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A Comparison Of GDP Growth Of European Countries During 2008-2012 From The Regional And Other Perspectives

Abstract

The aim of the article is to compare the total real GDP growth of European countries from the 3rd quarter of 2008 with the 3rd quarter of 2012, the period characterized by a predominant economic stagnation or economic recession in the majority of examined European countries. The countries are divided into groups based on the following grounds: whether they are geographically close to the economic center (Germany) or peripheral, whether they are in the eurozone or not, whether they are (new) EU members or 'old' ones, etc. The main findings from the comparisons are as follows: 1. European countries close to the economic center (Germany and its neighbours) experienced, on average, positive economic growth during examined period, while countries from European periphery on average experienced negative economic growth during the same period. This difference was found statistically significant at the $\alpha = 0.01$ level. 2. Differences between eurozone and non-eurozone, old and new EU members, and between more and less populated countries were found statistically insignificant. 3. European regions with the most negative real total GDP growth included the Baltics, the Balkans, Southern Europe (Italy, Portugal) and Iceland. The most successful countries with the most positive real total GDP growth were central European countries (Poland, Slovakia, Germany, Switzerland, Austria) and those in northern Europe (Sweden and Norway).

Keywords: *economic growth, European Union, international economics, European regions*

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1. Introduction

The beginning of the current global financial crisis can be dated to the fall of two major US investment banks - Lehman Brothers and Merrill Lynch - on the 14^{th} and the 17^{th} of September 2008 respectively, following the bursting of US housing bubble in the summer of 2007. Investors liquidated their assets, stock markets dropped dramatically, and a downturn spiral began. During just a few months many banks, especially in the USA, followed the fate of Lehman Brothers.[1] This development led to a fall of large financial institutions around the globe or their bailout by national governments; some countries found themselves on the brink of financial breakdown as well.

According to Eurostat, in the European Union's decline in real gross domestic product (GDP) began in the 1^{st} quarter of 2008 in Estonia, Ireland, Latvia and Sweden. The European Union as a whole fell into a recession in the 3^{rd} quarter of 2008 and returned back to the growth one year later, in the 3^{rd} quarter of 2009. However, during 2010 and 2011 many European countries again slipped into recession, and at the end of 2012 twelve European countries were still declining, see Eurostat (2014).

Nevertheless, some countries experienced significant economic growth despite the crisis. The most successful country among 31 European countries monitored by Eurostat was Poland, followed by Sweden, Slovakia and eight other countries with positive economic growth since the 3^{rd} quarter of 2008, including Germany. The countries in recession are located predominantly in Southern Europe, the Balkans and the Baltics, so according to experts the current economic crisis is mainly a problem of the European periphery; see e.g. Aiginger (2013), Garcia-Ariaz et al. (2013) or Sobják (2013). Also, the question of whether and to what extent the common currency (euro) and the existence of European Central Bank is contributing to the crisis has been the subject of intensive discussion, including by notable economists such as Barry Eichengreen or Paul Krugman, since the beginning of the Great Recession (see e.g. Matei (2010) or Eichengreen (2009)), and the prevailing opinion is that the common currency deepened the crisis.

In addition the national economic performance in times of crisis might differ between the 'old' European Union members (developed economies) and new EU member states (mainly the transition or post-transition economies of the former Soviet bloc). But this problem has not been closely examined yet, together with the question whether the size of an economy matters, as small and open economies are often considered more vulnerable.

[1] According to the Federal Deposit Insurance Corporation (FDIC), more than 300 banks were closed in the USA during 2009 and 2010 (http://www.fdic.gov/bank /individual/failed/banklist. htm).

Hence the aim of the article is to examine above mentioned questions by a comparison of the total real GDP growth of European countries from the 3rd quarter of 2008 (the start of the EU recession) to the 3rd quarter of 2012 (when the recession was approaching its end), based on Eurostat's data. Countries are divided into several groups based on the following grounds:

- whether they are geographically close to the European economic centre (Germany) or not (i.e. in the European periphery),
- whether they are in the eurozone or not,
- whether they are new EU members (members after 2004) or not,
- geographic location,
- population size.

The paper is organized as follows: in Section 2 the data are presented; in Section 3 the method and results are provided; Section 4 is devoted to discussion of the results; and Conclusions close the article.

2. The data and the method

The real quarterly GDP growth rates (in %), adjusted for seasonality and working days, in a quarter-to-quarter comparison by Eurostat [1] were used. From these data total GDP growth during 2008Q3 - 2012Q3 was evaluated for each country. Altogether, GDP data for 31 European countries were utilized; the data for Greece was available only until 2011, so Greece was eliminated from the study, and the data for Macedonia were missing completely.

In Table 1 total GDP growth during the examined period is provided for all 31 countries, in alphabetical order. During this period 11 countries experienced positive economic growth, while the remaining 20 countries experienced negative economic growth, as did the European Union as a whole (27). Figure 3 provides a graphical comparison of the economic growth of all countries, based on the data from Table 1.

In Figure 1 the development of GDP growth rates of the European Union, Germany and France is shown. A sharp decline in GDP from the third quarter of 2008 (2008Q3) to the third quarter of 2009 (2009Q3) is visible for all three economies, but beginning with 2009Q4 economies returned to growth, which was followed by stagnation in 2012. In Figure 2 the economic development of the Baltic countries is provided.

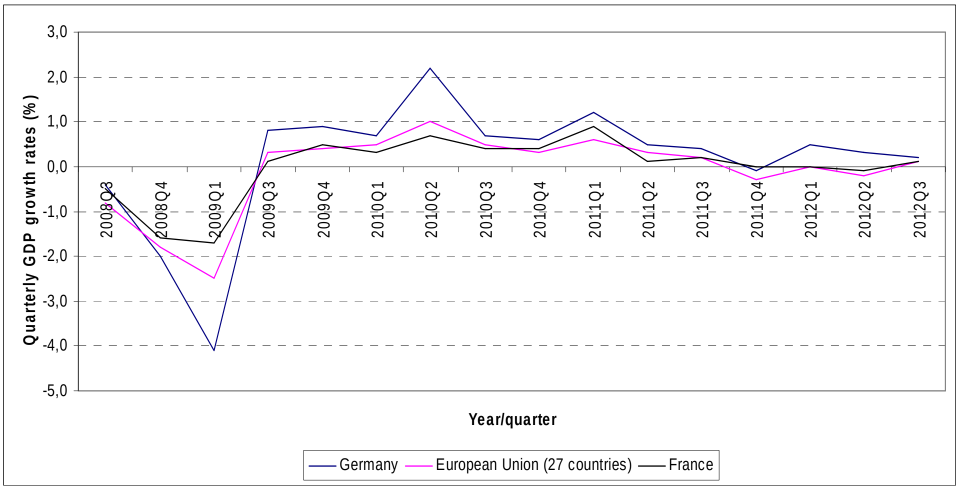
In the following sections groups of countries are compared - with respect to their total average real GDP growth - during 2008Q3-2012Q3 period.

For testing of the null hypothesis that there is no difference between groups, the two-sample t-test with non-equal sizes and non-equal variances was used with the following statistics:

$$t=\frac{\overline{X}_1-\overline{X}_2}{s_{\bar{x}_1-\bar{x}_2}}\ ,\ s_{\bar{x}_1-\bar{x}_2}=\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}} \tag{1}$$

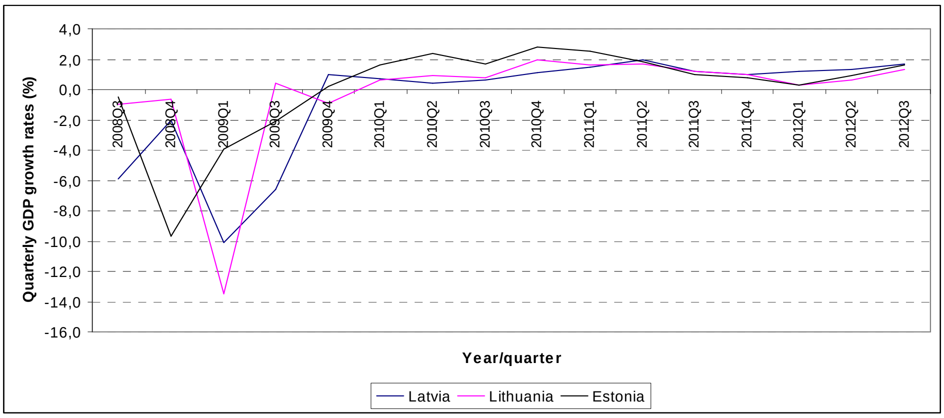
In relation (1) n_1 and n_2 denote simple sizes, $\overline{X}_1$ and $\overline{X}_2$ means, and $\bar{s}_1$ and $\bar{s}_2$ standard deviations. The testing was performed with the use of the statistical software Gretl. Each null hypothesis was accepted or rejected and corresponding *p*-values are provided as well.

Figure 1. Quarterly GDP growth rates (in %) of the EU, Germany and France from 2008Q3to the 2012Q3



Source: Eurostat (2014).

Figure 2. Quarterly GDP growth rates (in %) of the Baltic countries from 2008Q3 to 2012Q3



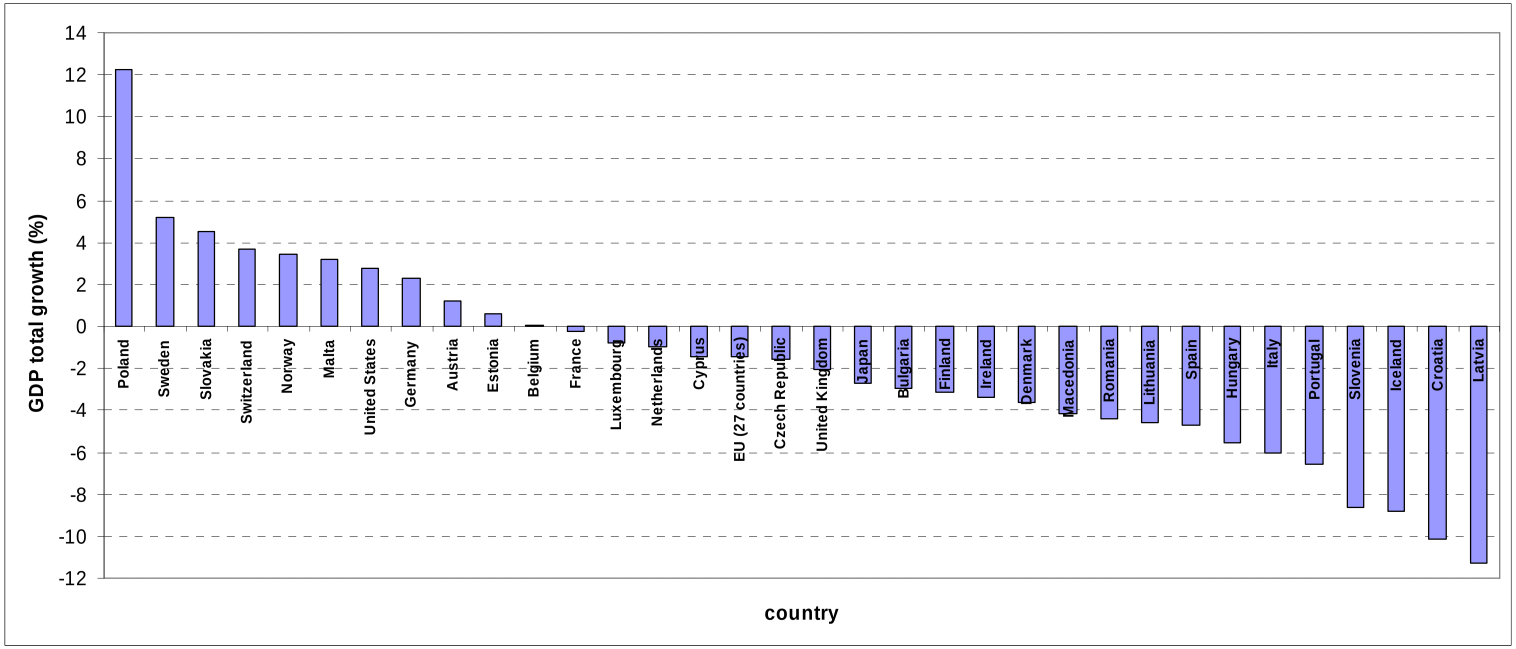
Source: Eurostat (2014).

Table 1. Total GDP growth during 2008Q3-2012Q3 period in selected countries

Country	Total real GDP growth from 2008Q3 to 2012Q3 (in %)	Country	Total real GDP growth from 2008Q3 to 2012Q3 (in %)
Austria	1.24	Lithuania	–4.58
Belgium	0.04	Luxembourg	–0.78
Bulgaria	–2.96	Macedonia	–4.13
Croatia	–10.14	Malta	3.23
Cyprus	–1.42	Netherlands	–0.95
Czech Republic	–1.58	Norway	3.46
Denmark	–3.64	Poland	12.23
Estonia	0.63	Portugal	–6.55
EU (27)	–1.45	Romania	–4.39
Finland	–3.12	Slovakia	4.55
France	–0.24	Slovenia	–8.62
Germany	2.27	Spain	–4.71
Hungary	–5.57	Sweden	5.22
Iceland	–8.80	Switzerland	3.71
Ireland	–3.37	UK	–2.05
Italy	–6.02	United States	2.77
Latvia	–11.28	Japan	–2.71

Source: own calculations from Eurostat (2014) data.

Figure 3. A graphical comparison of the economic growth of all countries from 2008Q3 to 2012Q3



Source: own calculations.

3. Results

European countries were ranked from the most economically successful to the least successful in the given period (see Figure 3).

The USA and Japan were also included into the figure for the comparison. As can be seen, the USA was among the best, while Japan's performance was average. In the following sub-sections other comparisons are provided, while a possible explanation of these results is included in Section 4.

3.1. Centre versus Periphery

In this section countries were compared on the basis of their geographic location. The centre is Germany – the strongest economy on the continent – together with its neighbours, while other countries constitute the European periphery. Results of the comparison are shown in Table 2.

The following null hypothesis was tested:

H_0 : *Average total GDP growth in Centre and Periphery is equal.*

The difference in the average total real GDP growth between Centre and Periphery was found statistically significant at a 0.05 level (p = 0.006), and the null hypothesis was rejected.

During the crisis, countries from the central part of Europe experienced positive total growth, while the periphery experienced an overall decline of GDP by 3.4% on average. Hence, the problems in the European periphery were confirmed.

Table 2. Centre versus periphery, average growth.

Groups	Countries	Total real GDP growth from 2008Q3 to 2012Q3 (in %)
Centre (10)	Germany, Czech Republic, Denmark, Belgium, France, Netherlands, Luxembourg, Switzerland, Austria, Poland	1.23% (σ = 4.15)
Periphery (21)	Bulgaria, Croatia, Cyprus, Estonia, Finland, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Macedonia, Malta, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK	–3.36% (σ = 4.58)

Source: own calculations from Eurostat (2014) data.

3.2. 'Old' EU countries versus 'new' EU countries

In this section a comparison of the 'old' EU member countries (with the EU membership dating before 2000) versus new the EU member countries (excluding Croatia) is shown in Table 3.

The following null hypothesis was tested:

H_0 *: Average total GDP growth in the old and new EU countries is equal*

The difference in the average total real GDP growth between old and new EU members was not found to be statistically significant at a 0.05 level ($p = 0.82$), so the null hypothesis couldn't be rejected.

Because new EU members are (with the exception of Cyprus) economies of the former Soviet communist bloc, this result can be interpreted to mean that the transition economies of the former Eastern bloc performed as well as their western counterparts during the crisis.

Table 3. Old EU countries versus new EU countries, average growth

Groups	Countries	Total real GDP growth from 2008Q3 to 2012Q3 (in %)
Old EU members (14)	Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, UK	–1.62% ($\sigma = 3.15$)
New EU members (11)	Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia	–2.09% ($\sigma = 6.10$)

Source: own calculations from Eurostat (2014) data.

3.3. Eurozone versus non-eurozone

Another factor which might influence the impact of the crisis is the common currency – i.e. the euro. In this section a comparison of eurozone countries versus non-eurozone countries is provided in Table 4.

The following null hypothesis was tested:

H_0 : *Average total GDP growth in eurozone and non-eurozone countries is equal*

The difference in the average total real GDP growth between the eurozone countries and the rest of EU countries was not found statistically significant at the 0.05 level ($p = 0.66$), so the null hypothesis cannot be rejected. Hence, the euro did not provide an advantage during the crisis.

Table 4. Eurozone versus non-eurozone, average growth

Groups	Countries	Total real GDP growth from 2008Q3 to 2012Q3 (in %)
Eurozone (16)	Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, Spain	–1.49% (σ = 3.56)
non-eurozone (15)	Bulgaria, Croatia, Czech Republic, Denmark, Hungary, Iceland, Latvia, Lithuania, Macedonia, Norway, Poland, Romania, Sweden, Switzerland, UK.	–2.30% (σ = 6.04)

Source: own calculations from Eurostat (2014) data.

3.4. European regions

In this section regional differences are examined (see Table 5). Countries were divided geographically (mainly in accordance with the UN regional division) into seven regions.

The best region was Scandinavia, with the total average GDP growth of 1.87%, while the regions most affected by the crisis were the Baltics and the Balkans, with the overall average GDP decline of –5.08% and –5.40% respectively.

Because of the small number of countries in some groups, statistical analysis was not performed in this case. It should be noted that some countries (e.g. Sweden or Norway) were included in more than one region.

Table 5. European regions' average growth

Region	Countries	Total real GDP growth from 2008Q3 to 2012Q3 (in %)
Scandinavia	Finland, Norway, Sweden	1.87
Central Europe	Austria, Czech Rep., Germany, Hungary, Slovakia, Slovenia, Switzerland	1.03
Western Europe	Belgium, France, Ireland, Luxembourg, Netherlands, UK	–1.22
Northern Europe	Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway, Sweden,	–2.76
Southern Europe	Cyprus, Italy, Malta, Portugal, Spain	–3.09
Baltic	Estonia, Latvia, Lithuania	–5.08
Balkans	Bulgaria, Croatia, Macedonia, Romania	–5.40

Source: own calculations from Eurostat (2014) data.

3.5. More populated countries versus less populated countries

In this section the possible differences in the economic development between more populated (large economies) and less populated countries (small economies) is examined for the selected period. Small and open economies are generally more vulnerable to external shocks, as they are more dependent on foreign investments and export/import from their larger counterparts. Countries were divided into two groups (the 15 most populated countries versus the 16 least populated countries) based on their population from 2012 according to the World Bank (2013) (see Table 6). The following null hypothesis was tested:

H_0: *Average total GDP growth in more and less populated EU countries is equal*

The difference in the average total real GDP growth between more populated and less populated EU countries was large, but was not found statistically significant at the 0.05 or (tightly) at the 0.10 level ($p = 0.12$), so the null hypothesis couldn't be rejected.

Table 6. More populated countries versus less populated countries, average growth

Groups	Countries	Total real GDP growth from 2008Q3 to 2012Q3 (in %)
More populated countries (15)	Austria, Belgium, Czech Rep., France, Germany, Hungary, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland, UK	–0.49% ($\sigma = 4.85$)
Less populated countries (16)	Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Norway, Slovakia, Slovenia.	–3.18% ($\sigma = 4.58$)

Source: own calculations from Eurostat (2014) data.

4. Discussion of regional differences

Poland demonstrated the best economic performance during the examined period. The main reasons for its exceptionally good results were strong domestic demand despite the crisis abroad, an out-of-date financial system which kept foreign investments low before the crisis, thus preventing the outflow of foreign capital, see Knibbe (2011), devaluation of the Polish zloty, which enabled lower interest rates, and also the impact of neighbouring Germany, the strongest economy on the continent and Poland’s most important export country, was not neglible. The massive government spending (mainly into infrastructure) before EURO 2012 might also have contributed to the GDP growth

On the other hand, the most negatively affected regions were Southern Europe, the Baltics, and the Balkans.

The well-known problems of Portugal, Spain, Italy and Greece in particular were caused by governmental debt and lower productivity, without the possibility of devaluation of their currencies, which led to austere measures by their national governments. Despite these measures, all the afore-mentioned countries remained in a recession in the first half of 2013.

For an explanation of the situation in the Baltics, see e.g. Knibbe (2011), Kajaks (2013) or Kattel and Raudla (2013). Before the crisis the Baltic countries were among the fastest-growing economies in Europe (Latvia grew by 12% annually in 2006, Lithuania 8% and Estonia by 10%), but when the crisis began they fell into one of strongest recessions on the continent. Mazurek and Mielcová (2013) and Kajaks (2013, summary) provide a concise explanation of causes of such a development: “The basic reason for this is that the country’s development was based not on industrial production but on an influx of cheap and readily available foreign capital, which was invested in consumption in the form of loans granted by commercial banks, thus creating an illusion of growing and sustainable prosperity... until the capital stopped flowing.”

Lithuania tried to soften the crisis by internal devaluation, but to no avail. During 2011-2013 Latvia and Lithuania returned to the modest growth, while Estonia fell into another recession in the first half of 2013.

The problems of the Balkan countries were examined in, e.g., Minchev (2010), Karasavvoglu and Polychronidou (2014) and Pere and Hashorva (2012). Apart from its dramatic history - even in the recent decades - the Balkans is sometimes considered to be a ‘periphery of the periphery’ in Europe, due to its remote geographic location from European centres, i.e. Germany and France. In general, the Balkan countries are low opened economies vulnerable to external shocks, with relatively stable banking systems but without the automatic stabilizers of their social welfare systems as their Western counterparts. Before the crisis the Balkan countries experienced an economic boom (Montenegro 11% of real GDP in 2007; Romania 8%; Serbia 7%; Macedonia 6% etc.). The Balkan countries were still growing in 2008, as they usually followed the trends from the Western Europe with a time lag of approximately one year. Because the Balkan economies were closely tied to the European Union countries (namely to Italy, Greece and Germany), the decline in demand from EU also brought about a decline of their economies. However, Romania, the major economy of the Balkans (with exception of Greece), returned to growth at the end of 2012, while Bulgaria and Croatia were still in stagnation in the first half of 2013.

It should also be noted that both the Baltics' and the Balkans' GDP growth rates are computed based on a much lower base than in the West, so the growth or decline in real GDP (in %) is more visible.

Finally it should be noted that the role of pre-crisis conditions on performance during the crisis in general is discussed in, e.g., Aiginger (2011), while the crisis in the euro area was examined by, e.g., Beblavý et al. (2011).

5. Conclusions

In this paper a selected set of 31 European countries (using the data available from Eurostat) were selected for a comparison of their economic growth during 2008-2012; a period of predominant economic recession or stagnation.

The countries were divided into two or more groups with regard to different criteria, e.g. whether they belong to European periphery or the Centre, whether they are part of the eurozone or not, etc.

It was determined that only geographic location matters: the economic crisis in the European periphery was indeed significantly worse than in the European Centre.

On the other hand, neither membership in the eurozone, the difference between the old and new EU members, nor the difference between small and large economies was found to be statistically significant.

The comparison also enabled the identification of those regions most affected by the financial crisis, as well as those least affected. In the examined period the best-performing country was Poland, while the worst was Latvia. As for regions, the most successful was Scandinavia, while the least successful were the Balkans and the Baltics.

The result of the study can be used for a more detailed analysis of the causes for such developments, as well as their policy implications, as the most affected regions can be supported by the European Commission via European Cohesion or Structural Funds.

Finally it must be kept in mind that the Great Recession is still an ongoing event, so definitive answers still have to wait until it ends.

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Streszczenie

PORÓWNANIE WZROSTU PKB W OKRESIE 2008-2012 W KRAJACH EUROPEJSKICH Z REGIONALNEJ I INNEJ PERSPEKTYWY

Celem artykułu jest porównanie całkowitego wzrostu realnego PKB w krajach europejskich od III kwartału 2008 roku do III kwartału 2012 roku, w okresie charakteryzującym się przewagą stagnacji i recesji gospodarczej, która miała miejsce w większości badanych krajów europejskich. Kraje zostały podzielone na grupy na podstawie następujących kryteriów: geograficzna bliskość lub peryferyjność w stosunku do centrum gospodarczego (Niemcy), członkostwo w strefie euro lub jego brak, członkostwo w UE (z podziałem na kraje starej i nowej Unii) lub jego brak. Główne wnioski z porównania są następujące: 1. Kraje europejskie blisko centrum gospodarczego (Niemcy i sąsiedzi) zanotowały dodatni wzrost gospodarczy w badanym, okresie podczas gdy w tym samym okresie kraje europejskiej peryferii wzrostu gospodarczego osiągnęły wzrost ujemny (średnio). Różnica ta była statystycznie znacząca na poziomie $\alpha = 0{,}01$. 2. Różnice pomiędzy krajami w i poza strefą euro, różnice między starymi i nowymi członkami UE oraz różnice między bardziej i mniej zaludnionymi krajami UE nie były statystycznie znaczące. 3. Europejskie regiony z najwyższym ujemnym wzrostem realnego wzrostu PKB obejmują kraje bałtyckie, Bałkany, Europę Południową (Włochy, Portugalię) i Islandię. Najwyższy dodatni wzrost PKB osiągnęły kraje Europy Środkowej (Polska, Słowacja, Niemcy, Austria), Zachodniej (Szwajcaria) i Północnej (Szwecja, Norwegia).

Słowa kluczowe: *międzynarodowa ekonomia, regiony europejskie, Unia Europejska, wzrost gospodarczy*