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Procedia - Social and Behavioral Sciences 207 (2015) 690 – 699

Procedia Social and Behavioral Sciences

11th International Strategic Management Conference 2015

Competitiveness Gap of the European Union Member Countries in the Context of Europe 2020 Strategy

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Abstract

This paper is addressing issues of the competitiveness gap of the European Union member countries in the context of Europe 2020 strategy's smart growth. Authors are examining current competitiveness situation when economic performance of some countries are significantly better than others and how does it fit in the competitiveness framework set by Europe 2020 strategy. To have a closer look at the smart growth of European Union member countries authors examine R&D expenditures and their impact on patents and high-technology share in exports as one of the indicators of the competitiveness.

Keywords: Competitiveness, European Union, Research and Development, Patent

1. Introduction

Europe 2020 is the European Union's ten-year growth and jobs strategy that was launched in 2010. It is about more than just overcoming the crisis from which our economies are now gradually recovering. It is also about addressing the shortcomings of our growth model and creating the conditions for a smart, sustainable and inclusive growth (European Commission 2010). European Union's competitiveness issue is still very topical despite a fact that Lisbon Strategy proved to be very difficult to implement and reach a target of the most competitive region in the world (Natali 2010; Tausch 2010). Being most competitive region in the world is still on the agenda of the European Union and roadmap of achieving it is enclosed in the Europe 2020 strategy.

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doi:10.1016/j.sbspro.2015.10.139

2. Current Competitiveness Gap of the European Union Member Countries

Before addressing smart growth issues of the European Union we have to take a closer look at the current competitiveness of the European Union member countries to identify current economic performance and challenges in the post financial and economic crisis period. European growth has been disappointing in the past two decades. Europe failed to catch up with the US in factor productivity, and is growing slower than the US economy in and after the financial crisis. While Europe has a balanced external trade and relative stable export market shares, this is not the case for many EU Member countries and not for sophisticated industries. Competitiveness has increasingly gained currency across the globe. The international trade theories explain that different countries have different comparative advantages. Thus, if a country is rich in natural resources or capital, it has a comparative advantage over the others (du Granrut 1991; Porter 1990, 2007). However, in the current knowledge economy, knowledge as a resource has no natural home base and can be transferred easily anywhere in comparison to natural resources. This has made the XXI century more and more competitive (Pillania 2009). Competitiveness and country competitiveness rankings have increasingly become important and various studies are carried out on the subject. While competitiveness of enterprises has been studied by many scholars around the world, competitiveness of nations is a relatively new discipline (Garelli 2006). There are two internationally well recognized and popular annual rankings on the competitiveness of countries, namely Global Competitiveness Rankings and World Competitiveness rankings. The concept of competitiveness thus involves static and dynamic components: although the productivity of a country clearly determines its ability to sustain a high level of income, it is also one of the central determinants of the returns to investment, which is one of the key factors explaining an economy's growth potential (Schwab 2014). Competitiveness of the countries can be measured with different methods and criteria. One of the widely accepted methodology in compering competitiveness is carried out by Claus Schwab in Global Competitiveness Report (Schwab 2014). Methodology is based on measuring different areas of performance – so called 12 pillars (Fig 1).

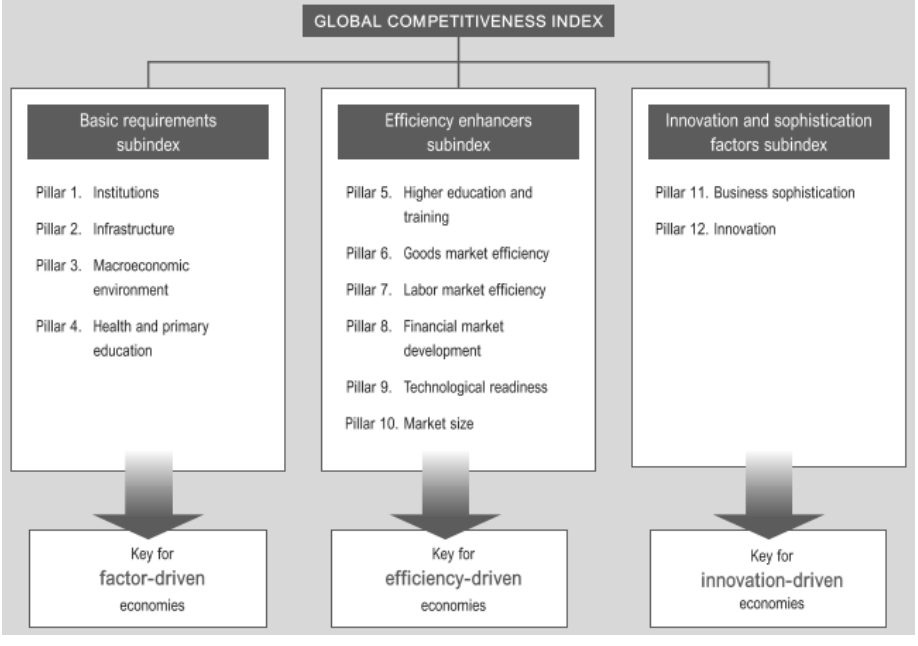

Fig 1. The Global Competitiveness Index Framework (Schwab 2014)

The determinants of competitiveness are many and complex. For competitiveness ranking of the countries, Global Competitiveness Report introduces the Global Competitiveness Index (GCI). The GCI captures this open-ended dimension by providing a weighted average of many different components, each of which reflects one aspect of the complex reality that we call competitiveness. When we look at the scores and ranking in the report, we will find a methodology which awards certain value in every category from 1 to 7. Countries are ranked based on each countries performance and value achieved (Fig 2).

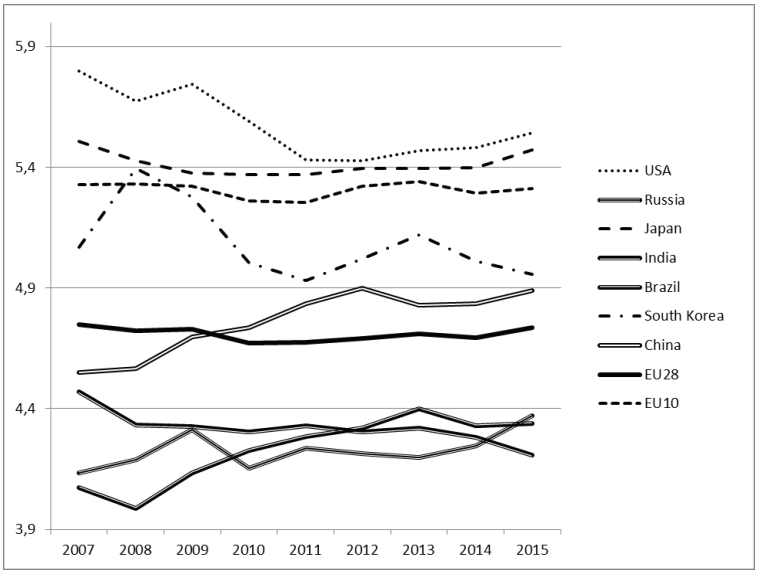

Fig 2. Competitiveness Performance of the Selected Countries and European Union, Score (1 - 7) (Schwab, 2014, Authors)

In Fig 2 authors has selected seven other countries (USA, Japan, China, South Korea, India, Brazil and Russia) to compare EU with. Authors are addressing a certain competitiveness issues of the European Union. It was already mentioned that EU is a union of 28 countries with different performance, than if we take into account average value of the score of the EU28 countries, results show that USA, Japan, South Korea and China has higher score. Of course, if we would take only the best EU performers (with score above 5), than we would take into account performance of only 10 EU Member countries (EU10): Austria, Belgium, Denmark, Finland, France, Germany, Luxemburg, Netherlands, Sweden and United Kingdom (Fig 2). Fig 2 shows that according to the Global Competitiveness Report (Schwab 2014) United States of America in our selected group of the countries has the highest score which decreased during financial crisis after 2008. Very steady performers turned out to be Japan and EU 28 (EU 10 as well). China and India over last 8 years has showed very rapid growth and improvement of the scores in the Global Competitiveness Report. If we take into account results of the EU10, results are much better and closer to USA and Japan. But that's just highlights one of the big challenges EU has – cohesion of the differences within European Union. EU has enlarged in the recent years rapidly (2004 and 2007 Eastern enlargements with Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Cyprus and Malta in year 2004 following by Romania and Bulgaria in year 2007 and Croatia in year 2013) by accepting less well performing countries to the Union, which, off course, brings certain corrections to the average scores in any rankings. After 2004 enlargement the less developed nature of these countries was of concern to some of the older EU Member states, who placed temporary restrictions on the rights of work of the citizens of these states to their countries. The movement westward of some of

the labour force of the newly acceded countries that occurred in the aftermath of the enlargement initially spawned clichés among the public opinion and media of some western countries, despite the generally conceded benefit to the economies concerned. In the Global Competitiveness Ranking Innovation driven economies are determined by Business sophistication and Innovation. While one of the most important measures to reflect countries commitment for innovation is expenditures for research and development, Global Competitiveness Report is using composite indicator to measure 12. pillar "Innovation" (Fig 3).

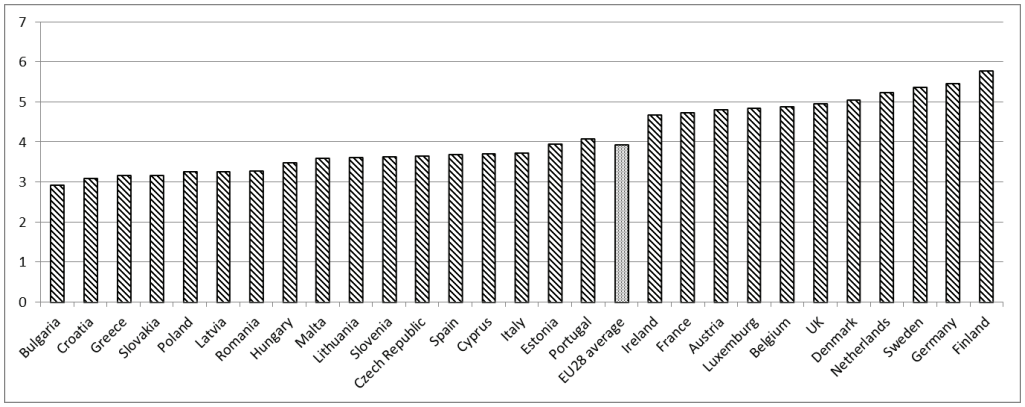

Fig 3. Performance of the European Union Member Countries in the "Innovation" Pillar, Score (1 - 7) (Schwab, 2014, Authors)

This composite indicator consists of seven sub-criteria: Capacity for innovation, Quality of scientific research institutions, Company spending on R&D, University-industry collaboration in R&D, Government procurement of advanced tech products, Availability of scientists and engineers, PCT patents, applications/million population. Based on "Innovation" criteria we can see in the Fig 3 that most innovative EU member countries are Finland, Germany, Sweden, Netherlands, Denmark and UK. And at the other end of the graph we can identify mostly the countries that were accepted to the EU after year 2004. And once again we can see differences in the countries' performance that can lead to impact of the average scores.

Innovation as a key factor in the international competitiveness is addressed in one of the previous papers (Priede and Pereira 2013) where as one of the indicators was used total expenditures on research and development as a percent from GDP. World leader in expenditures on research and development is South Korea with 4% from GDP. Following South Korea are Japan with 3,4% and US with less than 3%. European Union is spending around 2% from the GDP. This result is far from the Europe2020 strategic target – 3% (Fig 4).

But as we already discussed, EU is not homogeneous and some countries are performing better than average: Finland, Sweden and Denmark already fulfils 3% target. For example, larges EU economy – Germany spends 2,84% from the GDP and is very close to 3%. And as a consequence of commitment to investment in the research and development latest Innovation Union Scoreboard (European Commission 2014a) considers exactly these four countries to be Innovation leaders in the European Union (Fig 5).

The Innovation Union Scoreboard 2014 gives a comparative assessment of the innovation performance of the EU Member States and the relative strengths and weaknesses of their research and innovation systems.

It monitors innovation trends across the EU Member States.

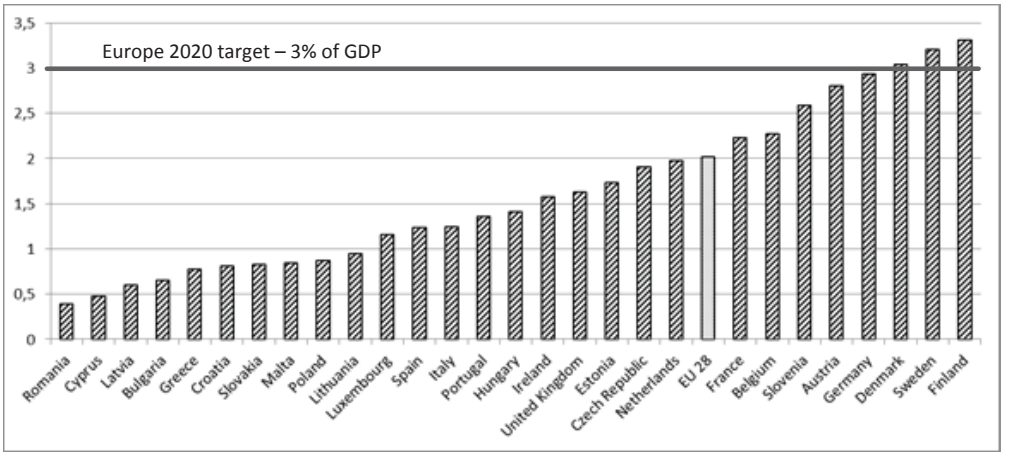

Fig 4. Gross Domestic Expenditure on R&D, % of GDP (Eurostat, Authors)

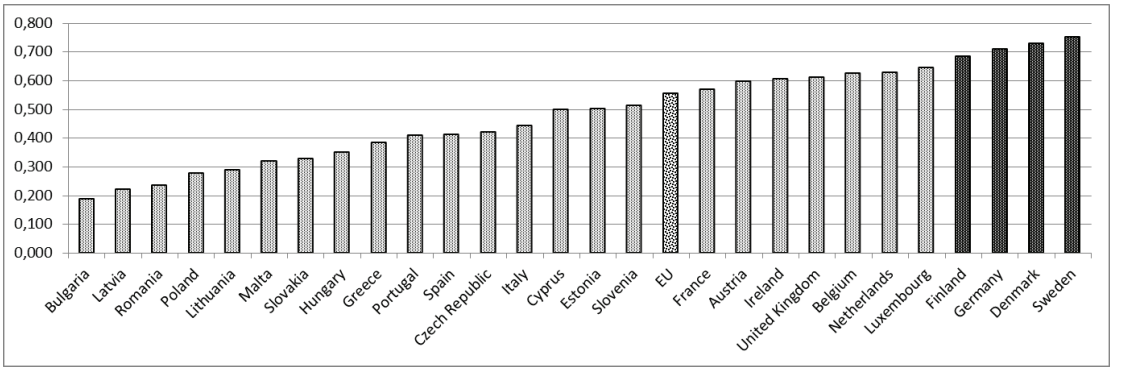

Fig 5. EU Member States' Innovation Performance (European Commission 2014b)

The Innovation Union Scoreboard distinguishes between 3 main types of indicators – Enablers, Firm activities and Outputs – and 8 innovation dimensions, capturing in total 25 indicators, like Human resources, Open, excellent and attractive research systems, Finance and support, Firm investments, Linkages & entrepreneurship, Intellectual assets, Innovators and Economic effects.

3. Smart Growth, R&D and its Impact on Patents and High-tech Export

The Europe 2020 strategy is about delivering growth that is: smart, through more effective investments in education, research and innovation; sustainable, thanks to a decisive move towards a low-carbon economy; and inclusive, with a strong emphasis on job creation and poverty reduction. The strategy is focused on five ambitious goals in the areas of employment, innovation, education, poverty reduction and climate/energy (European Commission 2010).

EU targets for smart growth include: 1. combined public and private investment levels to reach 3% of EU's GDP as well as better conditions for R&D and Innovation; 2. 75% employment rate for women and men aged 20-64 by 2020–

achieved by getting more people into work, especially women, the young, older and low-skilled people and legal migrants; 3. better educational attainment – in particular: – reducing school drop-out rates below 10%; – at least 40% of 30-34–year-olds with third level education (or equivalent).

Many authors stress the importance of the innovation in the development of competitiveness and export performance with evidence from different countries and product groups (Gatto et al. 2011; Jarreau and Poncet 2012; Kaimakoudi, Polymeros, and Batzios 2014; Nachum, Jones, and Dunning 2001; Sandu and Ciocanel 2014; Silgoner et al. 2015; Tomáš 2011; Xiong and Qureshi 2013; Xu 2010) and authors in further analysis will concentrate analysis on the importance of the R&D and its impact on competitiveness and export performance taking into account assessment models developed in the literature (Gittleman and Wolff 1995; Lefebvre, Lefebvre, and Bourgault 1998; Di Mauro et al. 2005; Priede and Pereira 2013; Sandu and Ciocanel 2014; Smith 2002). Smith has stressed in 2002 that public policies for science, technology and innovation have attracted increased attention as a result of claims that knowledge-intensive industries are now at the core of growth, and that we are now entering a completely new form of 'knowledge society' (Smith 2002) and knowledge based economy development is still topical and included into Europe 2020 strategy. Rodriguez-Pose and Crescenzi in 2008 tested the impact of innovation on regional economic performance in Europe by using three approaches: (1) the analysis of the link between investment in research and development (R&D), patents, and economic growth; (2) the study of the existence and efficiency of regional innovation systems; and (3) the examination of the geographical diffusion of regional knowledge spillovers (Rodríguez-Pose and Crescenzi 2008). Authors in this article will test necessity of investment in research and development and outcomes – impact on the patents and high-technology goods export share in total exports.

First, authors examined relation between investment in research and development and obvious outcomes – patents (Fig 6). The objective of patent rights is to foster innovation and economic growth. Many researches have been done in the area to prove this statement to be right. Stronger patent rights are associated with faster growth in more patent-intensive industries, and the effect is larger in higher-income countries (Hu and Png 2009, 2013). Hasan and Tucci in 2010 in a panel of 58 countries over 1980–2003 observed that economic growth increased with R&D expenditure and the stock of patents (Hasan and Tucci 2010). Many other authors have examined importance of the patents in the development of the economy (Chu, Leung, and Tang 2012; Gould and Gruben 1996; Iwaisako and Futagami 2013; Zeira 2011). Fig 6 gives general information about influence form the investment in research and development and impact to the number of patents. Regardless of the behaviour of the individual EU member countries (some negative relation can be observed over the years) we can observe a positive relation – higher investment in research and development in general leads to more patents. Investment in research and development leads to more inventions, more patents and eventually to more high-technology. Authors examined a relation between investment in research and development and high-technology goods share in total exports (Fig 7). As we see in Fig 7, in general certain trend can be observed in the data – higher gross domestic expenditures on research and development lead to higher high-technology exports. If we take a closer look at the data, we see several interesting observations. One of them is response behaviour of individual countries. In theory, higher gross domestic expenditures on research and development would lead to more patents and that would lead to mere high-technology exports. If we can observe very strong relation between gross domestic expenditures on research and patent applications (Fig 6) then individual EU member countries based on the relation analysis between gross domestic expenditures on research and high-technology exports show positive and negative relations.

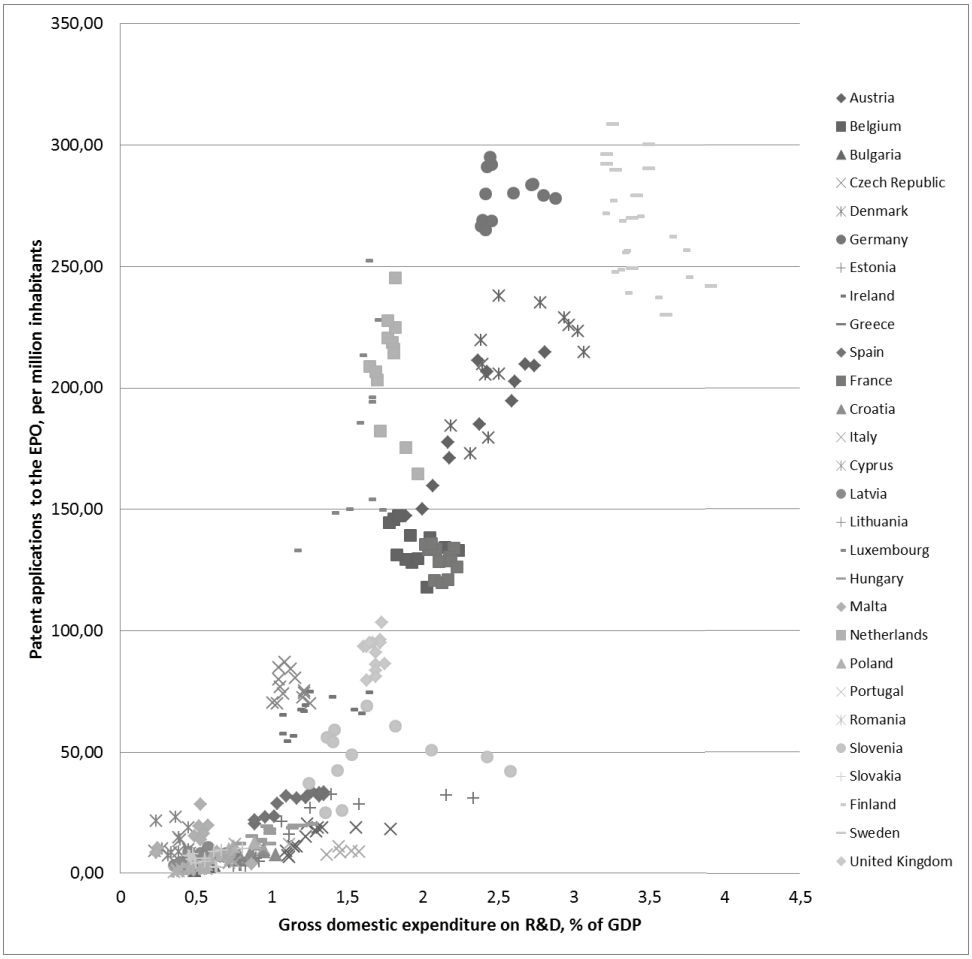

Fig 6. Relation Between Expenditure on R&D and Patent Applications in the European Union (Eurostat, Authors)

Positive gross domestic expenditures on research and development and high-technology exports relation can be observed in Belgium, Bulgaria, Croatia, Czech Republic, France, Greece, Latvia, Lithuania, Luxemburg, Netherlands, Poland, Romania, Slovakia, Slovenia, Sweden and United Kingdom. Negative gross domestic expenditures on research and development and high-technology exports relation can be observed in Austria, Denmark, Finland, Germany, Hungary, Ireland, Italy, Malta, Portugal and Spain. Negative relation at first site is unusual since many of these countries came very high with patent scores – patents per million inhabitants (In year 2012: Germany – 278,17; Finland – 270,55; Denmark – 223,24; and Austria – 214,59, compared to EU28 score – 108,55). But this result can be explained with the help international trade theories and international product life cycle theory in particular developed by Vernon and his associates – particularly Wells (Ayal 1981; Wells 1968). International product life cycle theory explains production location and market location depending on life cycle of the product. This theory explains that production of the high-technology products occurs only in the product introduction cycle and with product growth it is moved to other industrial countries and developing countries at the decline cycle. For example, according to The World Bank data, China has more than 26% share of high-technology goods in total exports. This partially explains negative relation of the developed countries. Another explanation would be separate cases of each country. For example, Finland in the past decade has lost high-technology share with the case of Nokia phone division.

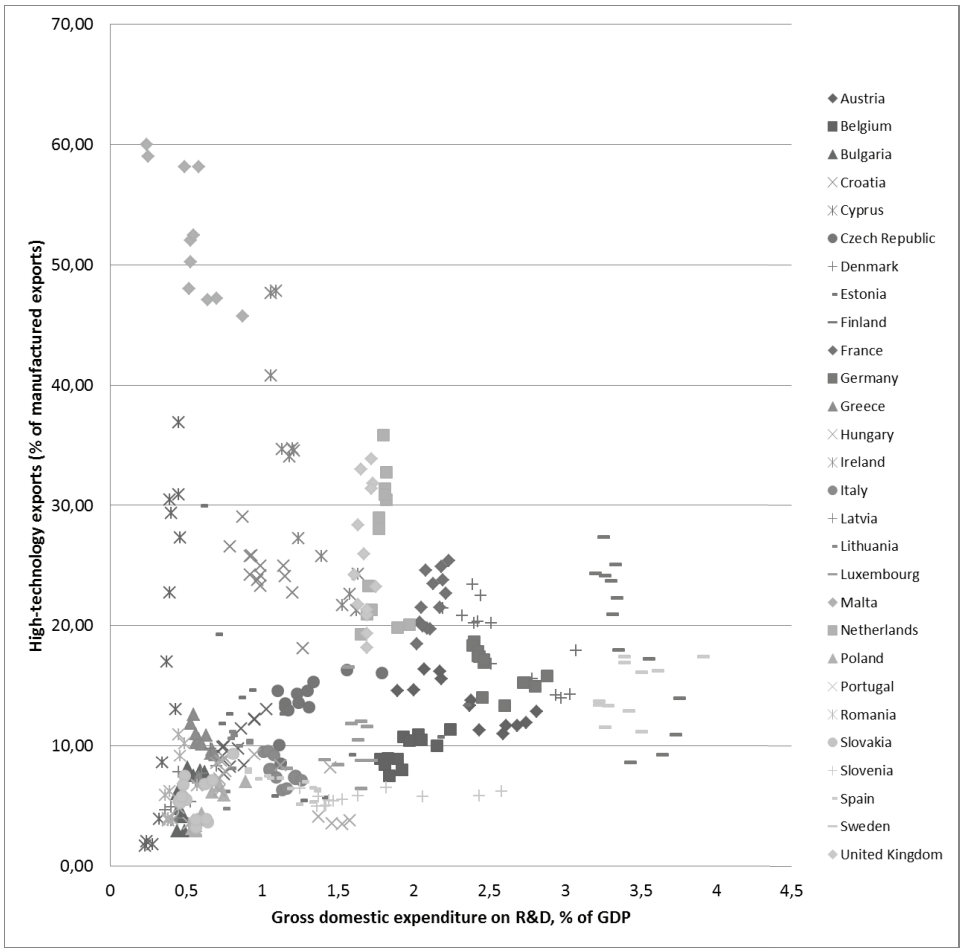

Fig 7. Relation between Expenditure on R&D and High-technology Share in the Export in the European Union (Eurostat, Authors)

4. Conclusions

The Europe 2020 strategy is about delivering growth that is: smart, through more effective investments in education, research and innovation; sustainable, thanks to a decisive move towards a low-carbon economy; and inclusive, with a strong emphasis on job creation and poverty reduction. The strategy is focused on five ambitious goals in the areas of employment, innovation, education, poverty reduction and climate/energy. Europe 2020 puts forward importance of the investment into research and development and promoting a target of 3% from the GDP. Right now Finland, Sweden, Denmark has reaching this target and it is not likely that European Union as a region will reach the target. Great challenge for the European Union is major differences in the economic performance of the Member countries that can be observed it the commitment to innovation thru expenditures in research and development. Our study shows evidence that higher investment in research and development lead to more patents that eventually can lead to larger high-technology goods share in total export. For individual countries we observed positive and negative relation between investment in research and development and share of high-technology goods in total exports. International trade theories explain certain pattern of this behaviour, for example, international product life cycle states that location of the production depends on the cycle of the product. Competitiveness gap is observed

between EU member countries before and after enlargement of 2004 when many countries with poorer economic performance joined European Union. To diminish competitiveness gap, countries has to increase commitment to smart growth by promoting investment in research and development.

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