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Causal Nexus Between Export and Economic Growth in the European Union Countries

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ABSTRACT

The relationship between export and economic growth is still a topic of discussion by researchers. Some studies have confirmed that export leads to economic growth, while others see economic growth leads to export. Many countries are still in a dilemma of whether to open up their economies to promote export or whether they should concentrate on economic activities, which will promote export. This paper has aimed to examine export – growth nexus in the European Union (EU) countries during the period of 1995 – 2015.
Descriptive statistics analysis and econometric methods have been applied for this purpose. On the basis of correlation analysis, twenty-two countries have had significant relationships between export and economic growth. Granger causality test has been applied to detect the direction of causality.
The research has found unidirectional causality running from export to GDP in Poland, Portugal, Slovakia and Sweden. In contrast, unidirectional effects from GDP to export have been detected in eleven the EU countries, such as Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Netherlands, Romania and Slovenia. Moreover, the research also has noticed bidirectional causality in Denmark. That is, GDP causes export and vice versa. Finally, in six countries, such as Austria, France, Germany, Italy, Luxembourg and Malta Granger causality has not been found. It means that export does not cause economic growth and vice versa. The presence of a causal link between export and economic growth has implications of great importance on development strategies for the EU countries.

INTRODUCTION

The export capacity of a country is often considered as an indicator of its competitiveness and success. It is generally assumed that exporting countries tend to be more productive than non-exporters (Neves et al., 2016). Export contributes to the balance of payments and increases the job opportunities of a country. Export impacts on economic growth by encouraging the domestic producers to use better production resources and to be more competitive in the world market (Gokmenoglu et al., 2015).

The relationship between export and economic growth has been widely debated among scholars in scientific literature. In this context, researchers have come up with different views at different times and the studies put forward a debate on this issue. The scientists have agreed, that one group of studies supports export-led growth hypothesis (Awokuse, 2007; Lee, 2011; Dritsaki, 2013; Szkorupova, 2014; Trošt, Bojnec, 2015; Ee, 2016), while the other group advocates for growth-driven export hypothesis (Mishra, 2011; Tekin, 2012; Abbas, 2012; Shihab, Abdul-Khaliq, 2014; Gokmenoglu, 2015). Even more, the studies also provide the evidence that export leads to economic growth and economic growth promotes export, i.e., the bi-directional causality between export and economic growth (Elbeydi et al., 2010; Dritsaki, Stiakakis, 2014; Hussaini et al., 2015). Export – growth nexus has still been a subject of extensive debate since the 1960s. It is obvious that there is no clear consensus between the export-led growth and growth-led export in cross-section studies (Ee, 2016). According to Mishra (2011), due to such contradicting evidence about the causality between export and economic growth many developing countries are still in dilemma whether to open up their economies to promote international trade or whether they should concentrate on economic activities that will accelerate international trade.

The export-led growth hypothesis generally argues that export promotion through policies such as export subsidies or exchange rate depreciation will increase economic growth (Mishra, 2011). Competition in international markets promotes economies of scale and increases efficiency by concentrating resources in sectors in which the country has a comparative advantage. On the contrary, the growth-led hypothesis argues that economic growth promotes export growth and supports the idea that gains in productivity give rise to comparative advantages in certain sectors that lead naturally to export growth (Mishra, 2011). In addition, a bi-directional relationship between these variables reveals that export causes economic growth and vice versa.

In 2015, export amounted to 43.8 percent of EU-28 GDP (Eurostat, 2016). Over two decades this indicator has increased by 1.6 times. By the average of two decades, the biggest exporters have been Luxembourg, Malta, Ireland, Belgium and Slovakia. Export share as a percentage of GDP has made from 70 to 160 percent in these countries. The smallest exporters have Greece, Italy, United Kingdom, France and Spain. The share of export in GDP has varied from 22 to 27 percent of these countries.
The object of the research: export – economic growth nexus in the EU.
The aim of the research: this research attempts to provide more reliable estimates of the relationship between export and economic growth in the EU during the period of 1995 – 2015.

Limitation of the research: this study has been bounded by two indicators, such as export as a percentage of GDP and GDP per capita. Other indicators and relationships among them have not been considered in this paper. It is the main limitation of the research. Despite the limitation, we believe that the research highlights key relationships in the EU countries. Even more, it is expected to be useful for policy makers.
The paper is divided into two sections. The first section is aimed at the recent studies overview and research methodology. The long-run relationships between export and economic growth are examined across the EU countries in the second section.

1. EMPIRICAL EVIDENCE AND RESEARCH METHODOLOGY

1.1 The overview of recent studies on export – growth nexus

The research on export – growth nexus has been done by many scholars using different econometric methods (Haydory, Salahuddin, 2009; Uddin et al., 2010; Jarreau, Poncet, 2012; Chandran, Rasiah, 2013; Mehmood, 2013; Jarra, 2013; Tong et al., 2014; Sahoo et al., 2014; Sheridan, 2014; Gokmenoglu et al., 2015; Saaed, Hussain, 2015; Hye, Lau, 2015; Vianna, 2016; Rahman, Mamun, 2016). In general, recent studies have shown that causality relations vary with the period of study, the use of econometric techniques, treatment of variables, and the presence of other related variables or inclusion of interaction variables in the estimated equation (Ee, 2016). The relationship between export and economic growth has still been a subject of extensive debate since the 1960s. The subject of export – growth nexus has been still unresolved issue theoretically and empirically as well. However, some findings have been revealed and four different approaches have been described in recent studies.

The first approach is export-led growth. This view has been supported by a large number of recent studies.

The study of Awokuse (2007) examined causal relationship between trade and economic growth for Central and Eastern European countries. The empirical results have suggested that export and import stimulate economic growth.

Lee (2011) empirically investigated the extent to which technological characteristics in exports affect the patterns of trade-led economic growth across countries. The research has involved a sample of 71 countries in periods beginning in 1970. The results have indicated that the countries with increasingly specialized export of goods with high technological content have typically experienced more rapid growth. The author has concluded that the findings bear important policy implications. Export might be conducive to economic growth, but the particular structural characteristics of exporting industries are also relevant for sustainable growth. Emerging countries like China have grown more rapidly not only due to the export but also because they are more competitive in exporting high-tech products.

Dritsaki (2013) did research in order to determine the relationships between economic growth, export and government debt of Greece over the period of 1960 – 2011. The results have shown that both short and long run relationships exist among these variables. Specifically, the results have revealed unidirectional Granger causality that runs from export to economic growth as well as from economic growth to government debt, whereas there is no short run causality between export and government debt.

The study of Szkorupova (2014) was focused on the causal relationship between foreign direct investment, export and economic growth in Slovakia. Estimation of effects on economic growth was performed in the period of 2001-2010. The results have confirmed the existence of long-term causal links between variables studied. The research has revealed a positive impact of foreign direct investment as well as export on economic growth of Slovakia.

Trošt and Bojnec (2015) examined the relationship between export and economic growth in Slovenia using the quarterly data for the period of 2001–2014. The results of the Granger causality test have shown an existence of a causality from export to economic growth.

The objective of Ee (2016) study was to examine the validity of export-led growth hypothesis in selected Sub-Saharan African for the period from 1985 to 2014. The empirical findings have revealed a long-run and a positive impact of export on economic growth.

In contrast to the previous approach, the second view is growth-driven export. It means that export follows economic growth. Several recent studies have supported this approach.

Mishra (2011) reinvestigated the dynamics of the relationship between export and economic growth for India over the period 1970 to 2009. The Granger causality test has indicated that there is a causal relationship running from GDP to export in the long-run. This means that any increase in GDP would have a positive impact on the growth of export. In general, India has provided the evidence of growth-driven export over the sample period.

Tekin (2012) examined the relationship of export and economic growth in least developed countries for the period between 1970 and 2009. The results of the study have indicated direct, one-period-ahead and unidirectional causality running from GDP to export in Angola, Chad and Zambia. In other countries such as Haiti, Rwanda and Sierra Leone export has impacted on economic growth.

Abbas (2012) investigated causal relationship between GDP and export for the period of 1975 to 2010 in Pakistan. The results of causality test have shown short run and long run causality running from GDP to export. The author has concluded that both in short and long run only growth in production causes export growth. In this light, government should attempt to increase production, which in long run impacts on trade and economy.

The study of Shihab and Abdul-Khaliq (2014) aimed to examine the causal relationship between economic growth and export in Jordan using annual data during the period of 2000-2012. The research has found that there is a causal relationship going from the economic growth to export, and not vice versa. Based on the results of causality test, the changes in the economic growth help explain the changes that occur in the export.

Gokmenoglu et al. (2015) empirically examined the validity of export-led growth hypothesis for the case of Costa Rica over the period of 1980 – 2013. According to the results of the study, for the period under investigation, export and economic growth have had a log-run relationship and there has been unidirectional causality from economic growth to export. This means that the economic growth Granger causes export growth of the country. Moreover, export growth has not been a significant factor in determining the economic growth of Costa Rica. The authors have concluded that this finding is important for policy purposes. The results have revealed that economic sustainability plays an important role for the country's export. The authors have made assumption that export promotion policies may not contribute to the economic growth of Costa Rica. The government should give priority to the policies those maintain a fast and sustainable economic development.

The third approach relates with bidirectional causality between export and economic growth. It implies two-way causal relationship. Some studies have approved this hypothesis.

The study of Elbeydi et al. (2010) investigated the relationship between export and economic growth in Libya. The annual time series used for the estimation cover the time period of 1980 – 2007. The long run bidirectional causality between the export and growth has been confirmed. The study results have indicated that the export promotion policy contributes to the economic growth in Libya.

Dritsaki and Stiakakis (2014) examined the relationship between export and economic growth in Croatia using annual data for the period 1994–2012. The results of the research have confirmed a bidirectional long run as well as short run causal relationship between export and economic growth. According to the authors, the results have offered new perspectives and insights in Croatia for a sustainable economic growth.

Using annual data during the period of 1980–2013, Hussaini et al. (2015) tested export – growth nexus for India. The study has confirmed that over the period under study there exists bidirectional causality between GDP and export. The results have implied that export from India to international community helps the economy to earn more foreign currency for further investment, which in turn creates more income and employment. The authors have concluded that the policy implication of the positive association between export and economic growth reveals that economic reform and

the shift towards a free market help the economy to reallocate its resources to productive uses.

The fourth approach of neutrality states that there is no causal relationship between export and economic growth. Based on this approach, export does not cause economic growth and vice versa. The paper of Marwan et al. (2013) explored the role of export, overseas development aid and remittance inflows in relation to economic growth in Sudan for the period of the year 1977 – 2010. Taking into consideration export – growth nexus, no causal relationship has been found between these variables.

To sum up, the studies have revealed that in majority of cases the relationship between export and economic growth has been detected. Sometimes increasing amount of export has positively impacted on economic growth while in other cases economic growth has effected the export development. However, sometimes both export and economic growth causes each other and this supports bi-directional approach. Finally, export does not cause economic growth and vice versa. It has supported approach of neutrality. In general, recent studies have shown that causality varies across the countries observed due to the period of study, the use of econometric techniques, treatment of variables, and the presence of other related variables in the estimated equation. Export – growth nexus has been still unresolved issue theoretically and empirically as well.

1.2 Research methodology

In recent studies, various methodologies have been applied for the research of relationship between export and economic growth. According to Ee (2016), Giles and Williams (2000) made overview more than 150 export – growth studies and distinguished three groups of studies. The first group has been based on cross-country rank correlation coefficients, the second group has applied regression analysis and the third one has employed time series techniques. Granger causality test has been used in fifty percent of these studies. Table 1 has presented the summary of recent studies using Granger causality test.

Table 1. The summary of recent studies using Granger causality test

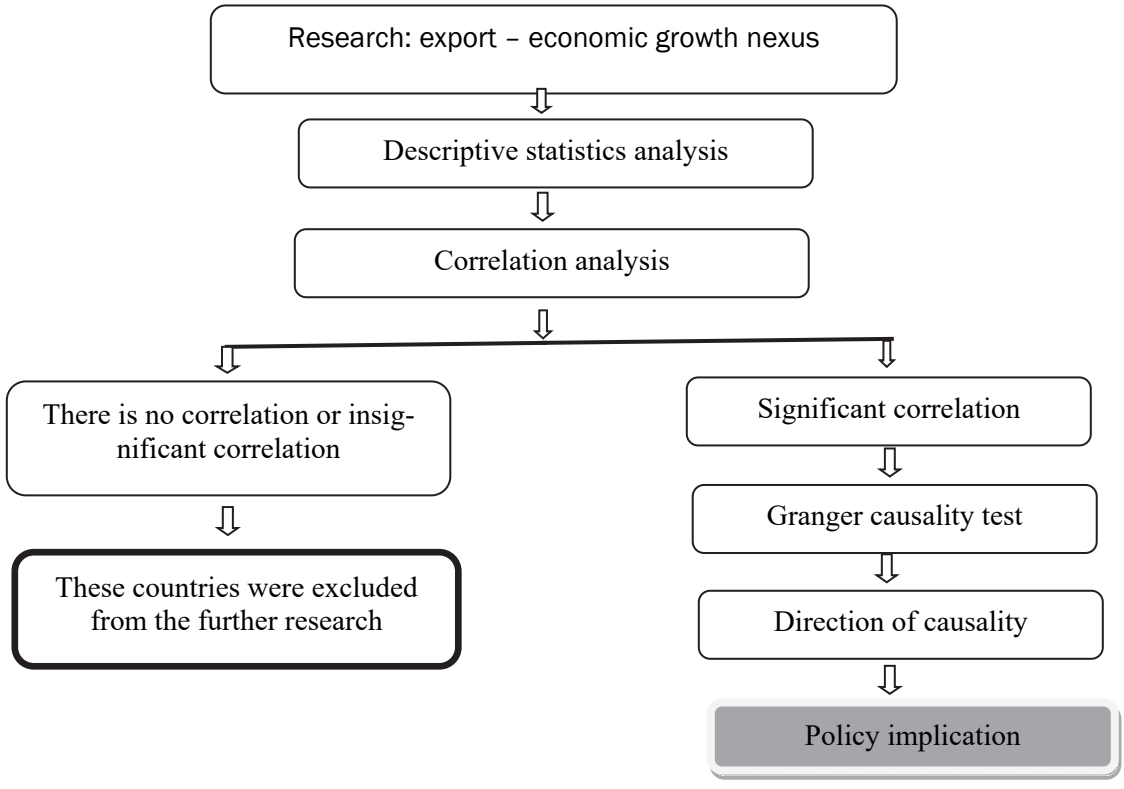
Authors (year)	*Countries*	*Period*	*Direction of causality*
Awokuse, Titus (2007)	Central and Eastern European countries (Bulgaria, Czech Republic, Poland)	Quarterly data covering the periods 1994:1–2004:3 for Bulgaria, 1993:1–2002:4 for Czech Republic, and 1995:1–2004:2 for Poland.	Export → Growth
Elbeydi *et al.* (2010)	Libya	Annual data for the period 1980 – 2007	Export ↔ Growth
Lee (2011)	71 countries in the world	Annual data for the period 1970 – 2004	Export → Growth
Mishra (2011)	India	Annual data for the period 1970 – 2009	Growth → Export
Tekin (2012)	Least developed countries (Angola, Chad and Zambia)	Annual data for the period 1970 – 2009	Growth → Export
Tekin (2012)	Least developed countries (Haiti, Rwanda and Sierra Leone)	Annual data for the period 1970 – 2009	Export → Growth
Abbas (2012)	Pakistan	Annual data for the period 1975 – 2010	Growth → Export
Marwan *et al.* (2013)	Sudan	Annual data for the period 1977 – 2010	Export ≠ Growth

Dritsaki (2013)	Greece	Annual data for the period 1960 – 2011	Export → Growth
Shihab, Abdul-Khaliq (2014)	Jordan	Annual data for the period 2000 – 2012	Growth → Export
Szkorupova (2014)	Slovakia	Annual data for the period 2001 – 2010	Export → Growth
Dritsaki, Stiakakis (2014)	Croatia	Annual data for the period 1994 – 2012	Export ↔ Growth
Trošt, Bojnec (2015)	Slovenia	Quarterly data for the period of 2001 – 2014	Export → Growth
Gokmenoglu (2015)	Costa Rica	Annual data for the period 1980 – 2013	Growth → Export
Hussaini *et al.* (2015)	India	Annual data for the period 1980 – 2013	Export ↔ Growth
Ee (2016)	Sub-Saharan African	Annual data for the period 1985 – 2014	Export → Growth

Source: summary made by authors

This research has been based on Eurostat annual data over the period of 1995 – 2015. It has provided a possibility to compare the European countries by export and economic growth indicators. This research has been guided by the estimation of the export share in GDP and GDP per capita. The research consists of some steps, which are presented, in Fig. 1.

Fig. 1. The framework of the research



Descriptive statistics analysis has allowed assessing the dynamics of export as a share of GDP and economic growth indicators over two decades. It has shown the main differences across the European Union countries. Correlation analysis helps to detect relationships. Granger (1969) causality testing has been applied to modeling the relationship and for the estimation of causality between export and economic growth. Granger causality demonstrates the likelihood of the causation or the lack of such causation more forcefully than does simple correlation (Stern, 2011). Granger causality test is expressed by the following two regression equations (Shahbaz et al., 2013; Mehmood, 2013; Gokmenoglu et al., 2015; Dudzevičiūtė et al., 2016):

$$y_t = \beta_{1,0} + \sum_{i=1}^{p} \beta_{1,i} y_{t-i} + \sum_{j=1}^{p} \beta_{1,p+j} x_{t-j} + \varepsilon_{1t} \quad (1)$$

$$x_t = \beta_{2,0} + \sum_{i=1}^{p} \beta_{2,i} y_{t-i} + \sum_{j=1}^{p} \beta_{2,p+j} x_{t-j} + \varepsilon_{1t} \quad (2)$$

Where: *p* is the number of lags, β- parameter, ε- error.

If the *p* parameters $\beta_{1,p+j}$ are jointly significant then the null hypothesis that x does not Granger cause y can be rejected. Similarly, if the p parameters $\beta_{2,i}$ are jointly significant then the null hypothesis that y does not Granger cause x can be rejected. Granger causality test is based on the concept of causal ordering and assumption as follows: a variable x is said to Granger cause another variable y if past values of x help predict the current level of y given all other appropriate information (Stern, 2011; Dudzevičiūtė et al., 2016).

All calculations have been made applying Windows-based econometric software Eviews v. 8.0.

2. THE EXAMINATION OF EXPORT AND ECONOMIC GROWTH TRENDS

2.1 The analysis of relations between export and economic growth

The long-run relationships between export and economic growth have been examined across the EU countries in this section. The analyzed period involves the years from 1995 to 2015. On the basis of average data, the indicators of export as a percentage of GDP and GDP per capita have varied across the EU countries, as shown in Table 2. The EU countries have been grouped into four categories, such as high exporters, upper middle exporters, and lower middle and low exporters.

Taking into consideration average data over the period of 1995 – 2015, within the EU countries there are clearly some interesting variations in export share of GDP and economic growth. This suggests that there are rich countries that are high and upper middle exporters (Luxembourg, Ireland, Belgium, Netherlands) and rich countries that are low and lower middle exporters (France, United Kingdom, Italy, Denmark, Sweden, Finland) as well as there are economically weak countries which export a lot (Slovakia, Estonia, Hungary) and countries which are economically weak with lower middle or low export (Bulgaria, Lithuania, Latvia, Poland, Romania, Croatia).

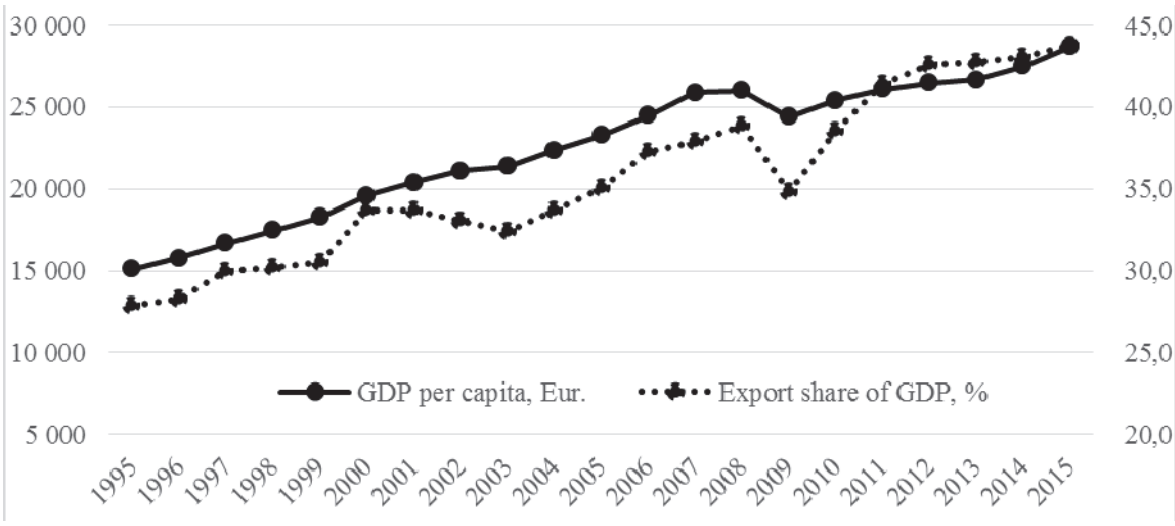
Table 2. Average indicators of the EU countries in 1995 – 2015

Groups of countries by export	*Export as a percentage of GDP*	*GDP per capita, Eur.*
High exporters		
Luxembourg	161.5	71.606
Malta	128.3	13.300
Ireland	91.0	36.811
Upper middle exporters		
Belgium	72.7	29.310
Slovakia	70.2	8.248
Estonia	69.6	8.538
Hungary	68.3	7.781
Netherlands	68.1	32.676
Cyprus	59.9	18.629
Slovenia	59.2	14.314
Czech Republic	58.3	10.400
Lower middle exporters		
Lithuania	54.8	6.786
Bulgaria	48.6	3.471
Denmark	46.6	38.205
Austria	46.5	31.033
Latvia	44.4	6.762
Sweden	43.9	34.995
Finland	39.1	30.640
Low exporters		
Croatia	37.7	9.031
Germany	36.3	29.371
Poland	34.6	6.919
Romania	32.3	4.205
Portugal	30.4	14.300
Spain	26.8	19.424
France	26.6	27.265
United Kingdom	26.1	28.938
Italy	25.7	24.057
Greece	22.1	16.252
EU-28	**35.7**	**22.538**

Source: grouping of the countries based on Eurostat data (2015 a, b).

Estimating the general tendencies of two indicators in the EU-28, a positive and strong association could be detected between export and economic growth (Fig. 1).

Fig. 1. Relationship between export and economic growth in EU-28



Source: Eurostat data (2015 a, b)

It should be assumed that majority of the EU countries demonstrate positive and strong association between export and economic growth. To approve or reject that assumption, correlation analysis has been employed. Table 3 shows association between export and economic growth across the EU countries.

Table 3. Association between export and economic growth in 1995-2015

Countries	*Correlation coefficient*	t^{st}	*Significance**	*Countries*	*Correlation coefficient*	t^{st}	*Significance**
Austria	0.93	11.03	+	Italy	0.54	2.79	+
Belgium	0.95	13.23	+	Latvia	0.76	5.11	+
Bulgaria	0.67	3.94	+	Lithuania	0.92	10.35	+
Cyprus	-0.92	10.35	+	Luxembourg	0.93	11.03	+
Croatia	0.35	1.63	-	Malta	0.77	5.24	+
Czech Republic	0.93	11.03	+	Netherlands	0.84	6.75	+
Denmark	0.97	17.41	+	Poland	0.96	14.98	+
Estonia	0.59	3.19	+	Portugal	0.62	3.44	+
Finland	0.37	1.74	-	Romania	0.57	3.02	+
France	0.66	3.84	+	Slovakia	0.93	11.03	+
Germany	0.95	13.23	+	Slovenia	0.91	9.62	+
Greece	0.40	1.90	-	Spain	0.36	1.68	-
Hungary	0.91	9.62	+	Sweden	0.74	4.81	+
Ireland	0.21	0.94	-	United Kingdom	0.29	1.32	-

t^{cr} =2.09, level of significance is 0.05

*+ significant, - insignificant.

Source: authors' calculations based on Eurostat data (2015 a, b)

As table above shows twenty-two countries have had significant relationships between export and economic growth. In these countries positive relationships have been found, except Cyprus, where correlation has been negative. Insignificant relationship has been detected in six countries, such as Croatia, Finland, Greece, Ireland, Spain and United Kingdom. These countries have been excluded from the further research. Very strong and significant relationships between export and economic growth have been detected in thirteen the EU countries such as Austria, Belgium, Cyprus, Czech Republic, Denmark, Germany, Hungary, Lithuania, Luxembourg, Netherlands, Poland, Slovakia and Slovenia. The correlation coefficients have varied from 0.84 to 0.97 in these countries. Strong and significant relationships between export and economic growth have been found in Bulgaria, France, Latvia, Malta, Portugal and Sweden. The correlation coefficients have varied from 0.66 to 0.77. Moderate and significant relationships with correlation coefficients from 0.54 to 0.59 have been detected in Estonia, Italy and Romania.
In order to make decision about the causality and its direction Granger causality test have been applied in next section.

2.2 Granger causality test

Granger causality test has been used in this section in order to study the forerunner-lag relationship between export and economic growth. A variable – export is said to Granger cause another variable – economic growth (GDP) – if past values of export help predict the current level of economic growth. Granger test is based on the concept of causal ordering. Similarly, if economic growth in fact causes export, then given the past history of economic growth, the tendencies of export can be predicted. Table 4 shows the results of Granger causality test of the selected EU countries, i.e. the countries with very strong, strong and moderate relationships as well as statistically significant correlations.

Table 4. The results of Granger causality test

Null hypothesis	*Observations /Lags*	*F-statistic*	*Probability*	*Test results*
Austria				
GDP does not Granger cause of Export	Obs.: 20	1.37060	0.2579	Accepted
Export does not Granger cause of GDP	Lags:1	0.99957	0.3314	Accepted
Belgium				
GDP does not Granger cause of Export	Obs.: 20	8.39826	0.0100	Rejected
Export does not Granger cause of GDP	Lags: 1	1.26512	0.2763	Accepted
Bulgaria				
GDP does not Granger cause of Export	Obs.: 19	7.66912	0.0056	Rejected
Export does not Granger cause of GDP	Lags: 2	1.29703	0.3042	Accepted
Cyprus				
GDP does not Granger cause of Export	Obs.: 16	7.90277	0.0203	Rejected
Export does not Granger cause of GDP	Lags: 5	0.27528	0.9084	Accepted
Czech Republic				
GDP does not Granger cause of Export	Obs.: 18	6.56043	0.0107	Rejected
Export does not Granger cause of GDP	Lags: 2	1.05802	0.3752	Accepted
Denmark				
GDP does not Granger cause of Export	Obs.: 20	8.25696	0.0105	Rejected
Export does not Granger cause of GDP	Lags: 1	6.22892	0.0231	Rejected
Estonia				
GDP does not Granger cause of Export	Obs.: 16	11.2825	0.0094	Rejected
Export does not Granger cause of GDP	Lags: 5	1.53927	0.3238	Accepted
France				

GDP does not Granger cause of Export	Obs.: 19	0.54190	0.4723	Accepted
Export does not Granger cause of GDP	Lags:1	0.00067	0.9797	Accepted
Germany				
GDP does not Granger cause of Export	Obs.: 20	0.05106	0.8239	Accepted
Export does not Granger cause of GDP	Lags: 1	0.34473	0.5648	Accepted
Hungary				
GDP does not Granger cause of Export	Obs.: 19	4.12709	0.0390	Rejected
Export does not Granger cause of GDP	Lags: 2	0.10478	0.9012	Accepted
Italy				
GDP does not Granger cause of Export	Obs.: 20	1.59337	0.2239	Accepted
Export does not Granger cause of GDP	Lags: 1	0.90775	0.3541	Accepted
Latvia				
GDP does not Granger cause of Export	Obs.: 19	10.3376	0.0017	Rejected
Export does not Granger cause of GDP	Lags: 2	1.03302	0.3815	Accepted
Lithuania				
GDP does not Granger cause of Export	Obs.: 19	3.87647	0.0457	Rejected
Export does not Granger cause of GDP	Lags: 2	0.46029	0.6403	Accepted
Luxembourg				
GDP does not Granger cause of Export	Obs.: 15	0.85778	0.3726	Accepted
Export does not Granger cause of GDP	Lags: 1	0.50870	0.4893	Accepted
Malta				
GDP does not Granger cause of Export	Obs.: 20	1.15338	0.2979	Accepted
Export does not Granger cause of GDP	Lags: 1	0.07299	0.7903	Accepted
Netherlands				
GDP does not Granger cause of Export	Obs.: 19	4.11271	0.0394	Rejected
Export does not Granger cause of GDP	Lags: 2	0.00668	0.9933	Accepted
Poland				
GDP does not Granger cause of Export	Obs.: 20	0.68693	0.4187	Accepted
Export does not Granger cause of GDP	Lags: 1	6.20504	0.0234	Rejected
Portugal				
GDP does not Granger cause of Export	Obs.: 16	1.79697	0.2678	Accepted
Export does not Granger cause of GDP	Lags: 5	5.93101	0.0365	Rejected
Romania				
GDP does not Granger cause of Export	Obs.: 17	6.18106	0.0144	Rejected
Export does not Granger cause of GDP	Lags: 4	1.12656	0.4088	Accepted
Slovakia				
GDP does not Granger cause of Export	Obs.: 20	1.33102	0.2646	Accepted
Export does not Granger cause of GDP	Lags: 1	5.90593	0.0265	Rejected
Slovenia				
GDP does not Granger cause of Export	Obs.: 19	5.50375	0.0172	Rejected
Export does not Granger cause of GDP	Lags: 2	0.88642	0.4340	Accepted
Sweden				
GDP does not Granger cause of Export	Obs.: 16	1.10783	0.4566	Accepted
Export does not Granger cause of GDP	Lags: 5	9.24066	0.0145	Rejected

Source: authors' calculations applying Eviews v. 8.0

The results of Granger causality test have provided new empirical insights into the long – run relationship between export and GDP. The rejection rule has been applied, when the probability value is at 5% and lower level of significance. The results of Granger causality test have supported four approaches regarding the relationship between export and economic growth. These approaches have been as follows: export-led growth, growth-driven export, bidirectional and neutrality. Unidirectional causality running from export to GDP has been found in Poland, Portugal, Slovakia and Sweden. The findings have provided important implications for policy makers. In these

countries export might be driving force for economic growth and the particular structural characteristics of exporting industries can be also relevant for sustainable growth. Economic policy should aimed to speed up the industrialization process of the countries by opening domestic markets to foreign trade. Reduced barriers and government support for exporting sectors should be an example of policies adopted to promote export and, ultimately, economic growth. In contrast to the previous causality, unidirectional effects from GDP to export have been detected in eleven the EU countries, such as Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Netherlands, Romania and Slovenia. In this case policy makers should focus on growth factors and ensure that resources are properly managed and efficiently allocated to accelerate economic growth.

Moreover, the research also has noticed that the relationship between export and GDP during the period examined has been also bidirectional. That is, GDP causes export and vice versa. Bidirectional causality has been found in Denmark. Six countries, such as Austria, France, Germany, Italy, Luxembourg and Malta have supported neutrality approach, which states that there is no causal relationship between export and economic growth. Based on this approach, export does not cause economic growth and vice versa.

The results of Granger causality test have offered new perspectives and insights in the EU countries for a sustainable economic growth.

Next section summarizes the results of the research and provides the main insights.

CONCLUSIONS

The paper investigates the long – run relationships between export and economic growth in the European Union countries. The research has been bounded by two indicators such as export and economic growth. Other variables have not been considered in this paper. It is the main limitation of the research.

Taking into consideration the empirical insights of different scholars, it could be concluded that the results of causality between export and economic growth vary across the countries observed. It depends on the period of study, the use of econometric techniques, treatment of variables, and the presence of other related variables. Export – growth nexus has been still unresolved issue theoretically and empirically as well.

Taking into account average data over the period of 1995 – 2015, within the EU countries there are some interesting variations in export share of GDP and economic growth. This suggests that there are rich countries that are high and upper middle exporters (Luxembourg, Ireland, Belgium, Netherlands) and rich countries that are low and lower middle exporters (France, United Kingdom, Italy, Denmark, Sweden, Finland) as well as there are economically weak countries which export a lot (Slovakia, Estonia, Hungary) and countries which are economically weak with lower middle or low export (Bulgaria, Lithuania, Latvia, Poland, Romania, Croatia).

Correlation analysis has shown that twenty two countries have significant relationships between export and economic growth. In these countries positive relationships have been found, except Cyprus, where correlation has been negative. Insignificant relationships have been detected in six countries, such as Croatia, Finland, Greece, Ireland, Spain and United Kingdom.

The results of Granger causality test have offered new perspectives and insights in the EU countries for a sustainable economic growth. Unidirectional causality running from export to GDP has been found in Poland, Portugal, Slovakia and Sweden. In these countries export might be driving force for economic growth. Economic policy should aimed to speed up the industrialization process of the countries by opening markets to international trade. Reduced barriers and government support for exporting sectors should be an example of policies adopted to promote export and, ultimately, economic growth. In contrast to the previous causality, unidirectional effects from GDP

to export have been detected in eleven the EU countries, such as Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Netherlands, Romania and Slovenia. In this case policy makers should focus on growth factors and ensure that resources are properly managed and efficiently allocated to accelerate economic growth, because export follows economic growth. Moreover, the research also has noticed bidirectional causality in Denmark. That is, GDP causes export and vice versa. In six countries, such as Austria, France, Germany, Italy, Luxembourg and Malta the Granger causality has not been found. It means that export does not cause economic growth and vice versa. The presence of a causal link between export and economic growth has implications of great importance on development strategies for the EU countries.

REFERENCES

Abbas, S. (2012), "Causality between exports and economic growth: investigating suitable trade policy for Pakistan*", Eurasian Journal of Business and Economics*, Vol. 5, No. 10, pp. 91–98.

Awokuse, Titus O. (2007), "Causality between exports, imports, and economic growth: evidence from transition economies", *Economics Letters*, Vol. 94, pp. 389–395.

Chandran, V. G. R., Rasiah, R. (2013), "Firm size, technological capability, exports and economic performance: the case of electronics industry in Malaysia", *Journal of Business Economics and Management*, Vol. 14, No. 4, pp. 741–757.

Dritsaki, C., Stiakakis, E. (2014), "Foreign direct investments, exports, and economic growth in Croatia: a time series analysis ", *Procedia Economics and Finance*, Vol. 14, pp. 181–190.

Dritsaki, C. (2013), "Causal nexus between economic growth, exports and government debt: the case of Greece", *Procedia Economics and Finance*, Vol. 5, pp. 251–259.

Dudzevičiūtė, G., Peleckis, K., Peleckienė, V. (2016), "Tendencies and relations of defense spending and economic growth in the EU countries", *Engineering Economics*, Vol. 27, No. 3, pp. 246–252.

Ee, C. Y. (2016), "Export-led growth hypothesis: empirical evidence from selected Sub-Saharan African countries", *Procedia Economics and Finance*, Vol. 35, pp. 232–240.

Elbeydi, K. R. M., Hamida, A. M., Gazda, V. (2010), "The relationship between export and economic growth in Libya Arab Jamahiriya*", Theoretical and Applied Economics*, Vol. 17, No 1(542), pp. 69–76.

Eurostat (2015a), available at:
http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_pc&lang=en (accessed 15 November 2016).

Eurostat (2015b), available at:
http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10_gdp&lang=en (accessed 15 November 2016).

Giles, J. A., Williams, C. L. (2000), "Export-led growth: a survey of the empirical literature and some non-causality results", *Journal of International Trade and Economic Development*, Vol. 9, No. 3: 261–337.

Gokmenoglu, Korhan K., Sehnaz, Z., Taspinar, N. (2015), "The export-led growth: a case study of Costa Rica", *Procedia Economics and Finance*, Vol. 25, pp. 471–477.

Granger,C. W. J. (1969), "Investigating causal relationships by econometric models and cross-spectral methods", *Econometrica*, Vol. 37, p.p. 424–438.

Haydory A. A, Salahuddin G. (2009), "Export, import, remittance and growth in Bangladesh: an empirical analysis", *Trade and Development Reviews*, Vol. 2, No. 2, pp. 79–92.

Hussaini, S. H., Abdullahi, B. A., Mahmud, M. A. (2015), "Exports, imports and economic growth in India: an empirical analysis", in Proceedings of the *International Symposium on Emerging Trends in Social Science Research* in 2015, 3-5 April.

Hye, Q. M. A., Lau, Wee-Yeap. (2015), "Trade openness and economic growth: empirical evidence from India", *Journal of Business Economics and Management*, Vol. 16, No. 1, pp. 188–205.

Jarra, S. T. (2013), "Exports, domestic demand and economic growth in Ethiopia: Granger causality analysis", *Journal of Economics and International Finance*, Vol. 5, No. 9, pp. 357–372.

Jarreau, J., Poncet, S. (2012), "Export sophistication and economic growth: evidence from China", *Journal of Development Economics*, Vol. 97, pp. 281–292.

Kozhan, R. (2010), *Financial Econometrics*, Roman Kozhan & Ventus Publishing ApS.

Lee, J. (2011), "Export specialization and economic growth around the world", *Economic Systems*, Vol. 35, pp. 45–63.

Marwan, Nur Fakhzan, Kadir, Nor Aziah Abd., Hussin, A., Zaini, Azniza Ahmad, Rashid, Mohd Elfee Ab., Helmi, Zulkifli Abd. Ghani. (2013), "Export, aid, remittance and growth: evidence from Sudan", *Procedia Economics and Finance*, Vol. 7, pp. 3–10.

Mehmood, S. (2013), "Do exports and economic growth depend on each other at intergovernmental organization level trade: an empirical study", *Academy of Contemporary Research Journal*, Vol. 7, No. 4, pp. 152–160.

Mishra, P. K. (2011), "The Dynamics of relationship between exports and economic growth in India", *International Journal of Economic Sciences and Applied Research*, Vol. 4, No. 2, pp. 53–70.

Neves, A., Teixeira, Aurora A. C., Silva, Sandra T. (2016), "Exports-R&D investment complementarity and economic performance of firms located in Portugal", *Investigación Económica = Economic Research*, Vol. LXXV, No. 295, pp. 125–156.

Rahman, Mohammad, M., Mamun, Shamsul A. K. (2016), "Energy use, international trade and economic growth nexus in Australia": new evidence from an extended growth model, *Renewable and Sustainable Energy Reviews*, Vol. 64, pp. 806–816.

Saaed, A. Abdull J., Hussain, M. A. (2015), "Impact of exports and imports on economic growth: evidence from Tunisia", *Journal of Emerging Trends in Economics and Management Sciences*, Vol. 6, No. 1, pp. 13–21.

Sahoo, A. K., Sahoo, D., Sahu, N. C. (2014), "Mining export, industrial production and economic growth: a cointegration and causality analysis for India", *Resources Policy*, Vol. 42, pp. 27–34.

Sheridan, Brandon J. (2014), "Manufacturing exports and growth: When is a developing country ready to transition from primary exports to manufacturing exports?" *Journal of Macroeconomics*, Vol. 42, pp. 1–13.

Shihab, R. A., Abdul-Khaliq, T. S. S. (2014), "The causal relationship between exports and economic growth in Jordan", *International Journal of Business and Social Science*, Vol. 5, No. 3, pp. 302–308.

Stern, D. I. (2011), "From correlation to Granger causality", Crawford School Research Paper No 13, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1959624 (accessed 12 October 2016).

Szkorupova, Z. (2014), "A causal relationship between foreign direct investment, economic growth and export for Slovakia", *Procedia Economics and Finance*, Vol. 15, pp. 123–128.

Tekin, R. B. (2012), "Economic growth, exports and foreign direct investment in least developed countries: a panel Granger causality analysis", *Economic Modelling*, Vol. 29, pp. 868–878.

Tong, T., Yu, T. E., Roberts, R. K. (2014), "Dynamics of transport infrastructure, exports and economic growth in the United States", *Journal of the Transportation Research Forum*, Vol. 53, No. 1, pp. 65–81.

Trošt, M., Bojnec, Š. (2015), "Causality between public wage bill, exports and economic growth in Slovenia", *Economic Research*, Vol. 28, No. 1, pp. 119–131.

Uddin, M. G. S., Khan, S.A., Alam, M. M. (2010), "An empirical study on export, import and economic growth in Bhutan", *Indian Development Review*, Vol. 8, No. 1, pp. 95–104.

Vianna, A. C. (2016), "The impact of exports to China on Latin American growth", *Journal of Asian Economics*, Vol. 47, pp. 58–66.