



**UNIVERSITY OF MACEDONIA**

**MA Politics and Economics of Contemporary  
Eastern and Southeastern Europe**

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**MA Thesis:**

**“Innovation and competitiveness in Greece,  
Bulgaria and Romania, focusing on the special  
importance of innovation as the most important  
determinant of competitiveness: an analysis of  
the literature and benchmarking scores”**

**Word count: 17,597 words**

**Supervisor: professor Harry Papapanagos**

**Deadline: October 31, 2014**

**(extended to: November 15, 2014)**

**Abstract:**

*Greece, Bulgaria and Romania are among the worst performers in the European Union on the two very important indicators of innovation and competitiveness. The three countries have a number of weaknesses and shortcomings that explain this poor performance and the distance that they have not just from the advanced nations of Western Europe, but from the “second tier” performers of Southern and Eastern Europe as well. However, while in the problems of Bulgaria and Romania are similar to those of the other former communist EU member states and can be resolved in a similar way over time, Greece suffers from deeper structural problems that are holding it back and making the drastic reforms needed extremely slow or impossible. Due to their difficult position and poor performance, all three countries can be particularly aided by any measures that can boost innovation, which in turn can improve competitiveness, which in turn can improve the economy and quality of life. European efforts to close the innovation and competitiveness gaps should be primarily focused on these three countries, as the weakest and most problematic links in the chain.*

**Table of Contents:**

1. INTRODUCTION .....	4
1.1. The Importance of Competitiveness and Innovation today .....	4
1.2. Rationale, Structure and Aims .....	6
2. BACKGROUND .....	10
2.1. Measuring Competitiveness.....	10
2.2. Measuring Innovation .....	14
2.3. The Impact of Innovation on Competitiveness .....	17
2.4. The State of Innovation and Competitiveness in SE Europe .....	19
3. ANALYSIS .....	26
3.1. Greece .....	26
Competitiveness in Greece .....	27
Innovation in Greece.....	30
3.2. Bulgaria.....	33
Competitiveness in Bulgaria .....	34
Innovation in Bulgaria .....	36
3.3. Romania .....	38
Competitiveness in Romania .....	39
Innovation in Romania.....	40
3.4. Comparative Analysis .....	43
4. CONCLUSIONS.....	50
4.1. Summary and Assessment .....	50
4.2. Policy Recommendations.....	54
4.3. Potential Shortcomings and Ideas for Future Research .....	58
4.4. In Closing.....	60
5. BIBLIOGRAPHY .....	62

# 1. INTRODUCTION

## **1.1. The Importance of Competitiveness and Innovation today**

Since the collapse of communism, the last two decades or so have witnessed the growth of a globally integrated, innovation-based economy which has transformed international trade, research and development and industrial production, while impacting on job growth and competitiveness almost everywhere in the world. During this time, the concept of competitiveness has emerged as a universal standard for economic development (Schwab & Sala-i-Martin, 2014).

Competitiveness, however, is a difficult concept to define and measure. According to the World Economic Forum (Schwab & Sala-i-Martin, 2014, p.4) it is the “set of institutions, policies, and factors that determine the level of productivity of a country”. This essentially determines the country’s performance in trade and the strength of its economy, and this, in turn, has a direct impact the level of prosperity that an economy can reach. Overall, therefore, competitiveness is so vital because, through this, it determines the living standards of a country (Lawrence, 2014). This means that competitiveness is not an obscure and specialised term of economic jargon, but a concept with an immediate and direct impact on the quality of everyday life.

Since the end of World War II, the United States, with its giant economy boosted by the application of free market principles, was by some distance the world leader in productivity and competitiveness. When the USA started to lose its competitive edge over other countries during the early 1980s, the Reagan administration launched Project Socrates, a classified Defence Intelligence Agency programme with the aim of determining why the United States was unable to maintain its economic competitiveness and of coming up with solutions to rectify the situation. The programme’s main recommendation was reverting to technology exploitation through the process of innovation, in order to maintain a major competitive advantage over all competitors worldwide for many generations (Smith, 1988). In other words, innovation was the key for ensuring a high level of economic competitiveness.

Innovation is another concept which is difficult to define and measure. The word initially arose from the Late Latin *novation*, first appearing in 13<sup>th</sup> century law

texts as a term for renewing contracts. Innovation became associated with science and industry in the 19<sup>th</sup> century, during the Industrial Revolution, although the term invention, and particularly technical invention, was preferred as a synonym (Green, 2013). The differentiation of innovation from invention can probably be attributed to the Austrian economic Joseph Schumpeter, in the 1930s. To Schumpeter, the crucial difference is that invention is an act of intellectual creativity undertaken without any thought given to its possible economic import, whereas in innovation, the aim from the start is to figure out how to craft inventions in such a way as to bring new technologies and new products to the market (Godin, 2008). Innovation, therefore, is invention designed and utilised within an economic context.

Innovation, especially technological innovation, has always been a vital determinant of progress and growth. Technological breakthroughs have been at the basis of many of the productivity gains that national and international economies have historically experienced. These range from the industrial revolution in the 18th century and the invention of the steam engine and the generation of electricity to the more recent digital revolution. The latter is not only transforming the way things are being done, but it is also opening a wider range of new possibilities in terms of products and services (Schwab & Sala-i-Martin, 2014).

Both competitiveness and innovation have evolved into major benchmarking indicators, used to measure country performance in competitiveness and innovation by the individual pillars comprising the two indexes, and to place countries into a global ranking according to their total performance. The Global Competitiveness Index (GCI), developed by the World Economic Forum, measures countries' performance on competitiveness on 12 different pillars, one of which is innovation (Schwab & Sala-i-Martin, 2014). The Global Innovation Index (GII), developed by Cornell University, The Business School for the World (INSEAD) and the World Intellectual Property Organization (WIPO) measures countries' performance on innovation on 7 different pillars (Cornell University, INSEAD & WIPO, 2014).

The European Union contains some of the largest and more technologically advanced economies in the world in the form of Germany, Great Britain and France and as such should be a strong rival of the US in terms of competitiveness. In reality, however, the EU is still trying to recover from the after-effects of the global economic crisis. Despite significant efforts to restore economic dynamism through macroeconomic interventions and structural reforms the prospects for even the EU's

largest and most advanced economies remain uncertain, with low growth rates and persistently high levels of unemployment. Under these difficult conditions, the EU is struggling to increase its competitiveness in the global scene, plagued by continued uncertainty about parts of its financial system, insufficient levels of competition in the service sector and fragmented markets in key strategic sectors (World Economic Forum, 2014).

Another part of the problem, however, is a vast “competitiveness divide” between EU countries, with the countries of Northern and Western Europe being among the most competitive and advanced economies in the world, while those of Southern and Eastern Europe are lagging behind not just their more prosperous European partners but behind several Asian, Middle Eastern, South American or African countries as well, being among the bottom half of the world’s economies ranked by competitiveness performance (Schwab & Sala-i-Martin, 2014). A very similar picture is provided by the EU countries’ innovation ratings and rankings, and according to the World Economic Forum (2014) this is no coincidence, as the Northwest-Southeast divide in the innovation capabilities of EU countries is the main factor explaining the existence of a similar competitiveness divide.

## **1.2. Rationale, Structure and Aims**

The present thesis evaluates the special role of innovation on competitiveness and the business environment in the Balkan members of the European Union, Greece, Bulgaria and Romania, identifying and explaining shortcomings and weaknesses as well as proposing potential solutions. The focus has been placed on those three neighbouring countries in the South-East of the European Union land borders, which have the lowest innovation and competitiveness scores in the EU, therefore the most pressing need to catch up with the innovation leaders of Northern and Western Europe (Cornell University, INSEAD & WIPO, 2014).

Other EU countries in the region have been excluded from this focus group for various reasons, as they don’t share all the same factors of location, size and economic morphology that Greece, Bulgaria and Romania have in common. Cyprus, as a small island country in the extreme South-East of Europe, whose economy is

built around services and tourism, has been excluded as a very different and special case. Croatia is too recent (i.e. since July 2013) a member of the European family of states for EU policies to have had a sufficient impact on it or for complete data to be available. Finally Slovenia has been excluded as it does not share the same innovation weaknesses that Greece, Romania and Bulgaria have in common (Cornell University, INSEAD & WIPO, 2014), and, in addition, by its own definitions, the country considers itself as belonging to Central Europe instead of the Balkans (The Economist, 2003).

Out of the 12 pillars comprising competitiveness according to the methodology followed by the GCI, the main focus of the present thesis is on innovation. Innovation has been singled out because it is by far the most important element of competitiveness, “the key driver of competitiveness, wage and job growth, and long term economic growth” (U.S. Department of Commerce, 2012, p.V). In fact, according to the Global Competitiveness Report itself (Schwab & Sala-i-Martin, 2013) excellence in innovation and strong institutional environments encouraging innovation are becoming increasingly more important for influencing the competitiveness of economies. Innovation adds value to every activity of a country’s economy. Countries with higher levels of economic development generally have higher levels of innovation on most indicators (Lioukas, 2009). After the European Council summit of 2013, European heads of State and Government stated that “Investment in research and innovation fuels productivity and growth and is key for job creation. Member States that have continued to invest in research and innovation have fared better in the current crisis than those that have not” (Stierna & Vigier, 2014), confirming the prominent role of innovation as a component of competitiveness.

Since all European economies are in an advanced stage of economic development compared to the developing world, innovation is a particularly vital driver for their competitiveness performance, as they need to focus their production on high value-added, innovation-rich format and services to maximise their competitiveness (Schwab & Sala-i-Martin, 2013). In addition, innovation is the pillar of competitiveness in which the gap between EU countries is the largest by far, with a highly competitive Northern Europe completely outperforming Southern and Central-Eastern Europe (World Economic Forum, 2014).

This gap in innovation performance goes a long way towards explaining the gap in competitiveness, itself responsible for an important part of the gap in living standards. The potential solution, however, can follow the reverse course. Innovation capabilities in the whole of the EU can be improved by supporting countries with less developed innovation capabilities in catching up with the leading innovators, which on the meantime can foster their continued sustainable development (World Economic Forum, 2014). This would in turn have an impact in increasing competitiveness and in turn increasing living standards and the convergence between EU countries (Gokhberg & Poliakova, 2014). The above factors that explain the rationale of the thesis in focusing on innovation as the key factor of competitiveness in South-Eastern Europe are summarised in figure 1.



**Why is innovation so important for competitiveness in SE Europe?**

- **Because it is arguably by far the most important element of competitiveness!**
- **Because it is particularly important for economies at or aspiring to be at an advanced stage of economic development!**
- **Because the gap in innovation capabilities in the EU shapes the competitiveness divide that leaves South Eastern Europe lagging behind in economic performance and living standards!**
- **Because fostering innovation capabilities in South Eastern Europe can allow it to catch up with the more advanced countries of the EU!**

**Figure 1: Thesis Rationale: Why is innovation so important for competitiveness in SE Europe?**

After this brief introduction on the basic concepts, issues, structure, rationale and aims of the thesis, there follows a comprehensive background section which explains how competitiveness and innovation are measured, how the latter influences the former, and how the region of South Eastern Europe fares on these two indicators. The analysis section contains thorough qualitative reviews of the state of

competitiveness and innovation in Greece, Bulgaria and Romania, presented through the conclusions of national and international reports and evaluations. In addition, a comparative analysis makes a brief examination of competitiveness and innovation performance in the three countries relative to other states in the region as well as to the EU as a whole, based both on qualitative data and index scores.

Finally, the conclusions section summarises the above data in order to produce some potential recommendations for increasing the innovation and competitiveness performance of Greece, Bulgaria and Romania, as well as those European states that lag behind their more advanced partners, with the long term aim of narrowing the innovation and competitiveness gap between European countries, and thereby closing the living standards gap as well.

## **2. BACKGROUND**

### **2.1. Measuring Competitiveness**

As explained in the introduction, competitiveness is a difficult concept to define and even more difficult to measure once a definition has been agreed upon. An important question is on what scale is competitiveness being measured – a company, a region, a country etc. The focus here is, of course, on the national scale, but national statistics themselves are created by combining regional and individual measurements (Durand & Giorno, 1987). An additional question is how complex and all-encompassing should the measurement of competitiveness be.

Understanding the factors that determine competitiveness is a complicated process, and one that has consumed economists' efforts for centuries, ranging from Adam Smith's focus on specialisation and the division of labour, to neoclassical economists' emphasis on investment in physical capital and infrastructure, to recent and modern trends towards mechanisms such as education and training, technological progress, macroeconomic stability, good governance, firm sophistication, and market efficiency, among others (Schwab & Sala-i-Martin, 2014).

When there is a need for simple indicators of economic competitiveness then a country's trade deficit may be used (Mann, 1999), or alternatively, the relative labour costs, which refer to the cost of labour compensation (including tax, social security etc.) per unit of output (Collington, 2012). These simple indicators, however, cannot provide the same kind of accurate depiction of an economy's competitiveness that is provided by specialised benchmarking indices. The most important and widely used of these are the WEF's Global Competitiveness Report, the IMD's World Competitiveness Yearbook, and the IFC's Business Competitiveness - Ease of Doing Business Report, released on a yearly basis (Arslan & Tatlidil, 2012).

Although the general consensus has been that there is no single perfect measure, and the construction or selection of indicators depends on what aspect of competition it is sought to study (Durand & Giorno, 1987), the World Economic Forum's Global Competitiveness Report and its Global Competitiveness Index (**GCI**) will be used as the main benchmarking measure in the present thesis, along with

specific quantitative and qualitative data concerning the region and the countries under study (Schwab & Sala-i-Martin, 2014).

The GCI captures the complex and multi-faceted nature of competitiveness by including a weighted average of many different components according to which factors are more important for each type of economy, each component measuring a different aspect of competitiveness. These aspects are represented by 12 distinct pillars. The score of each pillar gives an accurate understanding of the country's performance in that factor of competitiveness. However, despite the pillars being distinct, it must be noted that they are not independent from each other but interconnected, with a weakness in one area often having a negative impact in other areas (Schwab & Sala-i-Martin, 2014). These pillars will be briefly presented below, based on information provided by the creators of the GCI themselves (Schwab & Sala-i-Martin, 2014).

The first pillar is **institutions**. This pillar measures the existence of a sound and fair institutional environment determined by the legal and administrative framework within which individuals, firms, and governments interact to generate wealth. The crucial role of such an environment for competitiveness and growth has become all the more apparent during the recent economic and financial crisis.

The second pillar is **infrastructure**. This pillar measures the existence of an extensive and efficient infrastructure, which is critical for ensuring the effective functioning of the economy, determining the location of economic activity and the kinds of activities or sectors that can develop within a country. Well-developed infrastructure reduces the effect of distance between regions, integrating the national market and connecting it at low cost to markets in other countries and regions. The quality and extensiveness of infrastructure networks significantly impact economic growth and reduce income inequalities and poverty in a variety of ways.

The third pillar is the **macroeconomic environment**. This refers to the stability of the country's macroeconomic environment. This is an important factor for business and as such it is significant for the overall competitiveness of a country. Although macroeconomic stability alone cannot increase the productivity of a nation, it has been clearly shown, especially with the Eurozone sovereign debt crisis of recent years, that macroeconomic disarray harms the economy and hinders productivity and competitiveness.

The fourth pillar is **health and primary education**. Both of these factors are crucial to competitiveness and economic prowess. Economically speaking, a healthy workforce is vital to a country's competitiveness and productivity. Poor health leads to significant costs to business, as sick workers are often absent or operate at lower levels of efficiency. Basic education is equally crucial in today's economy, as it increases the efficiency of each individual worker. Workers who have received little formal education can carry out only simple manual tasks, so a lack of basic education can become a constraint on business development.

The fifth pillar is **higher education and training**. Quality higher education and training is vital for economies that want to move beyond simple production processes and products. Today's globalising economy requires countries to nurture pools of well-educated and well-trained workers who are able to perform complex tasks and adapt rapidly to their changing environment and the evolving needs of the production system.

The sixth pillar is **goods market efficiency**. This pillar measures the efficiency of a country's goods markets, which determines its ability to produce the right mix of products and services given their particular supply-and-demand conditions, as well as to ensure that these goods can be most effectively traded in the economy. The best possible environment for the exchange of goods requires a minimum of government intervention that impedes business activity. Healthy market competition, both domestic and foreign, is important in driving market efficiency, and thus business productivity, by ensuring that the most efficient firms, producing goods demanded by the market, are the ones that thrive.

The seventh pillar is **labour market efficiency**. This pillar measures the efficiency and flexibility of the labour market, which are critical for ensuring that workers are allocated to their most effective use in the economy and provided with incentives to give their best effort in their jobs. Efficient labour markets must operate on the principles of meritocracy and equity, and they must have the flexibility to shift workers from one economic activity to another rapidly and at low cost, and to allow for wage fluctuations without much social disruption.

The eighth pillar is **financial market development**. This pillar essentially measures the existence of a sound and well-functioning financial sector. This is a vital factor for economic activities, as demonstrated by the effects of the global economic

crisis. An efficient financial sector allocates the resources saved by a nation's citizens, as well as those entering the economy from abroad, to their most productive uses.

The ninth pillar is **technological readiness**. This pillar measures the agility with which an economy adopts existing technologies to enhance the productivity of its industries, with specific emphasis on its capacity to fully leverage information and communication technologies (ICTs) in daily activities and production processes for increased efficiency and enabling innovation for competitiveness. In today's globalised world, technological readiness is increasingly essential for firms to compete and prosper.

The tenth pillar is **market size**. This is a factor that directly affects productivity since large markets allow firms to exploit economies of scale. In today's highly globalised economy, small countries manage to overcome their deficiencies in market size by using international markets as a substitute for domestic markets. The pillar score is measured by including both domestic and foreign markets, giving credit to export-driven economies and geographic areas (such as the European Union) that are divided into many countries but have a single common market.

The eleventh pillar is **business sophistication**. It measures sophisticated business practices through two elements that are intricately linked: the quality of a country's overall business networks and the quality of individual firms' operations and strategies. Sophisticated business practices are conducive to higher efficiency in the production of goods and services. This pillar is especially important for countries at an advanced stage of development when, to a large extent, the more basic sources or productivity improvements have been exhausted.

The twelfth pillar is **innovation**. Innovation can emerge from new technological and non-technological knowledge, but this pillar focuses on technological innovation, as the non-technological aspects (e.g. know-how, skills, and working conditions that are embedded in organisations) are mostly captured by the eleventh pillar. As already explained above, innovation is the most important determinant of competitiveness (Stierna & Vigier, 2014). Similarly, innovation can be the most important pillar of competitiveness, especially for countries at an advanced stage of development, but it is also crucial for the less advanced ones, as they need innovation in order to progress. This progression requires an environment that is conducive to innovative activity and supported by both the public and the private sectors (Schwab & Sala-i-Martin, 2014).

In the context of the GCI, innovation is a kind of “master pillar”, potentially maximising the importance and making use of the efficiency of all the other pillars. Factors such as improving institutions, building infrastructure, reducing macroeconomic instability, improving human capital, or improving the efficiency of the labour, financial, and goods markets are important for competitiveness and growth, but all these factors eventually run into diminishing returns. In light of the recent sluggish recovery and rising fiscal pressures faced by advanced economies on the aftermath of the financial and economic crisis, it is important that public and private sectors resist pressures to cut back on the R&D spending that will be so critical for sustainable growth into the future. The Global Competitiveness Report itself concludes that, in the long run, standards of living can be largely enhanced only by technological innovation (Schwab & Sala-i-Martin, 2014). This is the main reason that makes this pillar so crucial for the GCI and also the reason that innovation deserves an equally prominent place as competitiveness in the context of the present thesis. The particulars of defining and measuring innovation, both as a pillar of the GCI as well as by separate indices, will be explained directly below.

## **2.2. Measuring Innovation**

As explained in the introduction, innovation, like competitiveness, is a concept that is difficult to measure. Schumpeter, despite introducing the concept in the context of economics, never analysed the process of innovation nor did he provide any instructions or recommendations for measuring it. The person who introduced the systematic study of innovation and the innovative process was the economic historian and MIT professor Rupert Maclaurin, almost a contemporary of Schumpeter. Maclaurin further developed and evolved Schumpeter’s ideas, analysing technological innovation as a process consisting of several steps and stages. Most importantly, he also created one of the first taxonomic systems of measuring technological innovation, a system that formed the basis for all the indices and measurement scales that are in wide use today (Gaudin, 2008).

Scales, indices and methods of measurement in general, though, vary according to the level and context in which innovation is evaluated, for example

whether innovation is measured in companies, organisations, regions or countries. Additionally, even in the same context, the emphasis can be on different sides or aspects of innovation. For instance, when evaluating innovation in companies, the focus can be in either product innovations, process innovations, marketing innovations or organisational innovations (EC & OECD, 2005). Often, in companies, the focus is on financial indicators such as the funding given to new, innovative ideas and the profit or the return on investment brought by such ideas (Malinoski & Perry, 2011).

Innovation is also measured on a regional level, by compiling statistics from companies and organisations and combining them with indicators concerning infrastructures and state initiatives on a regional scale. In the European Union, regional innovation is measured by tools such as the Regional Innovation Scoreboard (RIS). RIS evaluates innovation on a regional scale based on innovation enablers, firm activities, and innovation outputs. The scale is restricted by the fact that a lot of statistics are not available on a regional level. Still, the RIS uses a total 25 indicators to measure regional innovation performance in three categories, resulting in a total Summary Innovation Index (EC, 2014). On a country level, innovation in the European Union is measured by the European Innovation Scoreboard (EIS), which uses a set of 26 indicators to measure innovation, covering mostly factors concerned with structural conditions, knowledge creation, innovative efforts by firms, and outputs in terms of new products, services and intellectual property (EC, 2014).

As mentioned above, innovation on a country level is also measured as part of the Global Competitiveness Index. Specifically, innovation is the twelfth and final pillar of the GCI. The innovation pillar of the GCI refers to technological innovation. In particular, it means sufficient investment in research and development (R&D), especially by the private sector; the presence of high-quality scientific research institutions that can generate the basic knowledge needed to build the new technologies; extensive collaboration in research and technological developments between universities and industry; and the protection of intellectual property. Methodologically, the general score of the pillar consists of seven factors: (1) capacity for innovation, (2) quality of scientific research institutions, (3) company spending on R&D, (4) university-industry collaboration in R&D, (5) government procurement of advanced tech products, (6) availability of scientists and engineers, and (7) patent applications per million of population (Schwab & Sala-i-Martin, 2014).

The most widely used international index focusing exclusively on the measurement of innovation is the Global Innovation Index (**GII**). The Global Innovation Index project was launched by INSEAD (an international graduate business school) in 2007 with the simple goal of determining how to find metrics and approaches that better capture the richness of innovation in society and go beyond traditional, simplistic and one-dimensional measures of innovation such as the number of research articles published or the level of R&D expenditures. Instead, the GII adopts the broader and more modern notion of innovation as the ability to exploit new technological combinations (Cornell University, INSEAD & WIPO, 2014).

The GII consists of two sub-indices, the Innovation Input Sub-Index and the Innovation Output Sub-Index, each built around pillars, as was the case in the GCI. The GII essentially produces four measures of innovation: a total score for the Innovation Inputs Sub-Index, a total score for the Innovation Outputs Sub-Index, the overall GII score (a simple average of the two sub-indices), and the Innovation Efficiency Ratio (the ration of Output to Input, showing how much innovation a country is getting for its inputs). Each pillar is further divided into three sub-pillars, each of which is composed of individual indicators, for a total of 81 indicators. The GII pays special attention to presenting a scoreboard for each economy that includes strengths and weaknesses, making the data series accessible, and providing data sources, definitions and detailed technical notes (Cornell University, INSEAD & WIPO, 2014).

The first sub-index of the GII, the Innovation Input Sub-Index, has five enabler pillars: (1) Institutions, (2) Human capital and research, (3) Infrastructure, (4) Market sophistication, and (5) Business sophistication. Enabler pillars define aspects of the environment conducive to innovation within an economy. The Innovation Outputs sub-index focuses on the results of innovative activities within the economy. Although the Output Sub-Index includes only two pillars, it has the same weight in calculating the overall GII scores as the Input Sub-Index. There are two output pillars: (1) Knowledge and technology outputs and (2) Creative outputs (Cornell University, INSEAD & WIPO, 2014).

As can be discerned from the factors comprising these two innovation measures, the Global Innovation Index is broader and more inclusive than the competitiveness pillar of the GCI, as one would expect from the fact that the former is a whole index while the latter is just one pillar of a broader index. The GII includes

the aspects of non-technological innovation (such as know-how, skills, and working conditions that are embedded in organisations) that in the GCI are reflected in other pillars of the overall index, mostly pillar number 11 (business sophistication). In contrast, the innovation pillar of the GCI only includes technological innovation. In any case, the scores calculated by the two indices are extremely similar. A Pearson correlation ran on the GII total scores and the GCI innovation pillar scores for all European countries shows a correlation factor of 0.92, which indicates a very strong correlation (see table 1). Overall, innovation in the present thesis will be measured through the relevant pillar of the GCI, through the GII and through specific qualitative and quantitative information concerning the particular region and particular countries under study.

<b>Pearson Correlation Score between GII total score and GCI innovation pillar score for European countries:</b>	<b>0.92</b>
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**Table 1: Correlation score between GII and GCI innovation pillar**

### **2.3. The Impact of Innovation on Competitiveness**

The powerful impact that innovation has on competitiveness, making it the most important determinant of competitiveness by far, is the reason for analysing these two concepts together in the present thesis. The notion that innovation is the most vital component of competitiveness, and the one that is responsible for maximising the role of all the other components (Schwab & Sala-i-Martin, 2014) is central to economic analyses and policy making initiatives internationally (Stierna & Vigier, 2014).

This has been established in U.S. policy since the 1980s (Smith, 1988) and is still the basic tenet of current U.S. competitiveness policies (U.S. Department of Commerce, 2012). According to the U.S. strategy, Federal funding needs to target three key areas, research, education and infrastructure, that are crucial for increasing the innovative capacity of the United States, and along with it its competitiveness in the international markets (U.S. Department of Commerce, 2012).

The latest Innovation Union Competitiveness Report (Stierna & Vigier, 2014), overseen by the European Commission also reaches the same conclusions and makes

similar recommendations. According to the report, a strong innovation capacity proved to be the most important factor for maintaining a competitive economy under any conditions, as evident by the fact that the EU Member States that have been the most resilient to the current economic crisis, such as Germany and the Scandinavian countries, have high R&D intensities and innovation dynamics. This corroborates new findings that R&D intensity is positively correlated with total productivity growth. Overall, the report concludes that innovation-driven growth is *the* key for ensuring high competitiveness for European economies and high living standards for their citizens (Stierna & Vigier, 2014).

Bearing all this in mind, it is, of course, no coincidence that the most innovative economies are also the most competitive ones or at least the ones who are catching up and bridging their competitiveness deficits much faster (Lioukas, 2009; World Economic Forum, 2014). Running two correlations between the scales described above confirms the extremely close connection between competitiveness and innovation. A Pearson correlation ran between the GCI total score and the GCI competitiveness pillar score for all European countries shows an incredibly strong correlation with a factor of 0.97 (see table 2), while when the GCI total score is correlated with the GII total score is shows a similarly strong correlation with a factor of 0.92, even though the two indices are distinct and have been created by different organisations (see table 3).

<b>Pearson Correlation Score between GCI total and GCI innovation pillar score for European countries:</b>	<b>0.97</b>
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**Table 2: Correlation score between GCI and GCI innovation pillar**

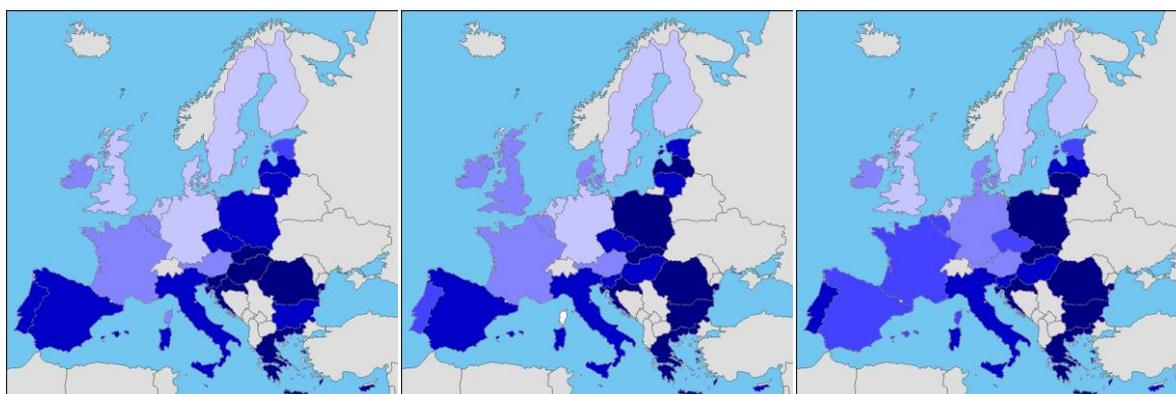
<b>Pearson Correlation Score between GCI total and GII total score for European countries:</b>	<b>0.92</b>
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**Table 3: Correlation score between GCI and GII**

## **2.4. The State of Innovation and Competitiveness in SE Europe**

As mentioned in the introduction, a vast divide in competitiveness performance exists between the highly advanced countries of Northern and Western Europe and the less advanced economies of Southern and Eastern Europe. A similar and equally vast divide exists in innovation performance between the two sides of Europe. The innovation gap is equally clear whether one uses the innovation measurement offered by the innovation pillar of the Global Competitiveness Index or the overall Global Innovation Index. These geographical differences in performance should be visible at a glance in the charts below, in figures 2, 3 and 4.

### **Colour maps of Competitiveness and Innovation levels in the EU<sup>1</sup>**



**Figure 2: levels of GCI scores in the EU**

**Figure 3: levels of GCI innovation scores in the EU**

**Figure 4: levels of GII scores in the EU**

*Note: lighter colours denote higher scores*

The 2013 European Commission Innovation Union Scoreboard also shows a widening innovation divide as the most innovative countries improve their performance while others have shown a lack of progress. Innovation performance in the EU is improving year by year in spite of the continuing economic crisis, but the innovation divide between member states is widening. The overall ranking within the EU remains relatively stable, with Sweden at the top, followed by Germany, Denmark and Finland. Estonia, Lithuania and Latvia are the countries that have improved the most since 2012. Innovation should now be at the heart of all Member States' policy agendas. Some significant progress was made in 2012, but further progress is needed in order to close the innovation divide in Europe (Sofia Globe, 2013).

<sup>1</sup> Maps created by author based on GCI and GII scores for 2014

Although the gap between the richer and more advanced countries of North-western Europe and the poorer and less advanced ones of South-eastern Europe is the main feature of the EU's internal imbalance and it extends into several areas (including GDP, corruption, economic performance etc.), the special impact that innovation has on competitiveness, outlined above, should leave little doubt that the innovation divide and the competitiveness divide are strongly connected, with the former being the main reason behind the latter (World Economic Forum, 2014).

In fact, out of the 12 different pillars of competitiveness, the difference in performance between Northern Europe on one hand and the countries of Southern Europe or those of Central and Eastern Europe (CEE) on the other is not that great in most. In fact, the difference is rather small and scores almost tend to converge on several pillars. The difference in scores between Northern Europe and *both* Southern Europe and CEE is alarming only in three pillars, which include Business Sophistication, Institutions and –of course- Innovation, where the difference between regions is greatest and it has a strong impact on overall competitiveness scores (see diagram 1) (World Economic Forum, 2014).



**Diagram 1: Comparison of GCI pillar scores for European areas (Northern Europe, Southern Europe, Central and Eastern Europe – CEE)<sup>2</sup>**

A number of specific EU countries, namely, the Scandinavian countries, the UK, Germany and the Netherlands, are unquestionable leaders in both

<sup>2</sup> Figure taken from: “Enhancing Europe’s Competitiveness” report (World Economic Forum, 2014).

competitiveness and innovation in the EU (see table 4) as well as being among the world leaders in these fields. On the other hand, the countries of Southern and Eastern EU fare rather poorly in both innovation and competitiveness, falling far behind the European and global innovation and competitiveness leaders. These poor performers do not only include the former communist states of Central and Eastern Europe that are expected to lag behind after 45 years of dysfunctional centrally-planned economies that discouraged, persecuted and punished any innovative or competitive initiative, but the countries of Southern Europe as well: Portugal, Spain, Italy and Greece (Cornell University, INSEAD & WIPO, 2014; Schwab & Sala-i-Martin, 2014).

GCI Competitiveness Total (2014)		GCI Innovation Pillar (2014)		GII Total (2014)	
country	score	country	score	country	score
Finland	5.5	Finland	5.8	United Kingdom	62.4
Germany	5.5	Germany	5.5	Sweden	62.3
Netherlands	5.5	Sweden	5.4	Finland	60.7
United Kingdom	5.4	Netherlands	5.3	Netherlands	60.6
Sweden	5.4	Denmark	5.1	Denmark	57.5
Denmark	5.3	United Kingdom	5.0	Luxembourg	56.9
Belgium	5.2	Belgium	4.9	Ireland	56.7
Luxembourg	5.2	Luxembourg	4.8	Germany	56.0
Austria	5.2	Austria	4.8	Austria	53.4
France	5.1	France	4.7	France	52.2
Ireland	5.0	Ireland	4.7	Belgium	51.7
Estonia	4.7	Portugal	4.1	Estonia	51.5
Spain	4.5	Estonia	4.0	Malta	50.4
Portugal	4.5	Italy	3.7	Czech Republic	50.2
Czech Republic	4.5	Cyprus	3.7	Spain	49.3
Lithuania	4.5	Spain	3.7	Slovenia	47.2
Latvia	4.5	Czech Republic	3.7	Cyprus	45.8
Poland	4.5	Slovenia	3.6	Italy	45.7
Malta	4.4	Lithuania	3.6	Portugal	45.6
Italy	4.4	Malta	3.6	Latvia	44.8
<b>Bulgaria</b>	<b>4.4</b>	Hungary	3.5	Hungary	44.6
Cyprus	4.3	<b>Romania</b>	<b>3.3</b>	Slovakia	41.9
<b>Romania</b>	<b>4.3</b>	Latvia	3.3	Lithuania	41.0
Hungary	4.3	Poland	3.3	Croatia	40.7
Slovenia	4.2	Slovakia	3.2	<b>Bulgaria</b>	<b>40.7</b>
Slovakia	4.1	<b>Greece</b>	<b>3.2</b>	Poland	40.6
Croatia	4.1	Croatia	3.1	<b>Greece</b>	<b>38.9</b>
<b>Greece</b>	<b>4.0</b>	<b>Bulgaria</b>	<b>2.9</b>	<b>Romania</b>	<b>38.1</b>

**Table 4: GCI, GCI innovation pillar, and GII rankings and scores for the EU**

GCI Competitiveness Total (2014)		GCI Innovation Pillar (2014)		GII Total (2014)	
country	score	country	score	country	score
Switzerland	5.7	Finland	5.8	Switzerland	64.8
Finland	5.5	Switzerland	5.7	United Kingdom	62.4
Germany	5.5	Germany	5.5	Sweden	62.3
Netherlands	5.5	Sweden	5.4	Finland	60.7
United Kingdom	5.4	Netherlands	5.3	Netherlands	60.6
Sweden	5.4	Denmark	5.1	Denmark	57.5
Norway	5.4	United Kingdom	5.0	Luxembourg	56.9
Denmark	5.3	Belgium	4.9	Ireland	56.7
Belgium	5.2	Norway	4.9	Germany	56.0
Luxembourg	5.2	Luxembourg	4.8	Norway	55.6
Austria	5.2	Austria	4.8	Iceland	54.1
France	5.1	France	4.7	Austria	53.4
Ireland	5.0	Ireland	4.7	France	52.2
Estonia	4.7	Iceland	4.2	Belgium	51.7
Iceland	4.7	Portugal	4.1	Estonia	51.5
Spain	4.5	Estonia	4.0	Malta	50.4
Portugal	4.5	Italy	3.7	Czech Republic	50.2
Czech Republic	4.5	Cyprus	3.7	Spain	49.3
Lithuania	4.5	Spain	3.7	Slovenia	47.2
Latvia	4.5	Czech Republic	3.7	Cyprus	45.8
Poland	4.5	Slovenia	3.6	Italy	45.7
Malta	4.4	Lithuania	3.6	Portugal	45.6
Italy	4.4	Malta	3.6	Latvia	44.8
Russia	4.4	Hungary	3.5	Hungary	44.6
<b>Bulgaria</b>	<b>4.4</b>	Montenegro	3.4	Slovakia	41.9
Cyprus	4.3	Russia	3.3	Lithuania	41.0
<b>Romania</b>	<b>4.3</b>	<b>Romania</b>	<b>3.3</b>	Croatia	40.7
Hungary	4.3	FYROM	3.3	Moldova	40.7
FYROM	4.3	Latvia	3.3	<b>Bulgaria</b>	<b>40.7</b>
Montenegro	4.2	Poland	3.3	Poland	40.6
Slovenia	4.2	Slovakia	3.2	Russia	39.1
Slovakia	4.1	<b>Greece</b>	<b>3.2</b>	<b>Greece</b>	<b>38.9</b>
Ukraine	4.1	Ukraine	3.2	<b>Romania</b>	<b>38.1</b>
Croatia	4.1	Croatia	3.1	Belarus	37.1
<b>Greece</b>	<b>4.0</b>	<b>Bulgaria</b>	<b>2.9</b>	Montenegro	37.0
Moldova	4.0	Serbia	2.9	FYROM	36.9
Serbia	3.9	Albania	2.7	Ukraine	36.3
Albania	3.8	Moldova	2.5	Serbia	35.9
Belarus	n/a	Belarus	n/a	Bosnia	32.4
Bosnia	n/a	Bosnia	n/a	Albania	30.5

Table 5: GCI, GCI innovation pillar, and GII rankings and scores for the whole of Europe

Out of the poor performers of the EU, some states are consistently “the worst of the worst”, falling behind not just the global leaders and the other EU states, but behind countries such as (in the case of competitiveness) Guatemala, Botswana, Sri Lanka, Morocco, Rwanda or Kazakhstan, which belong to the developing world (Schwab & Sala-i-Martin, 2014). These poor performers are the EU’s Balkan

members, Greece, Bulgaria and Romania, which, along with Slovakia and the EU's newest member, Croatia, consistently occupy the last positions in the competitiveness and innovation rankings (see table 4).

If non-EU members and/or candidate members are considered as well, the overall picture remains the same regarding the geographical division in competitiveness and innovation. Non-EU members of Northern and Western Europe such as Iceland, Norway and Switzerland are in the top positions, with non-EU members and candidate countries of South-Eastern Europe in the bottom positions (see table 5). In fact, the aspiring EU members of the so-called "Western Balkans" perform better than EU members in some cases. FYROM and Montenegro have better competitiveness and innovation scores than senior EU-member Greece according to the 2014 GCI ranking. Serbia and Albania, however, are very poor performers by all accounts (see table 5) (Schwab & Sala-i-Martin, 2014).

The poorly performing half of the EU can be further divided into the older members of Southern Europe (Portugal, Spain, Italy and Greece) and the newer members of Central and Eastern Europe, a number of former communist states that have joined the EU in the 21<sup>st</sup> century (Poland, the Baltic Republics, Czech Republic, Slovakia, Hungary, Slovenia, Romania, Bulgaria and Croatia). For the latter group of states, their difference in competitiveness and innovation performance compared to Western Europe (Estonia is a notable exception as it seems to be performing at almost "western standards") is connected to the wider issue of their course towards convergence that has been proceeding successfully since their European accession, although the 2008-2009 economic crisis has slowed the rate of their progress to a crawl (Polish Press Agency, Economic Service, 2013).

The transition economies of the region have been deeply affected by the global economic crisis and its aftermath. Since 2008, economic growth has been weak or non-existent in most cases, while unemployment and poverty levels have risen, and investments and confidence are decreasing (Buturac, Lovrinevic & Mikulic, 2011). Moreover, prospects in the near future do not seem particularly hopeful. Several countries in the region are also heavily exposed to the Eurozone sovereign debt crisis, which has the potential to spill over into Eastern Europe as well, causing deep and lasting damage to these countries' vulnerable economies. Furthermore, even if the debt crisis is resolved favourably, economic growth in the region is likely to be slow and marginal in the short term. Compounding problems is the fact that virtually all of

the EU members (as well as non-members) in Eastern Europe are plagued by a number of wider problems, such as corruption, weak tax administration and a lack of availability of skills (Sanfey & Zeh, 2012).

These underlying problems of the region's economies cannot be alleviated or resolved unless strong economic growth resumes. As has already been established, though, this is unlikely to happen in the short-term, especially in the form of the pre-crisis model, which involved booming credit growth and the influx of cheap capital from abroad. Under these conditions, potential solutions to spur economic growth are quite limited. A potential answer could be that authorities across the region show a much greater commitment than before to deep structural and institutional reforms which are intricately connected to growth (Sanfey & Zeh, 2012).

The states of Southern Europe are different cases. Despite consistently lagging behind in prosperity compared to Western Europe since their entry in the EU, they are not and have not been transitional economies (Kuzio, 2001). They are, however, currently facing even more pressing economic problems which are connected to the Eurozone sovereign debt crisis, precipitated by the global economic crisis, which froze growth in these states as well since 2008. Portugal, Spain, Italy and Greece have the highest national debt-to-GDP ratios in the EU (along with France and Ireland) (Eurostat, 2014). As illustrated by the case of Greece, debt crises can result in austerity measures or excessive taxation that actually shrink the economy and make the prospect of financial growth even more distant and unlikely (Matsaganis & Leventi, 2011). A much better solution for Greece and Southern Europe in general, lies in administrative and institutional reforms (Ladi, 2012), exactly as reported for the case of Eastern Europe, above.

While the economic difficulties of Southern Europe and Eastern Europe are of a different nature, they have a common precipitating cause in the form of the global economic crisis, and they might have common solutions as well. It has been clearly established that regulatory reforms can boost innovation among other effects (OECD, 1997), and it has been clearly explained that innovation is a vital factor for competitiveness. Overall, bold reforms that encourage innovation and competitiveness seem to have a much better chance of reinvigorating the badly hurt economies of South-eastern Europe than any other viable alternative.

The state of innovation and competitiveness in Greece, Bulgaria and Romania will be analysed in turn in the next chapter, in much greater detail, as part of an

attempt to highlight ways in which innovation can provide a much-needed catalyst for competitiveness as well as for general economic growth in these three weak economies, as well as in the region in general.

### 3. ANALYSIS

#### 3.1. Greece

<b>GREECE<sup>3</sup></b>		
<b>Population</b>	11.1 millions	
<b>GDP</b>	€182 billions	
<b>GDP per capita</b>	€16,400	
<b>Stage of Development</b>	Innovation driven	
	<i>Rank</i>	<i>Score</i>
<b>GCI total</b>	81 / 144	4.0 / 7
<b>GCI innovation</b>	74 / 144	3.5 / 7
<b>GII total</b>	50 / 143	38.95 / 100

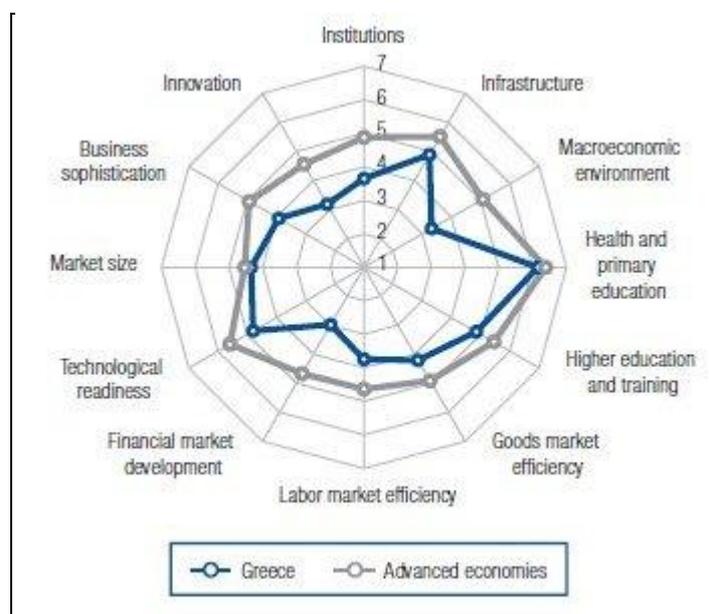


Diagram 2: 2014 GCI pillar scores for Greece compared to the advanced economies<sup>4</sup>

Greece joined the EU (then still the EEC) in 1981, as part of the same “Mediterranean enlargement” that later saw Spain and Portugal joining as well. The fact that it is among the European Union’s first twelve members and that it spent the Cold War

<sup>3</sup> Statistics taken by Eurostat for 2013 and from GCI and GII indices for 2014

<sup>4</sup> Figure taken from: “Enhancing Europe’s Competitiveness” report (World Economic Forum, 2014).

period free from Soviet occupation and communist control, unlike its northern neighbours, led to Greece's inclusion within the world's advanced economies. However, its distance from the countries of Western Europe is still great. It always lagged behind in terms of income, and the prosperity gap widened dramatically since the economic crisis. Moreover, it is lagging behind significantly in competitiveness and innovation, the true prerequisites of advanced economies. In fact, Greece's economic performance is closer to that of its emerging and developing Balkan neighbours than to that of the other countries of Southern Europe that represent a "second tier" behind the strong economies of Western Europe (Schwab & Sala-i-Martin, 2014).

As can be discerned from diagram 2, Greece is behind the advanced economies in nearly every pillar of the GCI. It matches them only in health and primary education as well as in market size. Major gaps exist in all the other ten pillars, with the gaps being more prominent in the macroeconomic environment (because of the country's huge debt), in financial market development and, of course, in the vital pillar of innovation. According to the Global Competitiveness Report, the five most significant problems for doing business in Greece are a lack of access to financing, an inefficient government bureaucracy, burdensome tax regulations, policy instability, and high tax rates (Schwab & Sala-i-Martin, 2014).

### ***Competitiveness in Greece***

Over the last year, Greece's competitiveness ranking improved by 10 places, climbing from the 91<sup>st</sup> to the 81<sup>st</sup> spot in world rankings. This represents a strong improvement which can be attributed to long overdue changes ensuring more flexibility in labour relations, stronger domestic competition and the gradual opening up of certain markets. The World Economic Forum (Schwab & Sala-i-Martin, 2014) notes that Greece is one of the few economies that are adopting and applying the reforms necessary to attain improved competitiveness.

Despite this, however, the pace of reform is slow and fundamental problems remain. The operation of basic state structures remains problematic and below par, while the country's potential in competitiveness remains strongly constrained by corruption in public administration, a lack of transparency and the inefficiency of the state. While Greece itself is technologically advanced, Greek companies are not,

which confirms that despite six years of recession the country's growth model has yet to evolve from one based on consumption to one based on production (Manifava, 2014).

An analysis report by Malliaropoulos (2010) suggests that a part of the Greek weakness in competitiveness can be attributed to European Monetary Union, since the competitiveness of the Greek economy had declined by 10% since 2000, even before the crisis, both in terms of relative prices and unit labour costs. Most of the deterioration in competitiveness took place in the agricultural and industrial sector, not in the service sector, which represents about 80% of the private economy. This is a significant loss, but not as significant as stated in other sources, which overstate the loss in competitiveness of the Greek economy because they estimate competitiveness of the service sector relative to Greece's main trading partners in manufacturing exports, which are different from Greece's competitors in tourism.

The conclusions of Malliaropoulos (2010) are optimistic, suggesting that the need for "internal devaluation" is not as large as markets currently seem to assume. Relative wage costs will most likely decline due to the ongoing recession in Greece, which, combined with higher labour market flexibility and a weaker euro, will help to restore competitiveness over the next few years. Perhaps the improvement in competitiveness reported in 2014 (Manifava, 2014) confirms a major part of this prediction. Under these circumstances, the export sector, having witnessed a boost in competitiveness, may become one of the main driving forces of growth for the Greek economy in the future. A vital recommendation for the future is that economic policy must focus on structural reforms in product markets which enhance price competitiveness, innovation and productivity (Malliaropoulos, 2010)

Last year's European Commission competitiveness report for Greece (EC, 2013) mentions the need for assistance to boost Greek competitiveness, such as the Second Economic Adjustment Programme for Greece, approved in March 2012, and foreseeing financial assistance of €164.5 billion by the end of 2014. Greek economy saw a drastic decline in competitiveness following an increase in labour costs of more than 50 % in 1999–2009. However, competitiveness is currently being restored through increased wage flexibility and low inflation. According to the figures from the Hellenic Statistical Authority, labour costs have been reduced by 20% over the past three years (EC, 2013)

The Economic Adjustment Programme has sought to adjust these imbalances in the economy. Greece has started the process of transformation, from an economy based on consumption to one with a bigger focus on investments and exports. Exports have already increased over recent years but, as a result of the recession and the credit crunch, as well as of bad policy-making and constant changes in taxation, investments are still disappointing. The regulatory environment has constrained businesses and entrepreneurship, and these, combined with the lack of competition, have led to lacklustre productivity and competitiveness. However, steps are being taken to tackle many of the structural barriers and regulatory failings (EC, 2013).

Encouragingly, many efforts are starting to show results, and the ranking of Greece in the World Bank's Ease of Doing Business indicators has improved. Further significant measures have been taken to ease the creation of companies, and to simplify licensing procedures and investment authorisations. With the technical assistance of the Task Force for Greece, cumbersome export procedures are being simplified. The difficult economic conditions, continuing uncertainty, and in particular the credit crunch continue to make conducting business difficult, in particular for SMEs. Economic growth is one of the top priorities of the government, and in this context, reforming the public administration remains central in terms of securing the capacity and competence to implement newly adopted legislation and to improve the business environment. Reforming the economy must remain a priority in order for the required changes to take place. A dynamic corporate sector is crucial to re-starting the economy and achieving growth. By tapping the entrepreneurial potential of citizens and creating the right business environment, Greece can overcome its difficulties and achieve sustainable economic and employment growth in the future (EC, 2013)

The OECD Competition Assessment (2014) identified 555 regulatory restrictions that are potentially harmful to competition in four vital sections of the Greek economy: food processing, retail trade, building materials and tourism. The report makes 329 specific recommendations to mitigate harm to competition from these restrictions. If the recommendations detailed by the report are implemented, benefits to consumers in Greece and to the Greek economy should arise in all four sectors. More specifically, the OECD has calculated a positive effect to the Greek economy of around €5.2 billion which will occur in this case. The amount is the total of the estimated resulting positive effects on consumer surplus, increased expenditure

and higher turnover, respectively, in the sectors analysed, as a result of removing current regulatory barriers to competition (OECD, 2014).

Provided all the recommendations are fully implemented, the benefits to the Greek economy will lead to the emergence of more competitive markets, resulting in faster productivity growth over time. Similar programmes to remove regulatory barriers to competition have been conducted successfully over the world, for example in Australia during the 1990s and 2000s, boosting national GDP by about 2.5% above levels that would have otherwise prevailed (OECD, 2014).

To ensure that similar benefits will eventually be enjoyed by the Greek economy and Greek consumers, it is important that the suggested measures are fully implemented. Partial lifting of restrictions will yield only partial results. Moreover, this should be seen as only the first part of a much longer process. The work undertaken by the Greek authorities in recent years to reinforce competition law and strengthen the Hellenic Competition Commission, to simplify business administration and to liberalise professional services, has demonstrated their political willingness to address existing regulatory barriers to competition that have contributed to holding back the economic recovery (OECD, 2014).

### ***Innovation in Greece***

As explained, the innovation performance of Greece is alarmingly low, especially for what is considered to be an advanced economy, and the impact of the crisis has made the need for an improvement of innovation even more pressing. There are challenges ahead for the innovation system, as the country needs to transform itself into a stable environment for entrepreneurship and create conditions for growth. According to the Innovation Union Scoreboard 2013, Greece is one of the moderate innovators, with a below-average performance. Innovation performance actually declined at an average annual rate of 1.7% between 2008 and 2012 (EC, 2013).

In the past decade R&D expenditure has stagnated, remaining at 0.58% of the GDP. In 2011 Greece set an R&D intensity target of 2%, to be achieved by 2020, but the National Reform Programme for 2013 revised this target downwards to 0.67% of GDP, which is considered as more consistent with current trends and with the post-

crisis economic outlook. The objective of Greece's innovation strategy is to promote innovation in all sectors as a key driver for restructuring the Greek economy and for its transition to a knowledge-based economy. EU programmes play a major role in the funding of innovation initiatives, but the level of funding available exceeds the amount that the business sector can absorb. Besides the general economic environment, financial constraints can play a role as many eligible companies cannot provide bank guarantees to receive an advance payment. The commitments to specific innovation policy initiatives for 2010-12 amounted to €596 million and are aimed at programmes supporting technological and knowledge transfer, cluster cooperation and the creation and growth of enterprises (EC, 2013).

To make a significant change, further efforts are needed, in particular closer links between researchers and industry, and improved technology transfer. Although policy is emphasising the use of new financial instruments, including funds dedicated to supporting innovation, there are substantial difficulties as almost no national co-finance and no private investment is available. Consequently, subsidies continue to be the main type of support for R&D, though tax incentives are also used. In an effort to boost development through R&D, the government has recently adopted new legislation that further enhances tax incentives for enterprises engaged in R&D (EC, 2013)

Despite some changes and improvements, and the stated willingness of the Samaras coalition government to implement reforms, Greece is still facing the same problems it did at the start of the crisis, with a stagnating economy and unemployed citizens. Six years of recession have made clear that enforcing austerity measures and trying to push through desperately needed reforms in the regulatory environment is not enough to create both new growth and a better future. After this realisation, the conversation in Berlin and Brussels now focuses on how Greece and other Southern European economies can grow out of the crisis through a comprehensive investment agenda (Kritikos, 2014).

But while the overarching conversation has changed, there are many other issues facing this country. By comparing Greece before the crisis with other similarly sized Eurozone states, such as Finland, the Netherlands, Austria and Belgium, it is clear that Greece's deficits are not only institutional but also structural, and they are mostly connected to a Kafkaesque bureaucracy that constraints entrepreneurship (Kritikos, 2014). According to the 2014 edition of the World Bank's Ease of Doing

Business report Greece ranks 72nd out of 189 countries. Despite some improvement, Greece still has an overregulated legal framework that puts substantial burdens on entrepreneurs. Requirements for licenses, permits, and reporting remain excessive, while key agenda items remain unfinished (Kritikos & Zimmerman, 2014).

The overregulated legal framework stops many entrepreneurs before they even get started. As a result Greece has thousands of relatively small businesses that cannot take advantage of economies of scale. Most firms are in low value-added sectors, such as tourism, beverages and the food industry. None of these requires serious investments in research and development, even if the funds were available. The country can only become prosperous by using its comparative advantages and laying the groundwork for higher value-added goods production. R&D investments are critical because these investments yield innovative, exportable goods, while simultaneously creating jobs, prosperity and hope (Kritikos, 2014). However, the institutional reforms under way are not enough. R&D needs an innovation-oriented industrial structure and a well-functioning innovation system. This simply does not exist in Greece, where R&D investment barely manages to reach the target of 0.67% of the GDP, compared to an average of around 3% for the other Eurozone economies (Eurostat, 2014).

### 3.2. Bulgaria

<b>BULGARIA</b> <sup>5</sup>		
<b>Population</b>	7.2 millions	
<b>GDP</b>	€40 billions	
<b>GDP per capita</b>	€5,500	
<b>Stage of Development</b>	Efficiency driven	
	<i>Rank</i>	<i>Score</i>
<b>GCI total</b>	54 / 144	4.4 / 7
<b>GCI innovation</b>	106 / 144	3.3 / 7
<b>GII total</b>	44 / 143	40.74 / 100



Diagram 3: 2014 GCI pillar scores for Bulgaria compared to emerging economies<sup>6</sup>

Bulgaria joined the EU in 2007 along with Romania, as the two countries were deemed not fully ready to join in 2004 along with the other former communist states. Bulgaria’s political system and its economy were lagging further behind those of other Eastern European states, and there was need for further reform of Bulgaria's judicial structures, as well as for further efforts to fight against political corruption and organised crime, including human trafficking (Sajdik & Schwarzinger, 2011).

<sup>5</sup> Statistics taken by Eurostat for 2013 and from GCI and GII indices for 2014

<sup>6</sup> Figure taken from: “Enhancing Europe’s Competitiveness” report (World Economic Forum, 2014).

Despite these difficulties, Bulgaria's EU accession took place successfully, and despite the effects the economic crisis or other obstacles, the country seems to be closing the distance with the other Eastern European members of the EU in several crucial indicators.

This is evident in diagram 3, which shows that Bulgaria is at about the same level as the average of the countries comprising "emerging and developing Europe" in the twelve pillars of competitiveness according to the GCI. Its macroeconomic environment is particularly strong because of its healthy fiscal surplus, and it has a good performance in health and primary education. Bulgaria only lags slightly behind in institutions and in the crucial pillar of innovation. According to the Global Competitiveness Report, the five most significant problems for doing business in Bulgaria are corruption, inefficient government bureaucracy, lack of access to financing, policy instability, and an inadequately educated workforce (Schwab & Sala-i-Martin, 2014).

### ***Competitiveness in Bulgaria***

According to the European Commission's competitiveness reports for 2014 (Novinite, 2014a) Bulgaria is one of the weakest EU members in competitiveness performance, having modest and stagnating or declining competitiveness. The EC has divided Member States into four groups on the basis of their performance in the sphere of industrial competitiveness, with Bulgaria ending up in the group of EU countries with "modest and stagnating or declining competitiveness," together with Slovenia, Croatia, Malta and Cyprus.

The EC argues that to ensure that growth does not stall, the EU and Member States urgently need to address a number of areas of concern: investment, access to finance, access to foreign markets, public administration, innovation and energy prices. Overall, the EU's competitive strengths in manufacturing remain intact: highly skilled workers, high domestic content of export goods, and comparative advantages linked to complex and high-quality products. EU Member States have also implemented a range of policies to increase competitiveness over the period since the start of the crisis in 2008 (Novinite, 2014a).

The data produced by both reports leads EC experts to a number of conclusions, including that additional investment is needed across all sectors to ensure that European industry can maintain its competitiveness. The EC points out that small and new firms find it more difficult to obtain bank credit compared to other firms, even if their financial performance is the same. According to the experts, competitiveness can be supported by more efficient innovation and commercialisation of research, and access to highly-skilled labour (Novinite, 2014a).

The EC also argues that competitiveness requires reducing costs and uncertainties for businesses when dealing with public administration. The EC experts also call for support to help the internationalisation of SMEs as smaller and newer firms are currently less likely to enter foreign markets and reap the associated benefits. A further problem is that competitiveness is negatively affected by electricity and gas prices which are higher in the EU than in a number of other economies (Novinite, 2014a).

On the other hand, the latest World Economic Forum report on global competitiveness (Schwab & Sala-i-Martin, 2014) ranks Bulgaria as the best in the Balkans. In fact, according to the report, Bulgaria is the leader in the Balkans, ranked 54<sup>th</sup> overall in the world – a modest but significant rise of three places compared to the previous year. The report however said that Sofia scored worst when it comes to “favouritism in decisions of government officials” where it was ranked 134<sup>th</sup> while its macroeconomic environment was ranked as 36<sup>th</sup> (Balkan Insight, 2014).

As a national report on the competitiveness of Bulgarian economy (Centre for the Study of Democracy, 2014) remarks, while Bulgaria’s 54<sup>th</sup> position in the global competitiveness ranking makes it the best performer in the Balkans (Schwab & Sala-i-Martin, 2014), it still represents stagnation at more or less the same levels for the sixth consecutive year. Bulgaria’s economy is reliant on exports, offers low living costs, and stable public finances. Its competitiveness remains narrow-based and unstable. The labour market crisis caused by the financial downturn seems to have abated but unemployment remains worryingly high. The economy is still suffering as a result of the inadequate business environment and the lack of a strong institutional framework, which could foster research, development and innovation activities, as well as adapt the educational system to the needs of the labour market (Centre for the Study of Democracy, 2014).

With increasing globalisation and Bulgaria's accession into the European Union, the question how to improve the country's international competitiveness has become very important and urgent. In the decade from 2002 to 2012, from preparing for Bulgaria's entry to the EU to five years after it, the country's competitiveness on international level has gradually improved but still remains at a comparatively low level as Bulgarian producers compete mostly on prices, invest very little in research and development, rely on low labour costs, and produce goods with low added value (Vassileva, Petkov & Zhelev, 2014).

### ***Innovation in Bulgaria***

Bulgaria's innovation performance is also weak. It again ranks bottom in the European Union's 2013 innovation scoreboard, having been at or near the lowest position every year since 2008. Bulgaria now was last in the 2008, 2012 and 2013 scoreboard, second from last in 2009 and fourth from last in 2010 and 2011. In the years that Bulgaria was not awarded the bottom spot, that place went to Turkey, which is not even an EU member state, but included in the ranking, thereby saving Bulgaria from the ignominy of the final spot (Sofia Globe, 2013).

To improve this poor performance, Bulgaria is to spend nearly €500 million (BGN 937.9 million) on innovations in 2015, including public spending and the expenses of the business sector. The sum is nearly double the amount earmarked for 2011, when the expenses for research and development amounted to €220 million (BGN 429.6 million). This doubling of investments is included in the last version of the Innovation Strategy for Intelligent Specialization 2014-2020, which is used to determine the distribution of EU funding under the program "Innovations and Competitiveness" in the 2014-2020 programming period (Novinite, 2014b).

More specifically, in 2015, Bulgaria's public spending on innovations is to amount to a total of around €270 million, including €140 million through EU funds and €100 million from the state budget, as well as €27 million coming from universities. Companies and non-commercial establishments are expected to spend around €210 million on innovations in 2015 (Novinite, 2014b).

Despite the growing innovation expenses, Bulgaria is still last in the EU in innovation performance. More specifically, Bulgaria is lagging behind substantially in

the use of digital technology. According to the digital agenda of Europe, 33% of small and medium-sized companies are to sell their products online by 2015. By the end of 2013, however, only 4% of these companies in Bulgaria were developing online trade, compared to an EU average of 13% (Novinite, 2014b).

Innovation in Bulgaria does have its strong points and advantages, however, and the same is true about Romania. Despite being considered –and ranked– as the weakest European economies, the rise of innovation and entrepreneurialism within the technology sector in Bulgaria and Romania offers significant promise. Both countries have strong ICT markets, revitalised every year by high numbers of bright, young engineers entering the labour market. With a rich technology talent pool, multi-national tech companies have increased investments in Bulgaria and Romania. For example, Microsoft has been present in Romania since 1996 and opened its Global Business Support Centre there over five years ago, where more than 300 technology professionals work today. In Bulgaria, Microsoft has worked with more than 900 local companies since setting up its local office in 1999 and has invested more than \$2 million to support Bulgarian education over the last decade. Furthermore, Sofia and Bucharest are two of the most promising start-up hubs in Eastern Europe. These capitals are developing vibrant start-up ecosystems with a growing number of organisations providing financial support and affordable working space for aspiring entrepreneurs (Grantham, 2014).

Despite encouraging developments in the tech space, the broader economic and labour market-related issues these countries face cannot be ignored. Both markets have high levels of youth unemployment, with 28.1% of young people out of work in Bulgaria and 22.7% in Romania, according to Eurostat (2014). Moreover, they also have some of the lowest GDP per capita ratios across the EU. Small businesses and start-ups are also challenged by lack of private funding, with Bulgaria and Romania both showing the lowest levels of venture capital funding across Europe (Grantham, 2014).

### 3.3. Romania

<b>ROMANIA<sup>7</sup></b>		
<b>Population</b>	21.3 millions	
<b>GDP</b>	€142 billions	
<b>GDP per capita</b>	€6,700	
<b>Stage of Development</b>	Efficiency driven	
	<i>Rank</i>	<i>Score</i>
<b>GCI total</b>	59 / 144	4.3 / 7
<b>GCI innovation</b>	78 / 144	3.5 / 7
<b>GII total</b>	55 / 143	38.08 / 100



Diagram 4: 2014 GCI pillar scores for Romania compared to emerging economies<sup>8</sup>

Romania joined the EU in 2007 along with Bulgaria, as the two countries were deemed not fully ready to join in 2004 along with the other former communist states. Having one of the most totalitarian and paranoid regimes in Europe under Nicolae Ceausescu, Romania had a lot of ground to cover to rebuild its political system and shortage-ravaged economy (Mazower, 2007). During the 2000s, Romania

<sup>7</sup> Statistics taken by Eurostat for 2013 and from GCI and GII indices for 2014

<sup>8</sup> Figure taken from: “Enhancing Europe’s Competitiveness” report (World Economic Forum, 2014).

implemented a number of reforms to prepare for EU accession, including the consolidation of its democratic system, the institution of the rule of law, the acknowledgement of respect for human rights, the commitment to personal freedom of expression, and the operation of a functioning free-market economy. Significant progress was made and Romania's EU accession took place successfully in 2007, with the country showing considerable growth until this was frozen by the global economic crisis (Sajdik & Schwarzingger, 2011).

Diagram 4 shows that Romania's performance in competitiveness is more or less the same as the average for what is termed as "emerging and developing Europe". Romania is slightly behind the average in infrastructure and health and primary education, and slightly above the average on macroeconomic environment and market size (primarily because of the country's greater size and population compared to most). According to the Global Competitiveness Report, the five most significant problems for doing business in Romania are a lack of access to financing, high tax rates, an inadequate supply of infrastructure, corruption, and inefficient government bureaucracy (Schwab & Sala-i-Martin, 2014).

### ***Competitiveness in Romania***

According to the latest global competitiveness report (Schwab & Sala-i-Martin, 2014), Romania is ranked 59<sup>th</sup> overall in the world. This constitutes an amazing improvement compared to last year's report, in which it was ranked 76<sup>th</sup>. Among the lowest scores Romania got were for the "wastefulness of government spending" – for which it was ranked 116<sup>th</sup> in the world - and for its capacity to retain talent, for which it was ranked 128<sup>th</sup> (Balkan Insight, 2014). Overall, assessments of national competitiveness in Romania (e.g. Herciu, 2013), tend to come up with negative conclusions, noting that that Romanian has more competitive disadvantages than competitive advantages, even if it has some unique comparative advantages vis-à-vis the European Union.

Another assessment of Romanian competitiveness, prepared for the National Development Committee, whose main goal is to promote and help implement policies that will achieve the strategic goal of Romania reaching developed country status, confirms the country's weaknesses (Tatucu, 2012). On one hand, Romania is geo-

strategically located in South-Eastern Europe along one of the main trade routes that connect Western Europe to South-Eastern Europe and Turkey, and it has access to the River Danube and the Black Sea, having the largest port on the Black Sea and the fourth largest in Europe. In terms of natural resources, the country is rich in natural gas, timber, coal, iron ore, gold, as well as arable land and hydropower. Its petroleum reserves have been declining, although this trend could be reversed by recent findings of new petroleum deposits in the Black Sea (Tatucu, 2012).

These advantages, however, are not being properly exploited or are not enough to improve the country's performance in competitiveness. Romania's transport infrastructure and broadband Internet penetration for both households and enterprises is rather weak, being considerably behind the EU average. Regarding human capital, although enrolment in education is strong, the quality of education is weak, and the country lags considerably behind in terms of innovation, patent production and R&D capabilities (Tatucu, 2012).

Moreover, while labour costs are still relatively cheap compared to the EU average, labour productivity is low, negating the advantage of low cost. This is further compounded by the considerable brain drain, with many of Romania's best and brightest leaving the country. Finally, although public administration has undergone through a considerable reform process over the past two decades and the country is doing well in a number of areas, there are still considerable issues pertaining to inefficiencies, transparency and the large number of complex bureaucratic processes that make public administration in Romania suboptimal (Tatucu, 2012).

In order to increase the competitiveness of its economy, Romania will concentrate by 2020 on the development of ten economic sectors among which tourism, auto industry, information technology, energy, agriculture, textiles and pharmaceuticals, as part of a competitiveness strategy whose purpose is to bridge the competitiveness gap with developed European countries (ACTMEDIA, 2014).

### ***Innovation in Romania***

The European Commission remarks that R&D intensity in Romania did make a moderate increase from 0.37% to 0.48% in the decade from 2000 to 2010 (EC, 2011). This moderate positive trend, though, was not enough to change the fact that

Romania still scores one of the lowest R&D intensities in the European Union. The Romanian 2007-2013 Strategy for Research, Development and Innovation had foreseen a gradual increase of the R&D public budget, but this did not take place, mainly due to the economic crisis. A substantial increase of the R&D spending, both in absolute and relative terms, will be instrumental for Romania in order to raise the economic competitiveness and secure high-quality jobs (Diaconu, 2014). Romanian authorities have recognised this and have set an ambitious but achievable target for 2020: R&D intensity is expected to account for 2.0 % of the national GDP in 2020 (EC, 2011).

An important challenge for reaching this target is the overall fragmentation of the Romanian Research and Innovation system, as reflected by the large number of research performers (universities, research institutes and institutes of the Romanian Academy) combined with a lack of critical mass of the quality of research results. Romania scores low both in terms of high-impact scientific publications and patent applications. The weak scientific and technological performance is combined with rather unfavourable framework conditions for business R&D, as reflected by the low figures of business enterprise expenditure on R&D. As expected in this context, the employment in knowledge intensive activities appears to be one of the lowest in the EU (EC, 2011).

In comparison with similar countries both in terms of industrial structure and R&D performance, as well as with the EU as a whole, Romania appears particularly weak as regards the dynamics of private sector R&D and implicitly the framework conditions for business R&D put in place by the national authorities. This is reflected both by the yet again overall decrease of business enterprise expenditure on R&D between 2000 and 2009 and the number of patent applications in societal challenges. On the contrary, Romania is improving beyond the EU average and the reference group of countries in public R&D expenditure and new doctoral graduates (EC, 2011).

The most recent picture of the European Union's innovation landscape, the Innovation Union Scoreboard 2013 report, reported some surprising results for Romania's case. In the "license and patent revenues from abroad" indicator, the growth recorded by Romania was the highest at EU level (i.e. 23.4%, whereas the Union's average was 6.1%). However, one can observe a certain discrepancy between the excellent results in terms of innovation commercialisation and Romania's constant

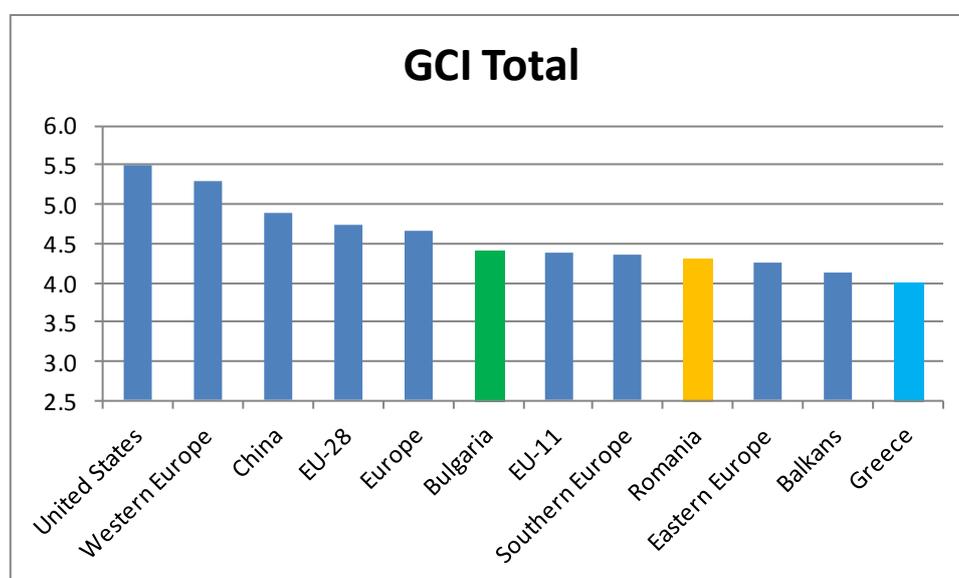
position of modest innovator, with aggregated results well below the EU average (Iancu, 2014).

Overall, EU indicators rank Romania as a modest innovator, with an underfunded research and innovation system, constantly positioned on the last places with regard to many of the coordinates that analyse the state and the development of the system. Thus, although it excels in some innovation indicators, this aspect is of marginal relevance to the innovation system in Romania. The main challenge that Romania still has to face is a low level of competitiveness, which has a direct impact on research and innovation. Although there are some positive results by the production of high technology, the Romanian economy is still characterised by the prevalence of low and medium technology sectors. The economic impact index of innovation is lower than the EU average, but higher than the reference country group which includes states with similar economic profiles (e.g. Bulgaria, Poland, Hungary) (Iancu, 2014).

Overall, this highlights a strong need to turn intellectual output into economic competitiveness. One of the possible strategic implications is the need to facilitate the creation of new innovative companies with the potential to promote and support the creation and marketing of knowledge. In this respect, a number of structural reforms may be envisaged. One of these is the development of a research base to focus on those sectors where Romania is already proving competitive at international level and where there is potential to attract relevant investments. On another level, but still related to the previous one, it is necessary to start building an entrepreneurship culture, to support dissemination of the results of research and innovation throughout the economy (Iancu, 2014)

### **3.4. Comparative Analysis**

An overall, general picture of the state of innovation and competitiveness in the region of Southern and Eastern Europe was provided above, in part 2.4. A specific analysis of the state of innovation and competitiveness in each of Greece, Bulgaria and Romania was made in parts 3.1 to 3.3, above. Complementing these, a brief comparative analysis on critical indices and sub-indices of competitiveness and innovation is conducted below. The comparative analysis will demonstrate how these three countries are fairing compared to the performance of other countries and regions in Europe and the world<sup>9</sup> and will connect the outcomes to the specific trends reported during the country analysis.



**Diagram 5: Comparison of GCI total scores**

In general, the poor performance of Greece, Bulgaria and Romania in competitiveness and innovation is evident when doing comparisons, although it is important to place these performances in context. Regarding competitiveness (see

<sup>9</sup> Regarding the different regions used in the comparison:

“Europe”: all countries European countries regardless of whether they are EU members or not.

“Western Europe”: Switzerland, Norway, Iceland, Denmark, Sweden, Finland UK, France, Belgium, Netherlands, Luxembourg, Germany, Austria.

“Southern Europe”: Portugal, Spain, Italy, Malta, Greece, Cyprus.

“Eastern Europe”: All former communist states and successor states.

“EU-28”: All EU members after Croatia’s entry in 2013.

“EU-11”: Former communist states who joined the EU, including Croatia.

“Balkans”: Greece, Albania, FYROM, Montenegro, Serbia, Bosnia, Croatia, Bulgaria, Romania.

diagram 5), Bulgaria, as explained, is one of the weakest EU members in competitiveness performance (Novinite, 2014a), being well behind both the EU and the European average. On the other hand, it is the best performer in the Balkans (Balkan Insight, 2014), having higher competitiveness than the average of the former communist EU members (the EU-11) and than the average of Southern Europe. Romania, having more obstacles (Herciu, 2013), has lower performance, being slightly above the averages for Eastern Europe and the Balkans. Greece is the worst performer in competitiveness, and despite the improvements in its score, brought on by the reforms necessitated by the economic crisis (OECD, 2014), it is still behind Eastern Europe and the Balkans in competitiveness.

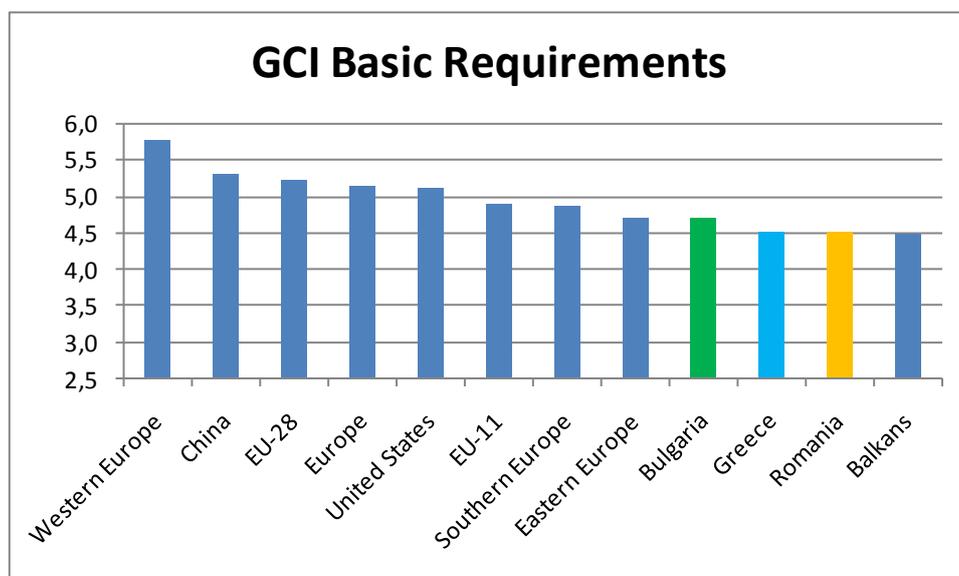


Diagram 6: Comparison of GCI Basic Requirements sub-index scores

Regarding performance in the basic requirements for competitiveness, including institutions, infrastructure, macroeconomic environment and health and primary education, the three countries have different strengths and weaknesses, with Greece having a dire macroeconomic environment but good infrastructures and health and education, while Bulgaria and Romania have strong macroeconomic environments (Schwab & Sala-i-Martin, 2014). In any case, the overall performance of all three countries on the basic requirements of competitiveness is poor, as they are behind the averages for both Southern and Eastern Europe, and only slightly above the Balkan average (see diagram 6).

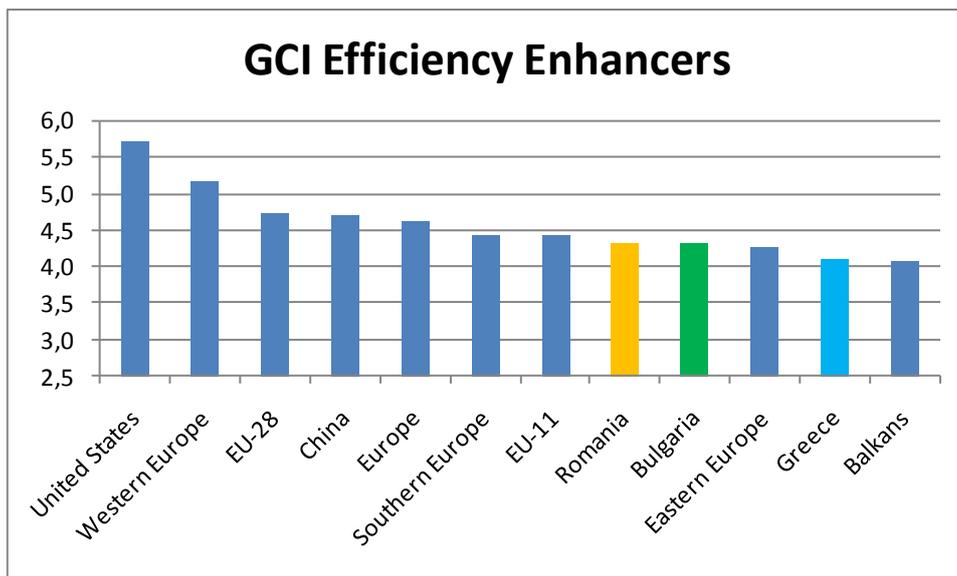


Diagram 7: Comparison of GCI Efficiency Enhancers sub-index scores

Good performance in the efficiency enhancers for competitiveness is critical for Bulgaria and Romania as they are categorised as efficiency-driven economies (Schwab & Sala-i-Martin, 2014). In reality, however, both countries are below the average for the EU-11 states, even though they are above the averages for Eastern Europe and the Balkans. Greece has a very poor performance in the efficiency enhancers, as it is below Eastern and Southern Europe and only slightly above the Balkan average (see diagram 7).

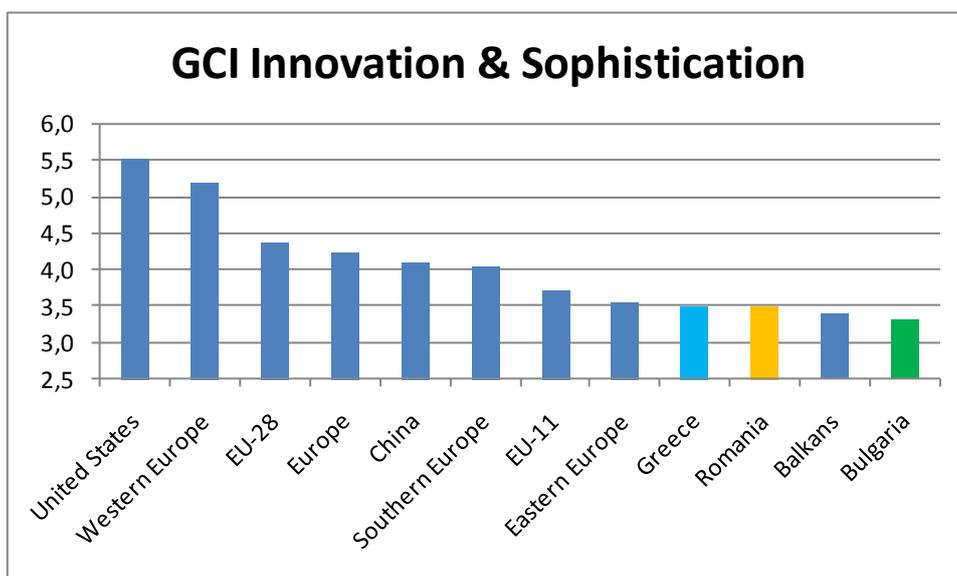


Diagram 8: Comparison of GCI Innovation & Sophistication sub-index scores

Good performance in the innovation and sophistication sub-index is critical for Greece, as it is categorised as an innovation-driven economy. In reality, though, Greek performance in the sub-index is very poor, with Greece being behind Southern and Eastern Europe and only slightly above Bulgaria, Romania and the Balkan average. The shortcomings in such a critical area can explain the very poor overall competitiveness performance of Greece. Romania and Bulgaria too are performing very poorly in the sub-index, with Bulgaria being the worst performer in the EU (Schwab & Sala-i-Martin, 2014) (see diagram 8).

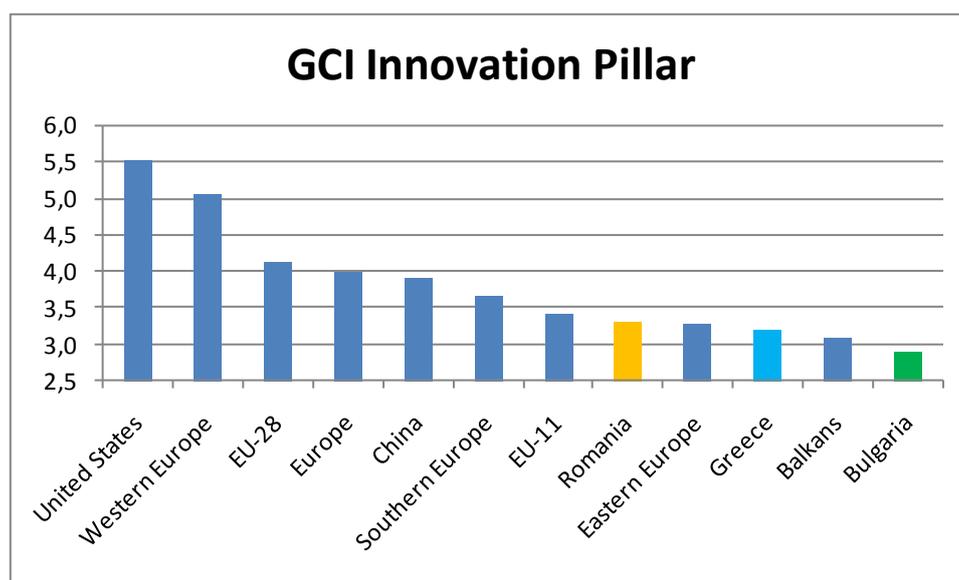


Diagram 9: Comparison of GCI Innovation pillar scores

In the innovation pillar of the GCI, which specifically measures technological innovation, the poor performance of the three countries is again evident (see diagram 9). Their distance from the leading developed innovators of Western Europe or from the US is bigger here than in the other dimensions of competitiveness. All three countries are behind the EU average, the Southern Europe average and the EU-11 average, while Greece and Bulgaria are behind Eastern Europe as well.

Interestingly, in the comparison of innovation performances using the GII total score (see diagram 10), the relative positions of the regions and countries are exactly the same as under the GCI innovation pillar (diagram 9), with the notable difference that Romania and Bulgaria's positions are almost reversed. While in the GCI innovation pillar Bulgaria appears as the worst performer in the EU (Schwab & Sala-i-Martin, 2014), in the GII, Bulgaria's innovation performance seems to be much

better, surpassing Greece, Romania and the average for Eastern Europe. This difference could be because the GCI innovation pillar measures only technological innovation, in which Bulgaria is weaker (Novinite, 2014b), while the GII measures more general aspects of innovation, in which Bulgaria might be stronger (Grantham, 2014).

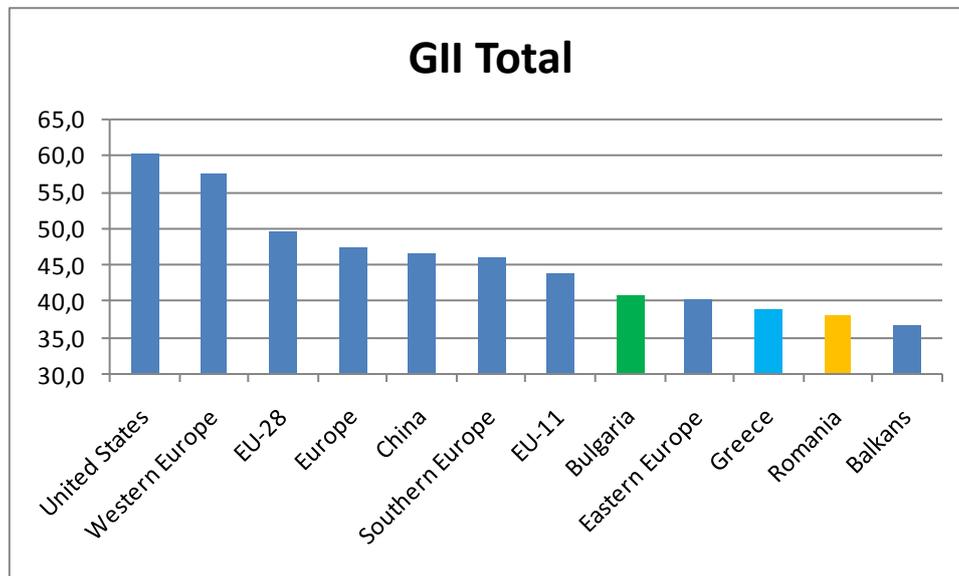


Diagram 10: Comparison of GII total scores

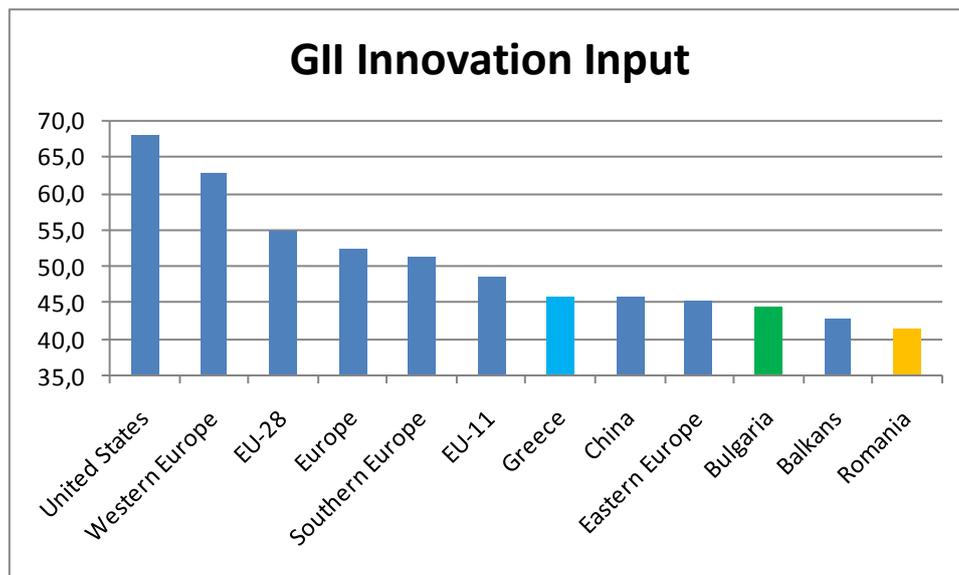


Diagram 11: Comparison of GII Innovation Input sub-index scores

The GII innovation input sub-index measures aspects of the environment conducive to innovation within an economy (Cornell University, INSEAD & WIPO,

2014). The innovation input performance graph (diagram 11) shows that Greece has an environment that is more suitable for innovation than that of Eastern Europe and even than that of China, which is striving to become one of the top innovators in the world (Cornell University, INSEAD & WIPO, 2014). On the other hand Bulgaria is only slightly above the Balkan average and Romania slightly below, being the worst performer in the innovation enabler pillars.

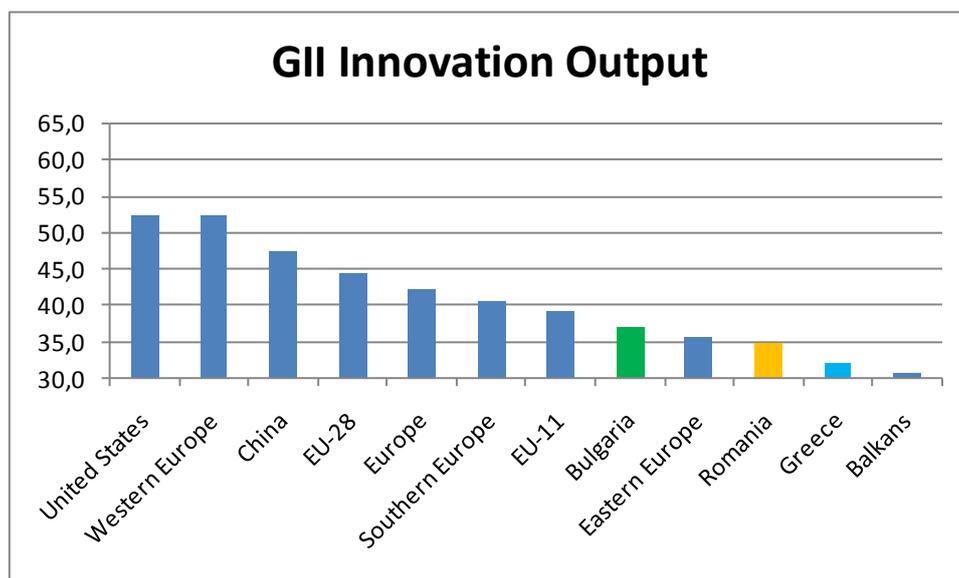


Diagram 12: Comparison of GII Innovation Output sub-index scores

The GII innovation output sub-index, though, which focuses on the results of innovative activities within the economy (Cornell University, INSEAD & WIPO, 2014) provides a very different picture (diagram 12). Greece has a very bad innovation output despite having decent innovation input, and its performance is below that of Bulgaria and Romania, below the average for Eastern Europe, and only slightly better than the average for the Balkans. It is interesting to note that China, which has a lower performance in innovation enablers than Greece, has a much better performance in innovation output, being above the EU average. Similarly, Bulgaria and Romania, while still among the poorest innovators, in Europe, get much more output than Greece for their modest input; Romania is above Greece and the Balkan average while Bulgaria is above the Eastern European average but still below the EU-11.

These differences between input and output are directly reflected in the GII innovation efficiency ratio (diagram 13). Romania and Bulgaria are more or less at the

same level with the EU-28 average and the EU-11 average efficiency ratio of about 0.8, which is also the efficiency ratio of the United States. Therefore, even if they are poor innovators, at least Bulgaria and Romania make use of their modest capacity for innovation and reach the same efficiency as most of the developed economies. On the other hand, Greece, with an efficiency ratio of 0.7, close to the Balkan average, is a very inefficient and wasteful innovator, making poor use of an innovation capacity which is significantly better than that of Bulgaria and Romania.

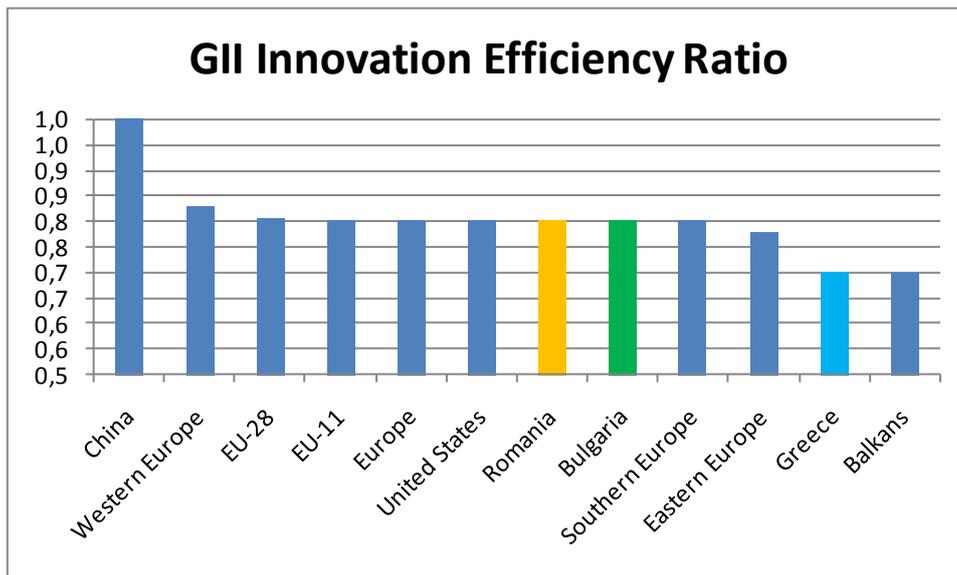


Diagram 13: Comparison of GII Innovation Efficiency ratios

## **4. CONCLUSIONS**

### **4.1. Summary and Assessment**

The analysis conducted above through the examination of various national and international reports as well as scores on the GCI and GII benchmarking indexes has revealed a large number of major weaknesses in innovation and competitiveness performance for Greece, Bulgaria and Romania. Considering the vital importance of innovation for competitiveness, and of competitiveness for the economy (U.S. Department of Commerce, 2012) these shortcomings might go a long way toward explaining why Bulgaria and Romania have the weakest economies in the EU and Greece the weakest in the Eurozone and one of the weakest in the EU (Eurostat, 2014). Weak economies result in low innovation levels (Lioukas, 2009), which in turn cannot boost the economy closer to those of Western Europe (Schwab & Sala-i-Martin, 2013), creating a vicious circle of low innovation and low competitiveness.

At least Bulgaria and Romania are making the most out of their innovation capacity, or at least as much as the Western European countries are making, having an Innovation Efficiency ratio that is similar to the one the top innovators of Western Europe have (Cornell University, INSEAD & WIPO, 2014). On the other hand, Greece, despite being a richer country with a better capacity for innovation and some considerable assets, like excellent research institutes (Kritikos, 2014), actually has a lower innovation input than its poorer northern neighbours. Therefore, Greece is a wasteful and inefficient innovator with a low Innovation Efficiency ratio (Cornell University, INSEAD & WIPO, 2014), prevented from making good use of its innovation capacity because of inherent weaknesses in its institutions and a Kafkaesque bureaucracy.

This epitomises the main difference between the three countries examined in the present thesis: despite being currently poorer than Greece, Bulgaria and Romania are young and vibrant market economies that have room to grow; Greece is stagnating, being hit by the crisis and not being able to institute the reforms that can bring back growth. Despite being in the EU (then EEC) since 1981 and considered as one of the advanced economies, Greece actually has more in common with the Eastern European countries than with the Western European or even the Southern European ones in terms of its economy and its poor performance on the vital

competitiveness and innovation indicators. The main question here is how this situation was brought about. To understand this, we need to examine the issue in historical depth and context, something that technical analyses usually fail to do.

The Balkan states until World War II were essentially the products of the same process, were in similar conditions of prosperity, with similar economies and similar problems and shared similar histories since their liberation from Ottoman rule, creating unstable states that gradually fell to authoritarian dictatorships in the interwar years (Mazower, 2007). Their fates diverged after the War because of the consequences of the Yalta agreement, which left Greece free to pursue a democratic path to progress while placing the rest of the Balkans (as well as all of Eastern Europe and half of what remained of Germany) under the Soviet yoke. With the notable exception of Tito's Yugoslavia and Hoxha's paranoid and isolated Albania, the regimes that emerged in these countries in the late 1940s were little more than Soviet puppets whose authority was maintained by the presence or threat of the Red Army (Isaacs & Downing, 1998).

This divergence did not make itself felt immediately. Greece was a poor and underdeveloped country too, and it had to repair the damage and disruption caused by the German occupation but more importantly by a long and bloody civil war caused by Greek communists, who, without the direct support of the USSR were eventually defeated. Eventually, though, the rebuilding started in Greece, with the help of the Marshall plan, and democracy flourished, with the unfortunate exception of the 1967-1974 military dictatorship, caused by political instability (Woodhouse, 1985).

In Greece's northern neighbours, though, dictatorship was much longer lasting and much more oppressive. For example, the systematic surveillance of leftists in post-civil war Greece cannot even be compared with the existence of a secret police in Romania "whose size and agent networks dwarfed the Gestapo" (Mazower, 2007, p.137). Moreover, in the communist states, the dictatorship was totalitarian, encompassing every sphere of life, including, of course, the economy. As a result of the application of the problematic socialist model of a centralised state-controlled economy, prices and unemployment rose sharply and growth rates dropped. The outcome was that "worker discontent was more serious in communism than in capitalism" (Mazower, 2007, p.136).

From the mid-1970s onwards, the contrast between Greece and its Balkan neighbours became much more marked. The oil crisis and the slowdown of the global

economy caused problems and change everywhere, but the communist countries were much more vulnerable. The heavy, labour-intensive, state-controlled industry they had constructed was unable to compete with overseas capitalist rivals. Even heavy borrowing from Western banks could not save them, and repression and goods shortages increased popular discontent (Mazower, 2007). The final collapse came when Gorbachev withdrew the threat of armed Soviet intervention, the only thing that kept these regimes in place, and chaos ensued during the transition to a free market economy.

For the former communist states of Eastern Europe the trauma and chaos of the collapse of socialism and the resulting transition can become their greatest asset. As the socialist dictatorships collapsed, the rotten, stagnated, bureaucratic institutions that kept them functioning collapsed with them. Even though the human capital and a big part of the mentality might remain, the collapse of communist structures gave a great opportunity to rebuild from scratch on the lines of liberal democratic principles, regardless of the fact that not all former communist countries managed to achieve this to the same degree (Sajdik, & Schwarzinger, 2011).

Greece, meanwhile, turned to socialism in 1981, when it was already failing in the rest of Europe. Greek socialism, brought by the Panhellenic Socialist Movement (PASOK) was, of course, a democratic form of socialism whose way was paved by popular discontent with the military dictatorship and a desire for change. While Greek socialism did not harm democratic freedom directly, it did curtail economic freedom and the free market, creating state monopolies on every major form of enterprise and led to a gradual dismantling or festering of the country's productive mechanisms and the creation of a parasitic and corrupt nepotistic bureaucracy (Sotiropoulos, 1996).

Despite this, PASOK rule coincided with the 1980s, a period characterised by a leap in prosperity for Western countries and their citizens, and –more importantly– with a tidal wave of money that followed Greece's accession to the EEC in 1981. This good fortune meant that socialism in Greece, in contrast to nearly every other case in history, actually led to an *improvement* of living standards. This effect led to the domination of the socialist model in Greek politics from 1981 until today, regardless of the orientation of the ruling party. The only exception, an attempt by the Konstantinos Mitsotakis short-lived government of 1990-93 to implement liberal reforms failed spectacularly. Despite its retreat all over the world, including China, socialism survived in Greece.

The excessive public borrowing needed in order to support this problematic system of clientelism which at the same time constricted and discouraged free enterprise, led to a deep economic crisis, which was finally exposed by the shockwaves of the global financial crisis of the late 2000s. Despite identifying the problem, though, the progress of much-needed reforms in Greece is not particularly fast (EC, 2013). Even the few reforms that did take place, however, have led to a noticeable improvement of Greece's performance and ranking in several important economic fields, such as a 10-place improvement in competitiveness from 2013-14 to 2014-15 (Manifava, 2014 ; Schwab & Sala-i-Martin, 2014).

Improvement of this kind leaves some room for optimism and can provide a stepping stone for economic recovery. However, the popular discontent with reforms, reflected in the current popularity of the opposition parties of the extreme left and right that oppose reforms (Maltezou, Babington & Lawrence, 2014) suggests that their pace is not likely to accelerate in the future. This can mean that economic recovery is bound to be a slow and limited process, as Greece is held captive by antiquated structures and systems that were swept away in the tide of the 1989 revolutions in its northern neighbours, including Bulgaria and Romania. While Greece has a similar opportunity to use this profound crisis to reinvent itself and to cast the unproductive practices of the past overboard (Kritikos & Zimmerman, 2014), the current impression provided both by the popular opinion and by the tortoise-like pace of reform (Palaiologos, 2014) is that this opportunity is being wasted.

This is evident by the fact that although all the former communist states of Eastern Europe had a significantly lower per capita GDP than Greece in the early 2000s, the Czech Republic, Slovakia and Slovenia have all now surpassed Greek per capita GDP, Estonia and Lithuania are only slightly behind and catching up fast, while the rest are not far behind (Eurostat, 2014). Bulgaria and Romania are the least prosperous EU members, being behind even new member Croatia. Yet even Bulgaria and Romania will eventually catch up with and finally overtake Greece in the long run if current trends continue (Eurostat, 2014). In any case, this trio of Balkan states is bound to remain at the bottom of the EU's economic and development rankings for a long time. Recommendations for potential solutions which might disprove this bleak prediction are considered below.

## **4.2. Policy Recommendations**

Despite the poor performance of all three countries in innovation and competitiveness, that leaves them far behind the developed economies of Western Europe and even significantly behind the “second tier” economies of Southern Europe or Central and Eastern Europe, there is room for improvements and initiatives which might close this gap. The potential for improvement is theoretically there.

The small size (especially in the case of Bulgaria and Greece) and peripheral position of these countries is not by itself an obstacle in their course to improve their innovation potential. In fact, some small countries (e.g. Sweden, Finland, Switzerland, and others) are global leaders in innovation. Innovation does not constitute an exclusive privilege of large countries (USA, Japan etc), which invest large amounts of resources in R&D, have sizeable research centres, attract high-level researchers and have large corporations with hefty R&D budgets. Innovation today increasingly spreads to the entire world, and small countries, with appropriate policies, can become leaders in innovation (Lioukas, 2009).

Yet, even if size can be an additional benefit, then close regional collaboration can help Greece, Bulgaria and Romania, as well as all the moderate innovators of South-Eastern Europe, to acquire the critical mass needed to provide a boost to their innovation capacity. This path is already being pursued. Working towards the direction of bold administrative reforms, several South-Eastern European countries are making an effort to harmonise their science and innovation policies, to work in collaboration and to share their research infrastructure. Eleven countries of the region are participating in an initiative to establish new avenues for better collaboration in five areas: infrastructure, policy, research statistics, research networking and science journalism. Seven of these countries are also establishing a regional science strategy, drafted by the World Bank, with the help of working groups from the countries, aiming to create two separate funds: one for research excellence and one for innovation. Centres of excellence, a technology transfer facility and a body to put the strategy into practice would also be set up, as well as a research fund that will also provide grants for the training of young researchers, and money for international collaborations (Tatalovic, 2012).

The driving idea behind such an initiative is that it will help boost the competitiveness of the region’s countries, bringing it to a level closer to that of their

richer counterparts in the EU and further afield. Individual countries, especially the smaller and economically weaker South-Eastern European states, cannot be competitive in such a huge space as the European Research Area. A regional approach where countries partner up and coordinate their activities might help, and increase the convergence with the advanced Western European economies (Tatalovic, 2012).

Of course, for this increase in convergence to take place, the most important element is to implement specific changes according to the situation and the particular strengths and weaknesses in each country. This requires country-specific recommendations, and there is no shortage of national and international reports providing this sort of recommendations.

For example, in the case of **Bulgaria**, the country should improve its strengths, those that underpin its competitiveness growth – a stable macroeconomic environment, a favourable tax environment, flexible labour markets, the growing interest and need for the introduction of new technologies and upgrading of production, openness to foreign markets, participation in international networks, etc., and overcome its weaknesses – low productivity and relatively low competitiveness, based primarily on cost factors, the insufficiently favourable business environment, the deterioration of the quality of human resources, insufficiently effective public administration, etc., in accordance with the opportunities and threats in the external environment. What should not be ignored is that the combination of these factors may require a different strategic choice than the approach currently in use, and that choice can improve Bulgarian competitiveness and become its driving force (Marikina, 2013).

According to the Centre for the Study of Democracy (CSD), an interdisciplinary public policy institute dedicated to the values of democracy and market economy, in order to improve its competitiveness further and approach EU levels, Bulgaria must complete a number of major challenges. It needs: (1) to introduce public administration reforms, and more and better e-government services; (2) to initiate performance-based financing of education; (3) to reduce energy security risks through energy efficiency and diversification of supply sources and technologies; (4) to improve regulatory control and compliance quality; (5) to tackle high-level corruption and market capture (Centre for the Study of Democracy, 2014).

For the case of **Romania**, in order to increase competitiveness, bringing the country closer to EU standards, a number of measures are needed to address the

shortcomings mentioned above. The low and declining quality of human capital should be addressed by investing significantly in human capital and human resource development and increasing the quality of education at all levels, increasing R&D expenditure, leveraging the Romanian Diaspora, and promoting brain networking and brain circulation to reverse brain drain. Corruption must be tackled by increasing transparency in public administration and making tax rules and regulations less rigid, especially with respect to doing business. Labour markets and regulations must be made more flexible. This is important to reduce the extent of the informal economy, improve cooperation in labour-employer relations and improve hiring and firing practices. Also, cluster development should be made a national priority. Finally, Romania needs considerable investment and urgent upgrading of its infrastructure. If this is accomplished it can leverage its geostrategic location to transform itself into a major inter-modal hub (Tatucu, 2012).

In general, both Bulgaria and Romania can follow the example of some of the other former-communist states that entered the EU and are performing extremely well. If Bulgaria and Romania follow the lead of their northern neighbour, and earlier EU entrant, Poland, then the future seems very bright indeed. Poland has been one of the strongest economies in Europe for the past five years and –despite its signs of slowing down in 2013– is expected to grow faster than most of its European counterparts this year according to the World Bank. The rise of the Polish economy is a great example of the long-term, positive change taking place across Central and Eastern Europe driven by investment in high quality education and local innovation. These are certainly investments that Romania and Bulgaria are pursuing as well (Grantham, 2014).

**Greece**, as explained, is a very different case from its two Balkan neighbours. Its economy and the quality of life of its citizens might be better off at the moment, but its path towards growth and convergence faces obstacles that are much more difficult to remove. There are opportunities and options, though. After the crisis, Greece finds itself at a crossroads. It can improve its competitiveness by reducing costs in its traditional sectors, such as tourism, agriculture, and trade, or it can aim higher by laying the groundwork for higher value-added goods production (Kritikos & Zimmerman, 2014). The export sector, having witnessed a boost in competitiveness, may become one of the main driving forces of growth for the Greek economy in the future. A vital recommendation for the future is that economic policy

must focus on structural reforms in product markets which enhance price competitiveness, innovation and productivity (Malliaropoulos, 2010)

Even if it is not being realised, Greece has great potential. The country has hidden assets that can serve as the foundation of a modern innovation system. Kritikos and Zimmerman (2014) identify the following assets and strengths: (1) Excellent research institutes; (2) a great number of top Greek researchers working outside the country; (3) some innovative companies that have remained in the country despite the high regulatory burden; (4) an impressive diaspora in research, finance and business, many of whom would be thrilled to help pull the country into the future; and (5) an amazing climate and quality of life that makes it easy to convince people to move there, providing an advantage in an increasingly global race for the best talents.

These assets can be unlocked and utilised by the transformation of Greece into a more innovation-driven economy, which can be aided by the design of a coherent innovation policy that will close the gaps in the innovation chain. Again, Kritikos (2014) identifies five strategic decisions that can transform Greece into a strong innovator and bring much-needed economic growth: (1) cutting the red tape, reducing bureaucratic hurdles, and making its business environment open to innovation; (2) investing in cutting-edge applied research centres, ensuring that high-quality science supports and serves entrepreneurs developing new technologies; (3) encouraging strong ties and knowledge transfer between its universities, research institutions and private companies; (4) making universities and research institutes independent of political influence to implement the previous measure; and (5) using Greece's talented diaspora to help fill gaps in its innovation chain.

The needed investment in people and research can be partly financed through the EU's Horizon 2020 program, which is designed to strengthen both European and national research systems. Of particular importance for Greece are the programs to develop cutting-edge research centres. Horizon 2020 could be the foundation underlying an integrated and comprehensive Greek investment strategy for creating scientific excellence in the country if public expenditures are shifted from consumption to investments into research and development (Kritikos, 2014).

Of course, whether or not Greece actually becomes an innovation hub depends not just on investments in R&D and research centres, but also on establishing a partnership between the spheres of research, business and entrepreneurship, where ideas can be freely exchanged. Creating an environment that brings both top Greek

and non-Greek researchers to Greece, and that also supports the local innovation chain, is critical for the country's future. The fruits of innovation policies will not appear overnight; it takes time to do research, to turn ideas into products, and to market the products –maybe even a decade. Greek ministers and MPs, regardless of party, must commit to investing time and money, formulating a vision that inspires young Greek entrepreneurs, scientists and citizens. They must also take concrete actions that signal a serious commitment to innovation to the rest of the world. Combined, these efforts are vital for creating trust in the Greek political system. The sooner these reforms and investments are put into place, the sooner Greece will start down the path toward sustainable economic growth (Kritikos, 2014).

#### **4.3. Potential Shortcomings and Ideas for Future Research**

The present thesis did not produce any significant original quantitative research. Such a goal, however, was considered unnecessary from the start, since the main issue, the special importance of innovation as the vital component and determinant of competitiveness, has already been established, it is stressed in several sources (e.g. Smith, 1988; Lioukas, 2009; U.S. Department of Commerce, 2012; Schwab & Sala-i-Martin, 2014; Stierna & Vigier, 2014) and it was further confirmed by the correlations run on the main benchmarking indicators (see part 2.3).

Instead, it was considered much more important to examine the relationship between innovation and competitiveness in the particular setting of the three Balkan EU members, Greece, Bulgaria and Romania, examining why they are so far behind the rest of the EU and how can this gap be closed, by analysing a number of national and international reports and their scores on international benchmarking indicators.

The findings made here can be expanded and exploited by future research. This research should focus on measures that would help in closing the innovation and competitiveness gap between the more advanced Western half and the less advanced Southern and Eastern half of the European Union. The example of the Greek crisis and its aftermath has demonstrated that austerity policies do not offer a solution, as they make economies shrink, they create or increase social problems and they make the return to growth even more difficult. Substantial investments in innovation and

competitiveness and the reforms that maximise the impact of such investments are a much better alternative (Kritikos & Zimmerman, 2014).

Future research can show where should such investments focus and how should such reforms take place in order to maximise their potential. This can be done using the same general approach used in the present thesis, focusing on the particular conditions, strengths and weaknesses of each particular country in order to produce customised recommendations offering country-specific solutions. These country-specific solutions can be complemented by other measures that can benefit the weaker innovators of Europe, such as research programmes of transnational cooperation (Kritikos, 2014) or regional collaboration and harmonisation of research policies (Tatalovic, 2012).

While various recommendations have been proposed in the literature, suggesting specific measures and explaining how to implement them (see part 4.2 above), these recommendations do not usually take financial and –perhaps more importantly- political restrictions into account. For example, while Kritikos and Zimmerman (2014) put forward an excellent “plan to revitalise Greece” by making use of its significant potential for innovation, some of the preconditions that must be met for their plan to work –such as Greek MPs regardless of party committing to formulating a vision that inspired young Greek entrepreneurs or scientists or making universities and research institutes independent of political influence- seem completely out of touch with Greek reality. While these seem to be extremely worthwhile and valid recommendations, the sluggish pace of reform under a nominally liberal government (OECD, 2014) and the desire of the likely future government of the extreme left to negate even these small reforms (Palaiologos, 2014) show that the possibility for implementing such recommendations in reality is extremely limited.

Therefore, future research should be oriented toward not just the ideal solutions, but toward the solutions that are realistic and feasible under the specific conditions in each country. If the climate is not suitable for major reforms due to financial constraints or political restrictions then it is worth exploring the steps that *are* possible and that *can* help. Even if these are more limited and less ambitious, they can still make a difference and can pave the way for bigger reforms in the future by proving successful.

Finally, an important path to follow in future research, since innovation has been shown to be critical for competitiveness and in turn competitiveness to be critical for economic growth and quality of life, is to further explore the components and determinants of innovation. By researching models that break down innovation into individual components it will be possible to determine which individual components are more important, and which ones are more convenient, feasible and cost-efficient to support in order to boost a country's innovation performance and close the innovation gap, closing the competitiveness gap along with it.

#### **4.4. In Closing**

Greece, Bulgaria and Romania were examined together in terms of innovation and competitiveness because they are three neighbouring states with many similarities, which are also consistently among the worst performers of the European Union on these two very important indicators. The analysis revealed a number of weaknesses and shortcomings that explain this poor performance and the distance that these countries have not just from the advanced nations of Western Europe, but from the “second tier” performers of Southern and Eastern Europe as well.

The difference between the three countries is that in the case of Bulgaria and Romania, things are (relatively) simple in the sense that these two countries were the economically weakest and less developed of the former Soviet puppets, so they needed more time for their European accession and now they need more time to develop and catch up with the other and more successful EU members of Eastern Europe. Otherwise, however, their process of development is otherwise more-or-less the same and can follow the same path.

Greece, however, is a different case. Despite being among the original 12 members of the EU and considered to be an advanced economy, its GDP after the crisis is lower than that of several Eastern European countries, its competitiveness performance is the worst in the EU and its innovation performance is the worst in the Eurozone. Greece seems to have been taking steps backwards since its entry in the EEC and unlike Bulgaria and Romania it requires a novel approach and crucial reforms which, however, do not seem feasible under the current political conditions.

Bulgaria and Romania, therefore, are young and vibrant economies with a lot of potential to overcome the obstacles they face, while Greece is “the sick man of Europe”, trapped in obsolete policies and unable to make use of its own potential. In any case, due to their difficult position and poor performance, all three countries can be particularly aided by any measures that can boost innovation and competitiveness, and European efforts to close the innovation and competitiveness gaps should be primarily focused on them, as the weakest and most problematic links in the chain.

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