

CHANGES OF PRIVATE CONSUMPTION PATTERNS IN ROMANIA AND THE EU: EVIDENCE BEFORE, DURING AND AFTER THE CRISIS

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Abstract

Private consumption as the main economic growth driver of countries is one of the main GDP components being also analyzed from the perspective of EU regions' convergence. It is thus important to study the consumption patterns of EU countries in order to reveal possible changing trends of households expenditure that directly influence the economic welfare of citizens at different periods in time. The purpose of the study is to analyze Romania's place between the EU countries regarding consumption patterns and how its position has evolved before, during and after the economic and financial crisis. In this regard the hierarchical clustering method was employed by using data for household final consumption expenditure and shares of consumption expenditure as defined by COICOP for the years 2008, 2009 and 2013. The results revealed an increasing divergence over time between EU members regarding most of the consumption categories and a persisting consumption pattern determined by high shares of expenditure on housing, food and transport mostly in south-eastern countries.

Keywords: Household Consumption, Consumption Categories, Consumption Patterns, EU, Cluster Analysis

INTRODUCTION

Household expenditure (private consumption) has a direct impact on the economic welfare of the people (Gerstberger & Yaneva, 2013; Piekut, 2015) and the structure of private consumption represents a relative measure that characterizes the households' standard of living (Kollarova & Vladova, 2009). But the economic or material welfare improves when the

household consumption is comprised of more expenditure on services like education, health, culture, recreation as opposed to those costs on basic needs like food and housing.

Differences between consumption patterns between countries in EU still exist even though this macro-indicator is one of the main variables used in the analysis for EU regions' convergence. Apart from this aspect one cannot deny the positive changes that the accession to EU brings to a country's economy. Taking this into account and also the fact that Romania is one of the latest EU members with its development largely dependent on the evolution of the EU economy (Stoiciu, 2012), it is necessary to analyze the consumption trends of it and of the other EU countries before, during and after the economic and financial crisis in order to reveal common patterns and consumption profiles.

In spite of the major importance of household consumption and its categories, country-specific consumption patterns studies are quite limited and have not received much attention even though there still exists discrepancies in the consumption behaviour between the EU countries as well as cyclical asymmetries in the euro area as Clausen and Schurenberg-Frosch (2012) revealed in their paper.

Studying the evolution of consumption structure in EU-27 Gerstberger and Yaneva (2013) found that the shares of household final expenditure devoted to housing and energy have increased, while the ones for furniture and maintenance were most affected by the crisis with the impact of the crisis greatest in the Baltic countries and Greece.

By using cluster analysis methods like Ward and k-means to classify EU member states according to their level and structure of household consumption for the periods 2000-2012 and 2011, Piekut (2015) revealed that over the first period Romania and Slovakia have registered the greatest rate of change in the actual individual consumption per capita, with an average annually increase of 10%. The cluster analysis regarding the shares of consumption categories in 2011 by using a panel of 24 EU countries (without Bulgaria, Romania, Lithuania and Croatia due to the lack of data) showed that in comparison with previous studies of the author the expenditure share on food and non-alcoholic beverages has decreased while the one on secondary goods such as recreation and culture, catering and hotel services has increased. The study concludes that there is not yet a common model of consumption in the EU countries due to significant differences both in the levels and the structures of household expenditure, the discrepancies being accentuated during the economic crisis (Piekut, 2015).

Another study that used the clustering procedure depending on household expenditure was the one by Polesel (2012) in which he classified all 39 European countries by food consumption (average daily per capita calorie – Kcal) for the years 1961, 1991 and 2009 with the results indicating a small homogenisation across the countries and decreasing differences

between the average clusters' diet and the European mean diet regarding food consumption. Across the periods analyzed Romania was placed in the cluster with the other central or eastern European countries being described as having a more varied diet, becoming less dependent on cereals (Polesel, 2012).

A recent and relevant paper that examines consumption patterns in EU belongs to Panagiotis (2009) in which he analyzes the structure of consumption in EU with an emphasis on Greece and also examines the convergence hypothesis of consumption expenditure. The analysis covered the period 1993-2007 with data for 15 EU countries referring to the twelve shares of household consumption defined by COICOP and comparing with the 12 euro zone members and a group of 4 Mediterranean countries. Using specific convergence indexes and econometric analysis the paper showed that most of consumption shares tend to converge across EU and the euro zone with an increased homogeneity in the case of Mediterranean countries. Another study to sustain this result is the one by Konya and Ohashiz (2007) which revealed the relative convergence of consumption patterns of eight categories of goods in 22 OECD countries during the period 1985-1999.

Nevertheless a previous work by Fiaschi and Lavezzi (2005) regarding this subject concludes that household consumption per capita in EU does not converge as the variation in values has increased between the periods 1977-1985 and 1986-1998.

Concerning the case of Romania a study by Iordan and Chilian (2013) using data for private consumption and its consumption categories for the period 2003-2011 revealed that Romanian total consumption expenditure registered a significant increase compared to the EU average but similar with those recorded by other new EU countries. Nevertheless, the analysis of consumption categories of Romania's households compared to EU averages ranked it on the lowest or second lowest place "indicating the presence of a rather <<quasi-subsistence consumption>> behavior" (Iordan & Chilian, 2013).

The hypothesis that the main part of Romania's private consumption is generally spent on basic needs such as "food and non-alcoholic beverages" and "housing, water, electricity, gas and other fuels" is reinforced by the work of Dudek (2014) in which the analysis performed over the period 2004-2012 for EU-27 (without Croatia) also revealed that during the time span a decrease of differences in the household consumption behaviour took place by the reduction in the variance of food and housing shares at EU-27 level.

The questions the study is trying to answer are the following:

In what group of EU countries do Romania stands in terms of household final consumption expenditure?

Is there any change in Romania's position before, during and after the crisis? What are the consumption patterns of Romania and the other EU countries and how is described the group profile that includes it?

Is there more homogeneity or heterogeneity between and across the clusters over time?

METHODOLOGY

In order to reveal the household consumption profiles of EU countries from a general picture to a more detailed one we used in the study the variables Household Final Consumption Expenditure in per capita constant 2005 US \$ (HFCE 2005), Household Final Consumption Expenditure in PPP constant 2011 international \$ (HFCE PPP) both retrieved from World Bank Database and the shares (%) of HFCE by consumption purpose as they are defined by COICOP, taken from Eurostat Database.

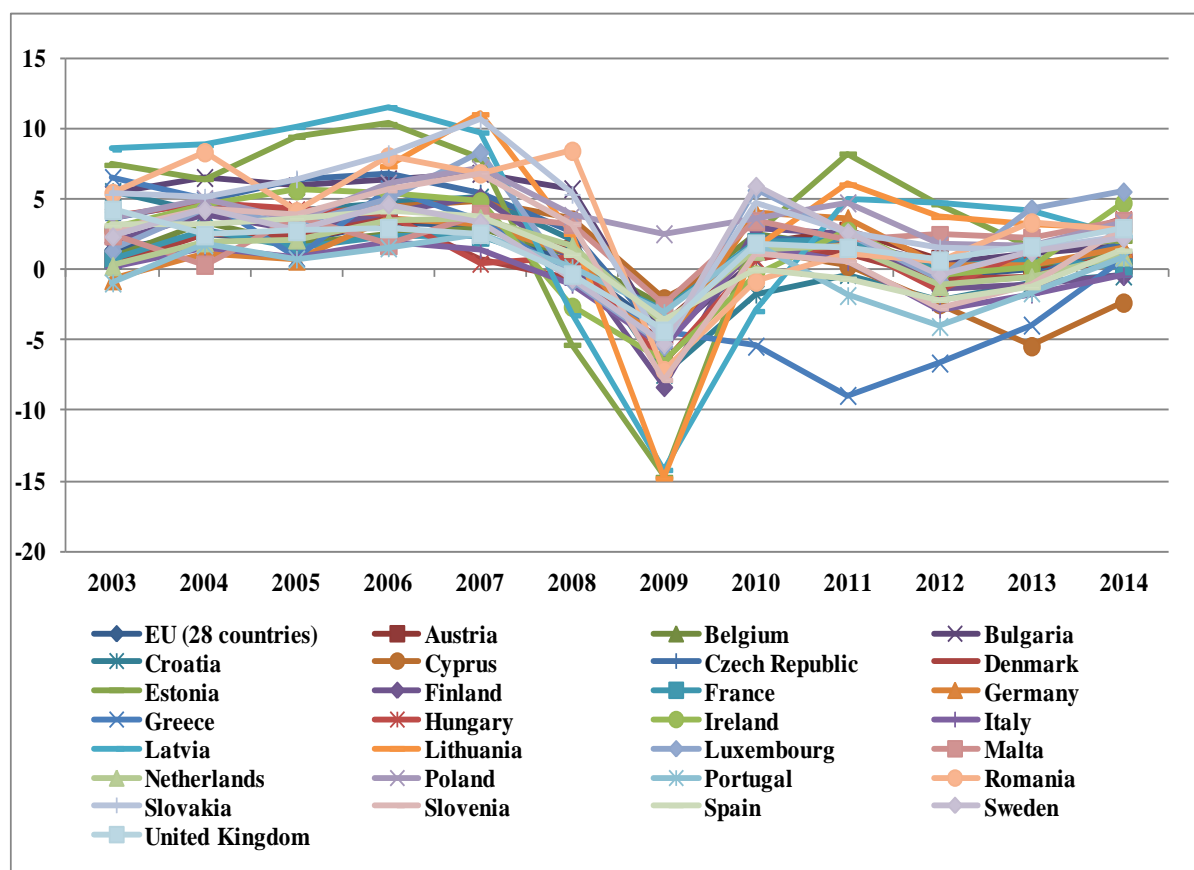
HFCE is defined as the households expenditure on purchasing goods and services in order to directly meet the individual needs of resident households members, government expenditure for individual consumption (education, health, social security, and welfare, culture, sport, recreation, collection of households refuse) and non-profit institutions serving households expenditure for individual consumption. Data of HFCE 2005 are in per capita (World Bank population estimates) constant 2005 U.S. dollars and data of HFCE PPP are converted to constant 2011 international dollars using purchasing power parity rates.

The shares of household consumption as defined by COICOP are comprising twelve categories : "food and non-alcoholic beverages", "alcoholic beverages, tobacco and narcotics", "clothing and footwear", "housing, water, electricity, gas and other fuels", "furnishings, household equipment and routine household maintenance", "health", "transport", "communications", "recreation and culture", "education", "restaurants and hotels", "miscellaneous goods and services".

The data covers annual values of household consumption in aggregates (HFCE 2005 and HFCE PPP) and shares of consumption by purpose (%) in EU countries for the years 2008, 2009 and 2013 representing the period before, during and after the economic and financial crisis. The year 2008 was chosen as the before-crisis period because in most of EU countries 2008 was the peak of economic growth in the last decade and also the last year before the economic consequences of the crisis occurred in 2009, the crisis-period when GDP had registered a drop of 4.6% and of 4.4% in the growth rate at EU-27 level (Gerstberger & Yaneva,

2013) and at EU-28 level respectively, as can be seen in Figure 1.. Due to data unavailability, the after-the-crisis period was taken to be 2013 as this is the last year with available data for the indicators of consumption when most of the EU countries recovered from the crisis and registered general positive growth of GDP (Figure 1.).

Figure 1: Real GDP growth rate % (t/t-1) on the period 2003-2014



Data source: Eurostat

For comparable results Malta was excluded from the clustering analysis by level of HFCE due to data unavailability between 2011-2013, remaining with EU-27. Also, regarding the shares of consumption categories in HFCE, the data for Netherlands was missing for 2008 and 2009 and the data for Croatia was unavailable for all of the years and thus these two countries were excluded from the clustering analysis concerning this indicator remaining with EU-26. As the values for the three indicators used in the clustering analysis for Romania were missing for 2013, the value of 2012 was used in all clusters for the after-the-crisis period as the data for the last years 2010-2012 were very similar.

The methodology used for answering the main questions of the study concerning the consumption profiles of EU countries with an emphasis on Romania was the hierarchical clustering analysis (HCA). HCA is an exploratory tool designed to reveal natural groupings (or clusters) within a data set that would otherwise not be apparent. This procedure is the most appropriate between clustering methods in the present study due to the relatively small number (less than a few hundred) of cases included (SPSS Case studies).

HCA starts by separating each case into a cluster by itself. At each stage of the analysis, the criterion by which cases are separated is relaxed in order to link the two most similar clusters until all of the cases are joined in a complete classification tree (SPSS Case studies).

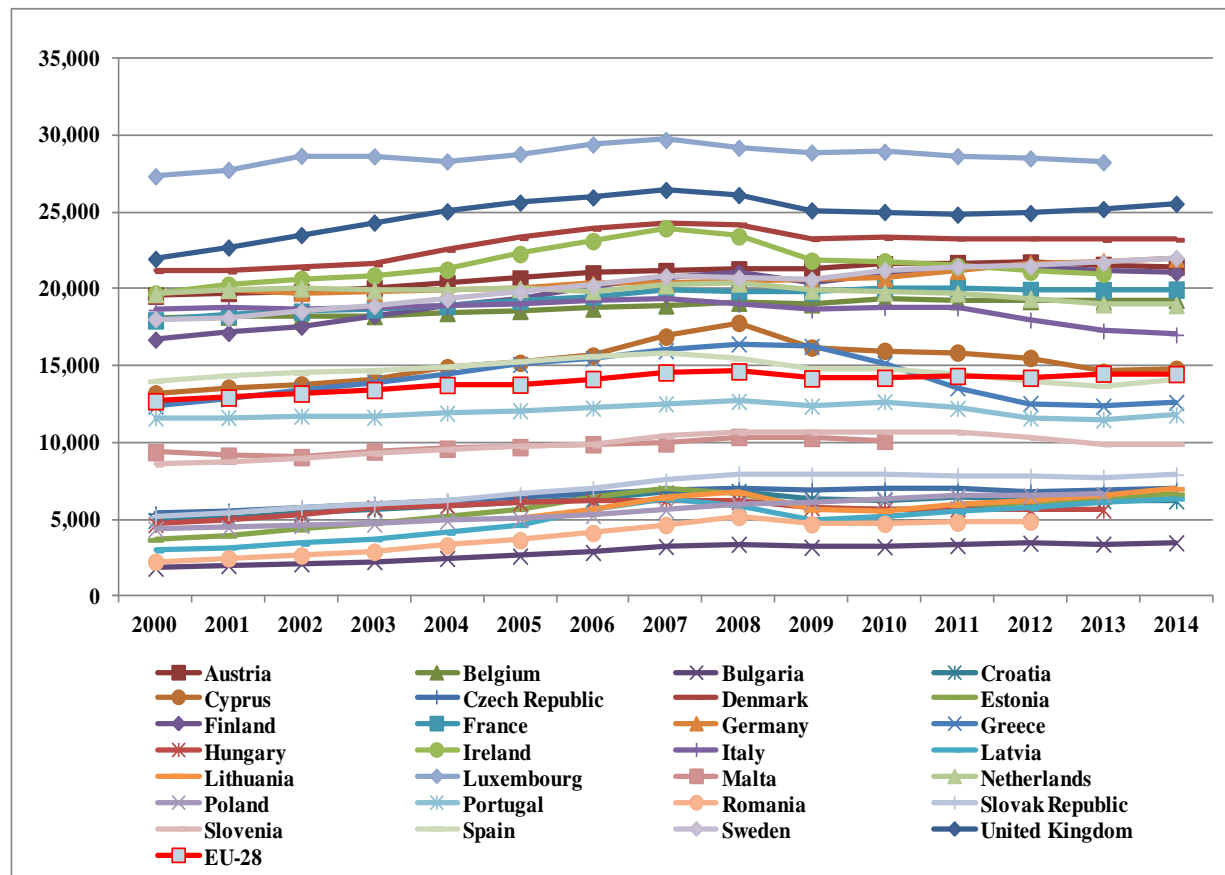
For the HCA the Ward method was chosen by using the Squared Euclidean Distance as it is generally applied in these cases (Piekut, 2015; Polese, 2012).

Moreover, to analyze the relative homogeneity of clusters obtained and to compare their average values to the EU mean, we computed the average values, standard deviation (Std. Dev.), coefficient of variation (CV) and the average differences to EU mean (computed as : $((\text{average value of cluster category} - \text{average EU}) / \text{average EU}) * 100$). All the procedures were computed with SPSS software version 17.0.

EMPIRICAL RESULTS AND DISCUSSION

In the last 15 years household consumption in EU countries had a relatively steady path with a slowly but sustained general growth during the period 2000-2008 (Figure 2.) followed soon after by a drop in the level of per capita private consumption as a result of the economic consequences of the crisis that began to be felt in 2009 in most of the member states. One of the EU states who took the harshest anti-crisis measures was Romania whose government decided in June 2010 to cut the wages of public employees by 25 per cent and social security benefits by 15 per cent, while VAT was increased by 5 percentage points from 19 to 24 per cent (Stoiciu). Nevertheless due to the measures taken by the governments of EU countries most of the economies have started to recover very hard but noticeable in terms of consumption reaching in 2014 a level slightly above the one recorded in 2000 as can be observed from Figure 2. During the whole period analyzed the lowest positions in terms of per capita private consumption are held by Bulgaria followed by Romania while the highest levels of this indicator are registered by United Kingdom and Luxembourg.

Figure 2: Household final consumption expenditure per capita constant 2005 US\$
in the period 2000-2014



In order to observe the evolution of trends in the level of household consumption we applied hierarchical clustering on EU-27 countries (without Malta due to lack of necessary data) for the three periods considered (2008, 2009 and 2013) and classified the member states first by HFCE in PPP constant 2011 international \$ and then by HFCE in constant 2005 US\$.

The results obtained from the first cluster analysis are presented in Table 1 and divides the EU-27 in two groups that almost do not change over time, one cluster consisting of the four main western countries France, Germany, Italy, Spain and United Kingdom (UK) with the rest of the EU states being merged into the other cluster. Across time the western countries cluster maintains its homogeneity having a low coefficient of variation (CV) and is characterized by average values higher than the EU-27 mean while the other cluster that groups the rest of the member states is heterogenous with increasing values for CV and lower values of mean household consumption compared to EU average (Table 3.).

Table 1: Clusters grouped by HFCE in PPP constant 2011 international \$

Cluster	2008	2009	2013
I	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania , Slovak Republic, Slovenia, Sweden	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania , Slovak Republic, Slovenia, Sweden	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania , Slovak Republic, Slovenia, Spain, Sweden
II	France, Germany, Italy, Spain, United Kingdom	France, Germany, Italy, Spain, United Kingdom	France, Germany, Italy, United Kingdom

When classifying the countries by HFCE in per capita constant 2005 US\$ the method groups three clusters that remain relatively with the same composition over the years, however very mixed as can be seen in Table 2. Cluster I consists of a mix between all of the regions of EU in which Romania is also included, the second cluster is mainly comprised by south-eastern and northern countries and cluster III is mainly a mix between Mediterranean countries and other western ones (Table 2).

Table 2: Clusters grouped by HFCE in per capita constant 2005 US\$

Cluster	2008	2009	2013
I	Austria, Belgium, Cyprus, Denmark, Finland, Greece, Hungary, Lithuania, Luxembourg, Portugal, Romania , Spain, United Kingdom	Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Sweden, United Kingdom	Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Sweden, United Kingdom
II	Bulgaria, Croatia, Czech Republic, Estonia, Latvia, Netherlands, Poland, Slovak Republic , Sweden, France	Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic	Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic
III	Ireland, Slovenia, Germany, Italy	Greece, Portugal, Slovenia, Spain	Cyprus, Greece, Portugal, Slovenia, Spain

If in 2008 the resulted clusters were more a mix of different European regions, during and after the economic crisis the three groups became more geographically homogenous with Romania included in the second cluster of south-eastern countries (Table 2). Regarding the groups' profiles we can notice a reduction of CV for all of the clusters over time as they became more

convergent and having very different average values compared to the EU-27 mean (Table 3.). If in 2008 only Cluster III had an average value of HFCE 2005 high above the European one, during and after the crisis Cluster I was the only one to have positive values for the average difference compared to EU-27 (Table 3.) meaning that this group of countries is characterized by a higher level of economic welfare yielded by private consumption than the other two clusters.

Table 3: Differences between clusters over time periods 2008, 2009 and 2013

HFCE PPP 2011 international \$	Cluster I	Cluster II	HFCE constant 2005 US\$	Cluster I	Cluster II	Cluster III
Average	1.31094E+11	1.30264E+12	Mean	14624.22	12408.82	21379.20
Std. Dev.	1.12496E+11	3.38239E+11	Std. Dev.	8358.12	6936.78	3220.78
CV	0.86	0.26	CV	0.57	0.56	0.15
2008 EU-27 average	3.48047E+11		EU-27 average	14804.44		
Av. diff. to EU-27	-62.33	274.27	Av. diff. to EU-27	-1.22	-16.18	44.41
Average	1.28309E+11	1.28477E+12	Mean	21620.17	5726.44	14047.34
Std. Dev.	1.14178E+11	3.47169E+11	Std. Dev.	2915.65	1286.43	2478.53
CV	0.89	0.27	CV	0.13	0.22	0.18
2009 EU-27 average	3.42468E+11		EU-27 average	14331.23		
Av. diff. to EU-27	-62.53	275.15	Av. diff. to EU-27	50.86	-60.04	-1.98
Average	1.55452E+11	1.42495E+12	Mean	21615.05	6040.12	12413.88
Std. Dev.	1.74325E+11	3.10601E+11	Std. Dev.	2932.13	1197.74	1850.36
CV	1.12	0.22	CV	0.14	0.20	0.15
2013 EU-27 average	3.43526E+11		EU-27 average	14142.64		
Av. diff. to EU-27	-54.75	314.80	Av. diff. to EU-27	52.84	-57.29	-12.22

Consumption Structure Patterns: A Cross Section Analysis

More important than classifying the EU countries by HFCE in level is to group them by using the shares of consumption by purpose (%) which are comprised by 12 categories as can be seen in Table 4.. Looking first at the CVs of the consumption categories of EU-26 (without Croatia and Netherlands due to lack of necessary data) it can be noticed that over time the variation has increased for the majority of categories. The consumption categories that exhibit high variation

are “alcoholic beverages, tobacco and narcotics”, “education” and “restaurants and hotels” while the most homogenous ones are related to “housing, water, electricity, gas and other fuels”, “furnishings, household equipment and routine household maintenance” and “transport” with the values presented in Table 4.

Table 4: Variation between consumption categories

Consumption categories	CV		
	2008	2009	2013
Food and non-alcoholic beverages	0.31	0.31	0.31
Alcoholic beverages, tobacco and narcotics	0.33	0.36	0.35
Clothing and footwear	0.20	0.20	0.22
Housing, water, electricity, gas and other fuels	0.18	0.17	0.18
Furnishings, household equipment and routine household maintenance	0.15	0.17	0.20
Health	0.23	0.24	0.27
Transport	0.17	0.16	0.17
Communications	0.26	0.25	0.28
Recreation and culture	0.23	0.23	0.20
Education	0.52	0.57	0.59
Restaurants and hotels	0.44	0.45	0.51
Miscellaneous goods and services	0.25	0.26	0.27

The cluster analysis by consumption purpose resulted in a solution with three groups that varied slightly in composition before, during and after the crisis as can be observed in Table 5.. For 2008 cluster I was mainly composed of central-west and northern countries, cluster II included south-eastern and some northern member states and cluster III generally consisted of Mediterranean countries. During the crisis the composition of the three groups became more regionally homogenous with changes in cluster II to which Latvia (cluster I) and Slovenia (cluster III) have been added and in cluster III where Ireland (cluster I) has been included. For 2013 cluster II became cluster III to which Portugal was added and cluster I has been divided between a first group consisting of Austria, Cyprus, Greece, Ireland, Italy, Luxembourg, Malta, Spain and UK and the another group composed of Belgium, Czech Republic, Denmark, Finland, France, Germany, Slovakia and Sweden (Table 5).

Table 5: Cluster grouped by consumption purpose

Cluster	2008	2009	2013
I	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Latvia, Luxembourg, Slovakia, Sweden, United Kingdom	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Luxembourg, Slovakia, Sweden, United Kingdom	Austria, Cyprus, Greece, Ireland, Italy, Luxembourg, Malta, Spain, United Kingdom
II	Bulgaria, Estonia, Hungary, Lithuania, Poland, Romania	Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania , Slovenia	Belgium, Czech Republic, Denmark, Finland, France, Germany, Slovakia, Sweden
III	Cyprus, Greece, Italy, Malta, Portugal, Spain , Slovenia	Cyprus, Greece, Italy, Malta, Portugal, Spain , Ireland	Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Portugal, Romania , Slovenia

Consumption Profiles in 2008

In 2008 the cluster analysis resulted in three clusters of which the first one was comprised of the central-west and northern countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Latvia, Luxembourg, Slovakia, Sweden, and UK. These members share a consumption profile that is mainly based on expenditure related to food, housing and transport with generally lower average values compared to EU-26 means except for the expenditure on housing, recreation and culture (Table 6.).

Table 6: Differences between average values of consumption categories in cluster I (2008)

Consumption categories	Cluster I				
	Average	Std. Dev.	CV	EU-26 average	Av. diff. I-EU-26
Food and non-alcoholic beverages	12.31	3.08	0.25	15.04	-18.16
Alcoholic beverages, tobacco and narcotics	4.88	1.82	0.37	5.14	-5.16
Clothing and footwear	4.78	0.52	0.11	4.94	-3.35
Housing, water, electricity, gas and other fuels	24.12	1.85	0.08	21.17	13.94
Furnishings, household equipment and routine household maintenance	5.73	0.79	0.14	5.67	1.09
Health	3.46	1.01	0.29	3.66	-5.46
Transport	12.62	2.44	0.19	13.29	-5.09
Communications	2.73	0.61	0.22	3.02	-9.44
Recreation and culture	9.92	1.73	0.17	8.73	13.71
Education	0.95	0.59	0.62	1.14	-16.22
Restaurants and hotels	7.37	2.46	0.33	7.98	-7.71
Miscellaneous goods and services	11.16	2.38	0.21	10.23	9.14

Cluster II includes the countries Bulgaria, Estonia, Hungary, Lithuania, Poland and Romania and exhibits a higher consumption for food, housing and transport like for cluster I but with higher average values for food and alcoholic beverages, tobacco and narcotics and with the lowest average values for expenditure on restaurants and hotels and miscellaneous goods and services compared to EU-26 means (Table 7).

Table 7: Differences between average values of consumption categories in cluster II (2008)

Consumption categories	Cluster II				
	Average	Std. Dev.	CV	EU-26 average	Av. diff. II-EU-26
Food and non-alcoholic beverages	21.47	3.92	0.18	15.04	42.75
Alcoholic beverages, tobacco and narcotics	6.72	1.13	0.17	5.14	30.62
Clothing and footwear	4.55	1.62	0.36	4.94	-7.94
Housing, water, electricity, gas and other fuels	19.00	2.49	0.13	21.17	-10.23
Furnishings, household equipment and routine household maintenance	5.20	0.75	0.14	5.67	-8.28
Health	3.82	0.60	0.16	3.66	4.24
Transport	14.48	2.04	0.14	13.29	8.96
Communications	3.40	1.23	0.36	3.02	12.76
Recreation and culture	7.22	1.15	0.16	8.73	-17.31
Education	1.13	0.52	0.46	1.14	-0.45
Restaurants and hotels	4.93	1.70	0.34	7.98	-38.21
Miscellaneous goods and services	8.07	3.13	0.39	10.23	-21.12

Cluster III is generally composed of the Mediterranean countries : Cyprus, Greece, Italy, Malta, Slovenia and Spain with the addition of Portugal mainly characterized by consumption spent on food, housing, transport, restaurants and hotels and to miscellaneous goods and services presenting average values above the EU-26 means for the categories education and restaurants and hotels while having lower average values than the EU-26 means for alcoholic beverages, tobacco and narcotics and for housing (Table 8).

Table 8: Differences between average values of consumption categories in cluster III (2008)

Consumption categories	Cluster III				
	Average	Std. Dev.	CV	EU-26 average	Av. diff. III-EU-26
Food and non-alcoholic beverages	14.60	1.73	0.12	15.04	-2.92
Alcoholic beverages, tobacco and narcotics	4.29	0.80	0.19	5.14	-16.66
Clothing and footwear	5.59	0.80	0.14	4.94	13.02
Housing, water, electricity, gas and other fuels	17.54	3.51	0.20	21.17	-17.12
Furnishings, household equipment and routine household maintenance	5.96	1.04	0.18	5.67	5.08
Health	3.90	0.59	0.15	3.66	6.51
Transport	13.53	1.54	0.11	13.29	1.78
Communications	3.21	0.50	0.16	3.02	6.60
Recreation and culture	7.80	1.99	0.26	8.73	-10.62
Education	1.49	0.57	0.39	1.14	30.50
Restaurants and hotels	11.74	3.15	0.27	7.98	47.07
Miscellaneous goods and services	10.34	1.50	0.14	10.23	1.13

Consumption Profiles in 2009

In 2009 the clustering procedure created three groups more geographically relevant with cluster I made mostly of the same countries which formed the one in 2008: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Luxembourg, Slovakia, Sweden and UK. This cluster has a consumption model based mainly on food, housing and transport even though the average value for food category is rather below the EU-26 mean as well as the one for education. On the other side the categories that present higher average values compared to the EU-26 ones are recreation and culture and miscellaneous goods and services as can be noticed in Table 9.

Table 9: Differences between average values of consumption categories in cluster I (2009)

Consumption categories	Cluster I				
	Average	Std. Dev.	CV	EU-26 average	Av. diff. III-EU-26
Food and non-alcoholic beverages	12.09	2.41	0.20	15.05	-19.68
Alcoholic beverages, tobacco and narcotics	4.76	1.88	0.39	5.48	-13.02
Clothing and footwear	4.75	0.64	0.14	4.86	-2.39
Housing, water, electricity, gas and other fuels	24.99	2.11	0.08	22.30	12.07
Furnishings, household equipment and routine household maintenance	5.79	0.68	0.12	5.51	5.07
Health	3.57	1.17	0.33	3.83	-6.64
Transport	12.07	2.45	0.20	12.39	-2.55
Communications	2.66	0.65	0.24	3.08	-13.43
Recreation and culture	10.13	1.43	0.14	8.50	19.20
Education	0.79	0.42	0.53	1.22	-35.13
Restaurants and hotels	6.97	2.04	0.29	8.03	-13.22
Miscellaneous goods and services	11.40	1.75	0.15	9.76	16.83

The second cluster is composed of the same countries from cluster II in 2008 namely Bulgaria, Estonia, Hungary, Lithuania, Poland and Romania to which Latvia (formerly cluster I in 2008) and Slovenia (formerly cluster III in 2008) have been added. This cluster's consumption is described by high average values for the items food, housing and transport with positive average differences to EU-26 for food and alcoholic beverages, tobacco and narcotics and with lower mean values compared to EU-26 averages for categories related to restaurants and hotels and miscellaneous goods and services (Table 10).

Table 10: Differences between average values of consumption categories in cluster II (2009)

Consumption categories	Cluster II				
	Average	Std. Dev.	CV	EU-26 average	Av. diff. III-EU-26
Food and non-alcoholic beverages	20.15	4.20	0.21	15.05	33.85
Alcoholic beverages, tobacco and narcotics	7.24	1.64	0.23	5.48	32.15
Clothing and footwear	4.53	1.34	0.30	4.86	-6.92
Housing, water, electricity, gas and other fuels	21.40	2.95	0.14	22.30	-4.04
Furnishings, household equipment and routine household maintenance	4.91	1.06	0.22	5.51	-10.87
Health	3.86	0.64	0.16	3.83	0.93
Transport	13.05	2.24	0.17	12.39	5.34
Communications	3.50	0.96	0.27	3.08	13.75
Recreation and culture	7.30	1.31	0.18	8.50	-14.08
Education	1.21	0.41	0.34	1.22	-0.55
Restaurants and hotels	5.24	1.62	0.31	8.03	-34.81
Miscellaneous goods and services	7.63	2.74	0.36	9.76	-21.86

Cluster III remained the same as the last cluster from 2008 made of Cyprus, Greece, Italy, Malta, Portugal, Spain to which it was included Ireland (formerly cluster I in 2008). Like the preceding clusters the consumption pattern of this group is mainly represented by higher shares for expenditure on food, housing and transport but with mean values below the EU-26 averages for categories regarding alcoholic beverages, tobacco and narcotics and housing while presenting quite high average values compared to EU-26 means for education and restaurants and hotels. Even though it has a high average difference compared to EU-26 the education share exhibits high heterogeneity meaning that high variation exists between the member states regarding this category (Table 11).

Table 11: Differences between average values of consumption categories in cluster III (2009)

Consumption categories	Cluster III				
	Average	Std. Dev.	CV	EU-26 average	Av. diff. III-EU-26
Food and non-alcoholic beverages	13.89	2.52	0.18	15.05	-7.76
Alcoholic beverages, tobacco and narcotics	4.59	1.19	0.26	5.48	-16.27
Clothing and footwear	5.43	0.88	0.16	4.86	11.66
Housing, water, electricity, gas and other fuels	19.10	3.82	0.20	22.30	-14.35
Furnishings, household equipment and routine household maintenance	5.76	0.98	0.17	5.51	4.46
Health	4.19	0.71	0.17	3.83	9.38
Transport	12.13	0.72	0.06	12.39	-2.10
Communications	3.24	0.43	0.13	3.08	5.39
Recreation and culture	7.30	1.59	0.22	8.50	-14.08
Education	1.90	0.80	0.42	1.22	55.84
Restaurants and hotels	12.90	2.34	0.18	8.03	60.56
Miscellaneous goods and services	9.61	1.30	0.14	9.76	-1.47

Consumption Profiles in 2013

The period after the crisis brought some changes in the cluster division. Thus formerly cluster I in 2009 partitioned in two and the first cluster in 2013 was comprised of countries Austria, Cyprus, Greece, Ireland, Italy, Luxembourg, Malta, Spain and UK. This mixed group is showing high mean shares for consumption of food, housing, transport and restaurants and hotels with a low mean difference compared to EU-26 average for category of food but with higher mean ones for education and restaurants and hotels. Like the last cluster in 2009 the category regarding education appears to have high variation between the countries included in this group (Table 12).

Table 12: Differences between average values of consumption categories in cluster I (2013)

Consumption categories	Cluster I				
	Average	Std. Dev.	CV	EU-26 average	Av. diff. III-EU-26
Food and non-alcoholic beverages	12.34	2.71	0.22	15.35	-19.58
Alcoholic beverages, tobacco and narcotics	4.93	1.56	0.32	5.49	-10.11
Clothing and footwear	4.79	0.91	0.19	4.60	4.11
Housing, water, electricity, gas and other fuels	21.63	4.31	0.20	22.61	-4.33
Furnishings, household equipment and routine household maintenance	5.23	1.24	0.24	5.16	1.47
Health	3.66	1.14	0.31	4.06	-9.91
Transport	12.46	2.11	0.17	12.39	0.54
Communications	2.66	0.69	0.26	2.94	-9.75
Recreation and culture	7.94	2.00	0.25	8.29	-4.20
Education	1.77	0.83	0.47	1.27	39.19
Restaurants and hotels	12.86	3.51	0.27	8.32	54.53
Miscellaneous goods and services	9.73	1.94	0.20	9.52	2.29

The second cluster in 2013 consists of members Belgium, Czech Republic, Denmark, Finland, France, Germany, Slovakia and Sweden which are also mainly characterized by consumption of food, housing, transport and miscellaneous goods and services with a higher average value than EU-26 mean for housing and recreation and culture and with quite low mean difference values compared to EU-26 in what regards categories of education and restaurants and hotels. Once again the category of education share reveals a high value of CV indicating high variation between the countries that belong to this cluster as it is noted in Table 13. probably due to the differences in consumption for education in the western and northern countries compared to eastern ones.

Table 13: Differences between average values of consumption categories in cluster II (2013)

Consumption categories	Cluster II				
	Average	Std. Dev.	CV	EU-26 average	Av. diff. III-EU-26
Food and non-alcoholic beverages	13.30	2.34	0.18	15.35	-13.36
Alcoholic beverages, tobacco and narcotics	4.55	1.66	0.36	5.49	-17.10
Clothing and footwear	4.28	0.61	0.14	4.60	-7.07
Housing, water, electricity, gas and other fuels	26.69	1.67	0.06	22.61	18.03
Furnishings, household equipment and routine household maintenance	5.48	0.64	0.12	5.16	6.15
Health	4.08	1.17	0.29	4.06	0.43
Transport	11.40	2.12	0.19	12.39	-7.98
Communications	2.69	0.49	0.18	2.94	-8.66
Recreation and culture	9.73	1.17	0.12	8.29	17.28
Education	0.73	0.42	0.57	1.27	-42.88
Restaurants and hotels	6.11	0.93	0.15	8.32	-26.53
Miscellaneous goods and services	10.96	1.49	0.14	9.52	15.21

The last cluster in 2013 is the formerly cluster II from 2009 composed of the south-eastern EU members Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia to which Portugal was added. This group has high average values for consumption of food, housing and transport with high average differences to EU-26 for food and alcoholic beverages, tobacco and narcotics and lower mean values compared to the EU-26 ones for restaurants and hotels and miscellaneous goods and services. Although homogenous as a regional group compared to the other clusters obtained this cluster exhibits high values for CV of education, restaurants and hotels and miscellaneous goods and services categories as it is presented in Table 14..

Table 14: Differences between average values of consumption categories in cluster III (2013)

Consumption categories	Cluster III				
	Average	Std. Dev.	CV	EU-26 average	Av. diff. III-EU-26
Food and non-alcoholic beverages	20.18	4.25	0.21	15.35	31.45
Alcoholic beverages, tobacco and narcotics	6.88	1.86	0.27	5.49	25.31
Clothing and footwear	4.70	1.35	0.29	4.60	2.17
Housing, water, electricity, gas and other fuels	19.97	2.27	0.11	22.61	-11.70
Furnishings, household equipment and routine household maintenance	4.80	1.05	0.22	5.16	-6.94
Health	4.44	0.97	0.22	4.06	9.53
Transport	13.20	1.78	0.14	12.39	6.55
Communications	3.46	0.97	0.28	2.94	17.44
Recreation and culture	7.37	0.77	0.10	8.29	-11.16
Education	1.26	0.59	0.47	1.27	-1.08
Restaurants and hotels	5.74	2.70	0.47	8.32	-30.95
Miscellaneous goods and services	8.01	3.08	0.38	9.52	-15.81

CONCLUSION

The consumption structure of EU-26 has increased in variation over time for the majority of categories, except for the one related to recreation and culture that has decreased and the one related to food that remained constant over the periods as can be noticed in Table 4. Moreover there are not changes before, during and after the crisis regarding the categories with high variation and those with low variation. The consumption categories indicating high CVs are alcoholic beverages, tobacco and narcotics, education and restaurants and hotels while the most homogenous ones are referring to consumption for housing, furnishings and household maintenance and transport (Table 4) indicating an increased convergence concerning consumption for basic needs as it was to be expected but with persisting heterogeneity relating to expenditure on alcohol and other narcotics, education and restaurants and hotels.

Comparing the clusters classified by consumption items, the ones in 2008 and 2009 differ slightly in country composition and consumption patterns. Thus all three groups of clusters before and during the crisis are defined by a high average share of consumption on food, housing and transport with the difference that the last cluster of both years, which is mainly composed of Mediterranean countries, has also significant average shares of consumption

related to restaurants and hotels and miscellaneous goods and services. In what regards the average differences to EU-26 means corresponding clusters of 2008 and 2009 share the same items as follows: cluster I 2008 and cluster I 2009 have average values for food category rather below the EU-26 mean as well as the one for education while the categories that present higher average values compared to the EU-26 ones are recreation and culture and miscellaneous goods and services; cluster II 2008 and cluster II 2009 are characterized by above average differences to EU-26 for food and alcoholic beverages, tobacco and narcotics and by lower mean values compared to EU-26 averages for categories related to restaurants and hotels and miscellaneous goods and services; and cluster III 2008 and cluster III 2009 are presenting mean values below the EU-26 averages for categories regarding alcoholic beverages, tobacco and narcotics and housing while having quite high average values compared to EU-26 means for education and restaurants and hotels. Regarding all the three clusters obtained in 2013 they exhibit quite low average differences to EU-26 means in case of recreation and culture with cluster I and II showing lower average values compared to EU-26 means also for education category.

Concerning the variation across categories and over time it can be noticed that all the country clusters obtained before, during and after the crisis are characterized by a high heterogeneity related to consumption share for education category. Even though the groups of countries became more regionally relevant in 2013 compared to 2008 they remained heterogenous in terms of consumption share for education.

Regarding the level of per capita HFCE Romania is slightly above Bulgaria but still remains on one of the lowest places between EU countries related to this indicator as also noted Jordan & Chilian (2013).

The group of south-eastern EU countries that includes Romania obtained as a result of cluster analysis by HFCE in per capita constant 2005 US\$ in 2013 (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic) is comparable with the one resulted in the study by Piekut (2015) who used data for actual individual consumption in the period 2000-2012 with the only difference that Croatia did not belong to the cluster.

The results obtained in this study concerning the fact that the main consumption shares of EU members consist of expenditure on housing, food and transport in all of the years analyzed are comparable with the ones found in previous studies by Panagiotis (2009) and Dudek (2014) also in what regards the consumption share for education that ranks as the lowest between all the categories Panagiotis (2009).

Concluding, it can be stated that if in 2008 the resulted clusters classified by HFCE 2005 were more a mix of different European regions, during and after the economic crisis the three groups became more geographically homogenous with Romania included in the second cluster of south-eastern countries (Table 2.). Concerning the groups' consumption patterns it can be noticed a reduction of the CVs for all of the clusters over time as they became more convergent but having very different average values compared to the EU-27 means. Moreover the variation of consumption categories across EU-26 member states (without Croatia and Netherlands due to lack of necessary data) has increased over time for the majority of items. This result means that due to the economic consequences of the crisis which were to be felt starting with 2009 in most of EU countries the consumption behaviour of the member states has become more heterogeneous increasing the discrepancies between them.

Romania's present position is still enclosed within the cluster of south-eastern states which are also the latest EU members even though in 2008 it was included in the group with Luxembourg, UK, Austria and other big economies in terms of HFCE in per capita constant 2005 US\$ (Table 2.). The consumption pattern of Romania follows a general trend of the other EU-26 countries in 2008 and 2009 with high shares of consumption for housing, food and transport being characterized by above average differences to EU-26 for food and alcoholic beverages, tobacco and narcotics and by lower mean values compared to EU-26 averages for categories related to restaurants and hotels and miscellaneous goods and services in contrast with the other two clusters obtained, meaning that Romania is still a part of EU members whose consumption is mainly based on food and non-alcoholic beverages also with a high share of expenditure on alcoholic beverages, tobacco and narcotics.

Limitations of the study are related to the missing data for Croatia and Netherlands concerning the shares of consumption categories in HFCE thus remaining with only 26 EU countries, however Croatia is the most recent country to have entered EU and its accession in 2013 could not have made visible economic effects as 2013 was chosen as the after-crisis period. Another possible limitation of the study can be the clustering method chosen as it is widely known that these methods are quite subjective and different methods can lead to different cluster groups.

The analysis in the study can be more expanded for further research by grouping the consumption categories into 3 main classes: primary needs ("food and non-alcoholic beverages", "clothing and footwear", "housing, water, electricity, gas and other fuels" and "transport"), secondary needs ("furnishings, household equipment and routine household maintenance", "health", "communications" and "education") and tertiary needs ("alcoholic beverages, tobacco and narcotics", "recreation and culture", "restaurants and hotels" and

“miscellaneous goods and services”) and classifying the countries in order to reveal more specific consumption profiles with respect to the importance of the basic to non-basic material products and services.

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