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# Problems related to measuring and interpreting indicators of the standard of living

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**Abstract:** The paper deals with different approaches to measuring living standards. Attention is drawn to income and expenditures recorded in selected countries of the European Union (the United Kingdom, Sweden, Germany, Spain and the Czech Republic). The basic model of linear regression analysis is used to present the curve of the income and expense situation of households. In order to reveal more specific details, analyses based on income quintiles are carried out. The European methodologies EU SILC and COICOP have been chosen as the main source of data. The period of interest was set for years 2005-2013. The article draws attention to ambiguity of commonly used objective indicators of the standard of living while measuring it.

**Keywords:** Living Conditions, Poverty, Measuring Income Inequality, Measuring Poverty, Income and Expenses of Households

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## 1. Introduction

Economically advanced countries, including those of the EU, the issues of income inequality and poverty have been becoming more important. Even though income inequality may have both positive and negative relations to the prosperity of people, a large number of economists believe that the increasing differences in income may have rather damaging effects on the whole of society. Big differences in income are ineffective, as they evoke dissatisfaction and instill anger in people, which results in a populist policy eliminating growth. According to the IMF, the income inequality slows down the economic growth, causes financial crises, and weakens the demand [1]. The relation between economic performance and social development of the society, which has been becoming more problematic, led renowned economists and sociologists led by Joseph Stiglitz, Nobel Prize winner, to identify and formulate an unambiguous opinion concerning this issue. These economists claim that the gross domestic product per capita (GDP) is an indicator unsuitable for finding out environmental, economic, and social impacts, as it says nothing about the quality of life. According to the committee, the quality of life, affluence, and related standard of living depend not only on economic

resources, but also on services provided by the public sector, i.e. medical, social, and educational services, feeling of security in public space, affordability of housing, and rate of employment. The quality of life, standard of living, and affluence are very similar terms that often overlap. The way they are presented shows how different they are, though. The standard of living is presented by real income, and it's supposed to present material and economic conditions of people. The quality of life refers to the overall wealth of people within a society and their chance to use opportunities in order to fulfill their aims, i.e. it doesn't contain only economic variables but also other variables based on subjective feelings. The affluence is considered mainly a subjective feeling, which is thus very hard to [2].

An inability to satisfy one's needs, insufficient access to education, bad health, and unsatisfactory healthcare, care for the old and the weak, tendencies to violence and crime, lack of political freedom, and an opportunity to assert oneself in the society – all these are phenomena of poverty [3]. The primal impulse in the chain of poverty indicators is often a lack of finances, which is why in economically advanced countries where the topic of interest is a relative poverty

(income of a single individual is lower than standard) the poverty is presented in form of an indicator of income poverty. It's far more difficult to present the relative poverty, as first it's necessary to determine (select) the break-even point to define the poverty line. This break-even point has to respect the conditions of the majority, i.e. it differs in individual regions or countries. For the purposes of comparing living conditions in individual its countries the EU defined this break-even point within a unified methodology as a certain percentage of the average income. Some sociologists claim, however, that the term poverty in advanced EU countries is rather about some people feeling they don't have what the others do, feeling that they're unable to handle everyday financial worries, and that they cannot keep pace with the majority in the society [4]. In order to resolve economic and social problems of the society it is necessary not only to have unambiguous definitions and indicators derived from them, but also an ability to find out and measure values for individual subjects. The ability to correctly interpret the obtained results is similarly important. The aim of this paper is to draw attention to the differences in approaches to measuring the standard of living and to interpretation of the results of the indicators related to measuring the standard of living of the EU inhabitants.

The paper is organized as follows: section 2 describes the methodology and introduces the dataset. Estimations results are presented in section 3 and finally, section 4 concludes.

## 2. Methodology

In order to present the level of economy and its progress in individual EU countries and the EU as a whole, an indicator of changes of the GDP curve and of the overall people's consumption was used. To illustrate the economic and material situation of people we used the data on income and expenses of households.

We used deciles in the income and expense analyses. From the created distribution function (ECDF) borders of deciles were found out.

The subject countries are EU countries selected based on their relation to various zones of cultural affinity [5]. Their representatives are UK, Sweden, Germany, Spain, and the Czech Republic. The period monitored is 2005–2013 due to the availability of the data for all the countries, as in 2005 the EU SILC examination was performed for the first time after joining the EU.

Poverty in the EU countries was demonstrated using an aspect of income poverty specified as 60% of the equalized income median, material deprivation, and unavailability of jobs.

In order to present the curve of income and expense situation of households in the relevant years, we used the basic model of linear regression analysis, in which the medium value of Y dependent variable is bound with one T independent variable in a relation where b is a direction of a straight line and  $\varepsilon_t$  stands for a residual item:

$$E(Y)=a + bT + \varepsilon_t$$

We also employed regression models to present income and expense situations of households in general in the selected quantile. T-statistics is provided to determine suitability of parameters of the regression function.

The main source of secondary data is an EUROSTAT database provided by the statistical office of the European Commission.

The source for information used in the evaluation of the standard of living is statistics obtained from the European Union – Statistics on Income and Living Conditions (EU SILC) project, which deals with income and living conditions in the EU.

The data on expenses of households in individual member countries of the EU are determined by the expenses on individual items according to the COICOP (Classification Of Individual Consumption by Purpose) methodology.

## 3. Results

This paper evaluates the standard of living of people in selected EU countries and focuses on the problem we come across when measuring and interpreting selected indicators and achieved results.

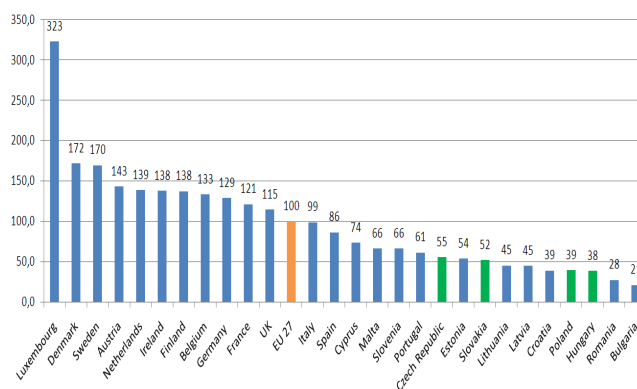


Figure 1. GDP per capita in EU (%)

Yet, it's impossible to omit monitoring of the curve of the GDP indicator, as the level of economy, or the achieved progress of the GDP, determines various economic and social decisions made by the government. Till 2007 the GDP in the EU countries had been permanently growing; then, during the world economic crisis, there was a drop in the GDP, while the biggest drop of 4.6% was monitored in 2009 for the whole of the EU. The crisis hit all the economies of the EU, and its impacts started to show in 2008. Even though most countries adopted extensive anti-crisis measures, basically no country managed to avoid a drop in its demand and a drop in the growth of the GDP [6]. The impacts of the crisis and economic development of individual countries both in and outside of the EU was very heterogeneous [7]. The differences between the member countries of the EU remain also very distinctive both in terms of the pace of the growth of the GDP (reflecting the differing levels of economies of

the EU members) and the GDP per capita [8]. From the currently-available data for 2013, we used the GDP indicator per capita, as calculated based on the purchasing power parity (figure), with the EU average marked as 100%, to show the levels of economy of individual countries.

The GDP indicator can be determined in several ways. There is a positive relation between the GDP curve and total expenses of households on consumption. The consumption of households reaches 56% of the average of the GDP in EU-27 in the given period. Based on these facts we can say that the total consumption of households is affected by the GDP curve and the conditions of the given economy.

The results of the examination of the income situation of households as a whole carried out from 2005 show a long-term positive trend (with certain fluctuations in 2009). The curve of this indicator in the selected countries is shown in figure 2.

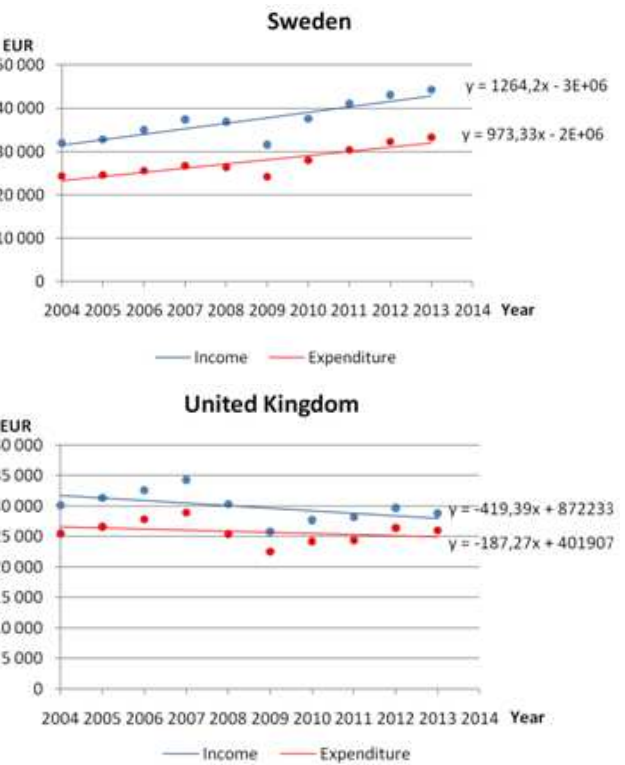
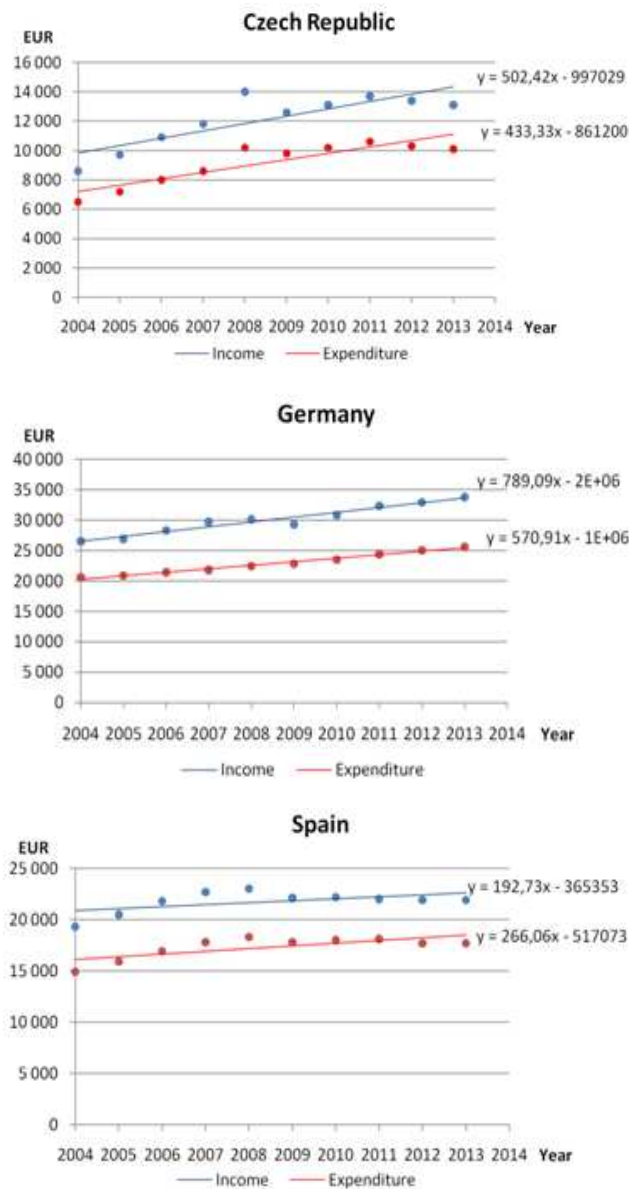


Figure 2. Income and expenses of households in selected countries

Even though there is a positive trend in most countries (except for the UK with rather stagnating income during the monitoring period of over ten years), there are various paces. The fastest pace is in the Czech Republic, even though it doesn't follow from the absolute values of the direction of the regression line, as this direction respects the lowest achieved level of average income. The fastest pace of growth with the highest absolute level is in Sweden and then in Germany. In Spain, there is the smallest increase in the positive direction.

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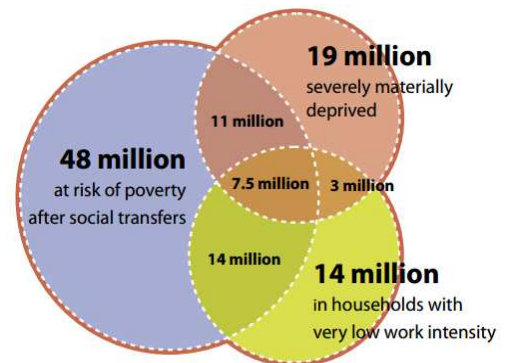


Figure 3. Three overlapping aspects of poverty

From the examination, it follows that around 12% of the people in the EU are endangered by poverty or social exclusion. Based on the frequency of these aspects we may say that around 9% of people are endangered by poverty due to one aspect of poverty, 2% of people are endangered by poverty due to two possible aspects, and almost 1% of people are endangered by all these three aspects of poverty. This group of households fulfills the conditions for being affected by all the negative social consequences, and rectification requires the biggest financial support with an unclear result. More detailed studies will help reveal countries (regions) with the biggest concentration of these people. Resolving the problem of poverty has to start with a group of households first affected only by one aspect of poverty.

Classifying someone as endangered is usually based on the income situation of households. This is why it's a subject of the most intensive interest and more detailed analyses. In this paper, the more detailed analyses and their findings will be carried out for selected EU countries based on zones of cultural affinity that show the biggest similarity of consumer behavior [10]. From the classification of households into individual quantiles (the 1<sup>st</sup> quantile in figure 4) based on their income, we can derive that even though all the monitored countries have higher income than expenses necessary to cover their needs in the monitored period, it is not like that at all in case of the households classified into individual income quantiles.

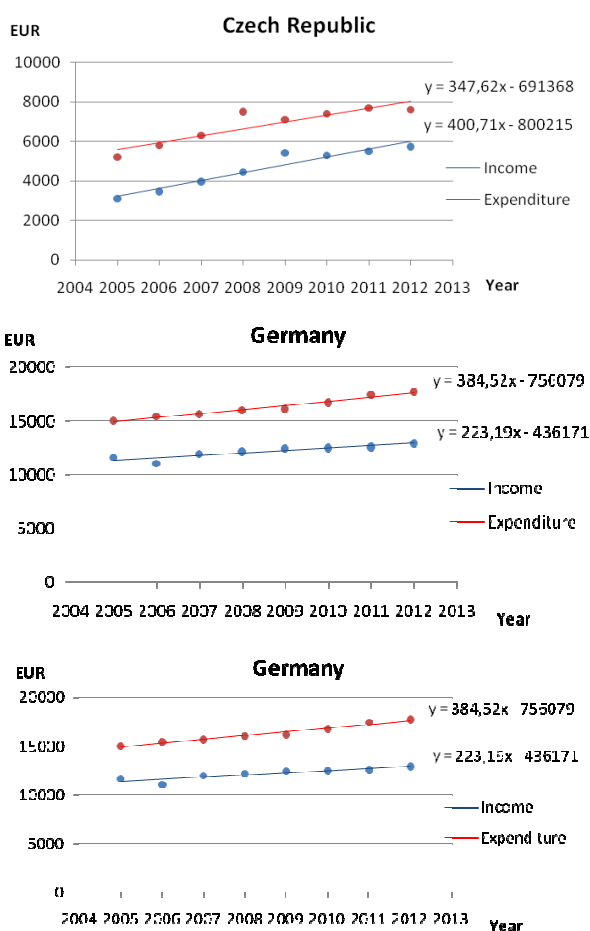


Figure 4. Situation in the 1<sup>st</sup> quantiles in individual countries

In the first quantile in all the monitored countries there are bigger expenses of households than their income. The smallest differences between income and expenses were monitored in Sweden while these differences are gradually rising for Germany and the Czech Republic, and the biggest differences are in the UK and Spain. This means that 20% of households with the lowest income in all the monitored countries should be monitored more intensively. It's necessary to find out about causes of their income situation, what types of households they are in terms of economic activities, education, and number of members of the household, how big their impact is on the situation of their household, how big the impact of social policy is on their household, how long have they been in such conditions, and – mainly – whether they want to or already deal with the lack of finances. The differences in the results of analyses of the income situation were monitored for the households classified in the second income quantile (figure 5). In Sweden, these households receive income bigger than their need of expenses, in Germany income and expenses are approximately the same, in the UK and Czech Republic income is slightly lower than expenses. In the Czech



Republic the amount of income gradually got closer to the required need of expenses. The situation in Spain is very negative, as the differences between income and expenses are very big. In the third quantiles, except for Spain, all the countries record income bigger than the amount of their required expenses. This shows that in Spain 60% of people live close to the poverty line and social exclusion, which is a signal of potential social unrests in the whole country.

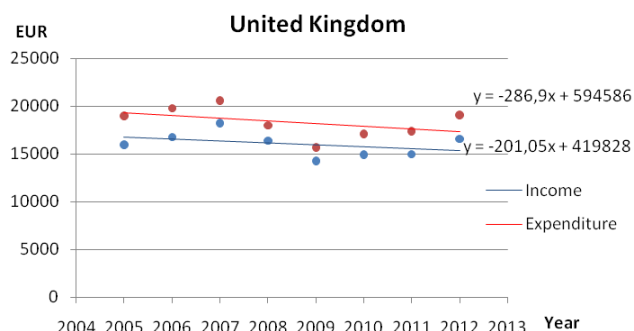
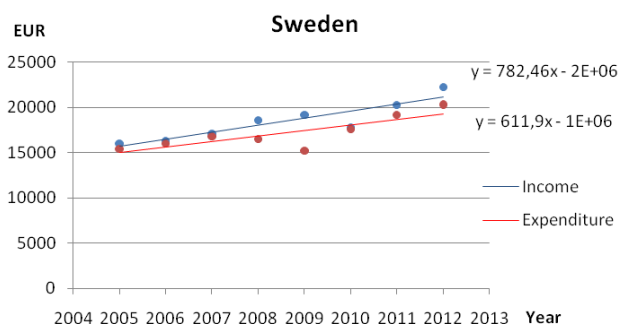
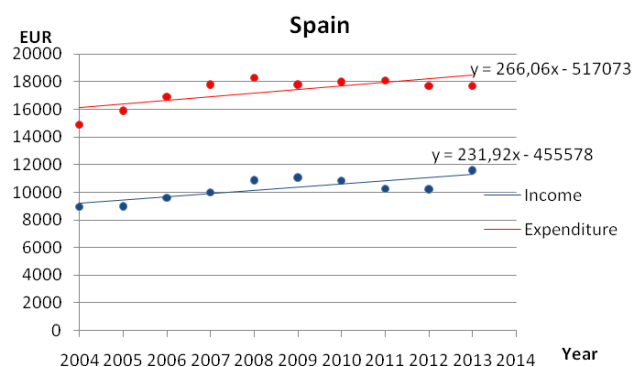
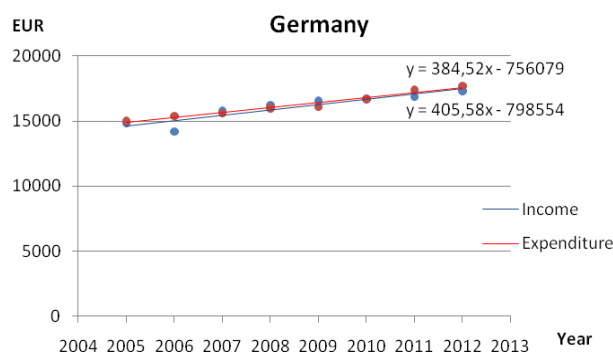
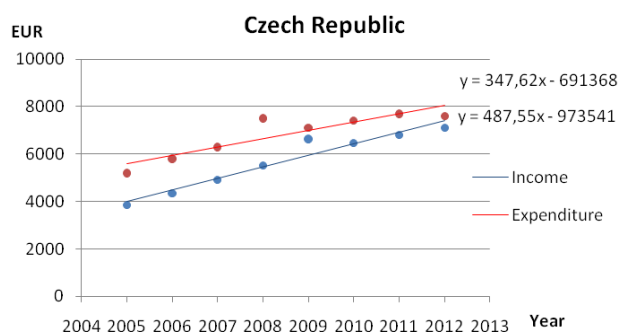


Figure 5. Situation in the 2<sup>nd</sup> quantiles in individual countries

Results of the analyses of the living standards indicators imply that the influence of the economic crisis proved itself widely divergent not only among the states, but even in the change of GDP per capita. Such a statement applies to expressing the living standards mainly via GDP. While expressing the living standards by average household income, it proves itself divergent but with a certain time shift. The crisis effects are more evident by the 1st and 2nd income quintiles. Influence of the world economic crisis is followed then by changes of poverty rate and material deprivation.

## 4. Conclusion

Based on the analyses of secondary data published every year by Eurostat that concern income and expense situations of households, we believe that it's necessary to deal with these issues in more detail. Income and expenses have to be analyzed always in mutual interactions, not separately between individual countries. The relation between these values is essential, as it provides a strong basis for evaluating the standard of living of people. The commonly available results are obtained by processing the data obtained from examinations carried out by EU SILC and CIOPOP according to a unified methodology binding for all the EU countries. These data are used for a partial evaluation of the standard of living. It's "partial" because the standard of living is influenced by numerous factors, which is why it is close to impossible to present it only within a single numerical value. Despite its limitations this evaluation is still of crucial importance, which is why a number of world-class experts deal with it. Unfortunately, the results concerning the income and expense analysis are very generalizing, as they work with average values for the whole set. Therefore, from these results it was possible to erroneously derive that during last 10 years in the whole of EU, and also in most countries, there was a positive development of the income situation and that the difference between the income and expenses necessary to satisfy the needs was getting bigger. Income variability differs so much that it's necessary to deal with arranging income values in the set and, mainly, with the situation in a big number of low-income households. This is why the authors of this paper dealt with an evaluation of the income and expense situation in partial sets created from the values classified into individual quantiles. From these analyses

major differences between the countries monitored followed. In the EU, there are countries that – despite the achieved high, absolute value of income – show a positive trend of development during the whole monitored period and a relatively big unit change. Such an example is Sweden followed by Germany. The big absolute level of income is recorded also in the UK, only this value didn't almost change during the 10 monitored years, and there's a slightly negative direction of the curve, which is – among other things – affected by the relation of different currencies of British pound and euro. In the Czech Republic, there was the fastest pace of growth of income; however, the starting absolute value was very low. Spain is quite the opposite, i.e. a relatively big absolute value of achieved income grew only slowly. From the analysis of income situation in individual income quantiles we can derive different opinions about the living conditions of the households, in terms of the positive trend in the growing difference between income and expenses. This is not fulfilled in any of the countries monitored in the 1st quantile.

It was fulfilled in the second income quantile in Sweden and Germany where the income gets closer to the expenses in the UK and Czech Republic (mainly in last monitored years), and in Spain in the second quantile the income doesn't cover the required expenses, and the households in the third quantile are able to cover them either. It's been confirmed, then, that among other things this fact makes us think that it's not suitable to analyze the relation between income and expenses from the average values of the society, but it's necessary to analyze also the differences between different groups of people that may be very distinctive in some cases. These analyses determine the countries where maximum of 20% of people are in danger of poverty, countries with more than one third of people in danger of poverty, and countries like Spain where over one half of people are in danger of poverty and social exclusion. These numbers of people in danger of poverty, when considered either from the perspective of one or several aspects of poverty monitoring, create a serious social and political problem that the analyses have to address, and it's thus impossible to hide any facts.

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