# ANALYSIS OF THE GLOBAL COMPETITIVENESS INDEX OF THE EUROPEAN UNION AND THE REPUBLIC OF CROATIA

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## ABSTRACT

*While approaching the tenth anniversary of the Global Financial Crisis, the world economy is showing stimulating signs of recovery, with GDP growth is accelerating to 3.5 percent in 2017. Despite this positive development, leaders face major difficulties when it comes to economic policy.*

*Governments, businesses and individuals are faced with a high level of uncertainty, as technology and geopolitical forces transform the economic and political order that has sustained international relations and economic policy over the past 25 years.*

*The aim of this research is to analyze the Global Competitiveness Report (GCI), by the World Economic Forum (WEF), developed by professor Xavier Sala-i-Martin of Columbia University. The World Economic Forum, the international organization for public-private collaboration, seeks to provide guidance, inform future-oriented solutions, and shed light on trade-offs that policymakers will face going forward. This flagship report, presenting the results of the Global Competitiveness Index, offers impartial information that allows leaders from the public and private sectors to better understand the main drivers of growth. This year*

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*it includes rankings and detailed data profiles for close to 140 countries and comparable time series.*
*The research focuses on European Union countries and especially on Croatia for the period 2007-2017.*

**Keywords:** Global Competitiveness Index, World Economic Forum, competitiveness, Republic of Croatia, advancement

**JEL classification: E22, E44, E60**

## INTRODUCTION

The notion of competitiveness is the result of a long history of scientific deliberations, during which various broad and narrow perceptions and diverse aspects of the content defining this concept emerged.

The classical economist A. Smith (1776) in his work Wealth of Nations emphasizes the role of the four fundamental factors of production necessary for the rapid growth and wealth of nations, while D. Ricardo (1817) in his book Principles of Political Economy and Taxation analyzes comparative advantage as a notion on the basis of which countries can compete.

Marxists emphasized the influence of sociopolitical environment on economic development, while J. Schumpeter underlined the role of entrepreneurs as a factor of competitiveness, pointing out that progress was a result of the equilibrium going in favor of innovation and technical advancement (Capitalism, Socialism, and Democracy, 1942).

R. Solow explored the factors boosting economic growth in the USA between 1948 and 1982, emphasizing in particular the role of education, technological innovations and growing know-how (Growth Theory and After, 1988).

Many contemporary economists analyzed and underscored the role of knowledge as a key factor for competitiveness, for instance M. Porter who had synthesized all aspects and influences on competitiveness in his competitiveness diamond (The Competitive Advantage of Nations, 1990).

Competitiveness is thus determined in a variety of ways:

- Productivity by which a state or a company uses its human resources, capital, and national resources. – Michael E. Porter
- Ability of the national economy to achieve sustainably high rates of economic growth, measured by annual changes in Gross Domestic Product per capita (WEF, 1996)
- Ability of the country to create added value and thus increase national wealth (IMD, 1996)
- Ability of the country to produce goods and services under free and fair market conditions which pass the test of the international market while simultaneously maintaining and increasing the real long-term income of the population (OECD, 2001).
- Ability of the country to produce goods and services under free and fair market conditions which pass the test of the international market while simultaneously maintaining and increasing the long-term income of the population (Pirić, 2008).

Trabold (1995) analyzes four significant aspects of competitiveness:

- the possibility of selling on the global market (export),
- the possibility of attracting investments (location),
- the possibility of adjusting the economy, and
- the possibility of creating and increasing the disposable income

and concludes that the various aspects from above make up a specific hierarchy. The possibility of achieving and increasing disposable income most often measured by GDP growth is thus the most common indicator of competitiveness of countries.

Taking into account all of the above, competitiveness in the broadest sense can be defined as the ability of individuals, companies, local communities, clusters, national states and regions to compete and become better, more innovative and more creative than other participants in creating added value on the local, regional and global marketplace (Dragičević, M., 2012). Individuals and companies can have such ability, but it does not guarantee that the state will have that same ability. This will happen in countries in which such ability spills over through synergic effects and stems from the interactive stimulation of the growth of competitiveness and the majority of economic participants. Competitiveness must constantly change,

adapt and refine in accordance with the new, ever-changing circumstances on the global market.

One of the most common indicators for comparing competitiveness among countries is the Global Competitiveness Index (GCI), published annually by the World Economic Forum (WEF) in the Global Competitiveness Report. The Global Competitiveness Report has been measuring competitiveness for over four decades. This year also marks the 10th anniversary of the global financial crisis and comes at a time of increased uncertainty and rapid transformations for the global economy. With slow and uncertain growth recoveries, the end of the commodity boom, shifting geopolitics, global imbalances, and increasing inequality in some economies, understanding the factors that determine growth continues to be a pressing global issue.

The Global Competitiveness Index refers to the microeconomic and macroeconomic fundamentals of national competitiveness, while its value contributes to the better understanding of the key factors which determine economic growth. Within global competitiveness rankings, each national economy was first ranked according to the results achieved in the global index, and then according to the results of the three sub-indices and twelve pillars of competitiveness. The pillars of competitiveness are interrelated, with one pillar tending to reinforce the other and vice versa, where each of them relates to a very specific aspect of competitiveness.

This paper analyzes the data of the Global Competitiveness Index based on a group of 28 European Union (EU) member states by comparing their rank and index during the 2007-2017 period, followed by a detailed analysis of Croatia's example. The first goal is to detect deviations of obtained values and to analyze the difference between the final rankings of the countries on the scale. Detecting the interrelatedness between individual pillars and the overall GCI result in order to determine the impact of key factors that improve or exacerbate its position and the sustainable development of the Republic of Croatia is the second objective of this article.

The analysis of this paper attempts to answer the following questions:

- Did the EU (28) countries improve or deteriorate their position within the Global Competitiveness Index ranking during the observed 2007-2017 period?

- Which factors can be considered as key factors affecting the improved competitive posit ion of the Republic of Croatia?

This paper consists of fifth parts. After the introduction, the second part reviews the literature, while the third part presents the methodology of calculating the global competitiveness index. In the fourth part of the study, based on regression analysis, a model for assessing the growth of global competitiveness of the Republic of Croatia is constructed. In the last part of the paper, final considerations are presented. The main contribution of this study stems from the fact that it explores the link between the global competitiveness index and the EU 28 competitiveness pillars, unlike the work of Pupavac and Golubović (2015) which investigates the link of the Logistics Performance Index and the Global Competitiveness Index for some twenty Southeast European countries.

## Literature review

## Competitiveness features

Competitiveness is one of the most widely used concepts in economic policy, regional or national framework policies and strategies, in business, especially when it comes to growth or convergence, when strategies are formed, or comparative analysis. There are different competitiveness theories, different approaches of policymakers, as well as different goals, are projected, both on a micro and macro level.

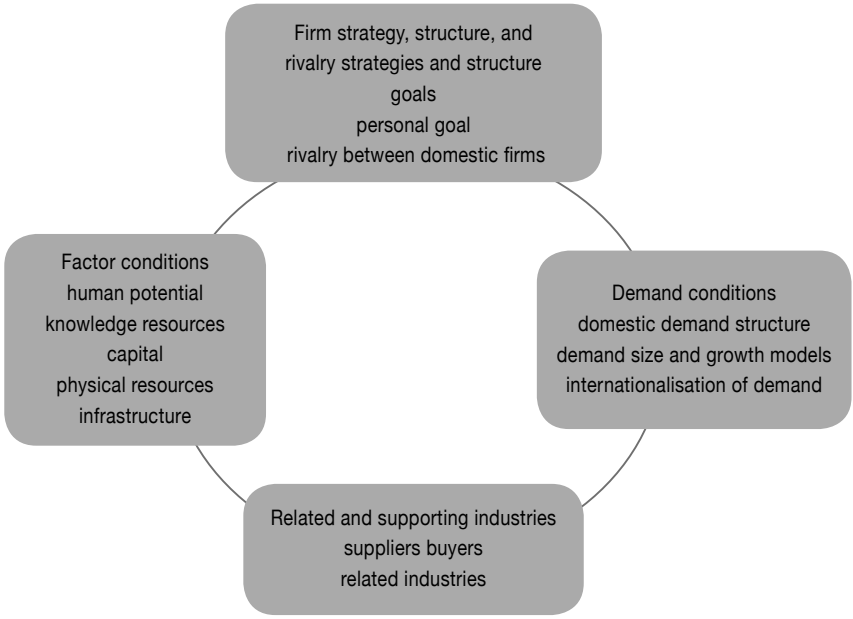
Competitiveness of countries can be measured in various ways. A SWOT analysis and benchmarking can be carried out, while a VRIO matrix can be created for a country on the basis of strengths that trigger and weakness which constrain as well as the degrees of institutional and other advancements. However, Porter's Competitive Diamond, formed in 1979, is of particular importance. According to Porter, national competitiveness is not inherited, but is constantly being built.

Porter's Diamond assumes that growth of competitiveness and prosperity of an economy can be caused only by the integration of micro and macro reforms as well

as the opportunities and policies of the government. It highlights the sources of national competitive advantage which includes the important role of geographical proximity. The interdependence of companies, industries, public and other institutions influences innovation and growth, while success on the international market is the primary indicator of the nation's competitive strength.

Almost every contemporary analysis of competitiveness and regional and industrial clusters as important modern competitive growth mechanisms begins with Proter's Diamond and the four key drivers of competitiveness.

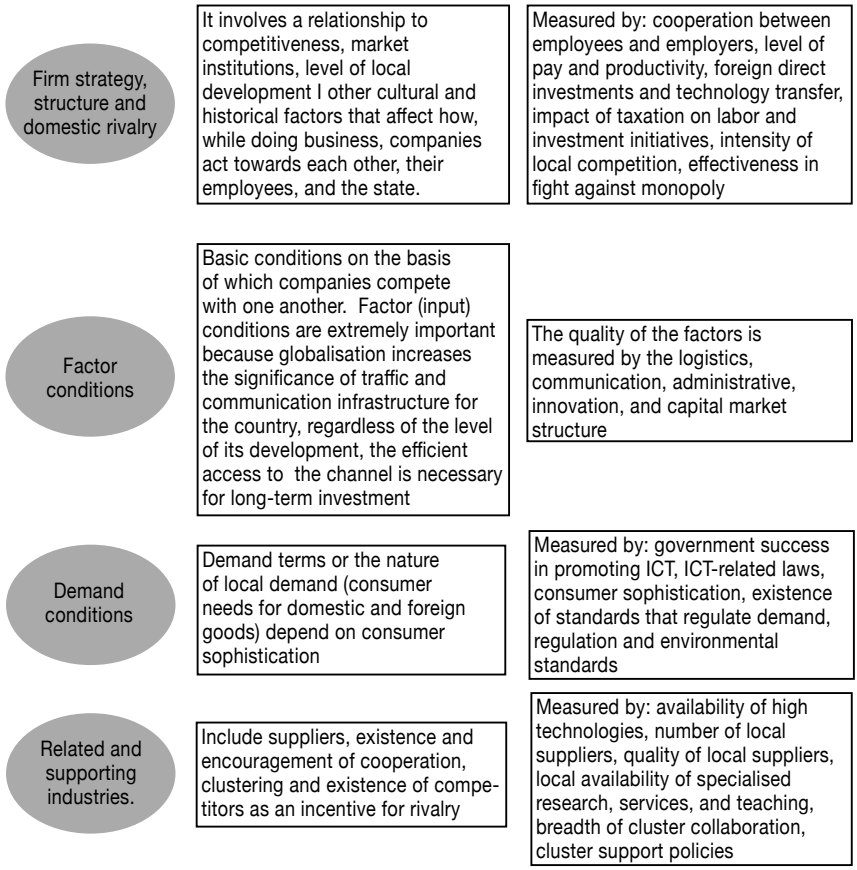
*Figure 1. Porter's Competitiveness Diamond*




Source: processed by the author according to Porter M.E., Competitive Advantage – Creating and Sustaining Superior Performance, Masmedia, Zagreb, 2008.

The success of each company depends on four interrelated factors

*Figure 2. Four interrelated factors*




CHANCE AND GOVERNMENT

Chance and government are additional elements of Porter's Competitiveness Diamond. They have a special influence on all diamond elements and their interconnections. An industry's chance for success in the greatest in those industrial segments where the diamond is the best. For each country, the above elements of Porter's competitiveness diamonds can be analysed, as well as the influence of chance and government, thereby assessing its competitive advantage, taking into account the position of the country in the region or beyond.

Source: processed by the author according to Porter M.E., Competitive Advantage – Creating and Sustaining Superior Performance, Masmedia, Zagreb, 2008.

Porter's Diamond has created a multidimensional method of measuring competitiveness, focused on the competitive advantage derived from links and networks, dynamically observing the factors that influence the international competitiveness of the nation.

Apart from analyzing the trend of macroeconomic aggregate movement, should the development of states' economies be evaluated, indicators of institutional development/underdevelopment of economies also need to be included. Based on macroeconomic indicators (GDP growth rate, GDP per capita, inflation rate and unemployment, etc.) one can conclude on the development and dynamics of a given economy, although it may be difficult to foresee the future movements and answer the question regarding the level and means of development of competitiveness in a country.

Institutional indicators and their respective time trends, highlighted by the Economic Freedom Index, the Human Development Index, the Corruption Perception Index, the Worldwide Governance Indicators, Doing Business and the European Innovation Scoreboard, will provide a more complete picture for analyzing the actual and potential impact on the country's competitive advantages.

Only a good link between macroeconomic and institutional indicators can provide a realistic and comprehensive position for a country and enable an analysis of its competitiveness as well as a projection of its future competitive advantages.

Important strongholds for comparative measurement of competitiveness of countries through the analysis of individual factors and sets of factors influencing it individually and interdependently, by means of different methodologies, are organized in two international organizations: at IMD – International Institute of Management Development which has been publishing its findings in the World Competitiveness Yearbook since 1989, and at WEF – the World Economic Forum, which has been publishing annually the Global Competitiveness Report since 1979. It is the Global Competitiveness Report by the World Economic Forum, which is the subject of this study.

## An overview of current research

Many authors emphasize the importance of innovation in the development of competitiveness and export (Nachum, Jones and Dunning, 2001; Xu, 2010; Gatto et al., 2011; Jarreau and Poncet, 2012; Kamakoudi, Polymeros and Btzios, 2014; Sandu and Ciocanel, 2014).

Loo (2012) investigated the competitiveness of the top five nations, based on WEF and IMD data, for the 2000-2009 period. In his second work (2015), he analyzed the competitiveness of countries over 15 years and identified the key challenges facing individual countries, highlighting the implications for future development. Democracy, colonialism, and religion are singled out as three factors which could have had an impact on the findings.

Innovation as a key factor for international competitiveness was treated in one of the works of Priede and Pereiro (2013). According to their research, the world leader in research and development expenditures are South Korea (4% of GDP), Japan (3.4% of GDP), and USA (less than 3%). The European Union spends around 2% of its GDP.

Dudaš (2013) provided an in-depth analysis of the methodological background and possible subjectivity of the GCI and WCI indices. Balčarova (2015) studied whether the differences in competitiveness by means of GCI and WCI among individual EU economies during the observed period were reduced or not. Convergence was corroborated only when using the GCI indicator.

In order to keep pace with the global and national competition, it is necessary to monitor the level of gross domestic product as one of the leading indicators measuring economic sustainability. This conclusion was reached by Jurigová, Tučková, and Solenes (2017) in their study. A different view is provided in the study by Gavurova, Virglerova, and Janke (2017). They attempt to find out how quickly they can change the confidence in economic growth and other determinants evident in variations of economic growth and competitiveness of countries. Dobrovič, Korauš, and Dančišinová (2016) analyze the sustainable development of Slovakia differently, through factors that determine optimal tax collection.

Kiselakova, Šofrankova, Čabinova, and Onuferova (2018) analyzed the obtained deviations from the GCI and WCI indices, identifying the impact of key factors affecting the competitive positions of countries, with an emphasis on Slovakia. The research was conducted within the EU (24) framework for the period 2006-2016.

Pupavac and Golubović (2015) explore the linkages between the Logistics Performance Index and the Global Competitiveness Index and conclude that this relationship is moderately strong and positive.

## Objectives, Methodology and Methods

In order to obtain a more accurate assessment of the global competitiveness of the Republic of Croatia, the authors conducted a correlation analysis and examined a multiple linear regression model. Within correlation analysis, we concentrated on examining the interdependence of individual GCI columns (SR – Republic of Croatia).

Regression analysis is a summary of statistical methods and procedures used to study the interaction between two or more variables (usually numerical) by employing a regression model. Both correlation and regression analyses examine the connection between the dependent and independent variables. They differ in that the regression analysis attempts to create forecasts for values of the dependent variable (y) based on the established correlation and the knowledge of the variable (x). Although neither regression nor correlation analysis explains the causal relationship between the variables, regression can still make predictions about one variable from know data of another variable. (Horvat, J., Mijoč, J., 2014.).

In this study, the dependence of the variability of Y on selected independent variables X (pillars 1-12 in GCI). For data processing, the statistical package Statistica was used.

## Global Competitiveness Index (GCI) and calculation methodology

Research into different aspects of country competitiveness in global contexts is predominantly linked to the activities of the World Economic Forum and the Global Competitiveness Index.

Since 2001 WEF has used the Global Competitiveness Index (GCI) which was developed by J. Sachs and J. McArthur, while Xavier Sala-i-Martin, one of the leading growth and economic development experts, has developed a comprehensive competitiveness model, first published in the 2004/2005 Report. Before that, the macroeconomic ranks were based on Jeffrey Sachs's Growth Development Index and the microeconomic ranks were based on Michael Porter's Business Competitiveness Index. The Global Competitiveness Index integrates the macroeconomic and the micro/business aspects of competitiveness into a single index.

The GCI includes statistical data from internationally recognized organizations, notably the International Monetary Fund (IMF); the World Bank; and various United Nations' specialized agencies, including the International Telecommunication Union, UNESCO, and the World Health Organization. The Index also includes indicators derived from the World Economic Forum's Executive Opinion Survey that reflect qualitative aspects of competitiveness, or for which comprehensive and comparable statistical data are not available for a sufficiently large number of economies

The comprehensive competitiveness model has experienced a variety of additions, modifications and methodology improvements to date. The development phases throughout the years (2006/2007-2017/2018 WEF's report) have been presented in the appendix A.

Today the Global Competitiveness Index (GCI) tracks the performance of close to 140 countries on 12 pillars of competitiveness. It assesses the factors and institutions identified by empirical and theoretical research as determining improvements in productivity, which in turn is the main determinant of long term growth and an essential factor in economic growth and prosperity. The Global Competitiveness Report hence seeks to help decision makers understand the complex and multifaceted nature of the development challenge; to design better policies, based on public-private collaboration; and to take action to restore confidence in the possibilities of continued economic progress.

According to the WEF (2001-2010) the goal of the Report is to provide a unique benchmarking tool for:

- companies; in developing business strategies and as a guide in making investment decisions,
- governments; in identifying obstacles to economic development,
- scientific community; for comparative analyses of economies of different countries, and
- civil society organizations.

Improving the determinants of competitiveness, as identified in the 12 pillars of the GCI, requires the coordinated action of the state, the business community, and civil society. All societal actors need to be engaged to make progress on all factors of competitiveness in parallel, which is necessary to achieve long-lasting results.

*Table 1. Twelve pillars of GCI*

| **FACTORS** | | **KEY FOR** |
|---|---|---|
| BASIC REQUI-REMENTS | INSTITUTIONS – implies a system of rules that shapes initiatives and ways in which economic participants interact with each other. They are one of the most important pillars of competitiveness growth. The institutional framework has a strong impact on competitiveness and growth and plays a key role in the way in which the countries distribute the benefits and costs of development strategies and policies. | FACTOR-DRIVEN ECONOMIES |
| | INFRASTRUCTURE – infrastructure construction encourages competitiveness. The availability of energy, the quality of roads, ports and network of total transport infrastructure as well as good communication also increase competitiveness. | |
| | MACROECONOMIC ENVIRONMENT – includes balance of the state budget, the rate of national savings, inflation, the level of the interest rates, government debt and credit rating of the country. | |
| | HEALTH AND PRIMARY EDUCATION – includes the impact of the business sector on the fight against malaria, tuberculosis, HIV, AIDS, statistical data on infant mortality, anticipated life expectancy, quality of primary education, data on population inclusion in primary education and state education expenditures. | |

| | | |
|---|---|---|
| EFFICIENCY - ENHANCERS | HIGHER EDUCATION AND TRAINING – crucial for the growth and development of an economy, the quality of the educational system is valued, as well as the number of highly educated people, the quality of science, the quality of mathematical and managerial education and other various teaching programs. | EFFICIENCY-DRIVEN ECONOMIES |
| | GOODS MARKET EFFICIENCY – measures the intensity of local competition, the effectiveness of antimonopoly policy, the overall tax rate, the number of procedures and time needed to launch a new business, trade barriers, tariffs, representation of foreign ownership, weight of customs procedures, impact on foreign direct investments and consumer sophistication. These components are used to measure market openness and entry and exit barriers in the economy. | |
| | LABOR MARKET EFFICIENCY – measures the market flexibility in setting wages, employer-employee cooperation, employment rigidity, recruitment and dismissal practices as well as brain drain and share of women in labor force. | |
| | FINANCIAL MARKET DEVELOPMENT – measured by financing through local capital markets, easy access to credit, restrictions in capital flows, and strength of investor protection and availability of venture capital in a country. It also includes measuring bank confidence, trustworthiness of banks and securities exchange regulation | |
| | TECHNOLOGICAL READINESS - measures the ability of the economy to adopt new technologies in order to enhance the productivity of its industries. This column also includes the level of technology absorption of companies, foreign direct investments and technology transfer, the number of internet users and the number of internet subscribers. This pillar is of utmost importance because technological discrepancies have caused big differences in competitiveness between countries. | |
| | MARKET SIZE – measures the size of the domestic market via the domestic market index as well as the size of the foreign market via the foreign market index for a country. | |

| | | |
|---|---|---|
| INNOVATION AND SOPHISTI-CATION FACTORS | ADVANCEMENT/BUSINESS SOPHISTICATION – measures the quality and quantity of local suppliers the level of cluster development, the nature of competing capabilities, the breadth of prevalence of value chains, the sophistication of production processes and the readiness to delegate. Although the breadth of public policy actively improving business is limited, experience has shown that geographic concentration of companies (clustering) can greatly improve company activity. Geographic proximity enables vertical and horizontal cooperation between companies, increasing their productivity. | INNOVATION-DRIVEN ECONOMIES |
| | INNOVATION – compared to all the previous pillars, it is crucial for long-term economic growth. Less developed countries can increase productivity through better use of existing technologies, but countries that have reached the stage of innovation-driven growth can no longer do so. Companies in these countries create new products and processes to boost competitiveness growth. The indicator of innovation is the level of allocation for research and development, especially in the private sector, the existence of high-quality scientific research organizations, the extent of university and business sector connectivity in research and the protection of intellectual property. Measuring innovation includes the measurement of: innovation capacity, quality of scientific research organizations, company allocations for research and development, company and university collaboration in research and development, number of patents per million inhabitants as well as the increase in numbers of scientists and engineers. | |

*Source: Sala-i-Martín et al. (2017)*

Twelve pillars of competitiveness are grouped into three distinct subsets, which represent the key to different ways of managing the economy, such as: basic requirements, efficiency enhancers, and innovation and sophistication factors.

According to a precise methodology, the average rating of the global competitiveness index is calculated on the basis of 12 pillars of competitiveness, with values ranging from 0 to 7 (0 worst, 7 best score). When looking at a position out of a total number of countries, a lower rank means better, while a higher rank means worse competitive position (Obadić, A., Tica, J. et al., 2016).

## Stages of economy according to WEF's GCI

The conception of the development stages is implemented by determining the importance of each sub-index for each individual country. In measuring GCI, the columns have different weights, depending on the stage in which each country finds itself. Greater importance is attached to those pillars which are most significant in that particular stage of development. For grouping of countries according to the level of development, a relatively precise and simple criterion of is used, ranging from the size of per capita GDP to the share of factors that drive a country. The following table shows selected examples in specific stages of development.

*Table 2. Stages of development for EU (28)*

| **Stage I.** | **Transition from stage I. to stage II.** | **Stage II.** | **Transition from stage II. to stage III.** | **Stage III.** |
|---|---|---|---|---|
| GDP p.c. USD < 2000 | GDP p.c. USD 2000 - 2999 | GDP p.c. USD 3000 - 8999 | GDP p.c. USD 9000 - 17000 | GDP p.c. USD > 17000 |
| | | Bulgaria | Romania | Luxembourg |
| | | | Croatia | Ireland |
| | | | Poland | Denmark |
| | | | Hungary | Sweden |
| | | | Latvia | Netherlands |
| | | | Lithuania | Austria |
| | | | Slovak Republic | Finland |
| | | | | Germany |
| | | | | Belgium |
| | | | | France |
| | | | | United Kingdom |
| | | | | Italy |
| | | | | Spain |
| | | | | Malta |
| | | | | Cyprus |

*continued Table 2.*

| **Stage I.** | **Transition from stage I. to stage II.** | **Stage II.** | **Transition from stage II. to stage III.** | **Stage III.** |
|---|---|---|---|---|
| GDP p.c. USD < 2000 | GDP p.c. USD 2000 - 2999 | GDP p.c. USD 3000 - 8999 | GDP p.c. USD 9000 - 17000 | GDP p.c. USD > 17000 |
| | | | | Slovenia |
| | | | | Portugal |
| | | | | Czech Republic |
| | | | | Estonia |
| | | | | Greece |

*Source: own processing based on the WEFs' annual reports and datasets*

For a countrys economy can be said that in the first stage of development it its annual GDP per capita is less than 2000 USD. Such countries, with the aim of improving competitiveness, should improve institutions, infrastructure, macroeconomic stability, health and primary education as these are basic requirements-driven economies. Countries with an annual GDP per capita between 2000 USD and 3000 USD are in transition from the first to the second stage of development, while countries with annual GDP per capita between 3000 USD and 9000 USD are positioned in the second stage of development. At the transition to the third stage are countries with per capita GDP between 9000 USD and 17000 USD, while highly-developed countries are considered those with an annual GDP per capita of more than 17000 USD.The value of the weights assigned to the groups of pillars forming the GCI is contingent upon the stage in which a country finds itself.

*Table 3. Subindex weights and income thresholds for stages of development*

| | ***STAGES OF DEVELOPMENT*** | | | | |
|---|---|---|---|---|---|
| GDP per capita (US$) thresholds | Stage 1. Factor-driven<br>GDP p.c. USD < 2000 | Transition from Stage 1 to stage 2<br>GDP p.c. USD 2000 - 3000 | Stage 2. Efficiency-driven<br>GDP p.c. USD 3000 - 9000 | Transition from stage 2 to stage 3<br>GDP p.c. USD 9000 - 17000 | Stage 3 Innovation-driven<br>GDP p.c. USD > 17000 |
| Weight for basic reqirements | 60% | 40-60% | 40% | 20-40% | 20% |
| Weight for efficiency enhacers | 35% | 35-50% | 50% | 50% | 50% |
| Weight for innovation and sophistication factors | 5% | 5-10% | 10% | 10-30% | 30% |

*Source: Sala-i-Martín et al. (2017)*

From the above tables it can be concluded that the majority of the EU (28) counties – even 20 of them – are classified as highly developed, where innovation-driven factors are the key drivers of competitiveness. In this respect, when computing the composite value of the GDI, the basic requirements comprise 20%, efficiency-driven factors comprise 50%, while innovation-driven factors comprise 30% of the weight.

The remaining 7 European Union member countries, including Croatia, are classified as countries in a transition period, found among the efficiency-driven and innovation-driven factors. This would mean that when calculating the composite value of the GCI, basic requirements weigh with 20%-40%, efficiency-driven factors weigh 50%, while innovation-driven factors weigh from 10% to 30%. Bulgaria is the only European Union country which is in the second stage of development.

## RESULTS AND DISCUSSION

### Comparison of competitiveness of EU (28) countries on the basis of the Global Competitiveness Report

The order and interrelatedness on the table of EU countries as well as the Republic of Croatia is the subject of interest of this research study. The analysis of the EU 28 competitive position is shown in Table 1. The table provides a comparison of ranks and indices from 2007 and 2017. The analysis was made on the basis of the global competitiveness report, with the original rankings being filtered for the EU (28) countries. The change of rank refers to the change of position, with a positive sign indicating a deterioration of the competitive position within a particular pillar of competitiveness.

*Table 4. Change of rankings and indices for EU 28 for 2007-2017 according to CGI index*

| zemlje EU | 2007 | 2017 | promjena ranga | 2007 | 2017 | promjena indeksa |
|---|---|---|---|---|---|---|
| Danska | 1 | 6 | 5 | 5,55 | 5,39 | -0,16 |
| Švedska | 2 | 3 | 1 | 5,54 | 5,52 | -0,02 |
| Njemačka | 3 | 2 | -1 | 5,51 | 5,65 | 0,14 |
| Finska | 4 | 5 | 1 | 5,49 | 5,49 | 0 |
| Ujedinjena Kraljevina | 5 | 4 | -1 | 5,41 | 5,51 | 0,1 |
| Nizozemska | 6 | 1 | -5 | 5,4 | 5,66 | 0,26 |
| Austrija | 7 | 7 | 0 | 5,2 | 5,25 | 0,05 |
| Francuska | 8 | 10 | 2 | 5,18 | 5,18 | 0 |
| Belgija | 9 | 9 | 0 | 5,1 | 5,23 | 0,13 |
| Irska | 10 | 11 | 1 | 5,03 | 5,16 | 0,13 |
| Luksemburg | 11 | 8 | -3 | 4,88 | 5,23 | 0,35 |
| Estonija | 12 | 12 | 0 | 4,74 | 4,85 | 0,11 |
| Španjolska | 13 | 14 | 1 | 4,66 | 4,7 | 0,04 |
| Češka republika | 14 | 13 | -1 | 4,58 | 4,77 | 0,19 |
| Litvanija | 15 | 17 | 2 | 4,49 | 4,58 | 0,09 |
| Slovenia | 16 | 20 | 4 | 4,48 | 4,48 | 0 |
| Portugal | 17 | 18 | 1 | 4,48 | 4,57 | 0,09 |
| Slovačka | 18 | 23 | 5 | 4,45 | 4,33 | -0,12 |
| Latvija | 19 | 22 | 3 | 4,41 | 4,4 | -0,01 |
| Italija | 20 | 19 | -1 | 4,36 | 4,54 | 0,18 |
| Mađarska | 21 | 24 | 3 | 4,35 | 4,33 | -0,02 |
| Poljska | 22 | 16 | -6 | 4,28 | 4,59 | 0,31 |
| Cipar | 23 | 25 | 2 | 4,23 | 4,3 | 0,07 |
| Malta | 24 | 15 | -9 | 4,21 | 4,65 | 0,44 |
| Croatia | 25 | 27 | 2 | 4,2 | 4,19 | -0,01 |
| Grčka | 26 | 28 | 2 | 4,08 | 4,02 | -0,06 |
| Rumunjska | 27 | 26 | -1 | 3,97 | 4,28 | 0,31 |
| Bugarska | 28 | 21 | -7 | 3,93 | 4,46 | 0,53 |

*Source: own processing based on the WEFs' annual reports and datasets*

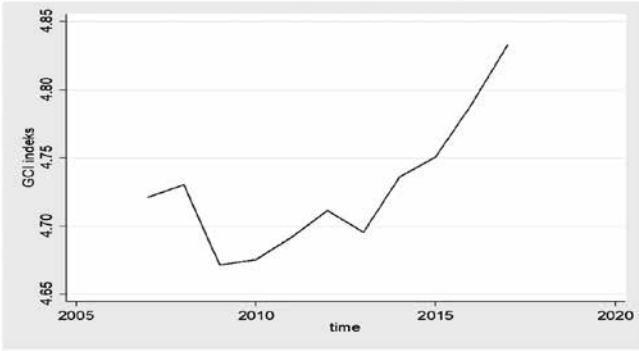
Based on the analysis of the Global Competitiveness Index for the EU (28) countries during the 2007-2017 period, Netherlands (5.66), Germany (5.65), Sweden (5.52) and the UK (5.51) stand out as the most competitive. Romania with 4.28% is ranked 26th, Croatia (4,19) is ranked 27th, while Greece with 4.02% is lowest ranked, at the 28th spot.

Looking at the rankings it can be concluded that from 2007 to 2017, Malta improved its competitiveness by as much as nine spots (GCI from 4.21 to 4.65), Bulgaria jumped seven spots (GCI from 3.93 to 4.46), while Poland improved by six spots (GCI from 4.28 to 4.59).

In the process of joining the European Union, the Republic of Croatia needed to implement changes to laws and regulations that had a significant impact on the business community. These changes were necessary for Croatian companies to meet EU standards and be competitive both in the EU and the global market. Croatia needed a programme of measures that would act as a basis for mobilization of all social groups and institutions which could find their interest in modernizing the country and advancing the economy. Today, in order to reach the average of EU countries to which it aspires, the Republic of Croatia as a developing country must invest so that it could achieve the level of development of developed countries.

Shown below is the average of the EU (28) Global Competitiveness Index for the period under observation.

*Graph1: The average of the EU (28) Global Competitiveness Index for 2007-2017*




*Source:* own processing

After assessing the development of rankings within the Global Competitiveness Index, the average EU (28) competitiveness value for 2007 was 4.72%, reaching 4.83% in 2017.

Based on the above, it can be concluded that the EU (28) as a whole improved in the observed period, thus answering the first question.

## Analysis of interdependence of GCI (SR) pillars by using correlation analysis

A more detailed analysis of the competitive position of Croatia in relation to the pillars of competitiveness is shown in Table 3. In order to better study the state of the Republic of Croatia, a correlation analysis of the Global Competitiveness Index pillars was conducted, and an overview was given of the average values of the GCI pillars for the 2007-2017 period.

*Table 5. The development of GCI pillars and GCI (SR) average rankings during 2007-2017*

| time | s1 | s2 | s3 | s4 | s5 | s6 | s7 | s8 | s9 | s10 | s11 | s12 | GCI SR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | 3,90 | 3,90 | 4,80 | 5,80 | 4,30 | 4,10 | 4,40 | 4,30 | 3,50 | 3,40 | 4,10 | 3,40 | 4,20 |
| 2008 | 3,80 | 4,00 | 5,10 | 5,90 | 4,40 | 4,10 | 4,40 | 4,40 | 3,70 | 3,60 | 4,00 | 3,40 | 4,22 |
| 2009 | 3,60 | 4,30 | 4,80 | 5,70 | 4,20 | 3,90 | 4,10 | 4,10 | 4,20 | 3,80 | 3,80 | 3,20 | 4,03 |
| 2010 | 3,60 | 4,60 | 4,80 | 6,00 | 4,30 | 3,80 | 3,90 | 4,00 | 4,20 | 3,60 | 3,60 | 3,10 | 4,04 |
| 2011 | 3,60 | 4,70 | 4,80 | 6,00 | 4,40 | 3,80 | 3,90 | 3,90 | 4,50 | 3,60 | 3,70 | 3,10 | 4,08 |
| 2012 | 3,50 | 4,70 | 4,70 | 5,80 | 4,50 | 3,90 | 4,00 | 3,80 | 4,40 | 3,60 | 3,70 | 3,10 | 4,04 |
| 2013 | 3,60 | 4,70 | 4,70 | 5,80 | 4,50 | 3,90 | 3,90 | 3,90 | 4,40 | 3,60 | 3,80 | 3,10 | 4,13 |
| 2014 | 3,60 | 4,70 | 4,40 | 5,90 | 4,70 | 4,10 | 3,90 | 3,90 | 4,60 | 3,60 | 3,80 | 3,10 | 4,13 |
| 2015 | 3,60 | 4,60 | 4,20 | 5,80 | 4,60 | 4,00 | 3,80 | 3,60 | 4,60 | 3,60 | 3,70 | 3,10 | 4,07 |
| 2016 | 3,60 | 4,60 | 4,40 | 5,80 | 4,70 | 4,10 | 3,90 | 3,60 | 4,70 | 3,50 | 3,80 | 3,10 | 4,15 |
| 2017 | 3,50 | 4,60 | 4,80 | 6,10 | 4,50 | 4,00 | 3,80 | 3,60 | 5,00 | 3,60 | 3,80 | 2,90 | 4,19 |

*Source: own processing based on the WEFs' annual reports and datasets*

Following the table shown, it can be noted that the values of the Global Competitiveness Index have been quite varied for the observed period from 2007 to 2017. It can be observed that an effective deterioration in institutions, financial markets, business sophistication, and innovations had the most substantial influence on the deterioration of the global competitiveness of Croatia from 2007 to 2017. In some pillars, Croatia also had significant improvements, such

as infrastructure, labor market efficiency, and technological readiness, which did not significantly affect the overall improvement of Croatian competitiveness. The Republic of Croatia had the worst result in 2009 (4.03), while the best one was in 2008 (4.22). Given the above it can be concluded that the decline of the global competitiveness index was the result of the global financial crisis.

Correlation analysis, shown in Table 6, is used to research and quantify the interrelatedness among the observed phenomena, i.e., variables – overall index, the Global Competitiveness Index, and the individual pillars.

*Table 6: Correlation analysis of the GCI(SR) pillars*

| Correlations among GCI and scores of GCI Pillars.<br>Market correlations are significant at p<0.05<br>N= 11 | |
|---|---|
| Variable | GCISR |
| s1 | 0,563025 |
| s2 | -0,516023 |
| s3 | 0,266840 |
| s4 | 0,243200 |
| s5 | 0,201299 |
| s6 | 0,744037 |
| s7 | 0,447655 |
| s8 | 0,266579 |
| s9 | -0,238358 |
| s10 | -0,575852 |
| s11 | 0,792052 |
| s12 | 0,331605 |

*Source: own processing in programme STATISTICA*

The analyzed correlation between the total GCI and its columns was validated in the case of 2 pillars: S6 (goods market efficiency) and S11 (business sophistication).

The most significant dependence (0.792052) can be found for the pillar S11 (business sophistication). On the basis of the obtained results it can be concluded that in order to improve global competitiveness in the Republic of Croatia, the S11 pillar should be improved –business sophistication.

**Regression analysis of the GCI (SR) movements within individual sub-indices**

On the basis of the regression analysis, we analyzed the casual relations to maximize the output variable. In this case, it represents the output variable GCI(SR)- y. The purpose was to quantify the impact of the individual pillars on the total index score, to identify the key factor that determine the country economic growth and to find out what change of pillars leads to the improvement of the Croatia competitive position.

*Table 7. Average values of the GCI (SR) pillars over the years 2007 -2017*

| Croatia | Average 2007-2017 |
|---|---|
| S1 - Institutions | 3,63 |
| S2 - Infrastructure | 4,49 |
| S3 – Macroeconomic environment | 4,68 |
| S4 – Health and primary education | 5,87 |
| S5 – Higher education and training | 4,46 |
| S6 – Goods market efficiency | 3,97 |
| S7 – Labor market efficiency | 4,00 |
| S8 – Financial market development | 3,92 |
| S9 – Technological readiness | 4,35 |
| S10 – Market size | 3,59 |
| S11 – Business sophistication | 3,80 |
| S12 - R&D Innovation | 4,30 |

*Source: own processing based on the WEFs' annual reports and datasets*

The fist subindex Basic requirements consists of 4 pillars (S1 – Institutions, S2 – Infrastructure, S3 – macroeconomic environment and S4 – Health and primary education). The results of the statistical output of the estimated variables for the GCI are shown in Table 8.

*Table 8. The statistical output of the estimated variables within subindex "Basic requirements"*

| Regression Statistics | |
|---|---|
| Multiple R | 0,702015 |
| **R Square** | **0,492825** |
| Adjusted R Square | 0,154709 |
| Standard Error | 0,0632 |
| observations | 11 |

| Analysis of Variance | | | | | |
|---|---|---|---|---|---|
| | Sums of Squares | df | mean Squares | F | p-value |
| Regression | 0,023288 | 4 | 0,005822 | 1,4556 | 0,323339 |
| Residual | 0,023966 | 6 | 0,003994 | | |
| Total | 0,047255 | | | | |

| | b* | Std.Err. of b* | b | std. Err. Of b | t Stat | p-value |
|---|---|---|---|---|---|---|
| Intercept | | | 2,363569 | 2,292039 | 1,031208 | 0,342207 |
| s1 | 0,381229 | 0,659082 | 0,22006 | 0,380448 | 0,578424 | 0,58402 |
| s2 | -0,421114 | 0,770583 | -0,09935 | 0,181787 | -0,54649 | 0,604442 |
| s3 | -0,225939 | 0,413354 | -0,06157 | 0,11264 | -0,5466 | 0,60437 |
| s4 | 0,498228 | 0,350951 | 0,287597 | 0,202583 | 1,41649 | 0,205516 |

*Source: own processing in programme STATISTICA*

The regression results do not confirm the logical and directly proportional relation between the pillars S1 to S4 and the overall GCI(SR) score, because significance F value is higher than statistically significant level and in other words, the model has no predictive capability. The determination factor (R") is **0,492825,** which means that model would explains up to 49,28% of variability.

The second and largest group of sub-indexes „Efficiency enhancers" is composed of 6 pillars (S5 – Higher education and training, S6 – Goods market efficieny, S7 – Labor market efficiency, S8 – Financial market development, S9 – Technological readiness and S10 – Market size). The results of tha statistical output of the estimated variables for the GCI are presented in Table 9.

*Table 9. The statistical output of the estimated variables within subindex "Efficiency enhancers"*

| Regression Statistics | |
|---|---|
| Multiple R | 0,91468193 |
| R Square | 0,83664303 |
| Adjusted R Square | 0,59160756 |
| Standard Error | 0,04393 |
| observations | 11 |

| Analysis of Variance | | | | | |
|---|---|---|---|---|---|
| | Sums of Squares | df | mean Squares | F | p-value |
| Regression | 0,039535 | 6 | 0,006589 | 3,414375 | 0,127375 |
| Residual | 0,007719 | 4 | 0,001930 | | |
| Total | 0,047255 | | | | |

| | b* | Std.Err. of b* | b | std. Err. Of b | t Stat | p-value |
|---|---|---|---|---|---|---|
| Intercept | | | 2,427486 | 1,417688 | 1,71229 | 0,162007 |
| s5 | -0,294018 | 0,453035 | -0,124051 | 0,191143 | -0,64900 | 0,551720 |
| s6 | 0,549556 | 0,442292 | 0,317225 | 0,255308 | 1,24252 | 0,281910 |
| s7 | 0,400820 | 0,833588 | 0,128467 | 0,267174 | 0,48084 | 0,655750 |
| s8 | 1,138907 | 0,679409 | 0,288512 | 0,172110 | 1,67632 | 0,168983 |
| s9 | 1,631433 | 0,815040 | 0,258151 | 0,128968 | 2,00166 | 0,115897 |
| s10 | -0,682061 | 0,296394 | -0,496739 | 0,215861 | -2,30120 | 0,082830 |

*Source: own processing in programme STATISTICA*

The resulting of regression analysis do not confirm the logical, directly proportional relation among the pillar, the model has no predictive capability. The determination factor ($R^2$) is 0,83664303, which means that our model explains up to 83,66% of variability.

The last and smallest, but also the most important subindex „Innovation and sophistication factors" consists of 2 pillars (S11 – Business sophistication and S12 - R&D Innovation). The results of the statistical output of the estimated variables for the GCI are shown in Table 10.

*Table 10. The statistical output of the estimated variables within the subindex "Innovation and sophistication factors"*

| Regression Statistics | |
|---|---|
| Multiple R | 0,8752967 |
| R Square | 0,7661443 |
| Adjusted R Square | 0,7076804 |
| Standard Error | 0,03717 |
| observations | 11 |

| Analysis of Variance | | | | | |
|---|---|---|---|---|---|
| | Sums of Squares | df | mean Squares | F | p-value |
| Regression | **0,036204** | **2** | **0,018102** | **13,10457** | **0,002991** |
| Residual | 0,011051 | 8 | 0,001381 | | |
| Total | 0,047255 | | | | |

| | b* | Std.Err. of b* | b | std. Err. Of b | t Stat | p-value |
|---|---|---|---|---|---|---|
| Intercept | | | **2,731089** | **0,318011** | **8,58804** | **0,000026** |
| s11 | **1,197958** | **0,252847** | **0,582302** | **0,122904** | **4,73787** | **0,001468** |
| s12 | -0,550960 | 0,252847 | -0,263070 | 0,120728 | -2,17902 | 0,060955 |

*Source: own processing in programme STATISTICA*

Finally, the last regression analysis has statistically corroborated a direct relation between the pillar S11 – Business sophistication and the GCI(SR). The determination factor ($R^2$) is 0,7661443, which means that our model explains 76,61% of variability. In this case the model has predictive capability. We can state that the significant determination of the overall GCI(SR) development is pillar S11 – Business sophistication. The statistically significant relationship was not confirmed for the other pillar. The regression results indicate that increasing the value of this pillar by one unit will cause an increase in the value of the overall indeks by 0,582302 points. Taing into account the regression findings, we can conclude that pillar S11 – Business sophistication is the key determinant of the Croatia's global competitiveness so it is necessary to identify the causes and try to eliminate them as soon as possible.

*Table 11. The statistical output of the estimated variables for GCI by regression model*

| Regression Statistics | |
|---|---|
| Multiple R | 0,79205243 |
| R Square | 0,62734706 |
| Adjusted R Square | 0,58594117 |
| Standard Error | 0,04423 |
| observations | 11 |

| Analysis of Variance | | | | | |
|---|---|---|---|---|---|
| | Sums of Squares | df | mean Squares | F | p-value |
| Regression | **0,029645** | **1** | **0,029645** | **15,15116** | **0,003661** |
| Residual | 0,017610 | 9 | 0,001957 | | |
| Total | 0,047255 | | | | |

| | b* | Std.Err. of b* | b | std. Err. Of b | t Stat | p-value |
|---|---|---|---|---|---|---|
| Intercept | | | 2,653364 | **0,376092** | **7,055083** | **0,000060** |
| s11 | **0,792052** | **0,203484** | **0,385000** | **0,098909** | **3,892449** | **0,003661** |

*Source: own processing in programme STATISTICA*

**GCI(SR) = 2.6533 + 0.38500*S11**

In the end of study we formulate the final regression model by using the key determinants (S11 – business sophistication). Our model explains 62,73% of variability. The statistically significant relationship was not confirmed for the other pillar. On the basis of these results we can state that our created model confirmed a statistically significant relation between pillar S11 and total GCI value.

## CONCLUSION

Competitiveness implies steady productivity growth along with quality strategy and business, influenced by both microeconomic and macroeconomic environments. Given that today's economy is characterized by openness and interaction, competitiveness has a key role in all the economies of the world, whether developed or developing. Economic development in the contemporary world rests on conditions based on exceptional knowledge, highly developed infrastructure, technology, and innovations.

By investigating WEF's GCI score for the most recent period (2017-2018) as well as the period (2006-2007), it is evident that the values in 2017 have changed. Some countries managed to even improve their position on the scale, such as Finland, Germany, Austria, and Poland. Other lost their competitive edge when compared to the period before the financial crises, such as Croatia, Greece, and Slovakia.

Some EU countries were in better position in 2007 than in 2017, so it would be advisable to consider sustainable competitiveness, i.e., to study the extent to which the price-influencing factors can themselves ensure lasting sustainability, either between the EU and the rest of the world or among the EU members.

When evaluating countries, it is essential to look at the results of relative indicators as well as the development of the business environment in other competitive economies. Based on the results, namely the average values of the pillars of competitiveness in the Republic of Croatia, it can be concluded that institutions (3.63), market size (3.59) and business sophistication (3.80) are key factors for Croatia's sustainable growth.

Even though the sub-index "Business sophistication" is ranked 3$^{rd}$ as a key sustainable growth factor, based on the findings of the GCI (SR) regression analysis, this sub-index is the most important, i.e., this is the only pillar for which a statistically significant link has been confirmed between the S11 pillar and the overall GCI values.

We must keep in mind that a country's low ranking sends a bad signal to potential foreign investors when deciding on the placement of their investments in a country. Taking into account the popularity of the WEF report, one can say that it represents

one of the first pieces of information on the basis of which foreign investors can form their expectations. Investors are often not able to gather information on their own, as it would entail high research costs, which would have to be conducted in several countries that are potential candidates for such endeavour.

## REFERENCES


Balcarová, P. (2015). Competitiveness of the European Union: Converging or Diverging Tendency? *The 18th International Conference "Enterprise and the Competitive Environment,"* Ed. Kapounek, S. March 05-06, Brno, Czech Republic. Brno: Univ. Mendel, 36-45.

Bris, A. (2016). IMD World Competitiveness Yearbook 2016. Lausanne, Switzerland: Published by IMD: Institute for Management Development.

Cornelius, P., Schwab, K., & Porter, M. E. (Eds.). (2003). *The global competitiveness report 2002-2003*. Oxford University Press.

Despotović, D., Cvetanović, S., Nedić, V., Despotović, M. (2016). Economic, Social and Environmental Dimension of Sustainable Competitiveness of European Countries, *Journal of Environmental Planning and Management* 59(9): 1656-1678.

Djogo, M., Stanisic, N. (2016). Je li Globalno izvješće o konkurentnosti prava mjera makro-konkurentnosti. *Zbornik radova Ekonomskog fakulteta u Rijeci: časopis za ekonomsku teoriju i praksu*, 34(1), 91-117.

Dobrovič, J., Korauš, A., Dančišinová, L. (2016). Sustainable Economic Development of Slovakia: Factors Determining Optimal Tax Collection, *Journal of Security and Sustainability Issues* 5(4): 533-544. http://jssidoi.org/jssi/uploads/papers/20/Dobrovic_Sustainable_economic_development_of_Slovakia_factors_determining_optimal_tax_col lection.pdf

Dragičević, M. (2012). *Konkurentnost: projekt za Hrvatsku*. Zagreb: Školska knjiga.

Dudáš, T. (2012). Competitiveness Development of the Visegrad Group in the Light of the International Competitiveness Indices During the Years 2001 – 2011, *Journal of International Relations* 10(2): 58-71.

Dudáš, T. (2013). Methodical Background of Global Indices of National Competitiveness. *The 14th International Relations 2013 "Contemporary Issues of World Economics and Politics"* Ed. by Lipková, Ľ.; Kucharčík, R. December 05-06, Smolenice, Slovak Republic, 192-201.

Gatto, Massimo Del, et al. (2011). The Revealed Competitiveness of U.S. Exports. *International Finance Discussion Papers* (1026)

Gavurova, B., Virglerova, Z., Janke, F. (2017). Trust and a Sustainability of the Macroeconomic Growth Insights from Dynamic Perspective. *Journal of Security and Sustainability Issues* 6(4): 637-648. http://jssidoi.org/jssi/uploads/papers/24/Gavurova_Trust_and_a_sustainability_of_the_macroeconomic_growth_insights_from_dynamic_p erspective.pdf

Horvat, J., & Mijoč, J. (2014). *Osnove statistike.* Naklada Ljevak, Zagreb, Croatia

Iersel, Gibellieri (2015). Informativno izvješće Europskog gospodarskog i socijalnog odbora – Promjene u svjetskoj ekonomiji i posljedice po konkurentnosti EU-a – Bruxelles, http://www.eesc.europa.eu

Jarreau, J., Poncet, S. (2012). Export Sophistication and Economic Growth: Evidence from China. *Journal of Development Economics* 97(2):281–92. (http://www.sciencedirect.com/science/article/pii/S0304387811000320).

Jurigová, Z., Tučková, Z., Solenes, O. (2017). The Impact of Chosen Economic Indicators on Tourism Sustainability: Case Study of the Czech Republic and Norway. *Journal of Security and Sustainability Issues*, 7(1):113-121. http://jssidoi.org/jssi/uploads/papers/25/Jurigova_The_impact_of_chosen_economic_indicators_on_tourism_sustainability_case_study_of_the_Czech_Republic_and_Norway.pdf

Kaimakoudi, E., Konstantinos, P., Batzios, C. (2014). Investigating Export Performance and Competitiveness of Balkan and Eastern European Fisheries Sector. Procedia Economics and Finance 9:219– 30. (http://www.sciencedirect.com/science/article/pii/S2212567114000239).

Kesner - Škreb, M. (2009). Regionalna politika Europske unije. *Financijska teorija i praksa*, 33 (1), 103-105, pp. 104.

Kiseľáková, D., Šofranková, B., Čabinová, V., Onuferová, E. (2018). Competitiveness and sustainable growth analysis of the EU countries with the use of Global Indexes' methodology. *Entrepreneurship and Sustainability Issues*, 5(3), 581-599.

Kiseľáková, D.; Šofranková, B.; Čabinová, V. (2016). Analytical View on the Competitiveness Development in the Slovak Republic and in the EU. *Acta Aerarii Publici* 2(13): 55-68.

Klaus, S. (2011). The Global Competitiveness Report 2011-2012. World Economic Forum.

Krugman, P. R. (1994). Competitiveness: A Dangerous Obsession. Foreign Affairs, 73(2):28-44.

Krugman, P. R. (1996). Making Sense of the Competitiveness Debate, *International Competitiveness. Oxford Review of Economic Policy*, 12(3):17-25.

Loo, M., K. (2012). Competitiveness: Top Five Nations Last Decade And Next Decade, *International Journal of Business and Management Studies* 1(3): 391-412.

Loo, M., K. (2015). The Global Competitiveness of BRIC Nations: Performance, Issues, and Implications for Policy, *Review of Integrative Business and Economics Research* 4(4): 22-62.

Mikušová Meričková, B.; Nemec, J.; Murray Svidroňová, M.; Pischko, V. (2017). Analysis of the Relationship between the Size and Structure of Public Expenditure and Socio-Economic Development, *Journal of Economics* 64(4): 320-333.

Nachum, L., G. G. Jones, J. H. Dunning. (2001). The International Competitiveness of the UK and Its Multinational Enterprises. Structural Change and Economic Dynamics 12:277–94.

Natali, David. (2010). The Lisbon Strategy, Europe 2020 and the Crisis in Between. *European Social Observatory* (May), 93–113

Obadić, A., Tica, J. (2016). **Gospodarstvo Hrvatske**. Ekonomski fakultet Sveučilišta u Zagrebu, Zagreb.

OECD (2001). LEED/CEI/EBRD Project. Clusters in Transition Economies. Mapping Clustering Firms, Paris: OECD

Pirić, V. (2008). Utjecaj korporacijskih komunikacija na imidž i konkurentnost poduzeća. Market-Tržište, 20(2), 149-162.

Porter, M. (1990). The Competitive Advantages of Nations, London and Basingstoke: Macmillan

Porter, M. E., Schwab, K., & Sachs, J. (2004). The global competitiveness report 2004-2005. New York, NY: Palgrave MacMillan

Pride, J., Pereira, E.T. (2013). Innovation as a key factor in the international competitiveness of the European Union, ISSN 1822-8402 European integration studies, 7: 212-221

Pupavac, Drago i Filip Golubović, (2015). Croatian Competitiveness within European Logistics Space. *Proceedings of the 15th International Scientific Conference, Business Logistics in Modern Management*, pp. 241-251, Osijek: Ekonomski fakultet.

Ricardo, D. (1819). On the Principles of Political Economy and Taxation, 2nd edition, London: John Murray

Sala Martin, X. et al. (2014.) The Global Competitiveness Report 2014-2015. http://www3.weforum.org/docs/WEF_GlobalCompetitiveness Report_2014-2015.pdf

Sala-i-Martín, X. A. V. I. E. R., Bilbao-Osorio, B., Blanke, J., Crotti, R., Hanouz, M. D., Geiger, T., & Ko, C. (2012). The global competitiveness index 2012–2013: Strengthening recovery by raising productivity. The Global Competitiveness Report 2012–2013, 49-68.

Sala-i-Martin, X., Bilbao-Osorio, B., Blanke, J., Hanouz, M. D., Geiger, T., & Ko, C. (2013). The Global Competitiveness Index 2013–2014: sustaining growth, building resilience. The Global Competitiveness Report, 2014.

Sala-i-Martin, X., Schwab, K., & Porter, M. E. (Eds.). (2004). The Global Competitiveness Report 2003-2004. Oxford University Press, USA.

Sandu, S., Ciocanel. B. (2014). Impact of R&D and Innovation on High-Tech Export. Procedia Economics and Finance 15(14):80–90. (http://linkinghub.elsevier.com/retrieve/pii/S221256711400450X).

Schwab, K. (2010, September). The global competitiveness report 2010-2011. Geneva: World Economic Forum.

Schwab, K. (Ed.). (2009). The global competitiveness report 2009-2010. World Economic Forum.

Schwab, K., & Porter, M. (2008). The global competitiveness report 2008–2009. World Economic Forum.

Schwab, K., Porter, M. E., López-Claros, A., & World Economic Forum. (2007). The global competitiveness report 2007-2008. Basingstoke: Palgrave Macmillan

Schwab, K., Porter, M.E., Sachs, J. (2002.). The global competitiveness report 2001-2002. Oxford University Press.

Schwab, K., World Economic Forum. (2014.) The Global Competitivenes Report 2014-2015. Geneva: World Economic Forum

Schwab, K., World Economic Forum. (2015.) The Global Competitivenes Report 2015-2016. Geneva: World Economic Forum

Schwab, K., World Economic Forum. (2016.) The Global Competitivenes Report 2016-2017. Geneva: World Economic Forum

Schwab, K., World Economic Forum. (2017.) The Global Competitivenes Report 2017-2018. Geneva: World Economic Forum

Solow, R.M. (1988). Growth Theory and After. American Economic Rewiew, 78 (3): 307-17

Tausch, A. (2010). The European Union's Failed 'Lisbon Strategy. Society and Economy 32:103–21.

Vedriš, M. (2005). Konkurentnost nacionalne ekonomije-osnova izvoznih performansi zemlje. *Ekonomija*, 12(1): 37-55.

Workie Tiruneh, M., Griffin, D. (2015). Can We Be Competitive without Being Educated? Empirical Findings from European Data. *Proceedings from the Annual Conference „Management Challenges in the 21st Century: HR Trends and Challenges: How to Succeed in Turbulent Times.* www.cutn.sk/Library/proceedings/mch.../27.%20Tiruneh_Griffin.pdf

Workie, M., Hekelová, E. (2016). Is the global competitiveness index informative?. In CBU International Conference Proceedings, Vol. 4, p. 132, Central Bohemia University.

Xu, Bin. (2010). The Sophistication of Exports: Is China Special? China Economic Review 21(3):482–93. http://dx.doi.org/10.1016/j.chieco.2010.04.005

Zekić, Z., Samaržija, L., Pupavac, J. (2017). Analiza konkurentnosti Republike Hrvatske u europskom i globalnom logističkom prostoru. *Privredna kretanja i ekonomska politika*, 26(1 (140)): 85-104.

## APPENDIX

| | | PILLARS | | | |
|---|---|---|---|---|---|
| | | BASIC REQUIREMENTS | | | |
| Global Competitiveness report | Country | 1st pillar - Institutions | 2nd pillar: Infrastructure | 3rd pillar: Macroeconomy | 4th pillar: Health and primary education |
| 2006 - 2007 | 125 | property rights, diversion of public funds, public trust of politicians, judicial independence, favoritism in decisions of government officials | quality of electricity supply, overall infrastructure quality,railroad infrastructure development, quality of port infrastructure | real effective exchange rate, government surplus/ deficit, government debt, inflation | primary enrollment |
| | | 1st pillar - Institutions | 2nd pillar: Infrastructure | 3rd pillar: Macroeconomic stability | 4th pillar: Health and primary education |
| 2007 - 2008 | 131 | efficacy of corporate boards, strength of auditing and reporting standards, protection of minority shareholders interests, intellectual property protection, wastefulness of government spending, efficiency of legal framework, ethical behavior of firms, reliability of police services, transparency of government policymaking, business costs of terrorism, burden of government regulation, business costs of crime and violence, organized crime | quality of roads, available seat kilometers, quality of air transport infrastructure, telephone lines | national savings rate, interest rate spread minus: real effective exchange rate | business impact of malaria, education expenditure, business impact of HIV/ AIDS, primary enrollment, HIV prevalence, business impact of tuberculosis, infant mortality, malaria incidence, life expectancy, tuberculosis incidence, quality of primary education |
| 2008 - 2009 | 134 | Intelectual property protection, Wastefulness of government spending, burden of government regulation, efficiency of legal framework, trasparency of government policymaking, business costs of terrrism, business cost of crime and violence, organized crime, realibility of police sevices, ethical, behaviour of firms, strength of auditing and reporting standards, efficacy of corporate boards, protection of minority shareholders interests, | Quality of roads, quality of air transport infrastructure, available seat kolometers, telephone lines | national savings rate, interest rate spread | Business impact of malaria, malaria incidence, business impact of tuberculosis, tuberculosis incidence, business impact of HIV/ AIDS, HIV prevalence,infant mortality,life expectancy, quality of primary education, edudation expenditure |
| 2009 - 2010 | 133 | protection og minority shareholders interests | | | |

*continued Appendix*

| | | PILLARS | | | |
|---|---|---|---|---|---|
| | | BASIC REQUIREMENTS | | | |
| Global Competitiveness report | Country | 1st pillar - Institutions | 2nd pillar: Infrastructure | 3rd pillar: Macroeconomic stability | 4th pillar: Health and primary education |
| 2010-2011 | 139 | irregular payments and bribes, strength of investor protection | mobile telephone subscriptions | country credit rating | minus: education expenditure |
| 2011-2012 | 142 | | | | |
| 2012-2013 | 144 | gov't services for improved business performance | | minus: interest rate spread, % | |
| 2013-2014 | 148 | minus: gov't services for improved business performance | | | |
| 2014-2015 | 144 | | | | |
| 2015-2016 | 140 | | | | |
| 2016-2017 | 138 | | | | |
| 2017-2018 | 137 | | | | |

| | | EFFICIENCY ENHANCERS | | | |
|---|---|---|---|---|---|
| Global Competitive-ness report | Country | 5th pillar: Higher education and training | 6th pillar: Market efficiency | | |
| 2006-2007 | 125 | local availability of research and training services,quality of management schools, extent of staff training, tertiary enrollment | local equity market access, intensity of local competition, foreign ownership restrictions, brain drain, effectiveness of antitrust policy, efficiency of legal framework, prevalence of trade barriers, agricultural policy costs, hiring and firing practices, flexibility of wage determination, cooperation in labor-employer relations, pay and productivity | | |
| | | 5th pillar: Higher education and training | 6th pillar: goods market efficiency | 7th pillar: labour market efficiency | 8th pillar: financial market sophistication |
| 2007-2008 | 131 | quality of math and science education, secondary enrollment, quality of the educational system, Internet access in schools | total tax rate, number of procedures required to start a business, time required to start a business, effectiveness of anti-monopoly policy, extent and effect of taxation, trade-weighted tariff rate, business impact of rules on FDI, prevalence of foreign ownership, burden of customs procedures, buyer sophistication, extent of market dominance, degree of customer orientation minus: local equity market access, foreign ownership restrictions, brain drain, effectiveness of antitrust policy, efficiency of legal framework, hiring and firing practices, flexibility of wage determination, cooperation in labor-employer relations, pay and productivity | flexibility of wage determination, non-wage labor costs, hiring and firing practices, cooperation in labor-employer relations, female participation in labor force, pay and productivity, brain drain, rigidy of employement, reliance on professional management, firing costs | regulation of securities exchanges, legal rights indeks, financing through local equity market, financial market sophistication, soundness of banks, venture capital availability, ease of access to loans, restriction on capital flows, strength of investor protection |

*continued Appendix*

| | | EFFICIENCY ENHANCERS | | | |
|---|---|---|---|---|---|
| Global Competitive-ness report | Country | 5th pillar: Higher education and training | 6th pillar: goods market efficiency | 7th pillar: labour market efficiency | 8th pillar: financial market sophistication |
| 2008-2009 | 134 | Secondary enrollment, quality of the educational system, quality of math and science education, Internet access in schools | Extended of market dominance, effectiveness of anti-monopoly policy, extent and effect of taxation, total tax rate, no. Of procedures required to start a business, time required to start a business, trade weighted tariff rate, business impact of rules on FDI, burden of customs procedures, degree of customer orientation, buyer sophistication | cooperation in labor-employer relations, flexibility of wage determination,non-wage labor costs, rigidity of employment, hiring and firing practices, firing costs, pay and productivity, reliance on professional management, brain drain, female participation in labor force | financial market sophistication, financing through local equity market, ease of access to loans, venture capital availability, restriction on capital flows, strength of investor protection, soundness of banks, regulation of securities exchanges, legal rights index |
| 2009-2010 | 133 | | | -non-wage labor costs | |
| 2010-2011 | 139 | | | | |
| 2011-2012 | 142 | | imports as a percentage of GDP | | minus:<br>restriction on capital flows |
| 2012-2013 | 144 | | | minus:<br>rigidity of employment indeks, 0-100(worst) | minus:<br>soundness of banks |
| 2013-2014 | 148 | | | effect of taxation on incentives to work, country capacity to retain talent, country capacity to attract talent<br>minus: brain drain | |
| 2014-2015 | 144 | | | | |
| 2015-2016 | 140 | | | | |
| 2016-2017 | 138 | | | | |
| 2017-2018 | 137 | | | | |

| | | PILLARS | | | |
|---|---|---|---|---|---|
| | | EFFICIENCY ENHANCERS | | INNOVATION AND SOPHISTICATION FACTORS | |
| Global Competitive-ness report | Country | 7th pillar: Technological readiness | | 8th pillar: Business sophistication | 9th pillar: Innovation |
| 2006-2007 | 125 | firm-level technology absorption, personal computers, technological readiness, FDI and technology transfer | | nature of competitive advantage, value chain presence, local supplier quantity, production process sophistication | government procurement of technology products, capacity for innovation, company spending on research and development, intellectual property protection, availability of scientists and engineers |
| | | 9th pillar: technological readiness | 10 th pillar: market size | 11th pillar: business sophistication | 12 th pillar: innovation |
| 2007-2008 | 131 | Internet users, broadband Internet subscribers, mobile telephone subscribers, laws relating to ICT, availability of latest technologies minus: technological readiness | domestic market size indeks, foreign market size indeks | value chain breadth, state of cluster development, control of international distribution, extent of marketing, willingness to delegate authority, local supplier quality minus: value chain presence | |
| 2008-2009 | 134 | availability of latest technologies, mobile telephone subscribers, broadband Internet subscribers - technological readiness<br><br>-cellular telephones | domestic market size, foreign market size | local supplier quality, state of cluster development, value chain breadth, extent of marketing, willingness to delegate authority - value chain presence | company spending on R&D, gov't procurement of advanced tech products |

*continued Appendix*

| | | PILLARS | | | |
|---|---|---|---|---|---|
| | | EFFICIENCY ENHANCERS | | INNOVATION AND SOPHISTICATION FACTORS | |
| Global Competitive-ness report | Country | 9th pillar: technological readiness | 10 th pillar: market size | 11th pillar: business sophistication | 12 th pillar: innovation |
| 2009-2010 | 133 | broadband Internet subscriptions, Internet bandwidth MINUS: laws relating to ICT, mobile telephone subscriptions, personal computers, broadband Internet subscriptions | | | |
| 2010-2011 | 139 | | | | |
| 2011-2012 | 142 | | | | |
| 2012-2013 | 144 | mobile broadband subscriptions/100 pop. | | | |
| 2013-2014 | 148 | | GDP (PPS$ billions), exports as a percentage of GDP | | |
| 2014-2015 | 144 | | | | |
| 2015-2016 | 140 | | | | |
| 2016-2017 | 138 | | | | |
| 2017-2018 | 137 | | | | |