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QUALITY OF LIFE RESEARCH: MATERIAL LIVING CONDITIONS IN THE VISEGRAD GROUP COUNTRIES

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ABSTRACT. The paper researches the quality of life, namely the dimension of material living conditions in the Visegrad Group countries (hereinafter V4 countries) represented by the Czech Republic, Hungary, Poland and Slovakia. The main value-added of the paper is a development analysis of the most important indicators of material living conditions recommended by Eurostat and calculations of the integrated indices which enable us to make comparisons among the V4 countries in 2005-2013. According to our results, the Czech Republic achieved the first position among the V4 countries, mainly due to the highest values of income indicator and GDP per capita and the lowest levels of income inequality, relative poverty and proportion of the materially deprived people. Slovakia came second and recorded improvement especially in the income indicator and the proportion of materially deprived people. Hungary yielded worsening of material living conditions mainly in the indicators of self-reported evaluation of poverty, social inclusion and material deprivation. Poland achieved relative improvement almost in all analysed indicators and moved from the last to the third position among the V4 countries.

JEL Classification: I310, I320

Keywords: quality of life, material living conditions, integrated index, Visegrad Group countries.

Introduction

There is a large amount of literature on quality of life (hereinafter QOL) measuring relationship between overall life satisfaction and the objective life conditions. There is no unified definition of QOL, neither a unified methodology for its assessment. According to Stiglitz *et al*. (2009), QOL represents a broader concept than economic production and living conditions. Many different factors have influence on the evaluation of life above its material aspect (Šoltés & Gavurová, 2015). Multidimensional character of QOL is implied by various research studies which explored QOL from different aspects (e.g. Eurostat, 2015a; Khaef & Zebardast, 2015; Eby *et al*., 2012). However, there is no standard method for selection of indicators (Diener, 1995). Eurostat (2015a) recommends multidimensional measurement of QOL which focuses on the different aspects of QOL complementing the traditionally used

indicators of economic and social development, e.g. GDP. Therefore, assessment framework for the QOL dimension of material living conditions is considered further in the paper in more detail.

The V4 countries belong to the former Socialist Bloc countries and have undergone the process of transformation from centrally planned to modern free market democracy, recording changes in value system of their citizens (Barták & Gavurová, 2014). According to their GDP per capita, they are on similar level of economic development, but in comparison with the average values of GDP per capita in the EU-27 (25.800 in PPS units), values in the V4 countries are considerably lower (from 17.200 to 20.600 in PPS units). Assessment of material living conditions in countries can provide more detailed picture of progress in the transformation process and social development than a development analysis of traditional indicators of economic growth itself. Indicators of material living conditions offer useful information about important issues of QOL, e.g. distribution of income in households, income inequality, risk of poverty, subjective perception of poverty and social exclusion in households, material deprivation or problems with housing.

The main goal of this paper is to assess material living conditions in the V4 countries in comparison to the EU-27 by the means of a development analysis of the most important indicators recommended by Eurostat and by the means of the calculated integrated indices. The paper consists of four parts. The first one contains brief overview of QOL research with emphasis on material living conditions. In the second part, there is a description of data used and methodology. The next part is dedicated to a development analysis of material and living conditions and the calculated indices during the period of 2005-2013. Finally, we conclude and evaluate research findings.

1. Literature Review

1.1. Defining the Quality of Life

According to Havasi (2013), well-being and its synonym – QOL do not equal welfare. QOL represents the concept with broader meaning and consists of many different aspect of human being which indicates its multidimensional character. For QOL, there is no universally accepted definition (e.g. Ira & Andráško, 2007; Das, 2008; Royuela *et al*., 2009). In general, there is distinction between two different sides of QOL: objective and subjective. The objective (descriptive) QOL consists of life conditions of people, whereas the subjective (evaluative) QOL is based on the judgement and evaluation of life conditions and feelings towards them (Havasi, 2013; Džuka, 2004; Stiglitz *et al*., 2009). According to Fayers and Machin (2000), QOL represents differences between the hopes and expectations of the individual and of the present experience of the individual. Veenhoven (2000) distinguishes between four qualities of life, namely: liveability of the environment, life-ability of the person, utility of life for the environment and appreciation of life by the person. He considers the indicator of how long and happily a person lives as the best available summary indicator.

Eurostat (2015a) recommends multidimensional measurement of QOL which focuses on the different aspects of QOL complementing the traditionally used indicators of economic and social development, e.g. GDP. It defines nine QOL dimensions, namely: material living conditions, productive or main activity, health, education, leisure and social interactions, economic and physical safety, governance and basic rights, natural and living environment and overall experience of life. The first eight dimensions assess the functional capabilities of citizens in filling the self-defined well-being. The last overall experience of life is devoted to the assessment of the subjective perception of own life and well-being.

QOL indicators often serve as an input for calculation of the overall aggregate indices, which can easily identify the situation and development in the economic, demographic, social, environmental and other areas. Aggregate index is a dimensionless number that has many advantages such as transparency, possibility of simple comparisons, and aggregation of various values (Heřmanová, 2012). Composite indicators can compare country performance and represent a useful tool in policy analysis and public communication (OECD, 2008). On the other hand, however, in case of bad construction or misinterpretation they can offer misleading policy messages.

1.2. Dimension of Material Living Conditions

The paper focuses on material living conditions, the first from the nine QOL dimensions. Sen (2004) considers material resources as the means which can be transformed into well-being in accordance with preferences, capabilities, free will and values of a person. In spite of the fact that the economic conditions do not reflect QOL per se, they can provide a measurement framework for the potential of the individuals and households to achieve and ensure their own self-defined well-being. It is important to assess dimension of material living standards in this wider context and not only in monetary terms (Eurostat, 2015a).

Standard of living of an individual can be stated by the means of three different parts: income, consumption and material conditions (Eurostat, 2015a). Both subjective and objective QOL indicators determine the overall QOL which is the reason their importance in QOL assessment (Aallardt, 1986; Diener, 2005; Stiglitz *et al*., 2009; Havasi, 2013). According to Weziak-Bialowolska (2014), living standard of people can be measured in both relative conditions (in comparison to other people) and in absolute conditions (their satisfaction with different life dimensions) and is able to reflect whether people live in poverty. There are many research activities assessing QOL from different views in the V4 countries. For example, *Social diagnosis* by Czapinski and Panek (2013) assessed objective and subjective QOL in Poland with emphasis on Poles' living conditions and QOL as they report it themselves. Jakubcová *et al.* (2014) researched the influence of the extraordinary flooding impact in June 2013 on QOL in Slovak rural regions. The table below summarizes objective and subjective indicators of material living conditions available on Eurostat database used in further analysis.

Table 1. Indicators of objective and subjective material living conditions

Indicator (Units)	Definition
Median equivalised net disposable income, (EUR)	*Sharing of individuals' incomes in one household*. Sum of all income from different sources acquired by all members of the person's household, divided by an equivalised household size in accordance with a standard scale, considering composition of the household.
Income quintile share ratio (S80/S20), (%)	*Aspect of income differences and inequality*. Proportion of the total income received by the top quintile to that received by the bottom.
At risk of poverty (AROP) rate by poverty threshold and anchored at a fixed moment in time (2008), (%)	It is defined in comparison with the overall income level in each society. Another AROP rate that uses the monetary thresholds levels of 2008 is updated for inflation and better reflects the effects of the crisis.
Inability to make ends meet (proportion of households making ends meet with great difficulty), (%)	*Subjective assessment of poverty and social exclusion*. It concerns self-appraisals based on the implicit criteria. Self-reported difficulty to make ends meet shows households experienced feeling of poverty.

Severely materially deprived people, (%)	*A state of economic strain characterised* as the enforced inability to afford representative material standards, considered by most people to be necessary to lead an acceptable life.
Share of total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames of floor, (%)	*Indicator reflecting housing conditions*. It represents objective existence of structural problems with dwelling, overcrowding and basic amenities.

Source: compiled from Eurostat (2015a).

2. Assessment of Material Living Conditions in the V4 countries

2.1. Data and Methodology

For a development analysis and calculation of the indices we used data obtained from the *European Survey on Income and Living Conditions* (Eurostat, 2015b) for the time period 2005-2013 available on Eurostat database. Indicators are summarized in the previous *Table 1*.

The economy of countries is often confronted with social development of society and QOL of its inhabitants (Jáčová & Horák, 2015). Therefore, increasing of QOL of citizens is a desirable trend. We calculated the integrated indices based on multi-criteria methods (decision making methods) to assess and compare the V4 countries in the terms of material living conditions. Multi-criteria methods were applied in several ways, e.g. assessment of sustainable development in country (Štreimikiene & Baležentis, 2013), selection of effective alternative of structures, technologies, investments (Zavadskas *et al.*, 2010), comparing the countries in the field of environmental quality and health status (Štreimikiene & Vveinhardt, 2015). We used this approach to provide comparative analysis of material living conditions in the V4 countries.

In this part we describe the process of calculation of the integrated indices based on (Ibid., 2015). The first stage is calculation of the partial indices from those indicators where desirable trend is increasing, by the means of the next formula:

$$X_{in} = \frac{x_{ni}}{x_{0i}}, \qquad (1)$$

where X_{ni} is the partial index of *i*- material living conditions indicator at time moment *n* and x_{0i} is the value of *i*- material living conditions indicator at time moment *n* for the EU-27 average; or calculation of the partial indices from those indicators where increasing is undesirable trend, by the means of the next formula:

$$X_{in} = \frac{(1/x_{ni})}{(1/x_{0i})}. \qquad (2)$$

In our case, we did not weight the time periods and we attributed equal weights to all of them which virtually implied that no specific weight vectors were used.

In the last stage we calculated the material living conditions integrated index which consists of the 5 partial indices by the means of the next formula:

$$I_n = \sum_{i=1}^{n} X_{in}, \qquad (3)$$

where I_n is the integrated index of material living conditions at time moment *n* and X_{in} is the material living conditions partial index at time moment *n*.

Finally, we can analyse and compare the values of the integrated indices of material living conditions for the V4 countries in the time period of 2005-2013. The highest the value of the index is, the better the performance of country in analysed time period. Within each country, equal weights were utilised for the different indices of material living conditions, therefore no specific weight vectors were used.

2.2. Development Analysis of Material Living Conditions Indicators in the V4 countries

A development analysis of the main material living conditions indicators in the V4 countries enables us to find out the most problematic issues. Development of partial indicators and the integrated indices (growth, decline or stagnation) was tested by the means of statistical test of growth, calculation of Pearson correlation coefficient. Values above 0.3 denote growth, values between -0.3 to 0.3 denote stagnation and values below -0.3 denote decline.

In *Figure 1*, development of median equivalised net income is showed in the V4 countries and EU-27.

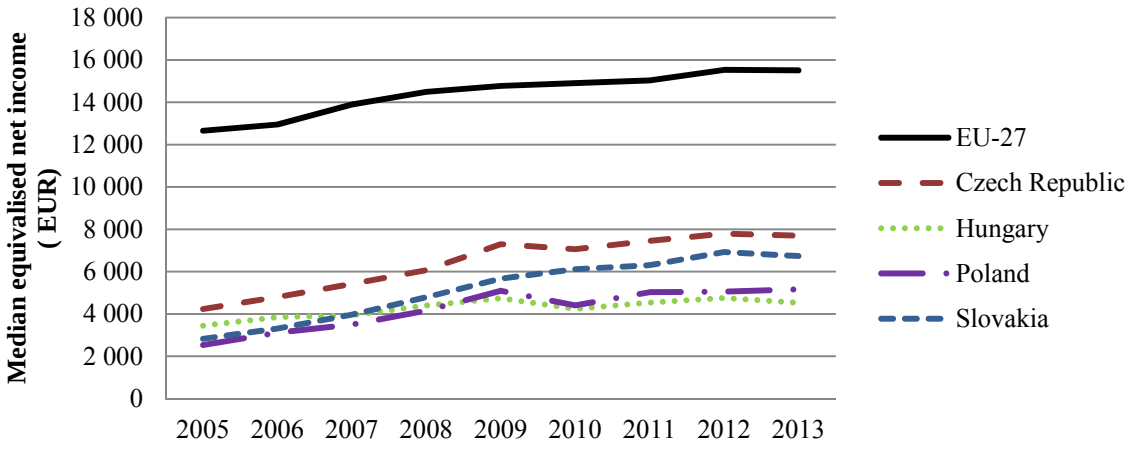

Figure 1. Development of median equivalised net income (EUR) in the V4 countries and the EU-27 (2005-2013)
Source: own processing based on data from Eurostat (2015b).

As we can see from the figure, median equivalised net income was the highest in the Czech Republic during the whole analysed period but below the EU-27 average. The highest growth of this indicator was recorded in Slovakia (from 2830 EUR in 2005 to 6737 EUR in 2013). The country with the worst results from the V4 countries was Hungary where there was only slight growth of this indicator what resulted in the fall from the second to the last place. Growth of median equivalised net income indicator was confirmed by correlation coefficients (values above 0.83).

The next *Figure 2* shows development of income quintile share ratio (S80/S20) that represents the income inequality in the analysed countries.

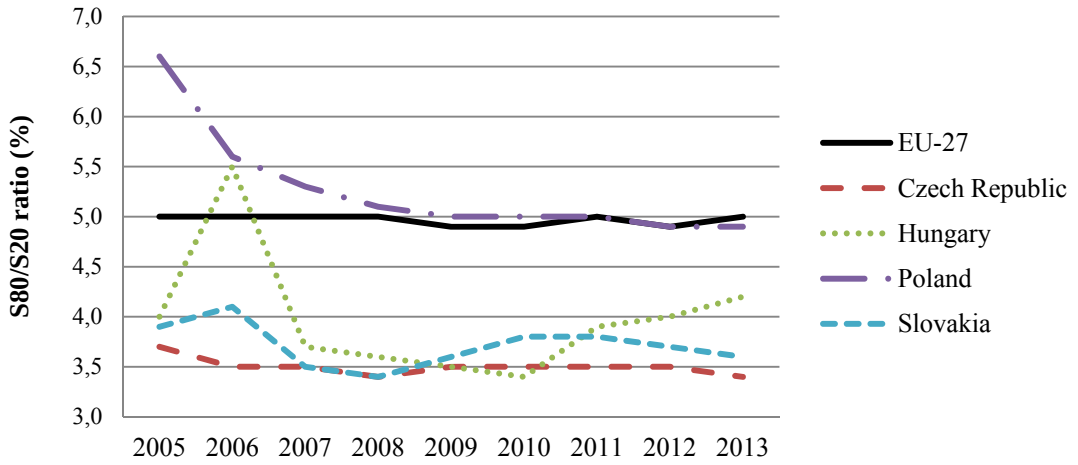

Figure 2. Development of S80/S20 ratio (%) in the V4 countries and the EU-27 (2005-2013)
Source: own processing based on data from Eurostat (2015b).

Growth of this indicator represents undesirable trend. As it is obvious from the figure, Poland had sharpest inequalities across the population from the V4 countries (value about 5.0% means that that people at the top of the income scale earned on average five times more than people at the bottom). According to this indicator, the most egalitarian was the Czech Republic with the lowest values of ratio below the average ratio in the EU-27 (about 5.0%) together with Slovakia and Hungary with values also below the EU-27 average. Decline of S80/S20 ratio indicator was confirmed by correlation coefficients in the Czech Republic and Poland (values below -0.58) and stagnation in Slovakia and Hungary (values around -0.25).

At risk of poverty indicator (AROP) is relative measure of poverty in the country. For our analysis we used AROP by poverty threshold (data available from 2005 to 2013) and AROP anchored at a fixed moment (data available from 2008 to 2013) updated for inflation and better reflecting the effect of crisis (in comparison to previous standard of living) (see *Figure 3*).

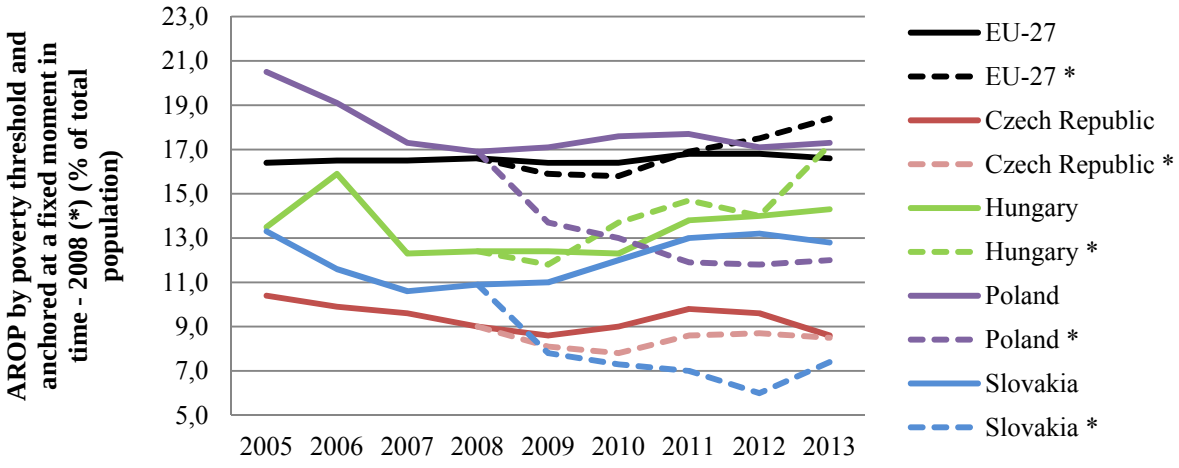

Figure 3. Development of AROP by poverty threshold and anchored at a fixed moment in time in 2008 (% of total population) (*) in the V4 countries and the EU-27(2005-2013)
Source: own processing based on data from Eurostat (2015b).

The lowest proportion of population under the poverty threshold was in the Czech Republic. When we consider AROP anchored at a fixed moment in time – 2008 (marked as dotted line) Slovakia had better results as the Czech Republic. During the analysed period Poland was above the EU-27 average, but if taking into account the fixed indicator, its proportion of population at risk of poverty was considerably lower. All the V4 countries recorded almost in all years better values of anchored indicator when comparing to the EU-27 average. Decline of AROP indicator by poverty threshold was confirmed by correlation coefficient in Czech Republic and Poland (values below -0.55), stagnation in Hungary (value about 0.02), and growth Slovakia (value about 0.37).

The next *Figure 4* illustrates development of self-reported evaluation of poverty and social inclusion – inability to make ends meet. It represents the proportion of population living in households that have a great difficulty to make ends meet.

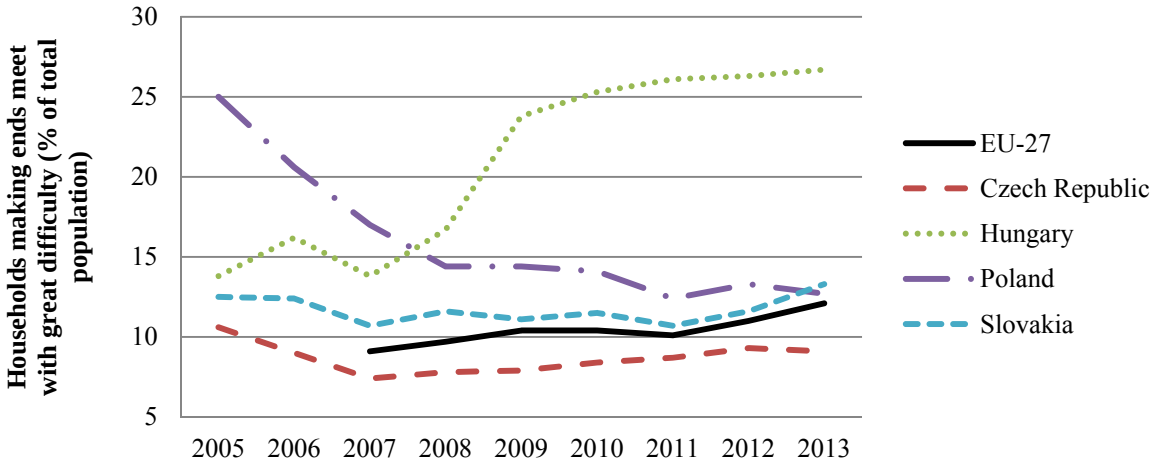

Figure 4. Development of proportion of households making ends meet with great difficulty (% of total population) in the V4 countries and the EU-27 (2005-2013)
Source: own processing based on data from Eurostat (2015b).

Proportion of population in Slovakia, Poland and Hungary living in households that have a great difficulty to make ends meet was between 2005 and 2013 above the EU-27 average. The steepest growth was recorded in Hungary (from 13.8% to 26.7%). Proportion of households which feel poor in Poland was significantly reduced from 25% in 2005 to 12.7% at the end of the analysed period. Only in the Czech Republic was development of values of this indicator constantly lower than in the EU-27. Decline of this indicator was confirmed by correlation coefficients in Poland (value about -0.87), stagnation in the Czech Republic and Slovakia (values about 0) and growth in Hungary (value about 0.92).

Figure 5 displays the proportion of population which is considered to be severely materially deprived in the V4 countries compared to the EU-27 average.

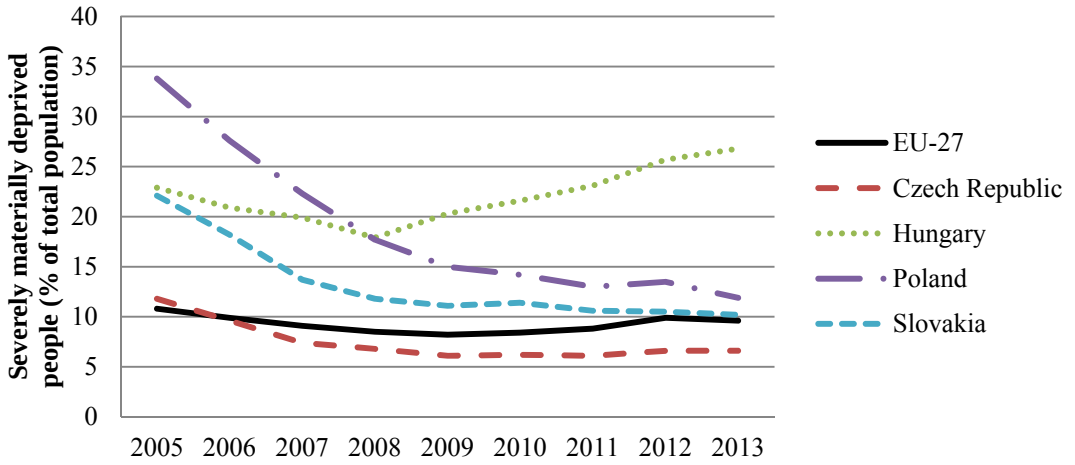

Figure 5. Development of proportion of severely materially deprived people (% of total population) in the V4 countries and the EU-27(2005-2013)
Source: own processing based on data from Eurostat (2015b).

As it is obvious from the figure, the largest proportion of materially deprived people lived in Hungary (26.8% in 2013). In Poland, development of this proportion decreased gradually during analysed period (from 33.8% in 2005 to 11.9% in 2013). The Czech Republic was the best performing country with proportion almost a whole period lower than the EU-27 average, Slovakian proportion of these people decreased slightly above the EU-27 average. Based on the values of correlation coefficients, there was decline of this indicator in the Czech Republic, Slovakia and Poland (values below -0.76) and growth in Hungary (value about 0.65).

The next *Figure 6* shows the share of total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames of floor in the V4 countries which points out problems with dwelling.

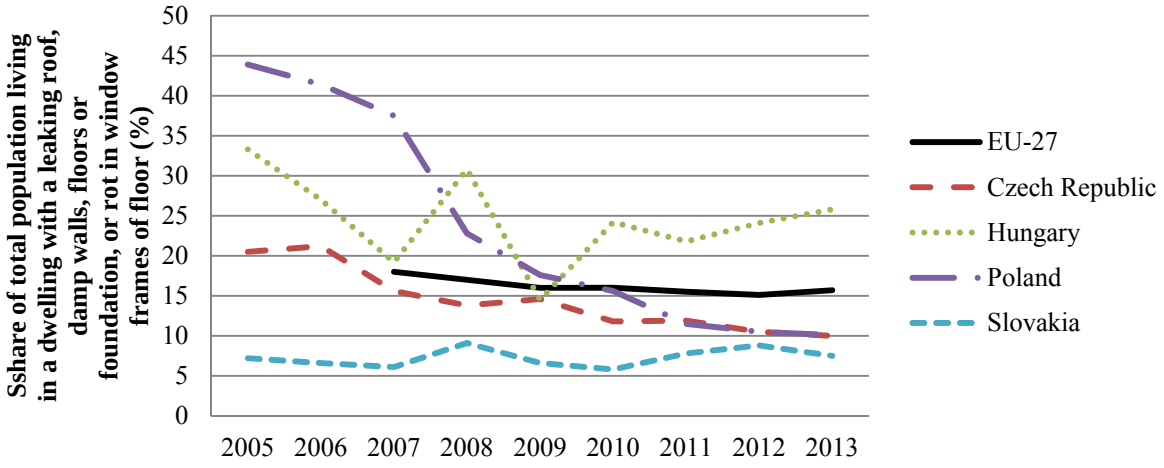

Figure 6. Development of share of total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames of floor (in %) in the V4 countries and the EU-27 (2005-2013)
Source: own processing based on data from Eurostat (2015b).

Slovakia and the Czech Republic had smaller proportion of population with structural problems of dwelling than the EU-27 average during period of 2007-2013. We can see from the figure that the rate in Hungary was above the EU-27 average and rose from the second half of the analysed period. Poland recorded sharp decrease of the ratio (from 43.9 to 10.1%). Values of correlations coefficients confirmed decrease of this indicator in Hungary, Poland and the Czech Republic (values below -0.32) and growth in Slovakia (values about 0.32).

The last *Figure 7* displays development of traditional indicator of economic performance of country which has also effect on QOL of inhabitants.

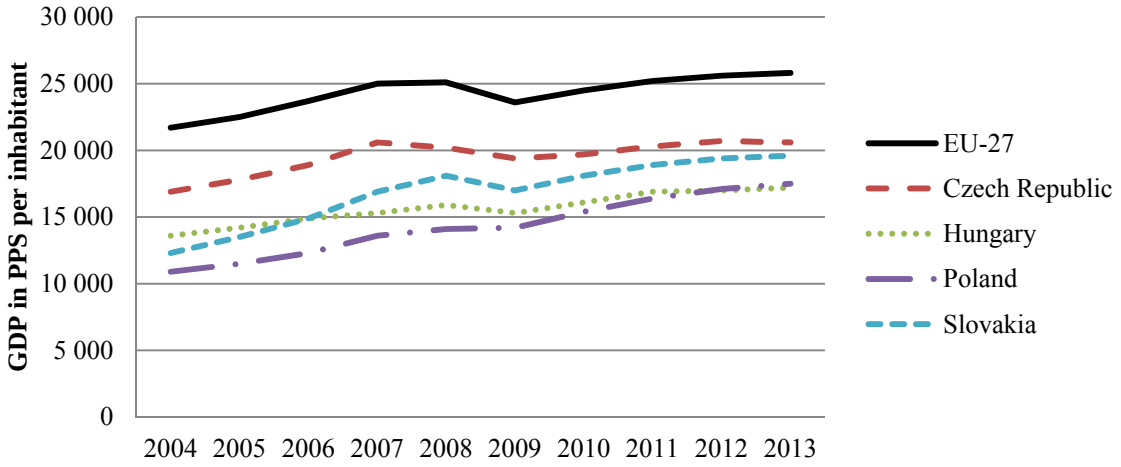

Figure 7. Gross Domestic Product (GDP) at market prices in Purchasing Power Standard per inhabitant in the V4 countries and the EU-27 (2005-2013)
Source: own processing based on data from Eurostat (2015b).

We can see different levels of economic performance of the V4 countries. All of the V4 countries were below the EU-27 average but recorded growth of GDP confirmed by correlation coefficients (values over 0.81).

2.3. Development of the Integrated Indices of Material Living Conditions in the V4 countries

A development analysis of the partial and the integrated indices of material living conditions enables us to compare the V4 countries with the EU-27 average. The calculated indices are recorded in the *Table 2*. The indices were computed based on data from Eurostat presented in the previous chapter in graphical analysis.We omitted two of the partial indicators from the calculation because of missing values in the years 2005 and 2006 (inability to make ends meet and indicator of problems with dwelling). The partial indices were computed by the means of *formula 1* in cases where an increase of the indicator is desirable trend, or *formula 2* in cases where an increase is undesirable trend, e.g. indicator of poverty, to ensure that growth of the indices represents the higher material living conditions quality. The integrated indices were calculated by applying *formula 3*.

Table 2. Dynamics of material living conditions the partial and the integrated indices in the V4 countries (2005-2013)

Median Income	***2005***	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***
Czech Republic	0,33	0,37	0,39	0,42	0,49	0,47	0,50	0,50	0,50
Hungary	0,27	0,30	0,28	0,30	0,32	0,28	0,30	0,31	0,29
Poland	0,20	0,24	0,25	0,29	0,34	0,30	0,33	0,33	0,33
Slovakia	0,22	0,26	0,29	0,33	0,38	0,41	0,42	0,45	0,43
S80-S20	***2005***	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***
Czech Republic	1,35	1,43	1,43	1,47	1,40	1,40	1,43	1,40	1,47
Hungary	1,25	0,91	1,35	1,39	1,40	1,44	1,28	1,23	1,19
Poland	0,76	0,89	0,94	0,98	0,98	0,98	1,00	1,00	1,02
Slovakia	1,28	1,22	1,43	1,47	1,36	1,29	1,32	1,32	1,39
Risk of Poverty	***2005***	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***
Czech Republic	1,58	1,67	1,72	1,84	1,91	1,82	1,71	1,75	1,93
Hungary	1,21	1,04	1,34	1,34	1,32	1,33	1,22	1,20	1,16
Poland	0,80	0,86	0,95	0,98	0,96	0,93	0,95	0,98	0,96
Slovakia	1,23	1,42	1,56	1,52	1,49	1,37	1,29	1,27	1,30
Material Deprivation	***2005***	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***
Czech Republic	0,92	1,03	1,23	1,25	1,34	1,35	1,44	1,5	1,45
Hungary	0,47	0,47	0,46	0,47	0,4	0,39	0,38	0,39	0,36
Poland	0,32	0,36	0,41	0,48	0,55	0,59	0,68	0,73	0,81
Slovakia	0,49	0,54	0,66	0,72	0,74	0,74	0,83	0,94	0,94
GDP per Capita	***2005***	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***
Czech Republic	0,79	0,80	0,82	0,80	0,82	0,80	0,81	0,81	0,80
Hungary	0,63	0,63	0,61	0,63	0,65	0,66	0,67	0,66	0,67
Poland	0,51	0,52	0,54	0,56	0,60	0,63	0,65	0,67	0,68
Slovakia	0,60	0,63	0,68	0,72	0,72	0,74	0,75	0,76	0,76
Integrated Index	***2005***	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***
Czech Republic	4,97	5,29	5,59	5,79	5,96	5,85	5,89	5,96	6,15
Hungary	3,84	3,35	4,04	4,13	4,09	4,10	3,85	3,79	3,67
Poland	2,59	2,88	3,10	3,29	3,43	3,43	3,61	3,71	3,80
Slovakia	3,83	4,07	4,61	4,76	4,69	4,54	4,61	4,74	4,82

Source: own calculations based on data from Eurostat (2015b).

The next figure illustrates graphical presentation of development of the integrated material living conditions indices in the V4 countries.

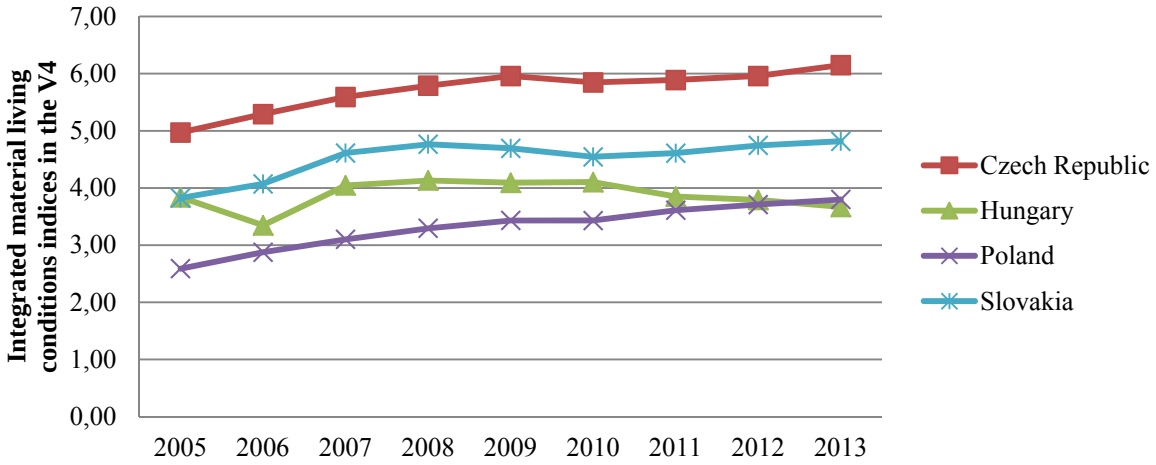

Figure 8. Development of the integrated material living conditions indices in the V4 countries (2005-2013)
Source: own calculationsbased on data from Eurostat (2015b).

We can see that the best performing country in the dimension of material living conditions was the Czech Republic during the whole analysed period. Slovakia achieved the second position. At the end of the analysed period, Hungary fell from the third to the last position and Poland recorded improvement from the last to the third position. Values of correlations coefficients confirmed growth of the indices in the Czech Republic (value about 0.90), Poland (value about 0.97) and Slovakia (value about 0.77) and stagnation in Hungary (value about 0.04).

Conclusions

QOL research contains different areas of life of the people which imply its complexity. Therefore, Eurostat distinguishes between 9 dimensions of QOL which can be measured statistically to access the different complementary aspects of QOL. In this paper we focused on the first dimension, namely material living conditions in the V4 countries during the time period of 2005-2013.

Firstly, we separately evaluated development of partial indicators, because the calculation of the integrated indices could miss important information about material living conditions. Secondly, we calculated the integrated indices to assess overall performance of the V4 countries in comparison to the EU-27 countries.

Our analysis confirmed the Czech Republic as the country with the best material living conditions from the V4 countries. It was mainly due to having the best values of the indicators except for the indicator representing housing conditions. Slovakia maintained second position during the whole analysed period and recorded improvement in areas of income, material deprivation of citizens and GDP. Hungary recorded worsening material living conditions almost in all indicators. Poland improved its position mainly by significant growth of income and decrease of indicators representing material deprivation and poverty.

It is important to consider that the aggregate indices could be sometimes deceptive, particularly in cases when there are large differences between social groups and households. Therefore, detailed analysis of partial aspects of the assessed area is necessary, to avoid misleading information resulting in ineffective policy recommendations (Eurofound, 2015).

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