Assessment of EU member states' positions in Global Value Chains

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Abstract

The participation of countries in GVCs can be measured in different ways; most commonly by using the GVC participation index and the GVC position index. The research is focused on the analysis of GVC participation of EU member states applying different indicators and comparing the characteristics of three groups of EU member states (EU core members, EU Southern members and EU new member states). We have applied statistical analysis on the TiVA[1] database. The results indicate a high level of participation of EU member states in GVCs with a predominance of backward linkages. Luxembourg, Slovakia and Hungary have the highest levels of participation while Croatia has the lowest participation. EU member states are very integrated and intra-regional, so about 80% of value added in their gross export or final demand originates from the EU (domestic value added or value added from other member states).

Keywords: GVC, EU, trade, forward and backward participation

Introduction

In the latest research on international trade, trade in value added (TiVA) has become increasingly important due to the international fragmentation of production. It determines the countries' involvement in global production (value) chains (GVCs).

Traditional approaches to trade statistics do not fully reflect the extent to which economies have become interconnected and interdependent. The total exports are over-estimated at the global level as some parts produced in foreign countries are calculated more than once, i.e. exports of intermediates are calculated in the gross export of the country that produces the intermediates but also in all the countries that follow in the production chain. Due to the increasingly interlinked global production

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[1] TiVA Database Online (retrieved from http://stats.oecd.org/Index.aspx?DataSet Code=TIVA2015_C1).

networks, double counting of international trade has been estimated at around $5 trillion or 28% of the $19 trillion of global gross exports in 2010 (UNCTAD, 2013a). Multinational enterprises (MNCs) have made a major contribution to the development of GVC and trade in value added because they are a platform for building the trade and production networks through outsourcing and off-shore activities. According to UNCTAD (2013b), MNC-coordinated GVCs account for some 80 per cent of global trade; many cross-border transactions take place within related firms and establishments.

The EU as an internal market without any trade barriers contributed to the increase in trade among the member countries with the dominance of intra-regional trade in all countries trade performances. It does not mean that all countries are in the same position regarding the trade balance – there are huge differences between EU member states where some countries achieved surpluses and other deficits. Some authors point out the core-periphery model in the EU due to developed North and Western Europe on the one side, and South East Europe which is lagging behind and is faced with numerous imbalances (and deficits) on the other. The EU also contributed to the high level of intra-regional foreign direct investments (FDI) with the main flows from Western European countries to the East and Southeast European countries. Many big companies, MNCs from West Europe, have opened branches in the new member states due to lower production costs. Whilst this is indicative of the high level of integration of EU members, it does not tell us about the characteristics, differences and particularities among EU members in GVC participation.

The aim of this paper is to analyse and compare the GVC characteristics in the EU. We will apply different measures and indicators: the GVC participation index, forward and backward participation, the GVC position index, shares of value added in export and final demand. By comparing the results of all these indicators, a conclusion about the level and intensity of GVC participation will be reached. The data are from OECD-TiVA database statistics and the methodology is based on applying mathematical relations. The novelty of this research is in (1) the focus on EU member states (the majority of literature deals with the Southeast Asian countries as they are more involved in GVCs); (2) the comparison of different approaches in measuring GVC participation; (3) highlighting the similarities and differences among EU member states.

The structure of the rest of the paper is as follows: the second chapter outlines the characteristics of GVC trade and presents an overview of the existing research. The third section presents the research, and this is followed by the conclusion.

1. Literature review

The term GVC has appeared in international business literature in the last 15 years; the term is derived from the global commodity chain. Gereffi and Fernandez-Stark (2011) give an overview of GVC development and its name changes. GVCs

are at the centre of Porter's research, where the importance of firm competitiveness is indicated (Porter, 1990). Countries tend to specialize in specific business functions rather than specific industries. The trade that takes place in GVCs refers to the trade in ***tasks*** and not in ***products***. Taglioni and Winkler (2016) give an overview of the role of GVCs in economic development pointing out the seller and buyer aspects of the GVC (and value added) and indicating possible implications of GVCs on national economies.

The development of GVCs has an important and inevitable role in the global trade flows because the products at different stages of value added may be imported and re-exported multiple times, in that way having an influence on the number of reported exports and imports relative to global and national value added. Trade in value added (TiVA) measures only the amount of value added by a particular country in the production of a particular exportable product that will be recorded as exports of this country (not total value of that product if it was partially produced abroad and imported). The measurement of GVC trade is more complicated due to limited data availability- it is based on international input-output tables that are calculated by the OECD and WIOD.

Even though authors usually consider that GVCs operate globally, the truth is that they are "regional" in nature and Stephenson (2013) states that they are "focused on three hubs - North America, Europe, and East Asia. The first two regions are primarily centres of demand and the latter is a centre of supply, although this may be changing as China moves to reform its economy toward more consumer-driven demand growth". Participation in GVC is measured as a sum of the backward and forward participations.

The backward participation (linkages) refers to the share of foreign value added in domestic exports (imports of intermediates from abroad in domestic exports) and the forward participation (linkages) indicates the share of domestic value added in foreign exports (domestic exports of intermediates in foreign export) (Koopman *et al*., 2010; Stephenson, 2013; Javorsek and Camacho, 2015). Although the majority of research has been carried out on a sample of Asian countries, the results of articles focused on GVCs in Europe or particularly on EU member states are presented here. Usually articles related to the EU consider the situation in new EU member states, or highlight the differences between the North member states and the South member states (the developed part of the EU vs. countries that are lagging behind). Also, many papers show the differences in GVC participation (fragmentation of production) that appear over a period of 10 or 15 years. As expected, with the increase of gross trade, countries' GVC participation also grows. The situation changed dramatically with the beginning of the global economic crisis and the sharp decline of trade and GVC participation. Because of this, we will analyse the situation in EU member states in 2011 when, in almost all EU member states, the recession was behind them.

For the euro-area members, Amador, Cappariello and Stehrer (2015) found (taken as a whole) that in 2011 "GVCs were as important as in China and more important than in the US and Japan. The high relevance of GVCs in the euro area, measured by the share of foreign value added in exports, is accompanied by their comparatively stronger resilience in the face of the trade collapse". Ederer and Reschenhofer (2016) elaborate in detail on the criteria of grouping countries in the Northern and Southern parts of the EU.

Leitner and Stehrer (2014) found that vertical specialization intensified in most of the EU new member states and that export growth is beneficial to performance. Stronger participation in global production processes is performance enhancing. Their results indicate that export growth and the degree of vertical specialization tend to reinforce each other. Cieslik, Bieganska and Sroda-Murawska (2016) have applied complex methods to get the position of a country in downstream or upstream stages of GVCs. They found mixed results for the EU, new member states (post-socialist countries) – countries that have stronger links with Western European countries are more integrated, and most of the exporters from Central and Eastern Europe are positioned in the downstream part of the production process. In addition, they found the highest internationalization in transport equipment and electronics where some of the countries were among the global leaders in the upstream segment. Grodzicki and Geodecki (2016) explain the core-periphery model in Europe based on the contribution of particular groups of countries to the value chain. They warn that GVC participation accelerates de-industrialization processes and that the CEE countries have a better position than the Southern EU members due to their (CEECs') continued dependence on foreign capital and technologies.

Further, on the industry level it is possible to measure the 'upstreamness' of a particular industry and distance from final demand (Fally, 2012, Antras *et al*., 2012). Van der Marel (2015) applies the distance from final demand as an indicator that shows the extent to which each country takes part in vertically fragmented production, i.e. "it measures how far countries are situated from the final downstream industry in the production process that deals with final demand in the supply chain". Antras *et al*. (2012) defined 'upstreamness' – the further away an industry (country) is from final demand, the more upstream this industry (country) is classified. If one country imports a low (high) share of intermediates and exports a high (low) share of intermediate exports, it is specializing in upstream (downstream) activities. Los, Timmer, and Vries (2015) apply WIOD data and perform an analysis on a sample of 40 countries about the participation in GVCs on industry level. They found that participation in almost all industries has increased since 1995, except in crisis years. They also introduced the term "Factory World".

Timmer *et al*. (2013) focused their research on the EU manufacturing sector where they found no strong correlation between gross export and income and job creation in the manufacturing sector. Also, the EU's comparative advantage is in the activities carried out by higher-skilled workers. They warn of the usefulness of

traditional comparative advantage analysis in comparison with the globalization processes and GVC appearance. The comparative advantage of the EU27 is shifting to activities related to the production of non-electrical machinery and transport equipment. In a more recent paper, Timmer *et al*. (2016) introduce a novel measure of production fragmentation – global import intensity (GII) of production. It traces (marks) the imports needed in all stages of production. The fragmentation was on the increase during the 2000-2008 period but it has halted since 2011 because of the shifting of demand to services that are less trade intensive than goods. The GII of services is much lower than for goods, but it is also important especially for the countries where services take a large part of GDP. Baldwin and Lopez-Gonzalez (2014) provide statistical analysis of some features of GVCs: Importing-to-produce (I2P), importing to export (I2E) and value added trade (VAT). I2P includes intermediate imports used in all sectors and I2E captures the content of imported inputs in exported goods and services. An important refinement of the I2E concept is value-added trade that eliminates the double counting of intermediate trade flows. De Marchi, Di Maria and Gereffi (2017) edited a comprehensive research in which researchers discuss the evolution of development, the importance and characteristics of clusters on the one hand, and the importance, development and key features of the global value chains on the other. Based on the differences between clusters and GVCs, they proposed a common framework for their analysis. Gereffi and Fernandez-Stark (2016) provide a number of case studies of the involvement of countries in GVCs, but they also include research about specific industry participation in GVCs (such as shipbuilding and electronics).

2. Research

2.1. Data and methodology

The idea of GVC (VA) trade is to calculate separately the domestic VA that is produced in any country and also to consider the foreign VA in imported intermediate goods. In that way, trade structure and value will reflect the real contribution of every country and avoid the over-estimation of foreign trade. Koopman *et al*. (2010), Johnson and Noguera (2012) and Stehrer *et al*. (2012) proposed broader and more comprehensive frameworks for calculating the foreign and domestic content in exports.

GVC participation index is a sum of backward and forward linkages in GVC.

GVC participation= DVA/EXP + FVA/EXP (1)

where DVA is domestic value added (intermediate export) in foreign export, EXP is gross export, FVA is foreign value added (intermediate import) in domestic exports.

Another measure is the GVC position that Koopman *et al*. (2010) suggest measuring in the following way:

GVC position= log (1+DVA/EXP)-log (1+FVA/EXP) (2)

The GVC position index indicates whether a country specializes in the first or the last stages of production. If a country is upstream in the production network (first stages of production), it is likely that it has a high value of forward participation relative to backward. If a country specializes in the last stages of production (downstream), it is likely that it imports a lot of intermediate goods from abroad and therefore it has high backward participation. The GVC position index is constructed in such a way that countries with high forward relative to backward participation record a positive value. These countries lie relatively more upstream in a supply chain in comparison with the countries that have a high share of intermediate export in their total export (WTO, 2014).

The important indicator in the increase of production fragmentation and also participation in GVCs is the share of intermediate products in imports and exports. Additionally, some authors analyse GVC income and final demand linkages (Grodzicki and Geodecki, 2016; Timmer *et al*., 2013; Cieslik, Bieganska and Sroda-Murawska, 2016).

GVC income is defined as the total value-added of all sectors of a country or a region's economy that is embodied, directly or indirectly, in manufactured final goods and it relates to production within the global value chain (Grodzicki and Geodecki, 2016). GVC income is the result of domestic and foreign demand when, in the last case, the higher value of GVC income arising from foreign demand ("exports of value added") indicates the better/higher competitiveness of that economy. GVC jobs are the number of jobs directly and indirectly involved in the production of final goods (Timmer *et al*., 2013).

Distance from final demand indicates a country's location within the supply chain. It measures how many production stages a product still needs to undergo before it reaches the final demand. It is connected with the share of intermediate imports and exports (Van den Marel, 2015).

We have performed the analysis by calculating the GVC participation index by indicating the backward and forward elements, the GVC position, interconnections among EU member states regarding the origin of value added in gross export and in final demand and comparing these indicators in three separate groups: EU core member states, EU Southern members, and EU new member states.

The methodological framework for measuring trade on a value-added basis is still developing. The most complete and, in some ways, official databases have been created by the WTO and OECD TiVA indicators in 2013 and in 2015 and WIOD database[2]. They are based on the International Input-Output (II-O) tables that enable

[2]The latest OECD- TiVA report presents indicators for 61 economies and is broken down into 34 industrial sectors (16 manufacturing and 14 service sectors). It includes the decomposition of gross exports by industry into their domestic and foreign contents; the services content of gross exports by exporting industry (broken down by foreign/domestic origin); bilateral trade balances based on flows of value added embodied in domestic final demand; intermediate imports embodied in exports, participation in GVCs via intermediate

the origin and the use of intermediate goods and services to be identified by country and sector. II-O tables provide relevant assets for the analysis of trade verticality as they make clear the inter-sectoral nature of the modern production processes and their international connections. Thus, they take into account all backward linkages between countries and sectors present in the table, and they capture the value of imported inputs used directly and indirectly (at all stages of a country's production) in the manufacturing of exported goods (WTO, 2011; De Becker and Miroudot, 2012).

This report covers the years 1995, 2000, 2005 and 2008 to 2011. We will use this database in our research[3]. The geographical sample covers the EU as a whole and also three groups of member states: (1) EU core - Austria, Germany, the Netherlands, Sweden, Belgium, Denmark, Finland, France, Italy, Luxemburg, United Kingdom; (2) EU Southern members - Greece, Spain, Ireland, Portugal, and (3) EU new member states: Bulgaria, Croatia, Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

2.2. Results

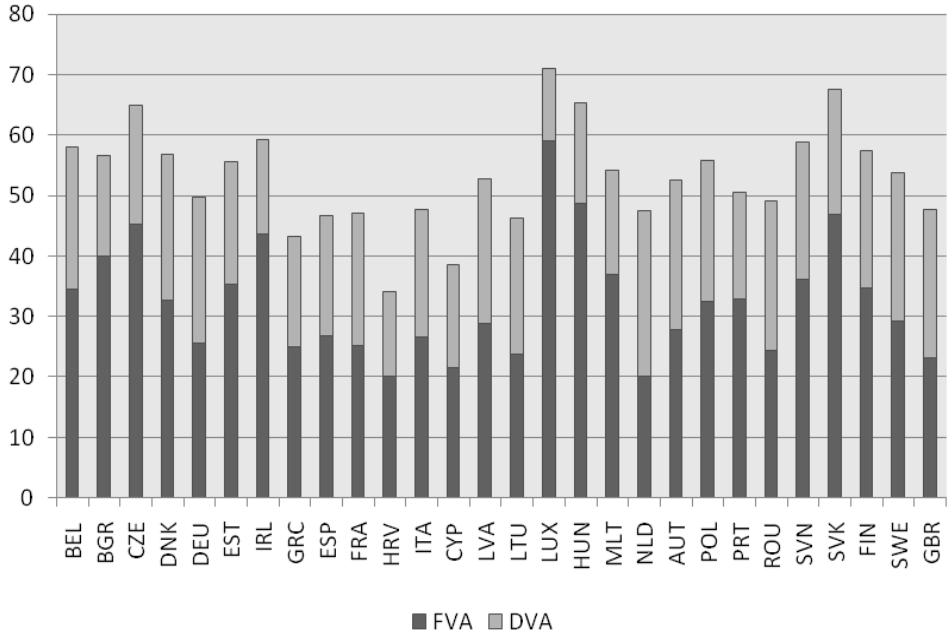
Firstly, we calculated the GVC participation index. The average value is 53.5% for EU core members, 53.7% for EU new member states and 49.9% for EU Southern members. The highest participation is in Luxembourg and Slovakia with the domination of backward linkages – a huge share of foreign value added in countries' export. It indicates high import levels of intermediates that are important for additional processing in a particular country and then for export (as intermediate or final goods and services). Figure 1 indicates that the majority of EU member states lie relatively more downstream in the supply chain - they have high values of backward participation (they depend on the import of intermediates from abroad). The average backward participation for EU core members is 30.74% while for new member states it is above 33% and for Southern members it is 32%. The shares of domestic value added in foreign countries' exports vary between average values of 17.85% in Southern members to 22.8% in core members.

imports embodied in exports (*backward linkages*) and domestic value added in partners' exports (*forward linkages*); share of industry value added that meets foreign final demand; origins of value added in final demand, by source country and source industry, including the origin of value added in final consumption (by households and government) and in GFCF (investment by businesses) and inter-regional and intra-regional relationships (OECD, 2015).

[3]There is also the World Input-Output Database (WIOD) that covers 27 EU countries and 13 other major world economies and comprises 35 industries (corresponding to a broad NACE classification). This database is created with financial support through the FP7 project (Amador *et al*., 2015; Dietzenbacher *et al*., 2013).

Among the new member states, Slovakia, Hungary and the Czech Republic have the highest GVC participation index and Croatia has the lowest. Backward participation is predominant in all of the countries, so they are positioned downstream in the supply chain. Croatia and Romania have the smallest difference between backward and forward participation. This means they export a lot of intermediates that other countries use in production and export.

Figure 1. GVC participation (backward and forward participation) for EU28 member states in 2011



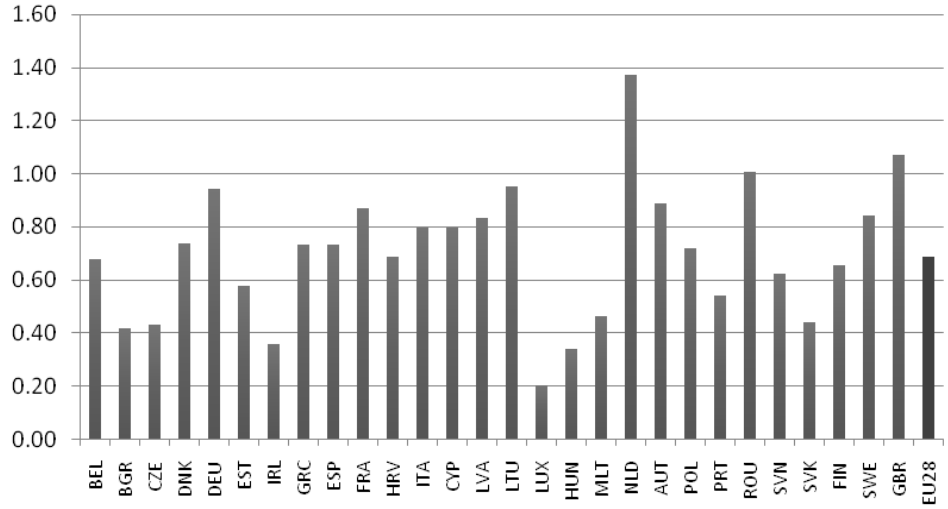
Source: own representation based on TiVA Database[4].

The shares of backward and forward participation indicate the relative position in GVC (Cieslik *et al.*, 2016) where the value above (below) 1 indicates the position in upstream (downstream) part of GVC. The relative position of EU28 in GVC is in the downstream part with the value of 0.69. Only the Netherlands, the United Kingdom and Romania lie in the upstream part of the GVC (values above 1). The relative position of new EU member states is lower than the EU average (0.59), while the EU core is 0.74 and Southern members' is 0.56. The same results are obtained by applying relations (2) by calculating the GVC position (Figure 3) where the

[4] Available at http://stats.oecd.org/Index.aspx?DataSetCode=TIVA2015_C1 (accessed February 18, 2016).

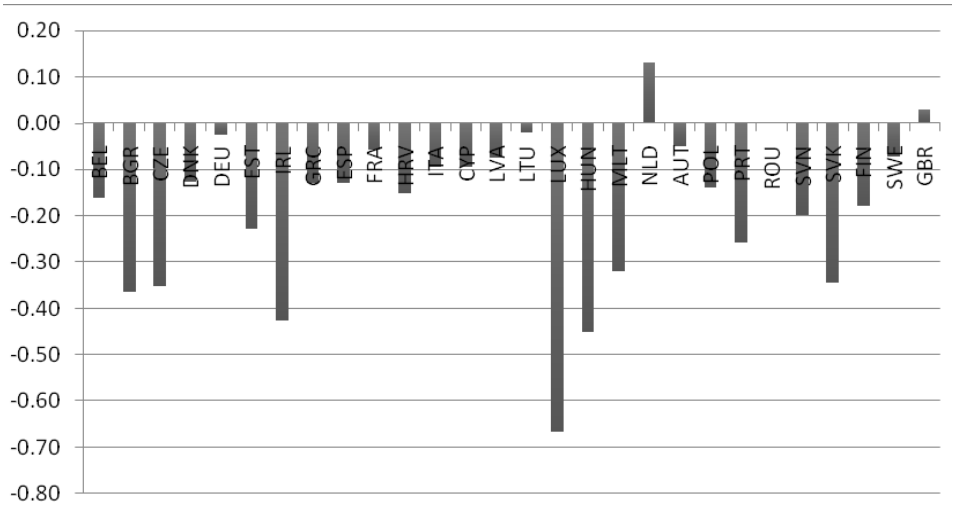
positive values indicate the position in the upstream part and negative values in the downstream part of the GVC.

Figure 2. Relative position of EU member states in GVC in 2011



Source: own representation based on TiVA Database.

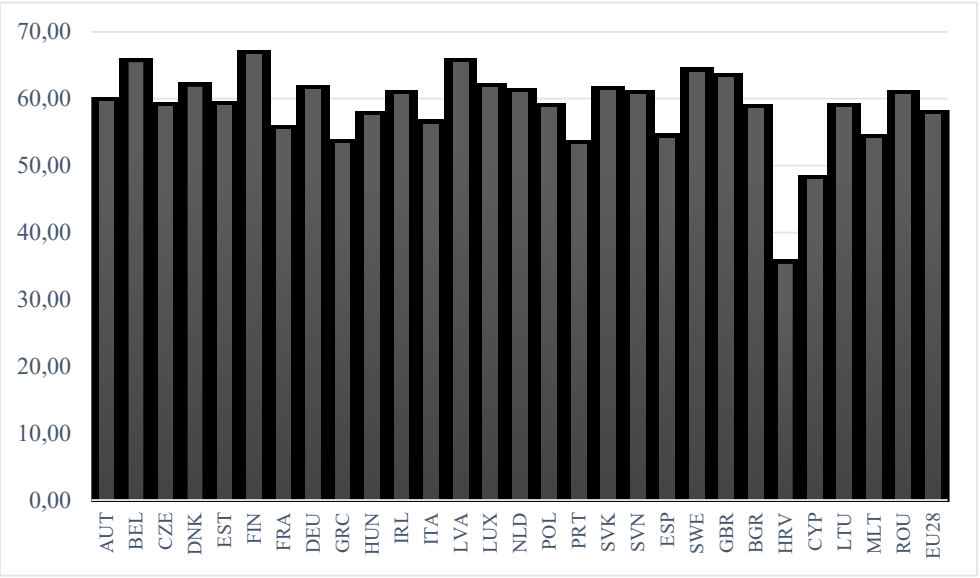
Figure 3. GVC position of EU member states in 2011



Source: own representation based on TiVA Database.

The dominance of intermediate products in gross export in almost all EU member states (Croatia and Cyprus are the only exceptions) indicates high participation in GVC. The highest shares are in Finland, Latvia and Belgium.

Figure 4. Intermediate products share in gross export in EU28 in 2011 (% of gross export)

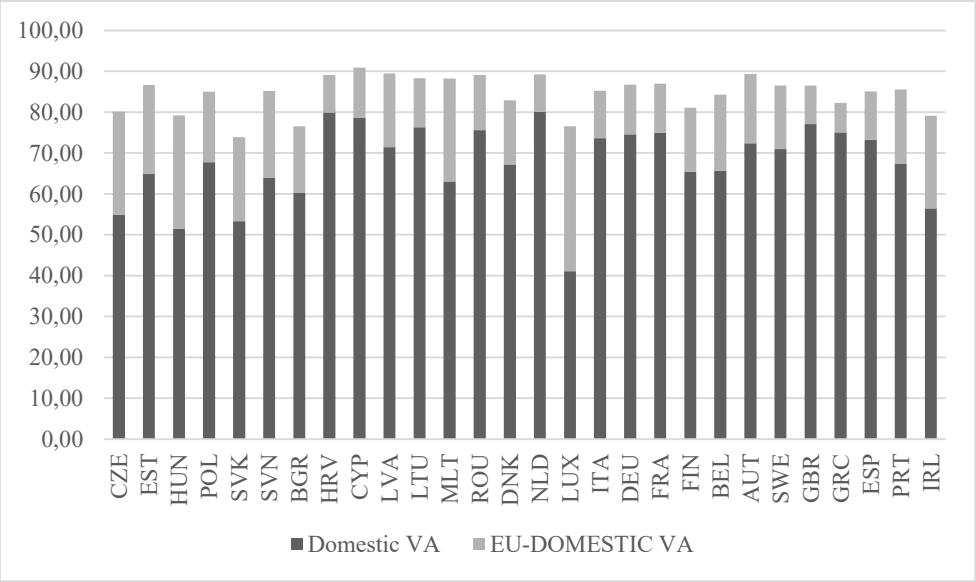


Source: own representation based on TiVA Database.

We continue with the analysis of interconnections among EU member states, i.e. the importance of VA from the EU for the export and final demand of every member state. In this way we can assess the contribution of the common market to the GVC participation. Figures 4 and 5 are presented here, and the detailed tables are in the Appendix.

The data from Figure 5 (and Table 1 in the Appendix) indicates the dominance of domestic VA in the gross export of member states. In EU core members, the domestic value represents between 41% of gross exports in Luxembourg to 80% in the Netherlands that indicates the average value of 69.3% and accordingly the EU members represent from 9.17% of total exports in the Netherlands to 35.42% in Luxembourg, the average value is 15.7%. In EU Southern member states, the domestic value is the lowest in Ireland (56.47% of gross export) and the highest in Greece (75.06%), the average value is 68%. The EU share (except domestic VA) in gross exports is 7.22% in Greece to 22.6% in Ireland with the average value of 15%.

Figure 5. Origin of VA in gross export of EU member states in 2011 (in %)



Source: own representation based on TiVA Database.

For the EU new member states the most important source countries are Germany and Italy. The share of Germany VA in gross export varies between 1.38% in Cyprus to 9.76% in Hungary, while Italy's share goes from 0.87% in Lithuania to 4.26% of gross export in Slovenia. Further, the importance of source countries can be partially explained by the gravitation model- the smaller the distance between the countries the more trade there is, i.e. Hungary with Austria and the Czech R. and Poland; the Czech R. with Poland, France, Austria; Estonia with Finland, Sweden and Latvia, etc. It also indicates the high share of domestic value added in gross exports that range between 51.5% in Hungary to 79.9% in Croatia, with an average of 66.2%.

The comparison of these three groups of EU member states shows that the new member states have the highest share of the rest of the EU in their gross export while the EU core and EU Southern members have similar shares of about 15% or 3 percentage points lower than in the new member states. This can be an indicator of overshooting in fragmentation of production as indicated by Baldwin and Venables (2013) and Harms et.al. (2012).

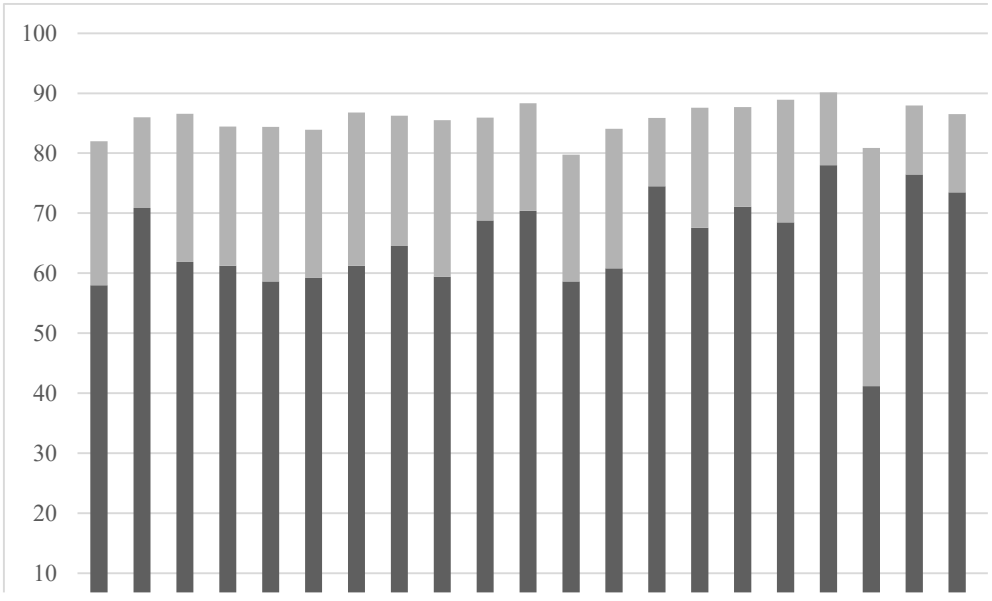
In Figure 6 and Table 2 (Appendix) we have analysed the origin of value added in final demand in EU core members, EU new member states and in EU Southern members (countries most affected by the crisis). A common characteristic of all the countries is that domestic value added dominated in domestic final demand

and the value goes from 52.9% of total value added in Ireland to 78% in the Netherlands. If we deduct the domestic value, the share of EU value added varies between 11.39% in the United Kingdom to 26.04% in Malta. The average value for EU value added is 22.32% for new member states, 17.03% for core members and 16.63 for Southern members.

Regarding the group of EU new member states, EU shares are higher than 20%. The highest share of domestic VA in final demand is in Croatia at 70.88% and the lowest level is in Bulgaria and Slovakia at 58%. The total EU share (together with domestic) varies from 79.76% in Slovakia to 86.78% in Latvia. Here, there is also a huge concentration of VA from Germany and Italy in final demand, but France, Poland and the UK also have significant shares. Historical relationships are also evident in the cases of the Czech R. - Slovakia, and Latvia - Lithuania.

Obviously, the final demand in EU new member states is more dependent on the imports from EU member states in comparison with the other two groups of countries. The most important countries in VA from the EU are Germany and Italy where the German shares in EU value added in final demand in EU new member states go from 10.8% in Cyprus to 35.14% in the Czech Republic, and the shares of Italy go from 5.43% in Estonia to 22% in Croatia. It demonstrates that these two countries are the most important trade partners of the EU new member states.

Figure 6. Origin of VA in final demand in EU member states in 2011 (in %)



Source: own representation based on TiVA Database.

Conclusion

The growing importance of international trade flows in contemporary circumstances together with MNC activities leads to the necessity of research on global value chains. Common features of global trade include: increasing shares of intermediate products in trade, production fragmentation, and the liberalisation of trade and capital flows. The EU common market and EU enlargements (from 15 to 28 members) act as a push factor to increase intra-regional trade and investments. This does not mean that all member states participate in global value chains to the same extent and in the same way. The aim of this research was to find the similarities and differences among EU members regarding participation in GVCs, as well as to point out the specificities of three particular groups of EU members: EU core members, EU Southern members and EU new member states.

In this research, we have provided the most commonly used indicators of GVC participation and we came to the following conclusions:

- the GVC participation index differs among EU member states with the highest value in Luxembourg, Slovakia and Hungary and the lowest value in Croatia;
- all countries lie in the downstream part of the GVC, i.e. backward participation dominates (they import a lot of intermediate products that are necessary for the production process and export);
- even though EU member states are very integrated, domestic value added is dominant in all member states, in gross exports (except Luxembourg) and in final demand;
- the countries are very strongly interrelated and so, the total share of EU value added (domestic and VA from other member states) varies from 73% to 90% of total export and from 80%to 90% of final demand. The highest share from the other EU member states comes from Germany, Italy and France whilst historical relationships are also evident (the Czech Republic-Slovakia; Latvia-Lithuania.).

There are differences in GVC participation in terms of the three groups of EU member states:

- it is higher for EU core and EU new member states than in the EU Southern members;
- the relative position in GVC – the highest value of backward to forward participation is in EU core members, as compared to the new member states and EU Southern members;
- EU new member states have the highest share of value added from the rest of the EU in their export and also in final demand. This emphasizes their dependence but also the very high level of trade integration within the EU.

To explain the differences among EU member states, it would be necessary to expand the analysis so as to include the economic structure of the countries (shares

of industry and service sector in GDP and trade) as well as their export and import structure because not all sectors are integrated into the GVC to the same extent.

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Appendix

Table 1. Origin of VA in gross export in EU NMS

	CZE	EST	HUN	POL	SVK	SVN	BGR	HRV	CYP	LVA	LTU	MLT	ROU
AUT	1.19	0.30	1.85	0.57	0.87	2.24	0.79	0.67	0.17	0.41	0.18	0.67	0.70
BEL	0.61	0.54	0.66	0.51	0.48	0.45	0.39	0.21	0.37	0.41	0.28	0.62	0.29
CZE	**54.9**	0.33	1.06	0.90	2.92	0.66	0.41	0.23	0.06	0.34	0.22	0.08	0.40
DNK	0.30	0.53	0.31	0.34	0.17	0.17	0.18	0.14	0.10	0.49	0.34	1.77	0.15
EST	0.02	**64.8**	0.01	0.02	0.01	0.01	0.01	0.00	0.04	1.41	0.64	0.02	0.01
FIN	0.19	3.52	0.23	0.32	0.13	0.13	0.09	0.06	0.05	0.97	0.61	0.07	0.08
FRA	1.73	0.96	1.90	1.56	1.82	1.52	0.99	0.52	0.80	0.85	0.48	1.32	1.16
DEU	9.50	3.53	9.76	6.00	6.43	5.77	3.01	2.17	1.38	3.06	2.05	4.55	3.29
GRC	0.12	0.13	0.09	0.11	0.09	0.16	1.42	0.06	3.03	0.13	0.11	0.17	0.28
HUN	0.62	0.24	**51.5**	0.35	0.81	0.50	0.53	0.28	0.05	0.18	0.10	0.05	0.84
IRL	0.32	0.25	0.49	0.20	0.16	0.33	0.28	0.11	0.15	0.25	0.11	0.46	0.13
ITA	2.00	0.90	2.21	1.80	1.67	4.26	2.09	2.22	1.18	1.10	0.87	3.82	2.33
LUX	0.10	0.10	0.11	0.08	0.07	0.11	0.06	0.05	0.30	0.10	0.05	0.39	0.05
NLD	0.63	0.72	0.99	0.61	0.38	0.37	0.36	0.24	0.44	0.48	0.56	0.47	0.36
POL	2.66	1.49	1.83	**67.7**	1.62	0.71	0.58	0.29	0.18	1.91	1.73	0.21	0.89
PRT	0.15	0.06	0.11	0.10	0.10	0.08	0.09	0.03	0.05	0.04	0.04	0.07	0.08
SVK	1.48	0.10	1.11	0.44	**53.2**	0.38	0.19	0.10	0.03	0.13	0.12	0.02	0.26
SVN	0.17	0.05	0.29	0.10	0.15	**63.8**	0.13	0.63	0.02	0.06	0.03	0.02	0.09
ESP	1.01	0.49	0.86	0.76	0.69	0.72	1.77	0.28	0.53	0.64	0.50	1.35	0.57
SWE	0.58	2.77	0.79	0.81	0.44	0.40	0.34	0.22	0.19	1.20	0.85	1.27	0.20
GBR	1.35	1.36	1.63	1.26	1.10	1.02	0.83	0.46	2.66	0.79	0.71	6.43	0.81
BGR	0.09	0.03	0.10	0.07	0.07	0.12	**60.1**	0.08	0.08	0.04	0.03	0.16	0.39
HRV	0.05	0.01	0.10	0.02	0.05	0.87	0.02	**79.8**	0.02	0.01	0.01	0.02	0.02
CYP	0.02	0.29	0.03	0.01	0.01	0.01	0.16	0.00	**78.5**	0.13	0.01	1.04	0.07
LVA	0.03	2.03	0.02	0.04	0.02	0.01	0.02	0.01	0.10	**71.3**	1.37	0.03	0.01
LTU	0.04	0.95	0.03	0.14	0.03	0.02	0.04	0.01	0.07	2.92	**76.2**	0.01	0.02
MLT	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	**63.0**	0.01
ROU	0.27	0.07	1.07	0.18	0.29	0.25	1.57	0.10	0.28	0.06	0.04	0.06	**75.6**
FVA from the EU	80.11	86.65	79.17	85.02	73.84	85.15	76.53	89.05	90.89	89.50	88.32	88.18	89.05

The source countries are in rows and exporting countries in columns.

Table 1. Origin of VA in gross export in EU- core members (cont.)

	DNK	NLD	LUX	ITA	DEU	FRA	FIN	BEL	AUT	SWE	GBR
AUT	0.21	0.19	0.67	0.50	0.88	0.24	0.28	0.26	**72.3**	0.32	0.18
BEL	0.66	0.95	3.88	0.51	0.64	0.83	0.56	**65.6**	0.34	0.55	0.50
CZE	0.23	0.09	0.25	0.22	0.59	0.19	0.20	0.21	0.71	0.25	0.17
DNK	**67.1**	0.20	1.11	0.14	0.29	0.14	0.74	0.28	0.14	1.86	0.33
EST	0.05	0.02	0.04	0.01	0.01	0.01	0.47	0.01	0.01	0.15	0.01
FIN	0.36	0.11	0.31	0.13	0.21	0.11	**65.4**	0.17	0.12	1.21	0.15
FRA	0.90	0.89	4.89	1.90	1.75	**74.9**	0.91	2.97	0.91	1.25	1.32
DEU	3.66	2.14	8.91	3.37	**74.5**	3.69	3.61	4.81	8.27	3.91	2.55
GRC	0.18	0.07	0.13	0.16	0.10	0.06	0.12	0.11	0.08	0.09	0.11

HUN	0.17	0.07	0.18	0.16	0.29	0.10	0.09	0.10	0.49	0.12	0.11
IRL	0.24	0.21	0.71	0.29	0.32	0.27	0.25	0.38	0.16	0.32	0.50
ITA	0.82	0.46	2.70	**73.5**	1.41	1.69	0.85	1.07	1.65	0.86	0.86
LUX	0.26	0.11	**41.0**	0.12	0.13	0.11	0.12	0.37	0.09	0.11	0.08
NLD	1.00	**80.0**	1.74	0.47	0.93	0.54	0.86	2.37	0.43	0.61	0.61
POL	0.68	0.25	0.49	0.40	0.83	0.36	0.53	0.34	0.60	0.62	0.38
PRT	0.15	0.06	0.25	0.11	0.12	0.17	0.12	0.15	0.08	0.09	0.09
SVK	0.06	0.02	0.07	0.12	0.20	0.09	0.06	0.05	0.40	0.11	0.06
SVN	0.04	0.02	0.07	0.13	0.10	0.04	0.03	0.04	0.25	0.04	0.02
ESP	0.65	0.59	1.98	1.08	0.86	1.27	0.57	1.05	0.53	0.63	0.75
SWE	2.37	0.30	1.06	0.32	0.50	0.37	3.41	0.54	0.40	**70.9**	0.43
GBR	2.69	2.21	5.83	1.04	1.65	1.49	1.54	3.14	0.76	2.04	**77.0**
BGR	0.06	0.01	0.02	0.10	0.06	0.03	0.02	0.07	0.07	0.02	0.02
HRV	0.02	0.02	0.03	0.05	0.02	0.02	0.02	0.04	0.10	0.02	0.01
CYP	0.01	0.02	0.01	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.02
LVA	0.09	0.01	0.02	0.01	0.02	0.01	0.14	0.02	0.02	0.12	0.02
LTU	0.10	0.05	0.02	0.02	0.04	0.03	0.09	0.03	0.03	0.08	0.02
MLT	0.02	0.01	0.02	0.01	0.01	0.01	0.00	0.00	0.01	0.03	0.01
ROU	0.04	0.08	0.06	0.24	0.18	0.12	0.05	0.11	0.22	0.06	0.07
FVA from the EU	82.90	89.21	76.49	85.22	86.70	86.94	81.05	84.32	89.27	86.45	86.45

Table 1. Origin of VA in gross export in EU South- member states in 2011 (in %) (cont.)

	GRC	**ESP**	**PRT**	**IRL**
AUT	0.12	0.20	0.17	0.20
BEL	0.38	0.40	0.50	0.92
CZE	0.06	0.18	0.14	0.14
DNK	0.18	0.16	0.14	1.10
EST	0.01	0.01	0.01	0.04
FIN	0.06	0.13	0.08	0.16
FRA	0.70	2.33	2.03	1.45
DEU	1.39	2.71	3.12	2.79
GRC	**75.06**	0.08	0.08	0.09
HUN	0.05	0.13	0.08	0.11
IRL	0.14	0.27	0.31	**56.47**
ITA	1.14	1.47	1.59	1.04
LUX	0.05	0.07	0.09	0.45
NLD	0.39	0.47	0.49	4.43
POL	0.15	0.30	0.22	0.30
PRT	0.06	0.72	**67.42**	0.14
SVK	0.03	0.07	0.05	0.04
SVN	0.03	0.03	0.02	0.03
ESP	0.52	**73.21**	7.20	1.16
SWE	0.17	0.30	0.37	0.51
GBR	0.99	1.64	1.30	7.31
BGR	0.24	0.04	0.03	0.02
HRV	0.01	0.01	0.01	0.03

CYP	0.16	0.01	0.00	0.02
LVA	0.01	0.01	0.01	0.03
LTU	0.01	0.02	0.02	0.03
MLT	0.01	0.01	0.00	0.02
ROU	0.14	0.09	0.07	0.08
FVA from the EU	82.28	85.06	85.57	79.11

Source: Author's calculation based on TiVA Database.

Table 2. Origin of value-added in final demand in EU new member states in 2011 (in %)

	BLG	**HRV**	**CYP**	**CZE**	**EST**	**HUN**	**LVA**	**LTU**	**MLT**	**POL**	**ROU**	**SVK**	**SVN**
AUT	1.31	1.09	0.27	1.21	0.34	2.09	0.55	0.32	0.58	0.58	0.95	1.09	2.20
BEL	0.51	0.28	0.51	0.56	0.46	0.57	0.52	0.40	0.56	0.46	0.36	0.44	0.40
CZE	0.71	0.37	0.13	**61.24**	0.36	0.96	0.45	0.38	0.09	0.83	0.51	3.56	0.65
DNK	0.25	0.21	0.18	0.35	0.55	0.28	0.68	0.56	1.36	0.38	0.20	0.18	0.17
EST	0.01	0.01	0.05	0.01	**58.65**	0.01	1.73	1.04	0.02	0.02	0.01	0.01	0.01
FIN	0.11	0.12	0.10	0.14	3.90	0.16	1.38	1.21	0.07	0.26	0.09	0.11	0.10
FRA	1.46	1.05	1.65	1.40	1.32	1.56	1.50	1.10	1.69	1.49	1.77	1.47	1.57
DEU	4.95	3.74	2.67	8.15	5.12	7.99	4.55	4.01	3.99	5.62	4.13	5.10	5.84
GRC	2.19	0.09	5.90	0.16	0.12	0.09	0.12	0.18	0.22	0.13	0.37	0.09	0.20
HUN	0.90	0.45	0.10	0.61	0.23	**59.25**	0.26	0.19	0.08	0.35	1.25	1.09	0.65
IRL	0.33	0.16	0.22	0.33	0.28	0.39	0.31	0.22	0.38	0.24	0.16	0.19	0.29
ITA	3.22	3.31	2.18	1.96	1.40	1.98	1.89	1.72	5.45	1.85	3.02	1.74	4.65
LUX	0.07	0.08	0.30	0.11	0.09	0.13	0.13	0.08	0.35	0.09	0.05	0.10	0.13
NLD	0.56	0.40	0.67	0.67	0.72	0.99	0.67	0.95	0.56	0.68	0.51	0.45	0.43
POL	1.04	0.49	0.28	2.48	1.79	1.70	2.75	3.28	0.27	**68.81**	1.01	2.12	0.78
PRT	0.10	0.05	0.10	0.13	0.08	0.10	0.07	0.06	0.09	0.10	0.10	0.08	0.08
SVK	0.32	0.16	0.06	1.55	0.11	1.10	0.19	0.18	0.03	0.43	0.29	**58.62**	0.35
SVN	0.17	1.06	0.03	0.13	0.06	0.38	0.08	0.05	0.03	0.07	0.12	0.15	**60.81**
ESP	1.42	0.54	1.23	1.00	0.64	0.85	0.93	0.77	1.62	0.88	0.84	0.71	0.87
SWE	0.46	0.31	0.28	0.48	2.65	0.57	1.57	1.41	1.10	0.71	0.24	0.37	0.33
GBR	1.33	0.79	4.98	1.20	1.78	1.35	1.39	1.26	6.16	1.36	1.21	1.35	1.12
BLG	**58.00**	0.11	0.15	0.10	0.04	0.11	0.07	0.07	0.17	0.09	0.56	0.06	0.17
HRV	0.07	**70.88**	0.03	0.15	0.02	0.29	0.02	0.01	0.04	0.08	0.04	0.38	1.96
CYP	0.22	0.01	**61.86**	0.03	0.36	0.05	0.15	0.02	0.98	0.02	0.09	0.01	0.01
LVA	0.02	0.01	0.09	0.02	2.13	0.02	**61.24**	2.13	0.04	0.04	0.02	0.02	0.01
LTU	0.05	0.02	0.07	0.04	1.09	0.03	3.48	**64.55**	0.01	0.18	0.02	0.03	0.02
MLT	0.01	0.00	0.35	0.00	0.01	0.00	0.01	0.01	**59.44**	0.02	0.01	0.00	0.00
ROU	2.19	0.18	2.13	0.22	0.09	0.92	0.09	0.08	0.08	0.16	**70.39**	0.24	0.26
EU	**82.00**	**85.97**	**86.57**	**84.43**	**84.39**	**83.92**	**86.78**	**86.24**	**85.49**	**85.93**	**88.32**	**79.76**	**84.08**
EU - domesticc	24.00	15.09	24.71	23.19	25.74	24.67	25.54	21.69	26.04	17.12	17.93	21.14	23.27

Table 2. Origin of value-added in final demand in EU core-members in 2011 (in %) (cont.)

	GBR	**BEL**	**SVE**	**AUT**	**NLD**	**LUK**	**ITA**	**DEU**	**FRA**	**FIN**	**DNK**
AUT	0.20	0.27	0.33	**68.49**	0.33	0.63	0.46	1.02	0.21	0.26	0.24

BEL	0.49	**67.57**	0.53	0.35	1.32	4.32	0.43	0.56	0.78	0.50	0.43
CZE	0.20	0.23	0.25	0.79	0.12	0.41	0.21	0.57	0.19	0.22	0.20
DNK	0.33	0.24	1.71	0.16	0.19	0.68	0.15	0.32	0.13	0.77	**73.29**
EST	0.01	0.01	0.17	0.02	0.02	0.03	0.01	0.01	0.01	0.69	0.05
FIN	0.13	0.15	1.21	0.12	0.10	0.22	0.10	0.17	0.09	**70.90**	0.34
FRA	1.72	4.42	1.39	1.06	1.43	8.23	1.96	1.90	**77.35**	1.01	0.90
DEU	2.81	5.29	4.02	9.68	3.01	11.41	3.18	**73.49**	3.11	3.80	3.76
GRC	0.17	0.13	0.14	0.15	0.10	0.38	0.18	0.18	0.08	0.07	0.16
HUN	0.12	0.12	0.13	0.67	0.08	0.22	0.17	0.28	0.10	0.09	0.13
IRL	0.67	0.39	0.40	0.21	0.32	0.44	0.29	0.34	0.26	0.23	0.32
ITA	1.07	1.23	1.15	2.22	0.69	3.37	**76.44**	1.55	1.65	0.92	0.85
LUX	0.08	0.61	0.14	0.11	0.17	**41.20**	0.14	0.18	0.14	0.17	0.22
NLD	0.75	2.38	0.70	0.55	**77.98**	1.87	0.50	1.16	0.57	0.82	0.76
POL	0.42	0.37	0.72	0.70	0.32	0.78	0.42	0.89	0.35	0.53	0.57
PRT	0.17	0.15	0.10	0.10	0.08	0.40	0.12	0.14	0.23	0.09	0.11
SVK	0.07	0.06	0.11	0.45	0.03	0.15	0.11	0.17	0.08	0.07	0.06
SVN	0.02	0.04	0.04	0.32	0.02	0.08	0.13	0.09	0.04	0.02	0.03
ESP	1.25	1.11	0.90	0.72	0.92	1.73	1.15	1.03	1.53	0.77	0.83
SWE	0.43	0.50	**71.06**	0.39	0.32	0.87	0.27	0.44	0.34	3.29	2.32
GBR	**74.50**	2.06	2.08	0.88	2.40	3.17	1.06	1.61	1.39	1.54	2.12
BLG	0.03	0.05	0.03	0.09	0.01	0.04	0.08	0.06	0.04	0.02	0.06
HRV	0.02	0.04	0.05	0.35	0.04	0.06	0.09	0.08	0.02	0.02	0.03
CYP	0.05	0.01	0.02	0.01	0.02	0.04	0.01	0.03	0.00	0.01	0.02
LVA	0.02	0.02	0.12	0.03	0.02	0.02	0.01	0.02	0.01	0.14	0.08
LTU	0.03	0.03	0.11	0.04	0.04	0.02	0.02	0.04	0.03	0.12	0.08
MLT	0.02	0.00	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.01
ROU	0.09	0.11	0.07	0.25	0.08	0.11	0.25	0.18	0.14	0.05	0.04
EU	**85.88**	**87.59**	**87.71**	**88.92**	**90.14**	**80.88**	**87.94**	**86.53**	**88.86**	**87.14**	**88.01**
EU – domestic	11.39	20.02	16.65	20.43	12.16	39.68	11.51	13.04	11.51	16.23	14.72

Table 2. Origin of value-added in final demand in EU South- member states in 2011 (in %) (cont.)

	ESP	**PRT**	**IRL**	**GRC**
AUT	0.18	0.15	0.20	0.26
BEL	0.37	0.45	0.74	0.41
CZE	0.17	0.12	0.16	0.13
DNK	0.16	0.16	0.81	0.23
EST	0.01	0.00	0.03	0.01
FIN	0.12	0.07	0.14	0.09
FRA	2.33	2.14	1.79	1.19
DEU	2.59	2.83	2.74	2.30
GRC	0.07	0.07	0.13	**75.91**
HUN	0.13	0.08	0.11	0.11
IRL	0.32	0.31	**52.88**	0.19
ITA	1.51	1.53	1.16	1.99
LUX	0.09	0.12	0.48	0.07
NLD	0.54	0.56	3.86	0.57

POL	0.29	0.25	0.36	0.24
PRT	0.78	**71.01**	0.16	0.10
SVK	0.08	0.05	0.05	0.05
SVN	0.02	0.02	0.03	0.03
ESP	**75.54**	7.50	1.22	0.86
SWE	0.29	0.38	0.45	0.23
GBR	1.65	1.35	9.98	1.51
BLG	0.04	0.03	0.03	0.46
HRV	0.02	0.01	0.04	0.02
CYP	0.01	0.00	0.03	0.23
LVA	0.01	0.01	0.04	0.01
LTU	0.02	0.02	0.03	0.01
MLT	0.01	0.00	0.02	0.01
ROU	0.09	0.07	0.11	0.19
EU	87.43	89.26	77.77	87.41
EU-domestic	11.89	18.25	24.89	11.51

Source: Author's calculation based on TiVA Database.