„Magic Diamond" in a Macroeconomic Performance: an Empirical Assessment of Selected EU Countries

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Abstract

A stable macroeconomic environment plays a crucial role in the overall stability of an economy. Although macroeconomic stability cannot certainly drive the country's productivity and competitiveness, its absence would have far-reaching consequences for its economy. The paper aims to analyze the macroeconomic performance of selected European (EU) countries, reflected in the "magic diamond "indicators: gross domestic product per capita, unemployment rate, inflation rate, and trade balance, striving to figure out what contributes the most to the economic development of a country. The study includes the EU countries that are in a transition from efficiency-driven to innovation-driven stage of development: Greece, Portugal, Spain, Cyprus, Malta and Slovenia, covering the 22 years' period from 1995 to 2016. The findings have provided better understanding of the overall macroeconomic performance, relation between individual indicators among each other, and their contribution to the economic growth in the context of selected EU countries.

INTRODUCTION

Measuring and comparing the macroeconomic performance of the countries has been always a topic of common interest. Although macroeconomic stability is not a guarantee for driving an economy towards prosperity, a sound macroeconomic environment undoubtedly plays an important role in shaping the long-term economic relief and giving a wind to the back of economic development of a country and higher living standard of the population.

Commonly, the macroeconomic performance of a country is measured by the extent to which the goals of macroeconomic policy are achieved (Crocket & Goldstein, 1987). Traditionally, the principal aim of economic policy makers in all the countries is achieving a high real Gross Domestic Product (GDP) rate. As suggested by Thanawala (1994), high real GDP growth is found to be even more advantageous if it is accompanied with a high degree of income equality. The

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growth of real GDP, being a summary measure for economic production, is generally considered to be an overall indicator of the size and development of an economy.

Even though economic growth being measured by GDP is widely accepted as a general measure of economic success, it still remains a challenge to assess the countries' macroeconomic performance solely on this criterion. This is due to the fact that to get an in-depth understanding of their overall economic achievements, it is necessary to consider different dimensions of their economic activity and measure the fulfilment of other commonly postulated macroeconomic goals. To get a comprehensive understanding of the macroeconomic performance, the magic diamond [1](rectangle), a concept that brings together and summarizes the economic prosperity of countries in terms of four different dimensions (real GDP, inflation, unemployment and the external account), could be used. The magic rectangle is commonly used to compare the macroeconomic performance of a single country across different periods or different countries in a specific period of time (Moesen & Cherchye, 1998).

Macroeconomists have devoted a significant volume of research efforts to the theoretical and empirical analysis of inflation and its impact on economic growth. Low inflation, being considered as the second important goal of macroeconomic policy, tends to discourage the incentives for investments in the private sector, thus having a negative impact on output. Therefore, along with real GDP growth and low inflation, low unemployment is seen as a third important policy aim and performance

indicator. Unemployment is, similarly to inflation, considered to be not favorable for an economy, given that among the other things, it determines the level of prosperity, living standard and poverty rate in a country, which is reflected in the aggregate demand, output level, tax revenues reduction and slowing down of the economy growth. Therefore, the economic policies that are geared towards strengthening the economic growth require reducing the unemployment. What becomes a peculiar problem to policy makers is the fact that reducing unemployment rate could be achieved by a high level of inflation, which is a relationship postulated by the well-known Phillips curve (Podgorska & Lesniowska-Gontarz, 2016).

In growth theories, it has been widely argued that international trade and openness of a country positively affects its economic growth by facilitating capital accumulation, technological progress and innovations, industrial structure and institutions advancement. In particular, an increase in export is seen as an engine of economic development for a number of reasons, including pressure for innovations due to increased competition, knowledge and technology spillover effects, increase in productivity, sales and profits, access to the currencies, increase in national income, the turnover and the surplus of a country (Bakari & Mabrouki, 2017).

While empirical studies support the relevance of these factors for economic growth, the results are often found ambiguous. There is still no consensus on the key determinants of economic growth and their relative importance, while a comprehensive

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[1] The magic rectangle represents a concept usually used by the OECD according to which the macroeconomic performance is assessed across four individual indicators in a single diagram having a shape of a diamond (See e.g. OECD, Economic Outlook, 41, 1987).

model that encompasses all the influences has not been elaborated enough. Due to the fact that a few countries have experienced an accelerated growth in GDP per capita, while other major economies have lagged behind, the last decades have witnessed a renewed interest in assessing the main drivers of economic growth in EU economies. In the light of previously raised points, it may be fruitful to investigate and compare the behavior of the key macroeconomic performance indicators and their relative importance to economic growth, which would allow for understanding whether or not there has been a systematic and non-marginal change in these growth parameters.

In the light of above mentioned, this study aims to assess how the macroeconomic performance of the selected EU countries (Greece, Portugal, Spain, Cyprus, Malta and Slovenia) is reflected in four magic diamond performance indicators, GDP growth, inflation, unemployment and trade balance (export and import), have evolved over the sample time interval, to what extent the evolution of the these macroeconomic variables has impacted the economic growth of the examined countries and which factor has had the greatest relative contribution in shaping the long-run economic growth patterns. For this purpose, a sample of pooled cross-country time-series data for four single performance indicators is utilized, covering the period from 1995 to 2017. The findings of this study have allowed more profound understanding of the relation between economic growth and policy settings and will be a worthy lesson to current EU members and candidate countries' economic authorities who should find a solution for an optimal macroeconomic policy that will be a function of achieving sustainable economic growth.

1. LITERATURE REVIEW

The literature on economic growth is vast and has flourished over the past decades. Along with the recent crisis in the Eurozone, policy-oriented studies, examining the macroeconomic policy settings in the context of economic development have attracted more attention. Yet, there is little agreement on the exact mechanisms linking policy settings to growth.

Inflation and growth

The relationship between the inflation and economic growth have caught a great interest of the macroeconomists and monetary policy creators. Although the relationship between these two variables has been studied extensively, the empirical results of the studies are not uniformed and sometimes not much conclusive.

Empirical findings on this relationship could be placed into four categories: There is no impact of inflation on economic growth (Dorrance 1966, Sidrauski 1967, Cameron at al. 1996); inflation has a positive impact on economic growth (Mallik and Chowdhury 2001, Repach 2003, Benhabib & Spiegel 2009); inflation has a negative impact on economic growth (Barro 1995, Valdovinos 2003); and the relationship between inflation and economic growth exists in terms of specific thresholds (Vinayagathasan 2013, Foluso & Odhiambo, 2017).

Using an extended Solow model, Harberger (1998) argues that the lower inflation rate has a positive impact on the total factor productivity growth. As the author suggests, the lower inflation is likely to prevent economic agents to observe the actual prices correctly thus allowing them to make rational investment decisions which leads to the enhancement of the resource allocation efficiency. Aiming to

examine the dynamic linkages between the inflation, its uncertainty and output growth for the UK economy data, being considered for the entire selected time period and 3 sub-periods, Ozdemir (2010) found the evidence on the impact of inflation uncertainty on economic growth. The results of the study in addition revealed that output growth uncertainty has a positive impact on inflation and output growth rate. However, no relationship was confirmed for the sub-periods examined.

For some studies, instead, the empirical results on this relation were not conclusive. Aiming to understand the causality between the real growth of GDP and inflation in the long run, Paul et al. (1997), using a sample of 70 countries, including both industrialized and developing countries, have confirmed the existence of a non-uniform relationship across the countries, where the unidirectional causality was confirmed for only 1/3 of the considered countries, while for 1/3 of the sample countries no causality between the variables is found. For the remaining countries, the relationship between inflation and growth is interdependent.

The relationship between inflation and growth was examined by some authors within specific thresholds. In this context, the results of the study done by Akgul & Ozedemir (2012), who examined this relationship for the Turkish economy, suggest that an inflation threshold of 1.26% is appropriate for economic growth. Instead, while an inflation rate above this level is found to have a negative impact on growth, the rate below this level had a positive impact on growth.

International Trade and Growth

There has been extensive research done to examine the linkages between the trade components (exports, imports, trade openness, trade restrictions) and economic growth.

Empirical results of a vast number of studies (Thorton 1996, Doyle 1998, Romer 1990, Barro 2003, Maudos 1999, Badinger 2008, Cuaresma et al. 2008, Bugarčić & Veselinović, 2020) have been consistent with the assumption of the trade openness theory, according to which there are sane theoretical reasons to believe that there is a strong and positive relationship between the trade openness and economic growth.

Accordingly, using several different indicators of trade openness, to measure the impact of trade liberalization on growth for a sample of 120 developing and developed countries, Ynikkaya (2003) confirmed the existence of a positive association between the analysed trade openness variables and growth. In addition, the study revealed that the trade restrictions have an acceleration impact on growth in developing countries. Similarly, the study of Al-Raimony (2011) in which the linkages between the real export and real import growth and economic growth in the Middle East were analysed, suggests that while real export growth has a positive impact on growth, the real import growth negatively impacts economic growth. In this context, Simut & Mester (2014), examining the relation between selected trade components and growth for 10 East European countries, provided the evidence on the existence of a direct correlation and causality between exports, trade openness and economic growth. The positive correlation between the degree of trade openness and human capital with economic growth was found by Mihut and Lutas (2014) for 12 new EU member countries.

Surprisingly, the study of Dar & Amilkhalkadi (2003) points out that a low

rate of trade openness and the expansion of export are the growth factors of minor importance, whose relevance however increases with acceleration of trade openness. In the same context, Dar and Amilkhalkali (2003), conducting an analysis for 19 OECD countries, concludes that the export has found to be the least significant factor of growth for the countries that had the lowest rate of openness. However, the author suggests that the significance of this factor increases with the expansion in the trade openness until a certain point. Accordingly, Zhou & Li (2011), who conducted a nonparametric research to evaluate the relationship between openness and growth, claim that a necessary condition for having a significant contribution of trade to growth is a sound macroeconomic performance of a country being accompanied with the high degree of openness.

Unemployment and Growth

The relationship between unemployment and economic growth has been mostly analyzed by the scholars within the framework of Okun's law, according to which having an extra percent point in the unemployment rate above 4% (standing as a rate of full employment excluding the natural unemployment) is in association with about a 3% decrease in the real Gross National Product (GNP) (Okun, 1962). Thus, according to this law, the existence of an inverse relationship has been postulated between unemployment and economic growth.

Even though Okun's law has been derived based on the study by which (Okun, 1962) has examined this relationship for the US economy, there has been a number of studies in macroeconomics that tested this law using time series data for a number of countries worldwide (Attfield & Silverstone

1997, Freeman 2001, Izyumov & Vahaly 2002, Adanu 2005, Huang & Lin 2008, Villaverde & Maza 2009, Tatoglu 2011, Dogru 2013, Elshamy 2013).

According to the study of Saget (2003), which examined the relationship between unemployment and growth in the long run in 11 European countries, economic growth was found to be closely related with unemployment decline in three countries (Poland, Hungary and Slovenia), whereas linkages in the changes of the two variables were observed of lower strength for Russia, Slovakia and the Baltic countries. In the case of Bulgaria, Romania and Ukraine the results suggested no statistical significance of the relationship. The existence of the relationship between economic growth and unemployment was also identified by Schmid (2008) and Onaran (2007) in OECD countries. However, the coefficient was significant only for several sample countries. In the study conducted by Dritsaki & Dritsakis (2009) and Villaverde & Maza (2009), Okun's coefficient for the Mediterranean countries confirms the inverse relationship between growth and unemployment. Nevertheless, the coefficient is found to be of a different value across the countries and different regions country-wide thus suggesting different strength of the relationship.

Despite the fact that numerous studies that have validated the existence of an inverse relationship between unemployment and economic growth, there have been also found the empirical evidence that tends to reject Okun's law (Vistrand, 2006, Herman 2012, Sadiku at al. 2015). These results suggesting a simultaneous decline in GDP and rise in the labor productivity were mostly particular for the period of recession and occurred in US, Spain and Ireland (Rowe, 2011).

Encompassing all previously said, the evidence on the relationship between inflation and growth is found to be somewhat mixed: while there is evidence that investment and economic efficiency decline in cases of high inflation and its volatility, this relation is less clear in cases of moderate or low inflation. The relatively open stance towards the trade may have an important influence on economic growth through a multitude of different channels like technological transfers, competitiveness advantage and increase in economies of scale. However, the amount of trade conducted reflects the patterns of growth as much as it reflects constraints in terms of tariff and non-tariff barriers. Even though, the empirical results of many authors have confirmed the inverse association between the unemployment and growth, this relationship was also found to vary across different time periods and business cycles. Ambiguously, the Okun's law has been confirmed as a very useful forecasting tool.

2. DATA AND METHODOLOGY

The aim of the research is to provide an overview and to analyze the macroeconomic performance of a country, based on the following indicators: gross domestic product (GDP) per capita, unemployment rate, inflation rate, and trade balance. The subject of the analysis are countries have been chosen according to their level of development. Namely, given the level of GDP per capita, all national economies can be divided into certain stages of development, such as: factor-driven, efficiency-driven and innovation-driven, including also a transition from one stage to another, as follows:

Stages of development	GDP per capita, US$
Stage 1: Factor-driven	<2000
Transition from stage 1 to stage 2	2000-2999
Stage 2: Efficiency-driven	3000-8999
Transition from stage 2 to stage 3	9000-17000
Stage 3: Innovation-driven	>17000

Source: WEF – The Global Competitiveness Report 2014

Countries analyzed in the paper are the EU countries that are in a transition from an efficiency-driven to innovation-driven stage of development, with a GDP per capita from 9000 to 17000 US$ in the first seven analyzed years: Greece, Portugal, Spain, Cyprus, Malta and Slovenia. These countries are at the same level of development although they have joined the EU in different years. Thus, Greece joined the EU in 1986, Portugal and Spain in 1986, Cyprus, Malta and Slovenia in 2004. Being in a transition from efficiency-driven to innovation-driven stage of development, those countries have been improving the production process and quality of products, and they have based a competitiveness on a quality education, efficient financial and good market. However, the countries strive to reach the innovation-driven stage, the highest level of development, where competitiveness is reflected in a brand new and innovative product being produced by modern and sophisticated techniques. The main drivers of development at this stage are high education, competences and investment in research & development. In addition to the human and other intangible forms of capital, financial capital still plays an important role in the innovation-driven economy (Frane, 2014).

A time frame of the research is a 22-year period from 1995 to 2016. The information

base of the analysis for the observed period and selected EU countries are data available in the World Bank publications. Methods used in the analysis are descriptive statistics, correlation, regression and comparative analysis.

The purpose of the analysis is to examine the trend of the main macroeconomic indicators that reflect a macroeconomic performance of the selected EU countries, as well as their inter-correlation in the analyzed period. Further, the regression analysis highlights the importance of one, among four indicators, that contributes the most to the countries' economics growth.

Limitations

Even though the concept of magic diamond as a synthetic measure of macroeconomic performance has proven to be more adequate for a thorough understanding of the economic patterns and results of a country, still, the selective power of this concept must be pointed out. Namely, given that evaluating the macroeconomic performance using the magic rectangle attaches equal weights to every single performance indicator, one may conclude that the concept reflects the assumption of assigning an equal priority to each macroeconomic policy aim. Nevertheless, such an assumption does not seem realistic in real life settings since policy makers in the countries worldwide with no exception prioritize the policy goals. Furthermore, one more challenge that is attached to this concept is related to the fact that the relative importance of each indicator, representing another economic policy objective, may vary across the countries and over time. Similarly, it often occurs that one country seems to perform better according to one indicator, whereas the opposite holds with respect to another indicator. These shortcomings of the concept may result in a peculiar challenge for the scholar and policy makers in an attempt to carry out a comparative analysis for the selection of countries and time intervals.

3. RESULTS AND DISCUSSION

3.1. Analysis of macroeconomic indicators of the selected EU countries (Greece, Portugal, Spain, Cyprus, Malta and Slovenia)

Macroeconomic performance refers to a country's ability to reach the main macroeconomic objectives. Namely, a high GDP per capita, low rates of inflation and unemployment, and a satisfactory trade balance are most common key objectives of the macroeconomic policy makers. These objectives are summarized as the so cold "magic diamond" of OECD – the Organization for Economic Cooperation and Development (Skare & Rabar, 2017). Therefore, in the paper the mentioned indicators are taken into consideration.

a) *GDP per capita*

GDP per capita is the most often used indicator of the countries' economic development and serves as a useful tool for their comparison. In this analysis, GDP per capita also plays an important role in terms of selecting countries. Thus, Table 1 shows the GDP per capita for the selected EU countries that range between 9000 and 17000 US\$ in the first seven years over the period from 1995 to 2016. Given the long analysis period (22 years), all counties are subject to change the level of its GDP per capita and move from one to another stage of development. For the purpose of a comparison, the EU as a whole takes part in the analysis as well.

Table 1. GDP per capita in current US$ for Greece, Portugal,
Spain, Cyprus, Malta, Slovenia, and the EU, 1995-2016

Country / Year	Greece	Portugal	Spain	Cyprus	Malta	Slovenia	EU
1995	12,959	11,783	15,430	15,098	9,114	10,691	19,860
1996	13,749	12,185	16,069	14,969	9,398	10,801	20,274
1997	13,428	11,578	14,696	14,304	9,680	10,448	19,102
1998	13,472	12,203	15,340	15,247	10,184	11,165	19,726
1999	13,245	12,475	15,678	15,458	10,649	11,442	19,656
2000	12,043	11,502	14,677	14,673	11,039	10,228	18,244
2001	12,538	11,729	15,324	15,063	11,022	10,479	18,407
2002	14,110	12,882	17,020	16,372	11,844	11,814	20,018
2003	18,478	15,773	21,496	20,293	13,690	14,880	24,278
2004	21,955	18,046	24,919	23,932	15,109	17,261	27,922
2005	22,552	18,785	26,511	25,324	15,835	18,169	29,093
2006	24,801	19,821	28,483	27,170	16,672	19,726	30,923
2007	28,827	22,780	32,709	31,387	19,376	23,841	35,594
2008	31,997	24,816	35,579	35,391	21,929	27,502	38,136
2009	29,711	23,064	32,334	32,106	20,676	24,634	33,979
2010	26,918	22,539	30,737	30,818	21,088	23,437	33,677
2011	25,916	23,196	31,835	32,234	22,840	24,985	36,409
2012	22,243	20,577	28,564	28,985	21,926	22,532	34,235
2013	21,875	21,619	29,212	27,942	23,817	23,358	35,588
2014	21,761	22,078	29,623	27,401	25,852	24,202	36,670
2015	18,071	19,253	25,790	23,212	23,759	20,873	32,207
2016	17,882	19,872	26,617	23,541	24,771	21,650	32,260

Source: The World Bank, www.worldbank.org

Based on the data from the previous table, Spain has the highest GDP per capita on average in the group of selected EU countries, and Portugal - the lowest. All six countries from the group are well below the GDP per capita for the EU as a whole.

b) *Inflation*

Inflation, as an indicator of economic development, refers to a change in the purchasing power of the population given a certain annual rise in overall level of prices. Table 2 shows the inflation rate for Greece, Portugal, Spain, Cyprus, Malta, Slovenia, and the EU as a whole in the period from 1995 to 2016.

Table 2. Inflation rate for Greece, Portugal, Spain, Cyprus,
Malta, Slovenia, and the EU, 1995-2016

Country Year	Greece	Portugal	Spain	Cyprus	Malta	Slovenia	EU
1995	8.94	4.12	4.67	2.62	4.43	13.46	4.27
1996	8.20	3.12	3.56	2.98	2.05	9.79	3.34
1997	5.54	2.16	1.97	3.61	3.11	8.36	2.65
1998	4.77	2.72	1.83	2.23	2.39	7.91	2.41
1999	2.64	2.30	2.31	1.63	2.13	6.15	2.17
2000	3.17	2.85	3.43	4.14	2.37	8.88	3.16
2001	3.37	4.39	3.59	1.98	2.93	8.42	3.15
2002	3.63	3.55	3.07	2.80	2.19	7.47	2.31
2003	3.53	3.28	3.04	4.14	1.30	5.58	2.10
2004	2.90	2.36	3.04	2.29	2.79	3.59	2.26
2005	3.55	2.29	3.37	2.56	3.01	2.48	2.48
2006	3.20	2.74	3.52	2.50	2.77	2.46	2.60
2007	2.90	2.81	2.79	2.37	1.25	3.61	2.63
2008	4.15	2.59	4.08	4.67	4.26	5.65	4.20
2009	1.21	-0.84	-0.29	0.37	2.09	0.86	0.95
2010	4.71	1.40	1.80	2.38	1.52	1.84	1.67
2011	3.33	3.65	3.20	3.29	2.72	1.81	3.31
2012	1.50	2.77	2.45	2.39	2.42	2.60	2.72
2013	-0.92	0.27	1.41	-0.40	1.37	1.76	1.39
2014	-1.31	-0.28	-0.15	-1.35	0.31	0.20	0.22
2015	-1.74	0.49	-0.50	-2.10	1.10	-0.52	-0.06
2016	-0.83	0.61	-0.20	-1.43	0.58	-0.06	0.22

Source: The World Bank, www.worldbank.org

Based on the results from the previous table, Slovenia has the highest average rate of inflation and Cyprus - the lowest. However, in the second half of the observed period, all analyzed countries (except Malta) record even a negative inflation rate in some years.

c) *Unemployment*

The unemployment rate as an economic indicator provides an insight into a country's labour force and how efficiently this resource has been employed in the economy. Table 3 shows the unemployment rate for the selected EU countries in the 22-year period.

Table 3. Unemployment rate for Greece, Portugal, Spain, Cyprus, Malta,
Slovenia, and the EU, 1995-2016

Country / Year	Greece	Portugal	Spain	Cyprus	Malta	Slovenia	EU
1995	9.06	7.06	22.67	3.41	6.07	7.15	10.82
1996	9.66	7.30	22.14	4.84	7.19	6.91	10.72
1997	9.58	6.57	20.70	5.09	6.91	6.65	10.39
1998	10.84	4.65	18.67	5.11	7.31	7.39	9.91
1999	11.85	4.60	15.48	5.70	7.08	7.32	9.66
2000	11.25	3.82	13.79	4.98	6.32	6.92	9.28
2001	10.46	3.83	10.35	3.97	7.11	5.68	8.61
2002	9.97	4.50	11.15	3.31	6.90	5.92	8.94
2003	9.41	6.13	11.28	4.13	7.49	6.48	9.01
2004	10.31	6.32	11.09	4.32	7.32	6.01	9.18
2005	9.99	7.58	9.15	5.31	6.92	6.51	8.91
2006	9.01	7.65	8.45	4.54	6.80	5.95	8.16
2007	8.40	7.96	8.23	3.91	6.47	4.82	7.12
2008	7.76	7.55	11.25	3.65	5.98	4.37	6.95
2009	9.62	9.43	17.86	5.36	6.89	5.86	8.87
2010	12.71	10.77	19.86	6.26	6.85	7.24	9.51
2011	17.86	12.68	21.39	7.87	6.38	8.17	9.59
2012	24.44	15.53	24.79	11.79	6.31	8.84	10.41
2013	27.47	16.18	26.09	15.88	6.39	10.10	10.81
2014	26.49	13.89	24.44	16.08	5.80	9.67	10.20
2015	24.90	12.44	22.06	14.92	5.39	8.96	9.38
2016	23.54	11.07	19.63	12.95	4.70	8.00	8.53

Source: The World Bank, www.worldbank.org

Unemployment is an issue in Greece and Spain in almost the whole analyzed period, recording higher rates compared to other countries from the group, as well as compared to the EU. These two countries in the last 5 analyzed years record an unemployment rate above 20%.

d) *Trade balance*

Trade balance as a balance between the export and import of a country, plays an important role in a country's economic growth. Therefore, Table 4 shows export and import as % of GDP for Greece, Portugal, Spain, Cyprus, Malta, Slovenia, and the EU as a whole in the period 1995-2016.

Table 4. Export and import of goods and services as % of GDP for Greece, Portugal, Spain, Cyprus, Malta, Slovenia, and the EU, 1995-2016

	Country / Year	Greece	Portugal	Spain	Cyprus	Malta	Slovenia	EU
Export	1995	14.43	26.77	21.93	66.76	122.27	45.61	28.61
	1996	14.29	26.55	23.12	70.21	114.10	46.19	28.97
	1997	16.22	27.15	25.75	69.19	110.62	47.59	30.75
	1998	16.30	27.32	26.18	68.70	110.34	47.54	30.95
	1999	19.26	26.47	26.40	66.93	112.36	44.15	31.13
	2000	23.72	28.19	28.62	69.96	119.33	50.01	34.44
	2001	22.79	27.42	27.86	68.21	108.50	51.75	34.38
	2002	20.11	26.95	26.48	62.41	111.63	52.16	33.62
	2003	18.54	26.75	25.45	57.76	107.72	50.90	32.93
	2004	20.71	27.25	25.18	56.89	103.46	54.97	34.33
	2005	21.31	26.73	24.67	55.69	104.37	59.58	35.67
	2006	21.17	29.92	24.87	53.44	123.45	64.70	37.78
	2007	22.52	31.01	25.71	53.26	129.54	67.60	38.39
	2008	23.36	31.13	25.32	50.09	148.48	66.11	38.97
	2009	18.98	27.08	22.67	48.73	147.74	57.24	34.75
	2010	22.10	29.87	25.52	50.21	153.26	64.29	38.45
	2011	25.54	34.29	28.92	52.93	160.31	70.37	41.11
	2012	28.68	37.71	30.70	53.44	165.25	73.12	42.31
	2013	30.35	39.52	32.22	58.65	157.06	74.52	42.43
	2014	32.37	40.07	32.71	62.06	148.60	75.81	42.79
	2015	31.72	40.40	32.94	64.52	139.46	76.99	43.36
	2016	30.46	40.13	32.95	64.71	136.11	77.65	43.16
Import	1995	22.68	33.14	22.90	67.63	131.70	47.86	27.19
	1996	23.21	33.66	23.21	70.64	123.47	47.44	27.53
	1997	23.05	35.14	25.54	70.58	115.49	48.73	29.05
	1998	25.97	36.49	26.68	66.21	112.97	49.23	29.72
	1999	28.12	36.82	28.34	64.28	114.66	48.48	30.39
	2000	34.70	39.23	31.62	67.53	126.53	53.67	34.19
	2001	33.35	37.64	30.21	63.64	110.16	52.79	33.61
	2002	30.24	35.22	28.51	61.24	107.23	51.17	32.19
	2003	29.65	33.69	27.66	56.24	106.85	51.21	31.81
	2004	29.19	35.51	29.03	57.02	104.79	56.41	33.08
	2005	29.59	35.84	29.67	56.23	106.82	60.22	34.77
	2006	31.68	38.16	30.79	56.37	126.83	64.74	37.13
	2007	35.00	38.65	31.70	58.02	128.97	68.89	37.57
	2008	35.97	40.84	30.44	62.86	148.72	68.04	38.60
	2009	28.76	34.00	23.82	54.08	149.24	55.37	33.66
	2010	30.73	37.43	26.82	57.48	154.17	62.85	37.51
	2011	32.31	38.57	29.17	55.86	158.07	68.54	40.03
	2012	33.13	38.22	29.23	54.92	160.61	68.91	40.27
	2013	33.17	38.51	28.96	56.82	150.79	68.96	39.78
	2014	34.78	39.89	30.28	60.01	136.69	68.41	39.95
	2015	31.67	39.82	30.67	63.72	132.40	68.40	39.85
	2016	31.18	39.01	29.93	65.49	125.41	68.50	39.71

Source: The World Bank, www.worldbank.org

Based on the previous table, import as % of GDP is slightly higher than export as % of GDP in Spain, Greece, Cyprus and Portugal, while in Malta and Slovenia the situation is the opposite. Malta records both import and export as % of GDP above 100% which usually happens with small economies. Cyprus and Slovenia have this share for around 60%, and other three countries (Greece, Spain and Portugal) around 30%.

3.2. Analysis of the interdependence between macroeconomic indicators of the selected EU countries (Greece, Portugal, Spain, Cyprus, Malta and Slovenia)

The interdependence of macroeconomic indicators can be determined by the correlation analysis. Namely, *Pearson's correlation coefficient,* as a measure of a linear relationship between indicators, ranges its values from 0 to 1 indicating the strength of their correlation (Soldic-Aleksic, 2015):

$$r = \frac{cov_{xz}}{s_x s_y} = \frac{\sum(x_i - \overline{x})(y_i - \overline{y})}{(n-1)s_x s_y} \tag{1}$$

For values of Pearson's correlation coefficient between 0.10 and 0.29, the correlation is considered to be low; if Pearson's correlation coefficient fluctuates between 0.30 and 0.49, correlation is medium, and correlation is high if Pearson's correlation coefficient scores above 0.50 (Soldic-Aleksic, 2015).

The relationship between variables can be both positive and negative. If variables change in the same direction, precisely, if a direction change of one variable follows a change of (an)other variable(s) in the same direction, the relationship is positive. On the other hand, the relationship is considered to be negative if variables change in opposite directions. Before the correlation analysis is applied, it is highly important to investigate the existence of a relationship between indicators, based on the concept of statistical significance.

Table 5 illustrates the results of the correlation analysis between the key macroeconomic indicators (GDP per capita, unemployment rate, inflation rate, and export &import as % of GDP) that form the "magic diamond" for the analyzed countries over the last 22-year period.

Table 5. Correlation analysis of the main macroeconomic indicators
for the six selected EU countries and the EU, 1995-2016

Correlation		Pearson Correlation	Coefficient of determination	*Sig. (2-tailed)
Greece:	GDP per capita-Exports	0.293	8.58%	0.185
	GDP per capita-Imports	0.507	25.70%	0.016
	GDP per capita-Inflation	-0.275	7.56%	0.215
	GDP per capita-Unemployment	-0.045	0.20%	0.842
Portugal:	GDP per capita-Exports	0.564	31.81%	0.006
	GDP per capita-Imports	0.511	26.11%	0.015
	GDP per capita-Inflation	-0.521	27.14%	0.013
	GDP per capita-Unemployment	-0.698	48.72%	0.000
Spain:	GDP per capita-Exports	0.210	4.41%	0.348
	GDP per capita-Imports	0.344	11.83%	0.116
	GDP per capita-Inflation	-0.291	8.47%	0.188
	GDP per capita-Unemployment	-0.014	0.02%	0.001

Correlation		Pearson Correlation	Coefficient of determination	*Sig. (2-tailed)
Cyprus:	GDP per capita-Exports	-0.913	83.36%	0.000
	GDP per capita-Imports	-0.735	54.02%	0.000
	GDP per capita-Inflation	-0.150	2.25%	0.504
	GDP per capita-Unemployment	-0.283	8.01%	0.202
Malta:	GDP per capita-Exports	0.824	67.90%	0.000
	GDP per capita-Imports	0.677	45.83%	0.001
	GDP per capita-Inflation	-0.485	23.52%	0.022
	GDP per capita-Unemployment	-0.639	40.83%	0.001
Slovenia:	GDP per capita-Exports	0.847	71.74%	0.000
	GDP per capita-Imports	0.886	78.50%	0.000
	GDP per capita-Inflation	-0.809	65.45%	0.000
	GDP per capita-Unemployment	-0.161	2.59%	0.074
EU:	GDP per capita-Exports	0.833	69.39%	0.000
	GDP per capita-Imports	0.854	72.93%	0.000
	GDP per capita-Inflation	-0.357	12.74%	0.103
	GDP per capita-Unemployment	-0.307	9.42%	0.164

Note: *Correlation is significant at the 0.05 level (2-tailed).
Source: Prepared by the authors (SPSS Statistics)

Based on the results of the correlation analysis provided in table 5, six analyzed EU countries and the EU itself record a positive correlation between GDP per capita and international trade (export and import) in the period 1995-2016, indicating the importance of trade openness to economic growth. Namely, the increase of exports and imports leads to an increase of GDP per capita as well. As for the export, the highest correlation with GDP per capita among the analyzed countries is recorded in Malta. While Malta, Slovenia, Portugal and the EU have a positive high correlation, Greece and Spain have a positive low correlation. On the other hand, Slovenia records the highest correlation between import and GDP per capita. This correlation is considered as a positive high correlation, which is also observed in Greece, Portugal, Malta and the EU, while Spain has a positive medium correlation. In the group of analyzed EU countries for the period 1995-2016, Cyprus is an exception with a negative correlation between imports & exports and GDP per capita indicating an opposite change between variables (an increase in exports and imports contribute to decrease in GDP per capita, and vice versa).

Given the negative impact that inflation and unemployment have on economic growth, a negative correlation of these indicators with GDP per capita is expected. Results of the correlation analysis between unemployment and GDP per capita on one side and inflation and GDP per capita on the other side indicate a low correlation for Greece, Spain and Cyprus. Portugal and Malta record a high correlation, while the correlation for the EU is considered as medium.

Table 5 also provides data of the coefficient of determination as a squared Pearson's coefficient of correlation R^2. This coefficient indicates a common variance of two variables, or precisely, how much a variance of one variable explains and influences the variance of another variable (Soldic-Aleksic, 2015).

Thus, the common variance between GDP per capita and export in Cyprus is 83.36%, where the variance of GDP per capita is explained and caused by the variance of export for exactly this percentage. The same explanation applies for other data.

3.3. Regression analysis – the impact on the economic growth in the group of selected EU countries (Greece, Portugal, Spain, Cyprus, Malta and Slovenia)

Regression analysis is a useful statistical tool in a variety of research areas, focused on the analysis of the relation between one dependent and one or more independent variables that are usually measured on the same scale. The main goals for a regression analysis are the following (Soldic-Aleksic, 2015):

- To investigate the relationship between dependent and independent variables, respectively the influence of (an) independent variable(s) on a dependent variable;
- To determine the strength of this relationship;
- To investigate the structure or mathematical form of the relationship;
- To predict the value of a dependent variable, etc.

As for the regression analysis, a multiple linear regression model has the greatest practical application. The general form of this model is (Soldic-Aleksic, 2015):

$$Y = A_0 + A_1X_1 + A_2X_2 + A_3X_3 + ... + A_kX_k + \varepsilon$$

where:

Y – dependent variable

X_i – independent variables

A_i – regression parameter with independent variables

ε - error that reflects all influences on the dependent variable which do not originate from independent variables.

Given the three main types of multiple regression, such as: 1) standard (simultaneous), 2) hierarchical, and 3) stepwise regression, in this research the most commonly used one– standard regression model will be applied. This model is reflected in a measurement of individual contribution of every independent variable to the explanation of the dependent variable variability (Soldic-Aleksic, 2015).

Table 6 shows the results of regression analysis between the GDP per capita as a dependent variable and four components of the "magic diamond" as independent variables, for the selected EU countries (Greece, Portugal, Spain, Cyprus, Malta, Slovenia, and the overall EU) in the period from 1995 to 2016.

Table 6. Regression analysis, 1995-2016

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.*
		B	Std. Error	Beta		
1	(Constant)	-868.010	17105.796		-0.051	0.960
	Greece_Export	214.614	1326.818	0.185	0.162	0.873
	Greece_Import	696.547	912.914	0.431	0.763	0.456
	Greece_Inflation	-231.904	981.393	-0.100	-0.236	0.816
	Greece_Unemployment	-323.621	701.064	-0.347	-0.462	0.650

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.*
		B	Std. Error	Beta		
2	(Constant)	-17802.884	11740.538		-1.516	0.148
	Portugal_Export	-935.238	335.400	1.027	2.788	0.013
	Portugal_Import	1447.559	441.835	0.687	3.276	0.004
	Portugal_Inflation	-825.060	550.649	-0.244	-1.498	0.152
	Portugal_Unemployment	1467.697	371.419	-1.152	-3.952	0.001
3	(Constant)	-32791.466	22717.347		-1.443	0.167
	Spain_Export	-3683.568	1277.433	1.715	2.884	0.010
	Spain_Import	4936.240	1492.409	1.780	3.308	0.004
	Spain_Inflation	-3149.992	1209.389	-0.653	-2.605	0.019
	Spain_Unemployment	1413.735	552.756	-1.164	-2.558	0.020
4	(Constant)	61117.357	4950.166		12.347	0.000
	Cyprus_Export	-1211.284	102.398	-1.242	-11.829	0.000
	Cyprus_Import	511.632	142.504	-0.379	-3.590	0.002
	Cyprus_Inflation	-83.875	335.286	-0.022	-0.250	0.805
	Cyprus_Unemployment	557.754	143.973	-0.336	-3.874	0.001
5	(Constant)	2155.987	9029.913		0.239	0.814
	Malta_Export	600.720	146.657	2.088	4.096	0.001
	Malta_Import	-443.720	152.827	1.373	2.903	0.010
	Malta_Inflation	-241.768	690.998	-0.043	-0.350	0.731
	Malta_Unemployment	-766.637	996.772	-0.089	-0.769	0.452
6	(Constant)	-3672.269	8640.551		-0.425	0.676
	Slovenia_Export	-122.716	293.399	0.232	0.418	0.681
	Slovenia_Import	609.794	336.559	0.865	1.812	0.088
	Slovenia_Inflation	-598.184	286.900	-0.369	-2.085	0.052
	Slovenia_Unemployment	-607.194	551.224	-0.147	-1.102	0.286
7	(Constant)	-18525.136	16291.907		-1.137	0.271
	EU_Export	-263.307	1771.255	0.173	0.149	0.884
	EU_Import	1678.069	1883.174	1.006	0.891	0.385
	EU_Inflation	-111.358	1206.056	-0.018	-0.092	0.928
	EU_Unemployment	-235.253	1134.886	-0.034	-0.207	0.838

Dependent Variable: Model 1: GDP per capita in Greece; Model 2: GDP per capita in Portugal; Model 3: GDP per capita in Spain; Model 4: GDP per capita in Cyprus; Model 5: GDP per capita in Malta; Model 6: GDP per capita in Slovenia; Model 7: GDP per capita in the EU
*Significance at the 0.05 level (2-tailed).
Source: Author's calculations (SPSS Statistics 20)

Based on Table 6, export and import have a positive impact on the GDP per capita in Greece, while inflation and unemployment have a negative impact. Namely, column B shows for how many units GDP per capita increases/decreases for one unit increase/decrease in each dependent variable. Therefore, one point increase in the GDP per capita in Greece corresponds to 214.61 points increase in Greece's export. The same explanation applies to the rest of data in column.

The Beta coefficient in Table 6 provides information about the size of the impact that independent variables have on the dependent variable. Import has the biggest impact on the GDP per capita in Greece, while inflation has the smallest. In Portugal, unemployment affects the GDP per capita most and inflation least. As for Spain, Slovenia and the EU as a whole, the GDP per capita is most under the influence of import, while inflation has the smallest influence in Spain and the EU as a whole, and in Slovenia unemployment. The GDP per capita in Malta is least affected by inflation and most affected by export. In Cyprus export has the biggest influence on the GDP per capita, while inflation has the smallest.

CONCLUSION

Given the theoretical propositions and the empirical evidence, one may conclude that a macroeconomic stability ensuring the economy's international competitiveness and favorable conditions for its sectors' development plays a crucial role in boosting the economic prosperity of a country. Commonly, the macroeconomic performance of a country is measured by the extent to which the goals of the macroeconomic policy are achieved. Although economic growth being measured

by GDP is widely accepted as a general indicator of economic success, it still remains a challenge to rank the countries according to their macroeconomic performance relying on one single measure.

In the light of above mentioned, this study aimed to assess how the macroeconomic performance of the selected EU countries is reflected in four magic diamond performance indicators: GDP growth, inflation, unemployment and trade balance (export and import). The empirical analysis of the study included the EU countries that are in a transition from an efficiency-driven to an innovation-driven stage of development: Greece, Portugal, Spain, Cyprus, Malta and Slovenia, covering the 23 years' period from 1995 to 2017. In this context, the study provides a comparative analysis of the mentioned indicators, striving to figure out what contributes the most to the economic development and competitiveness of a country.

The correlation analysis results have pointed out the existence of a positive relationship between the GDP per capita and international trade (export & import) for five analyzed EU countries and the EU itself. The negative correlation between inflation rate and GDP per capita, as well as between unemployment and GDP per capita, was confirmed as expected. The regression analysis results of the study suggest the diverse relative contribution of assessed macroeconomic performance to sample countries' growth. Namely, while import has been identified as a main driver of GDP per capita in Greece, Spain, Slovenia and the EU as whole, export is seen to have this role in Malta and Cyprus. The least contributing factors are inflation or unemployment.

The findings of this study have allowed to obtain a better understanding of the overall macroeconomic performance, the relation between individual indicators, and their contribution to the economic growth in the context of the selected EU countries.

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