EUROPEAN HOUSEHOLDS' CONSUMPTION EXPENDITURES IN THE DECADE 2000–2009

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Abstract

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Paper deals with analysis of consumption expenditures of European households at the beginning and at the end of decade 2000–2009. The aim is to evaluate the impacts of economic development on the life situation of households from a specific point of view. The period represents one phase of the economic cycle in Europe – it is characterized by economic boom as well as declines leading to current crisis. Data was obtained from the Statistical Office of the European Communities. Subjects of analysis were individual European countries and groups EU 27 and EU 15. Using the cluster analysis method it was found that there are certain groups of countries with similar structures of household expenditures. These groups were relatively stable over time and corresponded to the traditional perception of similarity between countries in terms of geographical, cultural, political, etc. factors. However, some exceptions occurred – e.g. position of Ireland close to South European countries or Estonia close to Central European countries. Results serve as a basis for evaluation of economic development and can be also used as an indicator of impacts of economic development on people's living situation.

consumption expenditures, household consumption, EU households, living situation, cluster analysis

The European Union as the most significant and influential of international economic integration schemes experienced a dramatic development during the years 2000–2009 (El Agraa, 2011). In the European economy the decade represents one phase of economic cycle. There were growths leading to unprecedented booms in many countries. However, due to the failure of some regulatory mechanisms subsequently occurred declines preceding global economic crisis (Krugman, 2009). The article aims to evaluate the impact of the economic development to life situation of households by analyzing consumption expenditures.

The beginning of the decade was characterized by ending phase of an economic downturn which took place from the late eighties and early nineties. Economy was starting to recover and in this process of recovery economies of Western Europe surpassed Central and Eastern European economies. Then there was period of economic growth in which especially the Baltic countries and also Central European countries started to achieve the highest dynamics. Acceleration of growth continued until 2008 when a sharp downturn came. Problems of the financial sector spilled over into the real economy and with varying intensity started to influence macroeconomic data of individual countries[1]. This showed up to be the first manifestation of emerging economic crisis. The last year of researched period, 2009, has already fully reflected ongoing economic recession.

Fundamental macroeconomic category for evaluation of economic development are consumption expenditures. They form the most important part

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1   In economic results of the strongest European economies the instability was already evident since 2007.

when calculating domestic product by using the expenditure approach. In Europe consumption expenditures often represent more than 80% of GDP. Household consumption expenditures, which are mainly targeted in the paper, then form the biggest part of total consumption expenditures and generally represent a major share of the GDP[2].

In Germany, for example, in 2009 consumer expenditures formed 78.5% of GDP, in the UK 87.6% in Greece according to provisional values[3] even 93.0% of GDP. Consumption expenditures of households themselves in these countries represented 55.4%, 60.9% and 74.5% of GDP[4]. In the Czech Republic shares of consumption expenditures are commonly below the average in comparison to European values (in 2009 Czech consumption expenditures amounted to 71.9% of GDP, consumption of households themselves to 51.8%). Even though they also obviously represent a critically important economic category. Besides, household consumption expenditures are one of derived indicators of living conditions of inhabitants of the country despite the limitations resulting from the methodics of consumption indicators calculation (Stiglitz, Sen, Fitoussi, 2010).

MATERIALS AND METHODS

Background for evaluations of consumption expenditures was data collected from national sources by the Statistical Office of the European Communities (Eurostat). Authors obtained the data from the Annual National Accounts database (acr. nama) which falls within the section of Economy and Finance in the vertical database structure[5].

International comparisons based on absolute values was not considered appropriate. Therefore was performed data structuring according to the purpose of spending. Then were calculated relative shares of each category of consumption. The system of classification was the standard "Classification of Individual Consumption According to Purpose" (COICOP). This system was compiled by the United Nations Statistical Division and is used for classification of individual consumption in United Nations Member States. COICOP includes two points of view on consumption expenditures – the first distinguishes the time horizon of consumption, the second distiguishes the purpose for which money was spent. Classification according to purpose is primarily carried out using twelve

groups including goods and services (which is so-called horizontal structure). Every group then has three levels of additional structuring – divisions, groups and classes (vertical structure)[6]. Overview of the COICOP categories shows Tab. I.

I: *COICOP, classification according to purpose of spendings*

Individual consumption categories	
01	Food and non-alcoholic beverages
02	Alcoholic beverages, tobacco and narcotics
03	Clothing and footwear
04	Housing, water, electricity, gas and other fuels
05	Furnishings, household equipment and routine household maintenance
06	Health
07	Transport
08	Communication
09	Recreation and culture
10	Education
11	Restaurants and hotels
12	Miscellaneous goods and services
* 13	Individual consumption expenditure of non-profit institutions serving households (NPISHs)
* 14	Individual consumption expenditure of general government

* Categories 13 and 14 do not correspond directly with consumption expenditures of households.
Source UNSTATS, modified

Comparative analysis of structures of consumption expenditures of households in various countries was performed using the multivariate statistical method of cluster analysis which applicability in economic research analyse Anderson (2010) and Bowerman and O'Connell (2010). Computations were carried out using the software Statsoft Statistica v. 9.0.

Cluster analysis is used to sort objects into groups (clusters) so that objects belonging to the same group are more similar than objects from different groups (see Meloun, 2006). Required are typified objects defined by identical set of variables. In this case individual countries and groups of countries were objects and relative shares of COICOP groups in total household consumption expenditures were variables. Object similarity was measured using

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2   See Burda, Wyplosz, 2009.
3   Greek national statistics data is currently undergoing extensive revisions, the available values are therefore presented as provisional.
4   Values taken from Eurostat, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_gdp_c&lang=en (valid on 2012-07-29).
5   Database links available on http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/ search_database (valid on 2012-06-13).
6   If purpose of the spending can not be clearly identified, respectively if a single purpose can not be assigned classification is performed according to the rule of main or prevailing purpose.

squared Euclidean distance which was calculated by the formula

$$d_E(x_k, y_l) = \sum_{j=1}^{m} (x_{kj} - x_{ij})^2 . \qquad (1)$$

Clusters were created by the hierarchical procedure which means successive refining of the division. The way of the process was agglomerative, i.e. starting from individual objects, clusters of one member which have been gradually interconnected.

The distance between objects was expressed by the method of the most distant connection[7]. According to this method the distance of clusters is determined by the distance of two most distant objects in different clusters. Similarity within a cluster is then expressed by the average distance of objects in it. The method is used in cases when examined objects naturally tend to form separate subclusters. The assumption of inherent tendency of countries to form subclusters was based on the existence of economic, natural, historical and cultural links (see below).

The output of the process of cluster analysis is a dendrogram, i.e. clusters' tree of development. Horizontal structure of dendrogram shows decomposition of clustering sequence, vertical direction in dendrogram depicts distance between clusters. The results of the research were presented by dendrograms showing the similarity of objects – countries – between 2000 and 2009[8]. Average values of household consumption in EU-15 and EU-27 were also included.

RESULTS

The initial period of the research, year 2000, was characterized by positive economic development of European economies. Central European countries, including the Czech Republic, begun to overcome recession of the mid-nineties, mainly due to growth in productivity of labour and increasing investment demand. The Baltic countries have emerged from problems of transformation period and their economic results started to reflect reforms which were performed especially in taxation systems. Growth of Western European economies had started even sooner and continued from previous periods.

Analysis of 2000 included 26 countries and groups EU 15 and EU 27. To secure comparability of diagrams for 2000 and 2009 Bulgaria was removed, because it has failed to deliver structured data on household consumption since 2006. Average shares of groups of spendigs for the current EU member countries, member countries in 2000, i.e. "strong"or "Western" economies and transforming economies which joined EU in 2004 and later are shown in Tab. II.

The largest share of households'budgets in Central and Southern Europe fell on food and non-alcoholic beverages (group 1). Compared to that family budgets in Western Europe were mainly burdened by expenditures on housing (group 4). Eastern and Central European households also could not afford to spend such a proportion of funds on recreation (group 9) and eating in restaurants (group 11). Nearly half the share had also group "Miscellaneous goods and services" (12) in which are significant spendings on insurance, credit and other financial services.
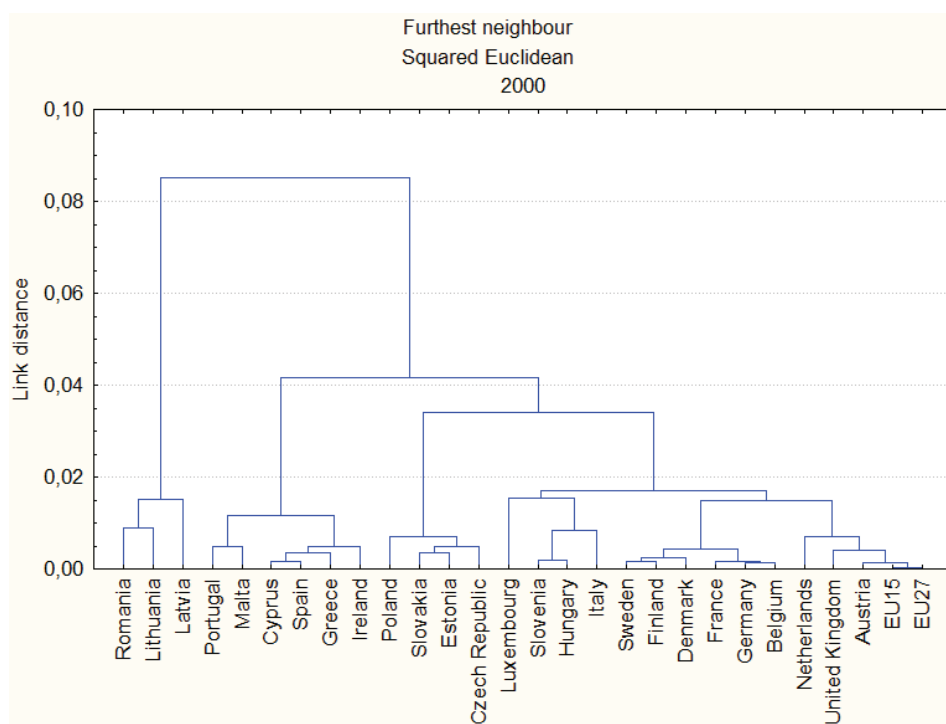
II: *Average household consumption expenditures in 2000, relative proportions of COICOP groups*

COICOP	European Union (27 countries)	European Union (15 countries)	EU 27 - EU 15
01	12.84%	12.60%	22.36%
02	3.67%	3.15%	6.13%
03	6.42%	6.30%	5.42%
04	20.18%	20.47%	19.47%
05	6.42%	7.09%	4.96%
06	2.75%	3.15%	2.97%
07	13.76%	14.17%	12.07%
08	2.75%	2.36%	3.38%
09	10.09%	9.45%	8.03%
10	0.92%	0.79%	0.98%
11	9.17%	8.66%	7.61%
12	11.01%	11.81%	6.62%
Total	100.00%	100.00%	100.00%

Data source Eurostat, own processing

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7   Also called "the furthest neighbour method."
8   An alternative to dendrogram of similarity of objects is dendrogram of similarity of variables, which reveals groups of correlating variables.

1: *Dendrogram of European household consumption expenditures in 2000*
Data source Eurostat, own processing

To investigate similarity of the structures of consumption expenditures the cluster analysis have been aplied. The resulting dendrogram is shown in figure 1.

The result of the analysis corresponds to traditionally perceived "natural" determinants of consumption patterns, while these determinants are given by geographic, cultural, historical, economic, political and technological factors. Světlík (2003) discusses this issue. An important concept here are so-called Cultural affinity zones (for details Usumier, 2005).

In accordance with this concept formed subclusters of countries of Southern Europe, Central Europe and North and West Europe. There were also "anomalies" which offer additional potential for analysis and research. For example Estonia, whose structure of consumption expenditures was much closer to countries of Central Europe than to the other Baltic republics. Also Ireland which was relatively closely similar to South European countries.

Closest to each other in the clustering sequence were groups EU 15 and EU 27. Among countries the closest were Belgium and Germany, Finland and Sweden and Spain and Cyprus. The most distant countries, i.e. the lowest similarity was found between structures of spendings of Romania, Lithuania and Latvia (which formed a subcluster) and the remaining objects.

The second examined year, 2009, was determined by ongoing economic recession. Since the second half of previous year financial market turbulences shifted and fully manifested in real economy. After a relatively long period of growth the economic situation in all 27 EU countries (except Poland which benefited from a large domestic market and low dependence on exports) turned and declines of GDP were recorded. All GDP components participated in the decline, the only exception were public spendings which reflected stimulus measures adopted by governments.

Changes in the economic environment in Europe reflected in structures of consumption expenditures of households. Shares of expenditure groups in EU 15, remaining countries of EU 27 and whole EU 27 shows Tab. III.

Compared to 2000 there is a particularly noticeable reduction of expenditures on food and non-alcoholic drinks (group 1) in countries of Central and Eastern Europe. On the other hand increases of shares of housing (group 4) and miscellaneous goods and services (group 12) were recorded. This means the structure of expenditures was more similar to Western and Northern European countries. However, also in Western and Northern Europe the share of spendings on housing grew at the expense of travelling, recreation and eating in restaurants[9].

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9   Declines of shares of these groups indicate economic difficulties that households had to face in 2009.

III: *Average household consumption expenditures in 2009, relative proportions of COICOP groups*

COICOP	European Union (27 countries)*	European Union (15 countries)	EU 27 - EU 15*
01	12.88%	12.33%	18.89%
02	3.79%	3.42%	5.91%
03	5.30%	5.48%	4.84%
04	23.48%	23.29%	21.41%
05	6.06%	6.16%	5.25%
06	3.79%	3.42%	3.75%
07	12.88%	13.01%	12.20%
08	3.03%	2.74%	3.24%
09	9.09%	8.90%	8.10%
10	0.76%	1.37%	1.38%
11	8.33%	8.90%	6.82%
12	10.61%	10.96%	8.20%
Total	100.00%	100.00%	100.00%

* Values affected by absence of data for Bulgaria
Data source Eurostat, own processing
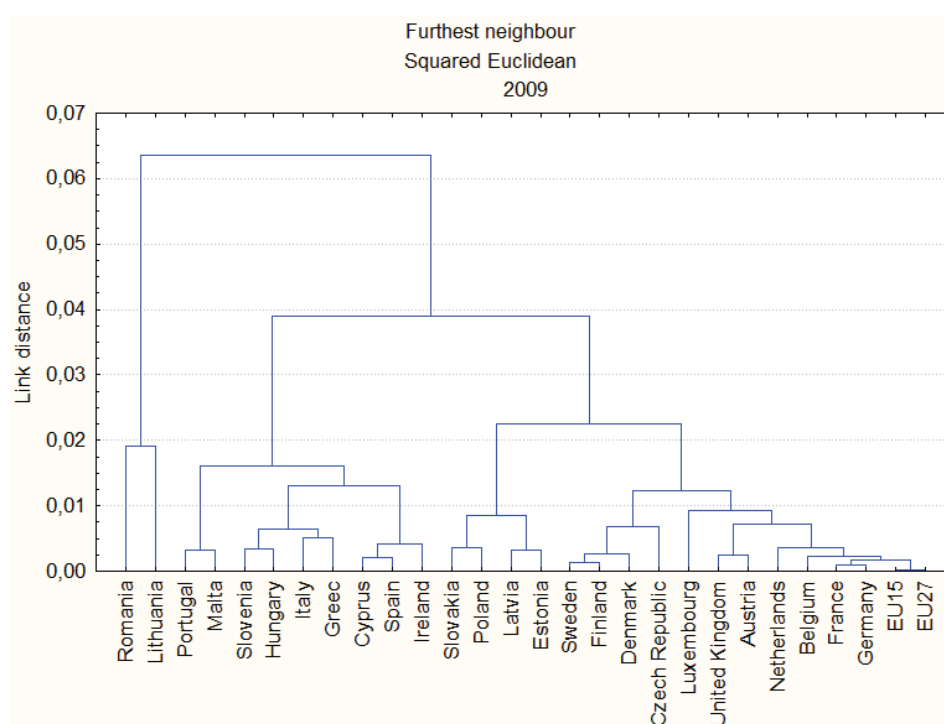
2: *Dendrogram of European household consumption expenditures in 2009*
Data source Eurostat, own processing

Cluster analysis of 2009 included the same objects as the analysis of 2000. The resulting dendrogram is shown in Fig 2.

Compared to 2000 the degree of similarity of structures of consumption expenditures underwent changes. Though most of the "naturally" formed subclusters persisted. So again was apparent a relative similarity between Southern European countries, also between countries of Western and Northern Europe. A significant change represented grouping of Central European countries and the Baltic republics. The new subcluster included

Slovakia, Poland, Latvia and Estonia while Lithuania "dropped behind" and preserved its similarity to Romania. Czech Republic was surprisingly assigned to the countries of Northern Europe.

The closest pair of objects, i.e. the most compact subcluster was again the EU 15 and EU 27 which means that averaging the values in both periods significantly reduced differences at the national level. The closest countries have been this time Germany and France, then analogically to 2000 Finland and Sweden and Spain and Cyprus.

CONCLUSION

Analysis of structures of consumption expenditures of European households showed some patterns which proved to be relatively stable over time. Major expenditure categories were generally food, housing and transport. Following these also "miscellaneous goods and services" which include among other spendings on financial services such as insurance or credit products. General trend was increasing of share of expenditures on housing particularly at the expense of eating in restaurants or buying clothes. The determinant of this is considered unfavourable economic development at the end of the decade. The economic downturn is also seen from stagnation of share of spendings on transport which include purchases and operation of vehicles.

(In addition to the economic situation structure of consumption expenditures was also influenced by other factors, such as use of new technologies or politics. This applies to all categories, including housing while in some categories these "non-economic" factors are considered primary. This relates to spendings on health, education and telecommunications. Share of expenditures on health slightly increased, while on telecommunications and education declined. However, despite its society-wide importance the proportionate value of these categories is marginal.)

Dividing the set of countries into "strong" economies, represented by EU members until 2004 and "weaker" economies which went through the period of transformation and joined EU in 2004 or later provided some additional findings.

At the beginning of the last decade EU 15 countries showed a significantly lower proportion of expenditures on food and beverages including alcoholic beverages. For COICOP category 1 the difference against group EU 15 – EU 27 amounted to 9.76 percentage points. At the end of the examined period the difference fell to 6.56 percentage points. Decrease was caused by decline in group EU 27 – EU 15 while the values of EU 15 stagnated. The share of expenditures is used as one of indicators of poverty (Sirovátka *et al.*, 2005)[10]. So that results may indirectly indicate that the life situation in acceding countries improved during the decade and they approached to Western European and northern European countries.

Next to reducing the share of expenditures on food and beverages a significant feature of structure of consumption spendings in the acceding countries was also an increase of share of category 12 – Miscellaneous goods and services. This development is attributed to a dynamic expansion of consumer credit products and other financial services for individuals and households.

Convergence of structures of consumption expenditures of "developed" and "transforming" economies has been a general trend. The average difference between groups EU 15 and EU 27 – EU 15 decreased from 2.32 percentage points in 2000 to 1.65 percentage points in 2009. The values were calculated by averaging the differences in expenditure categories.

By using cluster analysis were identified a partial subgroups of countries with similar structures of consumer expenditures. These subgroups were relatively stable over time. Primarily it was subcluster of major European economies and the Nordic countries. Followed subcluster of South European countries and subcluster of Central European countries. (While South European countries were considerably specific and stood relatively far from other countries. The main reason seems to be cultural and sociological specificity of Southern Europe, especially the rich tradition of eating at restaurants that survived even the economic downturn. Share of spendings on group 11 – Restaurants and hotels ranged on average around six to seven percent outside South Europe – e.g. in Germany in 2009 it was 6.00%, in France 7.09%, in Czech Republic 7.00%. In Southern Europe, however, it was often more than twice the share – e.g. in Malta 13.24%, in Cyprus 14.72%, in Spain 16.43%.)

The last identified subluster were the Baltic states Latvia and Lithuania (Estonia probably due to successfully ongoing transformation and stronger economic position approached more to Central European countries) together with Romania. This subcluster was specific by high shares of expenditures on food (and lagging of macroeconomic indicators as well) which supports thesis of posibility to identify living situation by analysis of consumption expenditures. At the end of the decade, Latvia shifted from this weakest group and assigned to Central European countries.

Formation of such sublusters of countries was partially anticipated due to geographic locations, cultural affinities and other mutual connections. There was however a number of unexpected "exceptions" such as a high degree of similarity between the structure of expenditures of Estonia and the Czech Republic and Slovakia, also Ireland's stable assignment among Southern European countries. Analysis of partial shifts of positions of countries during examined period also offers further research potential.

Overall, the results serve as a basis of evaluation of economic development and as an indicator of impact of economic development in the life situation of European households. Procedures and

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10   for details see also Wolff, 2009

findings are also applicable in marketing and business sphere for creation cross-border market strategies and can be used as a base for decision making of administrative bodies.

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