4,9	4,2	3,2	0,46	0,47	0,48	0,62
Sweden	3,3	–0,6	–5,0	6,1	2,3	3,40	3,70	3,61	3,22
Great Britain	3,5	–1,1	–4,4	2,1	3,7	1,78	1,79	1,86	1,69
Belgium	2,9	1,0	–2,8	2,3	2,8	1,89	1,97	2,03	2,05
Spain	3,5	0,9	–3,7	–0,1	8,4	1,27	1,35	1,39	1,35
Norway	2,7	0,0	–1,7	0,7	1,1	1,62	1,61	1,80	1,65
Serbia	5,4	3,8	–3,5	1,0	1,0	0,30	0,29	0,28	0,28
Croatia	5,1	2,2	–6,0	–1,2	2,5	0,80	0,89	0,83	0,74

Source: http://appsso.eurostat.ec.europa.eu (22.01.2015.)

In the coming years, EU countries have slightly increased allocations for scientific research, so that in 2013. the planned allocation for scientific research reached Finland (3.34 % of GDP), Sweden (3.30) and Denmark (3.06), and that level have converged Germany (2.85), France (2.23), Slovenia (2.59) and Belgium (2.28 % of GDP), which is above the EU average in 2013. amounted to 2.01 % of GDP. Other countries have allocations for scientific research which are far below the level determined by the Lisbon strategy, but also below the EU average. Serbia is among them, with allocations that have increased significantly compared to 2010., but still at a very low level of 0.72 % of GDP. Allocations for science and technology are directly related to the development indicators of the national economy, and in the following chart we can see that countries which allocate more for research and development have a higher GDP per capita.

Graph 1. Allocations for scientific research, in % of GDP and GDP per capita, in selected countries of the EU and Serbia, 2013



Source: http://appsso.eurostat.ec.europa.eu (22.01.2015.)

What distinguishes developed and underdeveloped countries of the world, countries that are developing rapidly and those that are developing slowly, first of all, is the economic structure. High technology products, based on knowledge and modern achievements, are a prerequisite for economic development in the long term way. Thus, the importance of investing in knowledge, technology and innovation is more emphasized. Research and development sector and the educational system are crucial to the economic development

process. Innovation system, understood as a set of institutions and their interaction aimed at creating new knowledge and the application of the existing, becomes a part of the infrastructure of any modern economy, just as in past centuries were railways, highways, telecommunication networks, distribution of electricity and the like.

It is obvious that the first objective of the Lisbon strategy was not achieved as well as the second one, that of a total amount of allocations for science, only 1/3 should be provided from the budgets of European countries and the EU, and 2/3 should be provided on the basis of investments of the private sector in research activities. Although all European countries aren't close to achieving this goal, the European average in 2010. shows that in the case of EU-27 only 34.6 % of allocations for science come directly from the budget, 54 % from the economy, and 10.6 % from other national and international sources.

Table 2

COSTS OF RESEARCH AND DEVELOPMENT BY SECTORS IN SELECTED EU COUNTRIES, JAPAN, THE UNITED STATES AND SERBIA, IN % OF TOTAL SPENDING ON RESEARCH AND DEVELOPMENT, 2010. AND 2013

Country	2010		2013	
	Sector of companies	Public sector	Sector of companies	Public sector
EU — 27 average	53,9	34,6	55,0	32,8
Hungary	47,4	39,3	46,8	35,9
Croatia	38,8	49,2	42,8	39,7
Czech Republic	48,9	39,9	37,6	34,7
Netherlands	45,1	40,9	47,1	34,3
Slovenia	58,4	35,3	63,8	26,9
Slovakia	35,1	49,6	40,2	38,9
G.Britain	44,5	32,3	46,5	27,0
France	53,5	37,0	55,4	35,0
Germany	65,6	30,3	66,1	29,2
Austria	44,7	38,7	44,1	39,1
Denmark	60,7	27,1	59,8	29,3
Finland	66,1	25,7	60,8	26,0
Sweden	58,8	27,5	61,0	28,2
Belgium	58,6	25,3	60,2	23,4
Japon	76,1	17,7	76,5	16,4
USA	61,6	31,3	59,1	30,8
Serbia	39,2	47,2	35,9	59,5

Source: http://epp.eurostat.ec.europa.eu (21.01.2016.)

In 2013, this ratio in most countries improved in favor of the private sector, so that the EU average is 55 % from the sector of companies and 32.8 % from the public sector. Some countries, such as USA, Finland, Denmark and Germany reached a level where investment from commercial sources in science amounts to 2/3 of the total investment in the field of science,in 2010., as shown in the previous table. In Japan, the share of the private sector reached the record of 76.1 % and still grows. Even in the countries of our region, there are significant private sector investments in science. In Slovenia, even 63.8 % of all investments in science come from industrial sources, while in the Czech Republic and Hungary a decline has been recorded compared to 2010. Research activities do not take place only at universities and national research institutes, and thanks to such incidents, the recruitment of a large number of scientists in the private sector has been enabled, where some of the most advanced global researches take place[1].

Conclusion

EU defined two priorities in the framework of the Lisbon Strategy in 2010: the total investment in the field of science by the year 2010. should be brought to the level of 3 % of GDP and that 2/3 of these investments come from the industry. By 2010., the European average was 2 % of GDP, and the most developed EU countries reached and exceeded the level of 3 %, while realizing the second objective.

Budgetary investments in science in Serbia are far below the European average and significantly below the investments in neighboring countries. Apart from low values the trend is problematic, too, which is in contrast with the growing trends of investments in EU countries and neighboring countries.

The Republic of Serbia set as its principal objective that allocations for science, beyond infrastructure, reach 1 % of GDP by 2015., for the period of 2010-2015. We started with less than 0.2 % in 2000., so we can conclude that there is a real rise of investment in science. Our objective has to be the same as the objective of the European Union — 3 % of GDP, 1 % of the budget, and the rest of the market. Of course, if the economy in our country develops the funds invested in science outside the budget will be thus increased. There are many reasons why every country requires science and why small countries should have theirs, they can't only use the achievements of the developed countries and they have to be aware of that.

[1] Povrenović D. — Analysis of innovation activities in Serbia, Belgrade: Institute for Intellectual Property, 2011, p.20.

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ІНТЕЛЕКТУАЛЬНИЙ КАПІТАЛ ЯК ОСНОВА ІННОВАЦІЙНОГО РОЗВИТКУ КОМПАНІЙ СФЕРИ ВИСОКИХ ТЕХНОЛОГІЙ

АНОТАЦІЯ. Розглянуто роль і значення інтелектуального капіталу в інноваційному розвитку компаній, що працюють у сфері високих технологій. Наведено фінансові показники компаній і вартість