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Working Poverty in the European Union and its Main Determinants: an Empirical Analysis

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There has been a widely accepted belief that employment growth is fundamental in the fight against poverty and social exclusion. The existence of working poverty proves that even if employment growth still represents the best way to avoid poverty risk it is not always enough, actions being needed to create not only more jobs, but also better jobs. The aim of this paper is to highlight the main causes and mechanism of working poverty in the EU countries, in the recent economic crisis and recovery period (2007–2012), in order to identify some possible measures that need to be taken so that in-work poverty reduces. The comparative analysis shows that the phenomenon of working poverty has been growing in sixteen EU countries and the prevalence of in-work poverty varies significantly across these countries. The correlation and regression analysis results suggest that gaps in the national human and economic development can be explained by disparities in working poverty rate. Vulnerable and precarious employment represents an important factor behind the high level of working poverty from the EU countries in the analysed period. By taking into consideration the cumulative influence of multiple socio-economic variables, for the (2007–2012) period, results of principal components analysis and cluster analysis highlight that there are common features and differences between the EU Member States according to their working poverty, employment performances, efficiency of welfare state system and the level of human and economic development. The findings of this study can be useful for policy makers in order to reduce the phenomenon of working poverty.

Keywords: *Working Poverty, Employment, Precarious and Vulnerable Work, Cluster Analysis, EU Countries.*

Introduction

The belief that employment growth is fundamental in the fight against poverty and social exclusion has been present at the centre of European strategies for a long time. However, past experience demonstrates that employment growth does not always affect the distribution of work across households in such a way as to reduce the risk of poverty (Cantillon, 2011; Vandenbroucke & Vleminckx, 2011). The EU Report (2012) emphasizes that although, in the pre-crisis period, at the EU level, the employment rate increased, there is "some concern about the quality of many of those jobs, not least in terms of pay and job security, and the need to strengthen the links between job creation policies and those intended to reduce poverty". (Fraser *et al.*, 2011) state that employment growth, in Europe, over the last fifteen years, has not been accompanied by a significant reduction in poverty because of a relative expansion of low quality jobs. Other studies (Marx *et al.*, 2012; Andreß & Lohmann, 2008) have tried to demonstrate that the apparent missing link between employment growth and poverty reduction is determined by several reasons: job growth has not sufficiently benefited poor people, an employed person does not always pay enough to escape poverty, and wage inequality and in-work poverty have increased.

Working poverty (or in-work poverty) has become a real socio-economic challenge at the European level, and not only (Pena Casas & Latta, 2004; Herman, 2013; EU, 2013), "a critical barrier impeding progress in addressing poverty through sustainable employment" (EAPN, 2013). It represents both a drag on economic performance and a scar of continuing social injustice state Lawton and Cooke (2008). Working poverty is a complex concept, which implies mixing two different dimensions, work and poverty. It combines two levels of analysis (individual and collective level): the working status of individuals and the income status of the household in which they live, which is below the poverty threshold (Eurofound, 2010; Lohmann, 2009). (Also & Kapos, 2005) underlines that, by combining labour market factors with poverty data, working poverty estimates give a clearer picture of the relationship between poverty and employment.

According to statistical data (Eurostat, 2014), in the recent economic crisis and recovery period (2007–2012), in-work poverty rate increased in most of the EU countries and the prevalence of in-work poverty varies significantly across these countries. Behind these differences there are specific factors that require specific measures. The existence of working poverty proves that even if employment growth still represents the best way to avoid poverty risk it is not always enough, actions to improve both the quantity and the quality of jobs being needed.

In the light of these considerations, *the aim* of this article is to highlight the main causes and mechanism of working poverty in the EU countries in 2007–2012 period, in order to identify some possible measures that need to be taken so that in-work poverty reduces. In order to achieve the goal, the following *objectives* were set out: to

investigate the link between in-work poverty and national level of economic and human development; to explore employment performances and its implications on working poverty; to identify both the common features of the EU countries and the differences between them, based on the relationship between working poverty, employment performances, the efficiency of the welfare state system and the level of human and economic development.

The *novelty of this research* is based, on the one hand, on the socio-economic variables selected in order to analyse the main determinants of working poverty in the EU countries, and, on the other hand, on the choice of the period analysed (2007–2012), the recent economic crisis and recovery period. To achieve this paper's objectives, statistical and econometric *methods* (descriptive statistics, correlation and regression analysis, principal component analysis and cluster analysis) have been applied, using the most recent data provided by Eurostat and UNDP. For data processing, the SPSS software package was used.

Main factors behind working poverty: A short literature review and research hypothesis

The literature studying the main causes and mechanism of working poverty is very broad: from low pay (Andreß & Lohmann, 2008), temporary and part-time work (Dafermos & Papatheodorou, 2012; Heyes, 2013), personal characteristics and professional status of employed person (Fraser *et al.*, 2011; Herman & Georgescu, 2012), to household structure of the person working (Pena *et al.*, 2004), different dysfunctions of the labour market (EU, 2012) and welfare states regimes (Davoine *et al.*, 2008). According to Crettaz & Bonoli (2010), low earnings, low labour force attachment or/and a high number of dependants, relative to national averages, represent three mechanisms or immediate causes of working poor status.

Low wage of employed people is a fundamental driver of in-work poverty (Eardley, 2000), but other aspects, such as the household characteristics are decisive. EU Reports (2012, 2013) highlight that after 2008 the share of jobless households increased in many countries, and it increased sharply in countries most hit by the crisis, fact which determined an increase in working poverty. The rise in the share of people living in jobless households represents the most direct effect of the deterioration of labour conditions.

Profound changes in the labour market, especially turning from the standard employment relationship (full-time, permanent jobs, employee status etc) to the non-standard employment relationship (part-time, temporary work, self-employment etc) have made work more precarious and more vulnerable (ILO, 2012a; Fuller & Vosko, 2008; Olsthoorn, 2013), leading to the increase in working poor. Heyes & Lewis (2013) show that the increase in involuntary participation in non-standard employment since the crisis has determined the increase in the risk of working poverty. Precarious work is characterized by low wages, uncertainty and income and job insecurity, work characterised by atypical employment contracts, lack of access to social protection or to its minimum level, lack of benefits, low job tenure etc (Vosko, 2006; Kalleberg, 2009; Herman, 2013).

According to ILO experts (ILO, 2012b; Crettaz & Bonoli, 2010) self-employment (especially own-account workers) and unpaid family workers represent "vulnerable employment". Self-employed workers (without employees) can have low and volatile earnings. In general, they are motivated by necessity and are driven to become entrepreneurs due to lack of other employment opportunities (Wong *et al.*, 2005; Jamal, 2009; Szabo & Herman, 2012). If self-employed workers are involved in opportunity and productive entrepreneurship their activity may be considered as a highly positive and innovative type of economic activity (Wennekers *et al.*, 2005; Carree *et al.*, 2007; Szabo *et al.*, 2013).

Vulnerable employment is characterised, in general, by low income and difficult working conditions, in which the fundamental rights of the workers can be undermined. High vulnerable employment indicates a high agricultural sector, high informal work, in which workers do not have, most of the times, an adequate social protection, guaranteed by employment contracts. In difficult periods, Perugini & Signorelli (2010) argue that agriculture is the sector that acts "as a buffer against unemployment by providing some employment, food and income to the most vulnerable groups in society".

Some empirical studies (Davoine *et al.*, 2008; Lohmann, 2009) point out that countries with similar levels of social expenditure achieve very different results in terms of economic and social outcomes (poverty reduction). In EU Report (EU, 2012), it is underlined that social expenditures act as stabilizers of economic activity because they sustain effective demand in periods of recession. On the other hand, (Berzinskiene & Juozaitiene, 2011) state that the development of employment security through employment security measures applying passive and "active labour market policy measures, help people adapt to the changes in the labour market and encourage professional mobility".

It is known that the most important impact of jobs is on the people who hold them, but jobs matter also for the societies they live in. World Bank experts (WB, 2012) consider that "good jobs for development" are those jobs that considerably contribute to society, taking into consideration that they are extremely important for the individuals who hold them but also their potential spillovers on others. The economic welfare of a country is due to the work that its inhabitants develop. "We are what we produce", state (Giarini & Liedtke, 2006), the value of people in society being determined by the value of their activity, by the value of their work.

Based on the specialist literature, the following research hypotheses (H) were formulated in relation to the objectives set:

H1: In the EU countries with low human and economic development, working poverty is higher.

H2: There is a positive link between working poverty and vulnerable employment (self-employment and agriculture employment), in EU countries, in 2007–2012 period.

H3: In EU countries, in 2007–2012 period, there is a positive link between working poverty and precarious employment (involuntary flexible work).

H4: There are common features and differences between EU Member States according to their working poverty, employment performances, efficiency of welfare state system and the level of human and economic development.

Data and methodological framework

There are significant variations in national definitions of working poverty (Pena Casas & Latta, 2004; Crettaz & Bonoli, 2010). For this reason, this paper uses the European definition of working poverty, according to which in-work at-risk-of-poverty rate shows "the share of persons who are at work and have an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income (after social transfers)" (Eurostat, 2014). By setting the poverty threshold in relation to the median equivalised disposable income, which depends on the size and composition of household, in the working poor category there are also employed persons who might be poor precisely because of the household context they live in (Herman, 2013). In order to analyse the multiple aspects of employment, (quantitative, qualitative and structural) and their implications on working poverty, we use eight indicators of employment, described in Table 1. We use for economic development GDP per capita and for human development HDI-Human Development Index. HDI measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living (UNDP, 2013). Labour market policy (LMP) expenditure and social expenditure, as percentage of GDP, are used for analysing the welfare state system. Our analysis has been restricted to the EU-27, without Luxembourg (an outlier in many variables' case) to ensure greater data homogeneity. Statistical data on these variables have been collected from Eurostat Database (2014) and they are for 2007–2012 period. In order to study the intensity of the relationship between variables, we have applied the Spearman's rank correlation coefficient. We have used the regression analysis in order to highlight the causality connection between working poverty and the variables that measure the economic and human development, vulnerable and precarious employment.

Table 1

Variables included in the PCA and cluster analysis. Descriptive statistics (2007–2012 average)

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Working poverty In-work at-risk-of-poverty rate (%)	26	3,8 (CZ)	17,70 (RO)	7,76	3,25
Employment					
Self-employment (%)[1]	26	4,6 (EE)	28,6 (RO)	11,18	5,99
Employment in agriculture (%)[2]	26	1,3 (UK)	30,5 (RO)	6,72	6,46
Involuntary part-time employment [3](%)	26	6,32 (NL)	57,05 (BG)	28,58	14,89
Involuntary temporary job (%)[4]	26	11,28 (AT)	92,93 (CY)	61,91	19,97
Employment in knowledge-intensive activities (%)[2]- KIA_emp.	26	19,9 (RO)	42,5 (SE)	34,05	5,53
Employment rate (15 to 64 years) (%)	26	56,3 (HU)	75,8 (NL)	64,65	5,82
Mean equivalised net income of employed persons (PPS)-Net income	26	4477,2 (RO)	25020,7 (UK)	17001,51	6546,02
Real labour productivity per hour worked (euro)– LP	26	4,5 (BG)	51,8 (DK)	26,12	15,92
Economic and human development					
GDP per capita (euro)	26	3583,3 (BG)	38016,7 (DK)	19876,92	11312,95
Human Development Index -HDI	26	0,78 (BG)	0,92 (NL)	0,86	0,04
Welfare state system					
Labour market policy (LMP) expenditure (%)[5]	26	0,4 (RO)	3,5 (BE)	1,52	0,99
Social expenditure (%)[5]	26	15,6 (LV)	33,5 (DK)	24,54	5,75

Note: [1]The share of own-account workers and contributing family workers, in total employment; [2]% of total employment; [3]% of total part-time employment; [4]% of temporary job; [5] percentage of GDP.
Source: Own calculations based on Eurostat (2014) and UNDP (2014)

In order to classify the EU countries according to their employment performances, working poverty, efficiency of welfare state system and economic and human development, different techniques have been used: Principal Component Analysis (PCA) and Cluster Analysis (CA). If PCA aims to reduce the dimensionality of a data set consisting of a large number of interrelated variables to a few factors or principal components, while retaining as much as possible of the variation present in the data set (Jolliffe, 2002; Janotka *et al.*, 2013), CA seeks to classify cases into homogeneous groups based on the characteristics analysed, so that objects in a group to be similar in terms of these variables, but different from the objects in other groups (Dimian *et al.,* 2013). The principal components obtained by PCA became the basis for cluster analysis, which led to the identification of the homogeneous groups of countries. Therefore, at first we used the hierarchical cluster analysis, using Ward's method and the Euclidian distance in order to determine the number of clusters. This method was followed by the k-means cluster analysis (Everit *et al.,* 2011). Descriptive statistics was used to thoroughly study the internal and external interpretation of the results obtained using the principal components analysis, as well as the cluster analysis. For data processing, the SPSS software package was used.

Results and discussions

Employment remains the best guarantee against poverty and social exclusion, since the risk of poverty faced by working age adults (18–64 years) without work (unemployed or inactive) is more than three times higher than those in work (29,9 % against 9,1 %), in EU-27, in 2012 (Eurostat, 2014). But for many people in poverty the solution is better work, not just more work. Statistical data suggest that, at EU-27 level, in 2012 9,1% of the people in employment were living under the poverty threshold.

The fact that in-work poverty rate, in 2007–2012 period, in EU-27 increased (by 0,9 p.p.) and the working poor represented a significant part of the working age adults at-risk-of-poverty (Figure 1) proves that a job is not a guarantee against the risk of poverty. The recent economic crisis and recovery packages in 2007–2012 period have brought additional downward pressure on labour market performances by an increase in working poverty rate in sixteen EU countries, according to data from Figure 1. Also, data from Figure 1 and Table 1, show that the level of in-work poverty rate differs from one country to the next. The highest in-work at-risk-of-poverty rate from EU-27 is recorded in Romania, 2.1 times higher than the European average and almost 5 times higher than in Finland, the most efficient European country from this perspective. In southern countries (Greece, Spain, Italy, Portugal) and Poland a level of in-work poverty rate above the EU-27 average is recorded.

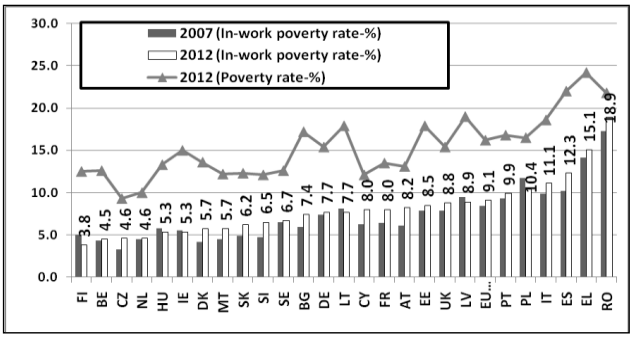

Figure 1. Overall poverty rate and in-work poverty rate
Source: Eurostat (2014)

The results of the correlation analysis (Table 2 and Figure 2) regarding the relationship between in-work poverty rate and human development (measured by HDI), in EU countries, in 2007–2012 period, emphasise that there is a moderate negative relationship, statistically significant (Spearman rank correlation $\rho = -0{,}563$, $p<0.01$).

Table 2

Correlation between in-work poverty rate and other variables

Spearman rank correlation	HDI	GDP /capita	Self-employment	Agriculture employment
In-work poverty rate	-0.536*	-0.427**	0.326**	0.493**

** p<0,01; ** p<0,05. Source: Own calculations based on Eurostat (2014) and UNPD (2014)*

The same relationship is set between in-work poverty rate and economic development, expressed by GDP/capita, but of a lower intensity ($\rho = -0{,}427$, $p<0{,}05$). In the countries where working poverty is higher, the level of human and economic development is lower and vice versa, fact which confirms *hypothesis H1.*

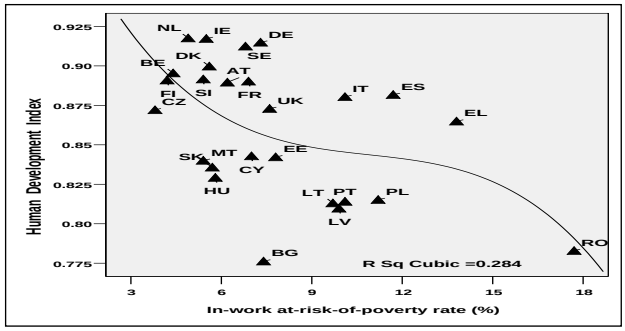

Figure 2. In-work poverty rate and HDI, 2007–2012 average
Source: Own calculations based on Eurostat (2014) and UNDP (2014)

By using a simple regression of HDI on in-work poverty rate (Figure 2), it turns out that R^2 is small ($R^2=0{,}284$), which implies that, despite the fact that working poverty is conductive to low human development, its magnitude cannot be used as a basis for an integrated explanation for the existence of low human development.

Statistical data from Figure 3 argue that the level of in-work poverty rate is influenced by the *personal characteristics of workers* (education, gender and age). In all EU member states, it is confirmed that the *education level* of employed people represents an important factor that influences in-work poverty. As the level of education attained increases, the in-work at-risk-of-poverty falls. In EU-27, in 2012, the incidence of working poverty was much higher for the low educated workers (18 %) than for those with high education (4,2 %). In the light of these data, we consider that, in order to reduce in-work at-risk-of-poverty, it is necessary to increase the level of education, which should correspond to requirements of the labour market (Barbulescu, 2012).

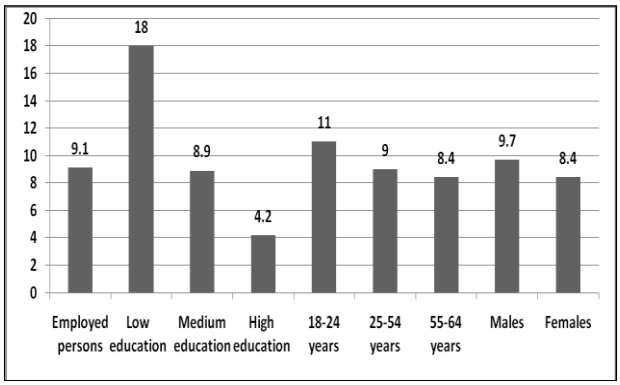

Figure 3. In-work poverty rate by personal characteristics of workers in EU-27, 2012 (%)
Source: Eurostat (2014)

Looking at the *gender-specific differences* of working poverty, statistical data in 2012 show that in-work poverty risk is lower for women (8,4 %) than for men (9,7 %) at the EU level and in most countries (except for six countries: Baltic states, Germany, Cyprus and Czech Republic), despite the poorer position of women on the labour market, which is generally indicated by the gender pay gap and higher incidence of part time and temporary work. According to EU (2012), one of the possible

explanations is the family status of employed women in each country.

From the point of view of *age effects* on working poverty, at the EU-27 level, the younger workers (11,9 %) are the most affected by this risk, followed by workers aged 25–54 years (9 %) and older workers (8,4 %). Therefore, at the EU level, in-work poverty risk decreases with the age of workers which can be determined by the fact that young people often have low-paid jobs at the beginning of their careers (Eurofound, 2010). However, in seven EU countries (Greece, Belgium, Latvia, Netherlands, Portugal, Slovenia and Lithuania), older workers are more affected by in-work at-risk-of-poverty than younger workers. In the context of the demographic changes and an accentuated ageing process, job satisfaction of *older workers* needs to be increased, in these countries and not only here, for older workers to remain active on the labour market, to prolong their working life to the detriment of retirement respectively (Aristovnik & Jaklic, 2013).

If we analyse the *individual employment characteristics* of the working poor we also notice some significant differences (Figure 4). Thus, in EU-27, in 2012, in-work poverty risk is more than 3 times higher for self-employed than for employees; 2,5 times higher for temporary workers than for permanent workers; 1.8 times higher for part-time workers in comparison to the full-time worker. The working poverty level can also be explained by the *household characteristics* besides the individual features. Incidence of working poverty is almost 8 times higher for the households with low work intensity than for the households with very high (VH*) work intensity (38,4 % against 5 %).

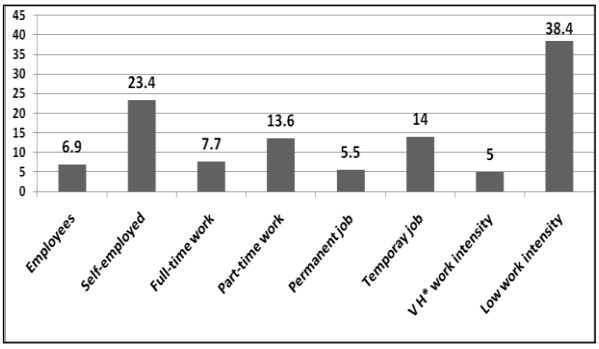

Figure 4. In-work poverty rate by employment characteristics in EU-27, 2012 (%)
Source: Eurostat (2014)

It is clear that risk of in-work poverty is significantly higher for self-employed relative to employees (23,4 % against 6,9 %, in Figure 4). Examining results of testing *hypothesis H2* analysis between in-work poverty rate and self-employment, expressed by the share of own-account workers and contributing family workers, in total employment, a positive moderate to low correlation is revealed (ρ=+0,326, p< 0,05, see Table 2). A positive relationship was also identified between in-work poverty rate and employment in agriculture (ρ=+0,493, p< 0,05). Corroborating these results with the positive link between self-employment and employment in agriculture (ρ=+0,394, p< 0,05), it is proved that in EU member states, in 2007–2012, own-account workers and unpaid family workers, especially those working in agriculture, are affected by working poverty risk. Thus, *H2 is confirmed.*

Data from Figure 4 show that in-work poverty risk is higher in non-standard employment relationship (part-time and temporary work) relative to standard employment relationship (full-time and permanent jobs). Involuntary (or forced) flexible work is linked with low-paid, job insecurity, which means precarious (or unsustainable) work, materialized in higher in-work poverty risk. Regarding *hypothesis H3*, results of correlation and simple regression analysis indicate a positive relationship between working poverty rate and involuntary part-time work (ρ=+0,682, R^2=0,505, p< 0,01, Figure 5). Also, a positive relationship, but one of a lower intensity was identified between working poverty rate and involuntary temporary work (ρ=+0,405, R^2=0,311, p< 0,05).

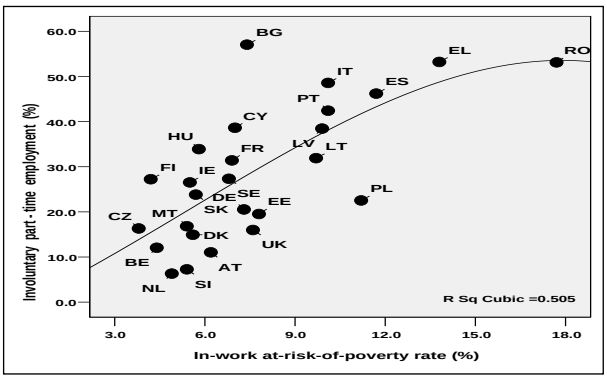

Figure 5. In-work poverty rate and involuntary part-time work, 2007–2012 average
Source: Own calculations based on Eurostat (2014) and UNDP (2014)

In order to test *hypothesis H4*, by taking into consideration the cumulative influence of 13 socio-economic variables selected - working poverty rate, employment performances indicators, welfare state system indicators and the human and economic development indicators (see Table 1), we have used complex statistical methods of data analysis, the principal components analysis (PCA) and cluster analysis, respectively. Starting from the significant, positive or negative correlations, identified between initial variables, using PCA (Rotation method: Varimax with Kaiser Normalization; rotation converged in 3 iterations), the information of 13 of the variables can be grouped into two components (factors). The two components explain 75,97 % of the total variance in the variables which are included in the components (Table 3).

Table 3

Total variance and eigenvalues explained

PC	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7,96	61,21	61,21	5,84	44,95	44,95
2	1,92	14,77	75,97	4,03	31,02	75,97
…	…	…	…			
13	0,01	0,06	100,00			

The first principal component (PC1), which explains 61,21 % of total variance, is made up of seven variables (Table 4). All variables have a positive contribution in the

creation of this component. A high level of these variables reflects a high performance of the labour market in an efficient welfare state system. *The second principal component* (PC2), explains 14,77 % of total variance and includes six variables (Table 4). Five of these variables reflect directly (in-work at-risk-of-poverty rate) or indirectly working poverty at national level (self-employment, involuntary part-time and temporary work, employment in agriculture).

The overall MSA (Measure of Sampling Adequacy) for the set of variables included in the analysis was 0,665, which exceeds the minimum requirement of 0.50 for overall MSA. PCA requires that the probability associated with Bartlett's Test of Sphericity to be less than the level of significance. The probability associated with the Bartlett test is <0.001, which satisfies this requirement.

To define the number of clusters in which the 26 countries will be classified we used the hierarchical cluster analysis, Ward's method and Euclidean distance. Then, we used the k-means analysis to actually form the clusters.

Table 4

Principal Components for EU countries (Rotated Component Matrix)

Initial variables	PC 1	PC2
Real labour productivity-LP	**0,949**	-0,274
GDP per capita	**0,949**	-0,289
Social expenditure	**0,930**	-0,122
Mean equivalised net income	**0,866**	-0,340
HDI	**0,845**	-0,394
LMP expenditure	**0,802**	-0,106
KIA employment	**0,680**	-0,543
In-work –poverty rate	-0,202	**0,854**
Self-employment	-0,084	**0,842**
Involuntary part-time employment	-0,207	**0,822**
Involuntary temporary job	-0,492	**0,680**
Employment in agriculture	-0,232	**0,665**
Employment rate	0,485	**-0,514**

The results of the Snedecor's F-distribution (ANOVA) show that the formed clusters are statistically significant, for a significance level smaller than 0,01 (Table 5).

Table 5

The results of the cluster analysis: Final cluster centres and ANOVA

	Final Cluster Centers				ANOVA					
	Cluster				Cluster		Error		F	Sig.
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Mean Square	df	Mean Square	df		
PC1	0,319	-0,853	-0,971	0,967	6,593	3	0,237	22	27,777	0,000
PC2	1,881	0,323	-0,768	-0,485	6,893	3	0,196	22	35,094	0,000

The analyzed 26 EU Member States were enrolled in four clusters, as can be seen in Table 6 and Figure 6.

Table 6

Cluster Membership

Cluster 1	Cluster 2	Cluster 3	Cluster 4
EL, ES, IT, RO	BG,CY, LT, LV, PL, PT	CZ, EE, HU, MT, SI, SK	AT, BE, DE, DK, FI, FR, IE, NL, SE, UK

Cluster 1 is strongly positive correlated with factor 2-PC2 (+1,881, Table 5), and containing countries (Greece, Italy, Spain - southern countries and Romania) with the highest working poverty rate, self-employment, employment in agriculture and involuntary flexible work (Figure 7/8). In 2007–2012 period, Romania is EU-27 leader in terms of in-work poverty rate (17,7%), self employment (28,6 %) and employment in agriculture (30,5 %). It is the country with the biggest problems concerning the structure and quality of employment with a negative impact on human and economic development. Romania's position in quadrant 2 (Figure 6) is due to the very low value of: GDP/capita, labour productivity and net income value, comparatively with the peer countries in the cluster. Unlike Greece, where a large part of the self-employed people work in tourism and adjacent services, in Romania, they work in subsistence agriculture. Spain and Greece are characterised by high unemployment rate (17,4 %, 13 % respectively). Moreover, unemployment among young people is a major problem in these countries (37 %, 33,9 % respectively).

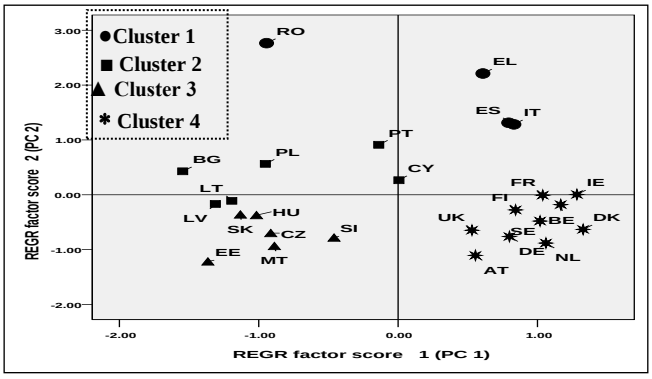

Figure 6. EU clusters analysis results

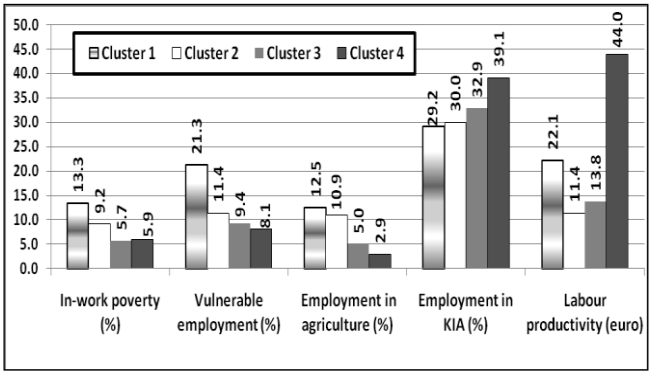

Figure 7. Working poverty, employment structure and labour productivity, 2007–2012 average
Source: Own calculations based on Eurostat (2014)

Cluster 2, which includes Latvia, Lithuania, Poland, Bulgaria, Portugal and Cyprus, is negatively correlated with factor 1 (-0,853). This group of countries is mainly

characterized by lowest values concerning human and economic development, labour productivity and net income of employed population. Bulgaria is on the last place in EU-27 in terms of these indicators. Within this cluster the countries show some heterogeneity. Poland and Portugal record the highest shares of temporary working (27,1 %, 22,2 % respectively), but also high employment in agriculture (the third and fifth place in EU27). Portugal tends to be closer to cluster 1, fact that can be explained by their relatively high labour productivity, GDP per capita, HDI and net income compared to peer countries in the cluster. Lithuania and Latvia are situated in the 3nd quadrant (Figure 6) because in these countries employment in agriculture and self-employment are more reduced, fact that determined a more reduced level of in-work poverty compared with the average of this cluster.

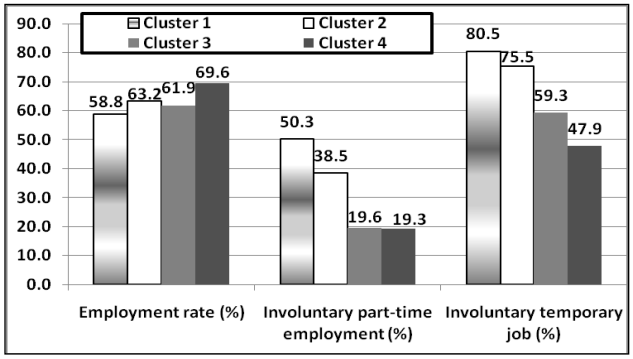

Figure 8. Employment rate and involuntary flexible work, 2007–2012 average
Source: Own calculations based on Eurostat (2014)

Cluster 3 is negatively correlated with factor 1, but also with factor 2 (-0,971 and -0,768 respectively, Table 5). All countries included in this group (Estonia, Cehia, Hungary, Slovakia, Slovenia and Malta) joined the EU in 2004, being placed in the 3nd quadrant (Figure 6). Although work vulnerability and precariousness is higher compared to that in cluster 4, working poverty rate is the most reduced (Figure 7). Czech Republic recorded, in 2007–2012 period, the lowest in-work poverty rate in EU. This can be explained by the highly distributive effects of its welfare system (EU, 2012). Countries in this group have lower social expenditure relative to those in cluster 1 (Figure 9), but they achieve an in-work poverty rate almost similar to cluster 1, having more redistributive welfare systems, helping them to be among the countries with the lowest levels of inequality in the EU.

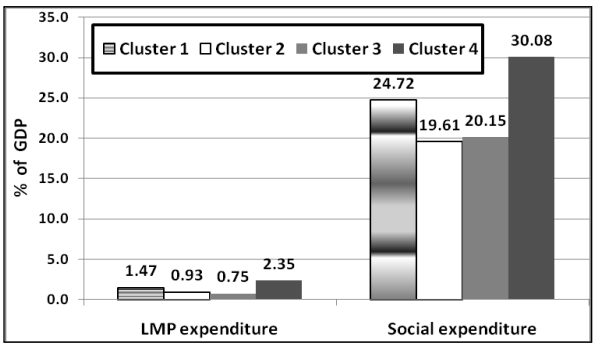

Figure 9. Social and LMP expenditure, 2007–2012 average
Source: Own calculations based on Eurostat (2014)

However, this cluster is ranked third in terms of GDP per capita, labour productivity and employment rate. This unfavourable position can be explained by the fact that countries of Central and Eastern Europe had to transform their economy from centrally planned to market economy while Western European countries have been practicing market economy for centuries (Vojtovich, 2013).

Nordic and continental EU countries enrolled in *cluster 4* can be characterized by highest productive and decent employment. It can be noticed that all these countries are distributed mainly in relation to the positive meaning of the variables that form the PC1 (Figure 6). They are characterized by the highest level of economic and human development and labour productivity. These countries have an employment rate over the EU average and a level of unemployment below the EU average. Over 70 % of jobs are created in services, below 3 % in agriculture and 39,1 % in knowledge-intensive activities (KIA), fact that demonstrates that they are knowledge-based economies. A high level of employment in KIA entails the existence of a high level of education in these countries, especially in the northern countries, and allows the growth of the employment degree. Using part-time and temporary work is also characteristic to these countries, but they have the lowest level of involuntary work compared to countries from other clusters (Figure 8). Netherlands is the EU leader in part-time work (49.3 % of total employment). Using these ways of making work more flexible and reducing unemployment go hand in hand with ensuring earnings and job security, under the circumstances in which these countries manage to assure the conditions for decent and productive work. Our results confirm that old Member States from this cluster have the highest spending on social protection and LMP and a strong impact in terms of poverty reduction, especially in working poverty.

Conclusions and Implications

Empirical research and EU Reports show that working poverty has become a real challenge for European countries. This study has shed light into the incidence and main determinants of working poverty, in the EU countries, in the recent economic crisis and recovery period (2007–2012). Some key arguments have been that, in this period, in-work poverty rate increased in sixteen EU countries and the prevalence of in-work poverty varied significantly across European countries, behind these differences there are specific factors that require specific measures.

The hypotheses in the study have been successfully supported by empirical data. The performed statistical relations' analysis between working poverty rate and human and economic development (HDI and GDP per capita) shows that in the European countries where working poverty is higher, the level of human and economic development is low, fact which requires taking some measures for reducing working poverty.

The research results show that vulnerable employment (expressed by the share of own-account workers and contributing family workers, in total employment, and employment in agriculture) and precarious employment (involuntary part-time and temporary work) represent

important factors behind the high level of working poverty from EU countries in period analysed.

Results of PCA and cluster analysis, for the 2007–2012 period, highlight that the advanced European countries proved to be more homogeneous in terms of the working poverty, employment performances, the efficiency of the welfare state system and the level of human and economic development, while new member states recorded different results, separated into two clusters. Romania together with southern countries (Greece, Italy and Spain) are grouped in the most inefficient cluster (cluster 1) in terms of working poverty and employment structure.

In order to increase employment efficiency and to reduce working poverty in the countries especially in cluster 1 and 2, it is highly necessary to make structural changes that should increase the importance of non-agricultural sectors in production and employment. As these clusters are characterised by the highest values of employment in agriculture, the quality of jobs in this sector needs to be improved. Any movement of employment from the agricultural sector to the one of industry and services entails an increase in labour productivity and decrease in working poverty, by reducing the self-employed population and contributing family worker or by making their work more efficient. Furthermore, it is imperative to turn self-employment from a "necessity entrepreneurship" into an "opportunity entrepreneurship", one driving productive and decent jobs and welfare implicitly.

Minimum wage policies need to have an important role in preventing working poverty and the decrease in income inequalities especially in the countries with the lowest minimum wages from EU (Bulgaria, Romania, Lithuania and Latvia). At the same time, national policies on the reduction of working poverty need to focus on improving labour productivity, as it is well-known that wages reflect people' productivity.

Under pressure from the population ageing process, improving working conditions and creating higher quality jobs for older workers, especially in the EU countries where working poverty rate is extremely high for this category, represent an important way of encouraging longer working lives for ensuring the sustainability of pension systems.

For reducing the utterly high unemployment, especially among young people, countries in cluster 1 (Greece, Spain, Italy), but not only them, need to take measures that, on the one hand, would stimulate investments in national economies (by monetary, budgetary policies etc.). These investments should generate new jobs, but not any kind of jobs, but decent and productive jobs. On the other hand, it is necessary to improve human resource employability, the matching of skills to the labour market needs, and efficient investments in human capital development. "Investing in entrepreneurship education is one of the highest return on investments Europe can make" has stated recently, the European Commission (2013).

In order to achieve Europe 2020 Strategy objectives in terms of poverty and employment (the reduction in the number of people experiencing poverty by at least 20 million by 2020 and reaching 75 % employment rate for women and men aged 20–64) and to make sure that the employment target does not undermine the poverty target (EAPN, 2013), we consider that the reduction in working poverty needs to be placed at the core of European and national strategies.

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