

# A MULTIDIMENSIONAL APPROACH TO THE INCLUSIVENESS OF ECONOMIC GROWTH IN THE NEW MEMBER STATES

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## Abstract

*This paper aims to analyze the responsiveness of different dimensions of multidimensional poverty to economic growth in the New Member States, from 2000 to 2011. The inclusiveness of economic growth is analyzed by a set of growth elasticity to different poverty measures. The common determinants of inequality, income poverty, material poverty and subjective poverty are comparatively examined using GMM panel regression models; the relationship between the poverty measures, inequality and economic growth is studied by random effects panel regressions. The results reveal a high heterogeneity within the NMS area. The subjective poverty has not an objective basis, and targeting different aspects of multidimensional poverty could generate undesirable effects for the other dimensions of poverty.*

**Keywords:** inclusive economic growth, multidimensional poverty, New Member States

**JEL Classification:** I32, O11, O47

## 1. Introduction

Despite the economic growth and economic development that have accompanied the enlargement of the European Union in the last decades, on the path to real economic convergence the social discrepancies between and within countries are still important, especially in the developed countries (François and Rojas-Romagosa, 2005). The multidimensional poverty, social inequality and financial strain have not decreased over time, so one could say that the advantages of the economic progress inside the EU were not reflected in the improvement of the EU citizen's standard of living. The growing social inequality, the raise of new forms of inequalities and the shrinking of the middle class are consequences of economic development not only in the EU, but in other developed regions and countries in the world as well.

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Although the analysis of economic growth, economic convergence and social inequality represent traditional topics in the EU integration studies, the GDP and the Gini indicator are the main focus in this type of studies. Besides the Gini index and the poverty rate, there are many other economic and social indicators reflecting the standard of living, but most of them are simply ignored in the macroeconomic analyses examining the relationship between economic growth, inequality and poverty. The complex analysis of this relationship requires examining a set of multifaceted indicators because the one-dimensional and objective indicators are not able to capture the complex picture of the standard of living. For this, the subjective and multidimensional indicators are needed as well.

This paper examines the inclusiveness of economic growth, the dynamics and relationship between different monetary and non-monetary dimensions of poverty in the New Member States (NMS), their common determinants, and also discusses the policy implications. In comparison with other papers on the same topic, this one exploits the last waves of Eurostat data, bringing new evidence about the dynamics of poverty, inequality and economic growth in the NMS.

The analysis of the common determinants of poverty measures and inequality is instrumented here through GMM panel regression models. Random effects panel regression models are also used to study the relationship between the poverty measures, inequality and economic growth. At a descriptive level, the representation of a set of growth elasticity to different poverty measures allows comparatively examining the inclusiveness of economic growth in the NMS.

The paper is structured as follows: the introduction provides an overview. The second section provides a short review of the literature in this field. The third section presents the data and the model, while the fourth section is the empirical part of the paper and includes, in the first subsection, a descriptive analysis and a quantitative analysis in the second one. The last section concludes and formulates policy recommendations.

## **II. Literature Review**

Over time, the relationship between economic growth, income inequality and poverty has raised controversial debates in the literature, given that the theoretical approach has always proved to be unable to completely explain the empirical results, because, among others, the empirical results are usually derived from different datasets from different continents. Either we refer to the poverty-inequality-growth relationship (known as the PIG theory) or to the poverty elasticity of growth (referred to as the PEG theories); in most cases, the income poverty and not the multidimensional one is the core of poverty measures. The analysis of this type of relationships falls under the large umbrella of the inclusiveness of growth. This concept links economic growth to that of equal opportunity, and studies the extent to which the benefits induced by economic growth into the society also contributes to the improvement of the standard of living for all citizens, especially the poor, the vulnerable groups and the socially excluded persons. The equitable distribution of benefits resulted from economic growth would, therefore, lead to sustainable economic development and poverty reduction. The concept of inclusive growth should take into consideration not only the

pace, but also the pattern of growth, as well as the multidimensional approach to poverty (Naqvi, 2010).

The sustainable growth is the final aim of any economy in the world; it results from a broad-based growth across sectors and an inclusive growth, covering the large majority of a country's labor force (Ianchovichina and Lundstrom, 2009; Rauniyar and Kanbur, 2009). Continuing at the regional level the empirical work of Dobrescu (2011), Jula D. and Jula N. (2013) find that in Romania the economic growth causes structural changes in total regional employment and that there may be an asymmetry between the effect induced by economic growth and recession-induced effect on the intensity of structural changes in regional employment. In fact, to empower the poor, the economic growth should focus on the productive employment and not on direct income redistribution (Ali and Zhuang, 2007; Ianchovichina and Lundstrom, 2009). In this light, not any type of economic growth produces positive effects for all social classes and citizens, as expected by the majority of population.

At least at a theoretical level, the economic growth should generate positive effects for all types of poor (Alam *et al.*, 2005). The unemployed poor will have new employment opportunities; the working poor will have higher wages and/or higher levels of labor productivity, while the economically inactive poor will benefit from higher public and private transfers. However, these gains could not be enough to move households out of poverty.

The empirical evidence has shown that economic growth, poverty and income inequality are interrelated concepts. On a consensual basis, it is considered that the most powerful determinants of poverty reduction are the economic growth, the initial level of income inequality and the changes in the level of inequality (Bourguignon, 2003; Klasen, 2003). The policy research suggests that high levels of income inequality are harmful for economic growth and also for poverty reduction (Deininger and Squire, 1998; Klasen, 2003; Fosu, 2011). This outcome is generally sustained by cross-country studies, in the sense that only the impact of the initial levels of inequality, and not also the changes in inequality within countries, has significant effects on economic growth. Recently, Balakrishnan *et al.* (2013) find that while poverty has fallen across the Asian regions over the last two decades, inequality has increased, dampening the impact of growth on poverty reduction.

The seminal work of Sumner (2003) on the poverty elasticity of growth has opened a series of studies on this topic, but also critical views at both theoretical and empirical level. This concept refers to factors influencing the degree of poverty reduction that accompanies economic growth and has been extensively used in the pro-growth literature. The relationship between income growth and poverty reduction has been studied in the literature either using simple linear regression models (Ravallion and Chen, 1997; Dollar and Kraay, 2002), or by taking into account the poverty/average income/distribution identity in the analysis of poverty dynamics and its determinants, but without focusing on the difference between the effects of poverty reduction on growth and the effects of distributional changes on growth (Ravallion and Huppi, 1991; Kakwani, 1993).

Dollar and Kraay (2001) explain the reasons behind the relationship between income and poverty reduction, by using the income of the lowest quintile as an indicator of

poverty. Their work has been criticized by Rodrik (2000), Amann *et al.* (2002) and Azis (2002), who found little evidence of such relationship, a weak theoretical formulation of models and wrong policy recommendations.

One common failure of traditional linear econometric models explaining the relationship between the rate of economic growth and speed of poverty reduction is the misspecification (Bourguignon, 2002). Income redistribution reduces the poverty rate either on short term through the “distribution effect” or on long term, at any given rate of economic growth, through the permanent increase in the poverty elasticity of growth.

The evidence of the impact of health and education expenditures on human development is mixed, in the sense that either strong positive relationships between public expenditures, on one hand, and education and health outcomes, on the other hand (Anand and Ravallion, 1993, Baldacci, Guin-Siu, and De Mello, 2003), or either no clear relationship or low correlations between these variables are found (Asian Development Bank, 2006; Pritchett and Filmer, 1999; Al-Samarrai, 2002). The explanation of the mixed outcomes is that although the public spending on health and education are quite important in the struggle with poverty, they are not sufficient. The management of public expenditures and the composition of resources also explain the effectiveness of these expenditures (Asian Development Bank, 2006).

The quality of governance and the political ideology have been approached in a large body of literature as key factors explaining the effect of economic growth on poverty reduction. The relationship between inequality and growth is found to be a negative one under left-wing governments and positive under right-wing governments (Bjornskov, 2008). The nature of governance seems to have a strange impact on economic growth in the case of Asia, where countries with deficits in the governance indicators have a higher growth than those with surpluses (Quibria, 2006).

There is another strand of literature arguing that the inclusive economic growth should not have a redistributive aim, but rather to target a sustainable development, which would be possible only by ensuring equal access to opportunities (Ali and Zhuang, 2007). The relationship between economic growth and income inequality reduction is also seen as a dimension of inclusive growth (Rauniyar and Kanbur, 2009). According to them, the determinants of inclusive growth are the broad-based equitable growth across sectors and regions, quality of infrastructure, social protection, legal identity, capacity building, rural infrastructure and agricultural technologies.

When analyzing the inclusive growth, in comparison with the income dimension of poverty, the non-monetary approach has been neglected in the literature for a number of methodological reasons. For instance, while the income distribution can be examined by policy makers at the level of deciles of population, in the case of non-monetary measurements of poverty only the average achievement levels can be examined. But in turn, the non-monetary approach provides a set of valuable insights into the pro-poor growth analysis that cannot be derived from the monetary approach. When measuring gender differentials, the household income says little about the distribution of that income (Klasen, 2004). Also, the comparative analysis between the monetary and non-monetary measures of poverty allows policy makers redefining the social policies in a broader sense.

It was shown in the literature that the income poverty measures were not able to capture the multidimensionality and complex features of poverty, so that also approaching the non-monetary dimensions allows providing a broader picture of poverty (Sen, 1979; Kakwani and Silber, 2008; Raileanu Szeles and Fusco, 2013). Although a rich strand of literature has developed around the measurement of multidimensional poverty, this topic involves a high degree of subjectivity and the results depend upon the poverty dimensions taken into consideration.

### **III. Data and Methodology**

The empirical section of this paper uses Eurostat data<sup>2</sup> from 2000 to 2011 for a number of 10 New Member States<sup>3</sup>. The income growth is represented here by the real GDP per capita growth, while the multidimensional poverty is measured by four indicators: the income poverty rate (one-dimensional poverty), the rate of material deprivation (multidimensional poverty), the “inability to make ends meet” and the “inability to face unexpected expenses” (subjective poverty). The Gini index is used to define income inequality, while other indicators, i.e. the tertiary educational attainments, work duration, the employment rate of older people, lifelong learning, total investments, corruption and social protection expenditures are used to explain inequality and poverty reduction. Beside the Gini index, other inequality indices have been also developed in the literature, e.g. the Atkinson index, the Robin-Hood index, the Élterő-Frigyes indexes, the Theil’s index, etc. In some cases, they could provide better results in comparison with the traditional Gini index (Ștefănescu, 2011). Nevertheless, in this study the Gini index is chosen to measure social inequality given its availability in the Eurostat dataset.

The empirical analysis develops in two steps. First, the growth elasticity to three different types of poverty measurement is comparatively assessed and, second, a set of GMM panel regression models are used to examine the effects of a set of common explanatory variables on the poverty measures. Also, the relationships between the poverty measures are analyzed using random effects panel regression models.

The growth elasticity of poverty is defined as the percentage reduction in poverty rates associated to a percentage change in the average income per capita. The empirical analysis of growth elasticity of poverty has raised controversial debates over time because the results were not constant across countries, across time-periods and across poverty measures. Our main research interest here is to compare the growth elasticity of income poverty, material poverty and subjective poverty, because they represent fundamental dimensions of poverty, and also because when struggling with poverty, the social policies must, in fact, address the multidimensional poverty.

In the second part of the empirical analysis, the paper uses panel regression models in order to explain not only the variations across countries, but also the variations

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<sup>2</sup> There is one exception: the variable “Total investments” is taken from the World Economic Outlook Database.

<sup>3</sup> Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia.

across years. The model chosen here to explain the relationships between economic growth, poverty and income inequality is the Generalized Method of Moments (GMM). This method represents an efficient estimator for a linear regression model with heterokedasticity and/or serial correlation of unknown form. It allows correcting the biases determined by endogenous explanatory variables. As the analysis of the economic growth-poverty-inequality triangle is suspected to be affected by endogeneity problems, this estimation method seems to be the most appropriate one.

Overall, the GMM has two important features: (1) it is based upon the empirical distribution that approximates the true distribution; and (2) does not request the specification of any sort of distribution and it does not use any information about the population distribution, except for its moments.

The models used to analyze the common determinants of income poverty, material poverty, subjective poverty and inequality are specified as follows:

$$pov1_{it} = \alpha + \beta_1(\log GDP)_{it} + \beta_2(\log GDP)_{it}^2 + \sum_j \delta_j D_{ijt} + \varepsilon_{it} \quad (1)$$

$$pov2_{it} = \alpha + \beta_1(\log GDP)_{it} + \beta_2(\log GDP)_{it}^2 + \sum_j \delta_j D_{ijt} + \varepsilon_{it} \quad (2)$$

$$pov3_{it} = \alpha + \beta_1(\log GDP)_{it} + \beta_2(\log GDP)_{it}^2 + \sum_j \delta_j D_{ijt} + \varepsilon_{it} \quad (3)$$

$$Gini_{it} = \alpha + \beta_1(\log GDP)_{it} + \beta_2(\log GDP)_{it}^2 + \beta_3(\log GDP)_{it}^3 + \sum_j \delta_j D_{ijt} + \varepsilon_{it} \quad (4)$$

where:  $pov1_{it}$ ,  $pov2_{it}$  and  $pov3_{it}$  are three measures of poverty (the one-dimensional, multidimensional and subjective poverty), GDP is the gross domestic product per capita, Gini is the Gini coefficient (measure of income inequality),  $D_{ijt}$  is a set of other common explanatory variables of poverty and inequality and  $\varepsilon_{it}$  is the error term.

The relationship between the poverty measurement and the Gini index is examined using random effects regression models, where two measures of subjective poverty are regressed upon a set of common explanatory variables.

$$Subj\_poverty1_{it} = \alpha + \beta_1(\log GDP)_{it} + \beta_2 GDPgrowth_{it} + \beta_3 Mater\_pov + \beta_4 Inc\_pov + \beta_5 Gini + \sum_j \delta_j D_{ijt} + \varepsilon_{it} \quad (5)$$

$$Subj\_poverty2_{it} = \alpha + \beta_1(\log GDP)_{it} + \beta_2 GDPgrowth_{it} + \beta_3 Mater\_pov + \beta_4 Inc\_pov + \beta_5 Gini + \sum_j \delta_j D_{ijt} + \varepsilon_{it} \quad (6)$$

where:  $Subj\_poverty1$  is the variable "Inability to make ends meet",  $Subj\_poverty2$  is the variable "Inability to face unexpected expenses",  $Mater\_pov$  is the material poverty rate,  $Inc\_pov$  is the income poverty rate, Gini is the Gini index of inequality,  $D_{ijt}$  is a set of other common explanatory variables of poverty and inequality, and  $\varepsilon_{it}$  is the error term.

## IV. Empirical Analysis

### a) A Comparative Perspective over the Growth Elasticity of Poverty in the NMS Area – A Preliminary Descriptive Analysis

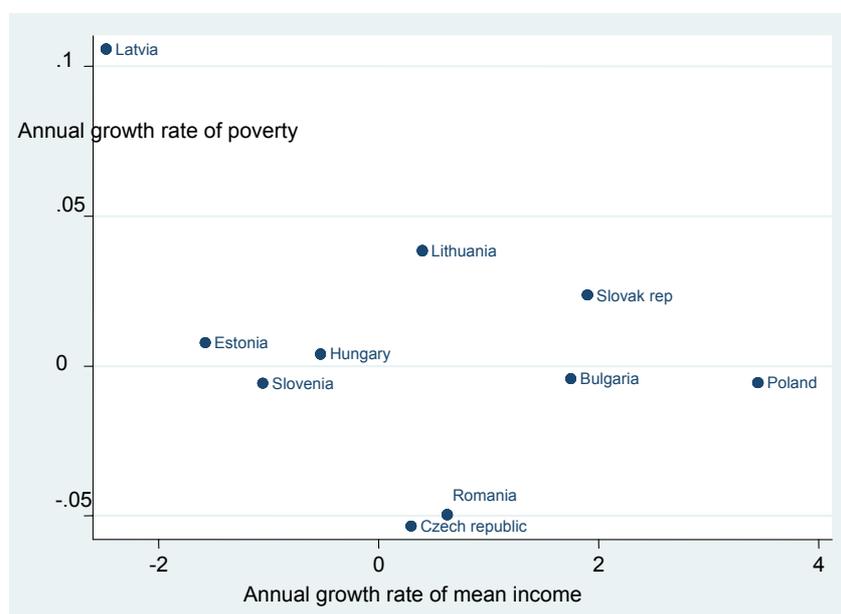
This section analyzes how poverty responds to economic growth in the NMS. As presented in the previous section, the inclusive growth generates positive effects for all social categories, so that this kind of growth is envisaged by all economies. But, in practice, things might be different. However, examining the response of poverty to economic growth is useful for policy makers, because it gives insights about whether the economic growth is sufficient for poverty reduction or whether redistribution policies are also needed.

Figures 1 and 2 below plot the annual growth rate of mean income on the horizontal axis against the annual growth rate of income poverty on the vertical axis, using two different growth spells, i.e. the time period 2007-2009 in Figure 1 and the time period 2005-2009 in Figure 2. The poverty spells have been selected based on the Eurostat data availability.

The picture of growth elasticity of poverty looks completely different in Figure 1 as compared to Figure 2, which suggests important changes on short term in the NMS area.

**Figure 1**

#### Growth Elasticity of Poverty (2007-2009)



*Note. The figure is based on Eurostat data.*

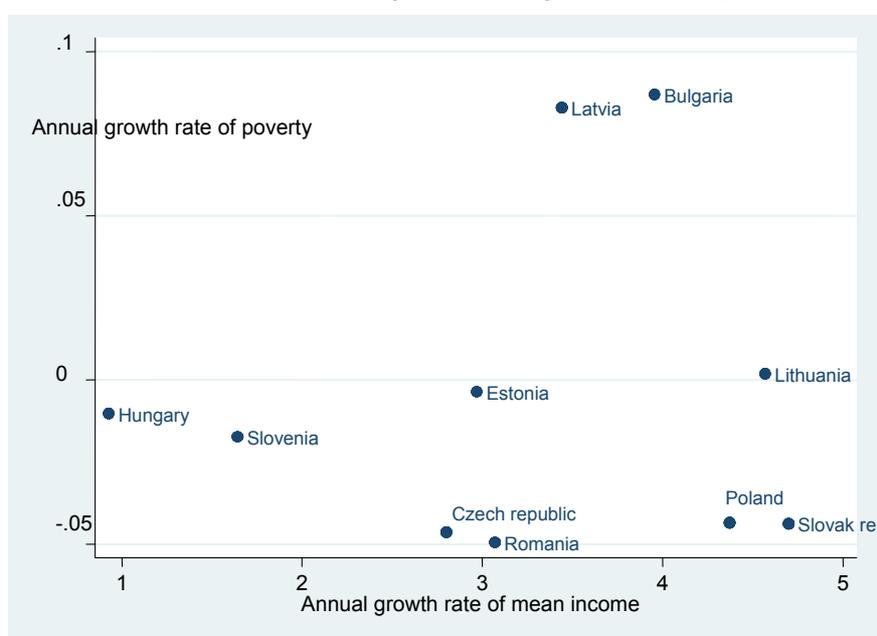
As shown in Figure 1, from 2007 to 2009 (which corresponds to the first phase of the global economic crisis in the EU), the Baltic countries have high average rates of

poverty, partially explained by weak economic growth rates, while on the opposite side Romania, the Czech Republic, Poland and Bulgaria show good responses of poverty reduction to economic growth. In the short term, it seems that the relationship between income growth and poverty rates in the NMS is an indirect one.

When considering a longer growth spell (see Figure 2), the annual growth rate of mean income and the annual growth rate of income poverty seem not to be connected anymore. This time Poland, the Slovak Republic, the Czech Republic and Romania show the best reactions of poverty reduction to economic growth, while Latvia and Bulgaria show the worst ones. Overall, Latvia did not use the economic growth for poverty reduction, while Romania, Poland and the Czech Republic have very good results in this respect.

Figure 2

**Growth Elasticity of Poverty (2005-2009)**



Note. The figure is based on Eurostat data. The income is represented by the real GDP per capita.

The growth elasticity of poverty is calculated in Table 1, based on five years growth spells in the NMS. The results support the findings suggested by Figure 1, and indicates once again a high diversity and heterogeneity within the NMS region. The poverty reduction does not respond to economic growth in Latvia and Bulgaria, which would suggest that redistribution policies are needed to a greater extent than in the other NMS. At the opposite side, Romania and the Czech Republic can use the income growth for poverty reduction, which indicates that the redistribution policies can be partially replaced here by economic growth mechanisms.

Table 1

**Growth Elasticity of Income Poverty, 2005-2009**

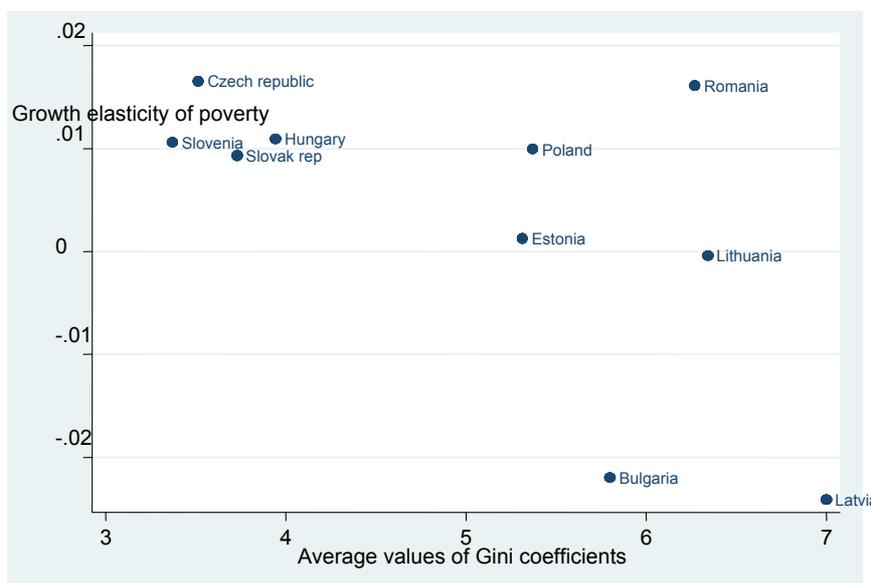
Country	Elasticity	Country	Elasticity
Bulgaria	-2.19	Lithuania	-0.04
Czech Republic	1.65	Poland	1
Estonia	0.12	Romania	1.61
Hungary	1.09	Slovak Republic	0.93
Latvia	-2.41	Slovenia	1.05

Source: Author's own calculations, based on Eurostat data.

As discussed in the previous section, the inequality plays an important role in explaining the relationship between poverty reduction and economic growth. In order to analyze the growth elasticity of poverty in relation to different levels of Gini coefficients, Figure 3 plots the mean value of the Gini coefficients on the horizontal axis against the growth elasticity of poverty on the vertical axis. It appears that, on average, the growth elasticity of poverty is larger for the group of countries with the smaller Gini coefficients, i.e. the Czech Republic, Slovenia, the Slovak Republic and Hungary. This result is in line with other empirical findings in the literature (Adams, 2004). Romania can be treated in this case as an outlier.

Figure 3

**The Growth Elasticity of Poverty for Different Levels of Inequality**



Note. Eurostat data.

However, the data indicate a negative relationship between the growth elasticity of poverty and the average values of Gini coefficients.

This is also confirmed by the outputs from a random effects regression model, based on our dataset:

$$\text{Growth elasticity of poverty}^4 = 5.22 - 56.14 \cdot \text{Gini} \quad (7)$$

The last issue investigated in this section regards the response of different poverty measurement to economic growth. As mentioned in the introduction, this paper focuses on the multidimensional poverty in the NMS, so that in the next step the growth elasticity of poverty is analyzed by using three distinct measurements of poverty. The first one is the poverty rate, which defines the one-dimensional poverty, the second one is the “inability to make ends meet”, which describes the subjective poverty, and the third is the rate of material poverty<sup>5</sup>, which defines the multidimensional poverty. According to the results shown in Annex 1 (Figures 4, 5 and 6), the response of poverty to economic growth depends on the poverty measures. For some countries, the differences are considerable.

In Poland and Lithuania, the economic growth has determined only the reduction in income and subjective poverty. It is expected that reduction in material poverty does not respond to economic growth during the growth spell analyzed here, because the dynamics of this indicator is much slower in comparison with the other two poverty measures. This is also the case of Romania and the Czech Republic. The worst response of “subjective poverty” reduction to economic growth is in the case of Estonia, which, in turn, has high levels of growth elasticity of income poverty and multidimensional poverty. In contrast, Latvia has a high level of growth elasticity to subjective poverty. For other countries, such as Slovenia, the Slovak Republic, Hungary and Poland, the choice of poverty measure does not significantly affect the growth elasticity, at least in relative terms. Bulgaria has a completely different and strange situation, given that the response of income poverty reduction to economic growth is high, while the response of subjective poverty to economic growth is low. This suggests that the subjective poverty is not based on objective considerations.

Overall, the average change in subjective poverty to the average growth of average income indicates a sort of rigidity, in the sense that the individual’s perceptions with regard to the improvement of standard of living do not suffer short-term adjustments to economic growth. The only exceptions here are Estonia (in the negative sense, i.e. the growth elasticity of subjective poverty has increased in comparison with the growth elasticity of material and income poverty) and Bulgaria (in the positive sense, i.e. the growth elasticity of subjective poverty has decreased in comparison with the other types of elasticity).

When taking into account the global picture provided by Figures 4, 5 and 6, one might come to the conclusion that the material deprivation rate is the most elastic poverty indicator to economic growth.

<sup>4</sup> *R-squared = 0.38; Coeff. sign. at 1% level.*

<sup>5</sup> *The material deprivation rate refers to the economic strain and durables dimension (source: SILC dataset). In this paper, the material deprivation rate is defined by deprivation for two items.*

**b) The Relationship between the Poverty Measurements and their Determinants**

The first step in this section is to test whether the dataset under analysis is affected by heterokedasticity and serial correlation. Two tests were applied to each regression model presented in this section. For instance, for the regression model reported in Table 2, where the dependent variable is the poverty rate, the likelihood ratio test indicates the presence of heterokedasticity, which justifies for the second step the use of the GMM estimator ( $LR\ chi2(9) = 40.52; Prob > \chi^2 = 0.00$ ). For the same regression model, the Wooldridge test has been used to check for the presence of autocorrelation in panel data. Under the null hypothesis of no first order autocorrelation, the results indicate the presence of the serial correlation ( $F(1, 9)=7.448; Prob > F = 0.023$ ). Considering both the detected heterokedasticity and the serial correlation, the GMM estimator proves to be the best solution here<sup>6</sup>.

In Table 2, three distinct measurements of poverty are comparatively examined through their determinants, i.e. the one-dimensional poverty (income poverty rate), the multidimensional poverty (rate of material deprivation) and the subjective deprivation (the inability to make ends meet<sup>7</sup>). Besides the poverty measurements, the Gini indicator of inequality is also examined. Initially, a large set of explanatory variables was analyzed, but finally only five indicators were selected, given the small size of our dataset, the Eurostat data availability for some years and the degree of significance in our regression models. They are: the GDP (logarithm), lifelong learning, the employment rate of older workers, tertiary educational attainments and the total investment<sup>8</sup> (% of GDP).

**Table 2**

**A Comparative Analysis of Poverty and Inequality Determinants**

Explanatory variables	(1) <i>Poverty rate</i>	(2) <i>Material deprivation</i>	(3) <i>Ends meet</i>	(4) <i>Gini</i>
Log GDP	12.66***	9.05***	-19.3***	258.9***
Log GDP <sup>2</sup>	-0.75***	-0.5***	1.06***	-28.74***
Log GDP <sup>3</sup>	-	-	-	1.06***
Lifelong learning	0.04***	-0.005	-0.06***	0.01*
Older employment	-0.005**	-0.004**	-0.01***	0.003*
Tertiary education	0.01***	0.002*	0.01***	0.009***
Investments	0.02***	-0.004	-0.03***	0.01***

Notes. GMM estimation based on Eurostat and IMF data, 2000-2011. Instruments: lag1 and lag2 for "lifelong learning", lag1 for "investments" and lag1 for "tertiary education". \*\*\* - signif. at 1percent level, \*\* - signif. at 5 percent level, \* - sign. at 10 percent level.

<sup>6</sup> Similar results regarding the presence of heterokedasticity and serial correlation have been also detected for the other regression models reported in Table 2.

<sup>7</sup> Only the category of households making ends meet with great difficulty is recoded as "poor" according to this poverty indicator.

<sup>8</sup> This is the only indicator that is collected from the World Economic Outlook Database. For the rest, the empirical section uses only Eurostat data.

In the regressions reported in Table 2, the *lifelong learning*, *investments* and *tertiary education* variables are found to be endogenous, so that in order to eliminate this problem they are instrumented by their lags in all regression models. As explained above, the GMM method allows dealing with the endogeneity problems.

The results in Table 2 show that the explanatory variables considered here could have different effects on poverty in the NMS area, when poverty is differently measured (using one-dimensional, multidimensional and subjective indicators). This empirical finding has important policy implications, because the social policies targeting poverty reduction could have different results for different dimensions of poverty.

As Atkinson (2003) and François and Rojas-Romagosa (2005) noted, the level of inequality in the rich countries has increased since 1980, and the decreasing trend in the 1960s and 1970s has reversed, at least in the case of developed countries. They found a U-pattern of inequality in the OECD countries for the last four decades. The inclusion of the log GDP squared and cubic among the set of regressors in Table 2 aims at investigating this issue at the level of NMS<sup>9</sup>. The regression model 4 (Table 2) suggests the presence of a cubic function in our data. This is not in contradiction with the Kuznets hypothesis, but in addition it adds an increasing trend. When studying the three poverty measures, the data do not allow for a cubic function, but allow for a quadratic one. With respect to the logs of the GDP per capita, the poverty rate and the material deprivation have initially an increasing trend and, then, a decreasing one, while the subjective poverty has first a decreasing trend and then an increasing one.

The GDP has the largest explanatory power for all types of poverty and also for inequality, but it is interesting to note here that a higher GDP level results in a higher poverty rate, a higher material poverty rate, a higher level of inequality and also in a lower level of subjective deprivation. Only the employability of older workers and the third educational attainments carry similar effects on the three poverty measures, i.e. the third educational attainments deepens poverty, while a high employment rate for older people reduces poverty. The process of lifelong learning, as well as total investments, has a positive effect on the reduction of income poverty rate and a negative effect on the reduction of subjective poverty. Their effects on the material poverty are not significant, which is not surprising, because, as mentioned in the previous section, this indicator generally has slower dynamics in comparison with the other two poverty measures.

In conclusion, the set of measures aimed to reduce the income poverty might have opposite effects for other dimensions of poverty.

Besides the comparative analysis of the determinants of the three poverty measurements, this empirical section also tries to examine the relationship between these poverty measurements. As the simultaneous analysis of the relationship between poverty indicators is expected to severely suffer from endogeneity problems, the analysis at this point is only aimed at explaining the subjective poverty by using a set of explicative variables which also includes the other poverty and inequality

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<sup>9</sup> When using the logarithm of the initial level of the real per capita GDP and the income growth instead of logarithms of GDP squared and cubic among the covariates, the other explanatory variables become insignificant.

measures. The regression model used to explain this relationship is the random effects panel model. In Table 3, two alternative measurements of subjective poverty are used as dependent variables: *the inability to make ends meet* (model 1) and *the inability to face unexpected expenses* (model 2).

**Table 3**

**Estimates from Random Effects Regressions, 2000-2011**

Explanatory variables	Dep.var.: Ends meet (model 1)	Dep. Var.: Unexpected expenses (model 2)
GDP growth	0.33**	0.95**
Log GDP	-13.05***	-20.52**
Poverty rate	0.93***	-0.40
Material poverty rate	-1.01***	-0.34
Gini	-1.81*	3.36
Work duration	-1.07**	-2.69*
Older employment	0.1	0.6*
Corruption	-3.55*	-3.65
Social protection expenditures	1.96***	4.16***
Constant	139***	217***

Note. (1) Dependent variable: *Inability to make ends meet*; (2) Model 1: R-sq: within = 0.39; between = 0.98; overall = 0.92; Model 2: R-sq: within = 0.38; between = 0.67; overall = 0.66; (3) \*\*\* - signif. at 1percent level, \*\* - signif. at 5 percent level, \* - sign. at 10 percent level.

The central model of our analysis is model 1, while model 2 is used here just for comparative purposes. In model 1, low levels of income inequality and material poverty rate, as well as high levels of income poverty and economic growth determine a high level of subjective poverty. Among the “objective” poverty indicators, only the increase in income poverty is likely to worsen subjective poverty. A low rate of material poverty rate could mean more resources allocated in this direction, which would decrease the disposable income needed to allow making other ends meet.

High levels of GDP, as well as low economic growth rates two years ago, determine the decrease in the subjective poverty levels. The economic growth has a negative impact on the reduction of subjective poverty because the corresponding adjustment in the standard of living needs a period of time to occur. In comparison with the other types of poverty, the subjective poverty is more inelastic to the short-term income growth dynamics.

A long duration of work activities is associated to lower levels of subjective poverty, maybe because they generate higher incomes. Corruption has a positive effect on subjective deprivation, because it might be seen as being helpful in making people’s ends meet. Higher expenditures with social protection result in higher levels of subjective poverty, because this source of income is always seen as being inadequate to the needs.

In comparison with model 1, in model 2 most explicative variables suffer from losses of significance, so that our main variables of interest, i.e. the income poverty, material poverty and Gini indicator, are not significant anymore. The effects of the rest of covariates are almost similar, with the difference that the employment of older persons

becomes a weakly significant regressor of subjective poverty, suggesting that a high rate of older employment would have negative effects on the subjective poverty.

Overall, improving the citizens' perception of their standard of living could be a difficult task for policy makers. While the income poverty directly affects the inability to make ends meet, it has no impact on the inability to face unexpected expenses. This indicates the complexity of dealing with subjective assessments, and the difficulty to conduct effective social policies targeting the subjective poverty.

## **V. Policy Implications**

The analysis of the responsiveness of different poverty and inequality measurements to economic growth in the NMS leads to a large set of empirical findings, which suggests a large heterogeneity in the area.

While the Slovak Republic exhibits high elasticity levels for all poverty and inequality measurements considered in this study, Bulgaria, Poland, Latvia and Lithuania have low elasticity levels, despite their considerable growth in the last decade. Apart from other countries, Estonia has only a low value of growth elasticity to subjective poverty reduction. The reduction in all the objective and subjective poverty, and income inequality, should be among the goals of economic growth in any country, in order to ensure the healthy and sustainable economic development and to ease the redistribution process. Unfortunately, the empirical evidence indicates that targeting all the measurements of poverty and inequality at the same time is an impossible mission. For instance, the subjective poverty reduction reacts, in general, with a delay to economic growth, in comparison with the other measures.

For the decision makers in the NMS area, this paper reflects the extent to which economic growth is directed toward poverty and inequality. More attention should be paid in the future by governments when conceiving public and social policies. This task should be done in a very strong relation with the social priorities set for the years to come. A particular mix of policies designed to alleviate objective income poverty could end up by enhancing another dimension of poverty. For instance, different measures in the field of education could have divergent effects on the poverty and inequality measurements. Also, the improvement in the levels of objective and subjective poverty may request different sets of measurements. Particularly, the subjective poverty proves to be a more difficult target in comparison with the objective poverty. This is because first, subjective poverty is rather inelastic to economic growth according to our empirical findings. Second, the indicators describing subjective poverty could have themselves different determinants.

To sum up, the mission of governments in reducing poverty and inequality based on economic growth with the final aim to improve the quality of life should take into account the priority objectives in the social field.

## **VI. Conclusions**

The multidimensional assessment of poverty dynamics and its determinants in the NMS is aimed at giving insights into the inclusiveness of economic growth and into the main factors leading to the increase in the standard of living in this region. In order to capture the multidimensional poverty, three different poverty measurements have been comparatively examined by the relationship among them and by their main common determinants, which also include the economic growth.

In the first step, the analysis of growth elasticity to the income poverty, material poverty and subjective poverty has indicated a high heterogeneity within the NMS area. The material poverty reduction is found to be the most responsive to income growth, while the subjective poverty reduction is found to be inelastic to economic growth, also because it requests a longer period of time for adjustments. The degree of poverty responsiveness to income growth differs between countries and depending on the poverty measure considered. The Slovak Republic is the only NMS having high growth elasticity to all poverty measures. Bulgaria, Poland, Lithuania and Latvia should pay more attention to the way the income growth benefits spread into the society, because in their case the material and income poverty rates have increased over time, in spite of their economic growth. Estonia should be more concerned with the citizens' perception of poverty, because this is more dramatic than the objective poverty.

The inequality plays an important role in the relationship between poverty and economic growth. In line with the literature, the paper finds that the growth elasticity of poverty is larger for the group of countries with the smaller Gini coefficients.

The comparative analysis of the determinants of income poverty, material poverty, Gini inequality index and subjective poverty showed different significant effects of the explanatory variables. The Kuznets curve is fulfilled by our data, which additionally exhibit a cubic trend. Quadratic trends are revealed by the relationship between the poverty measures and GDP, but at this point, once again, the GDP effect depends upon the poverty measurement.

The analysis of the relationship between the poverty and inequality indicators is instrumented through two regression models having as dependent variables two indicators reflecting subjective poverty. The results indicate different effects of income poverty, material poverty and Gini index for the two variables of subjective poverty. Although they both reflect the income poverty in a subjective way, according to our empirical results the citizens' perceptions about income poverty are not constant across the subjective poverty measurements, and not always based on the objective situation, which is defined by the income poverty indicator.

Overall, our empirical results lead to the conclusion that the policy makers have a difficult task in the NMS area when building social policies, because targeting different dimensions of poverty requires different social policies and actions, which sometimes could have undesirable effects on the other dimensions. Decreasing the level of subjective poverty could also be difficult to policy makers, given that the citizens' perceptions do not always have objective bases.

## References

- Adams, R. H., 2004. Economic growth, inequality and poverty: Estimating the growth elasticity of poverty. *World Development*, 32(12), pp. 1989-2014.
- Al-Samarrai, S., 2006. Achieving education for all: how much does money matter?. *Journal of International Development*, 18(2), pp 179-206.
- Ali, I. and Zhuang, J., 2007. Inclusive Growth toward a Prosperous Asia: Policy Implications. *ADB Economic and Research Department Working Paper Series*.
- Anand, S. and Ravallion, M., 1993. Human Development in Poor Countries: On the Role of Private Incomes and Public Services. *Journal of Economic Perspectives*, 7, pp. 133-150.
- Amann, E., Aslanidi, N., Nixon, F. and Walters, B., 2006. Economic Growth and Poverty Alleviation: A Reconsideration of Dollar and Kraay. *European Journal of Development Research*.18(1), pp. 22-44.
- Alam, A., Murthi, M., Yemtsov, R., Murrugarra, E., Dudwick, N., Hamilton, E. and Tiongson, E., 2005. *Growth, poverty and inequality. Eastern Europe and the former Soviet Union*. The World Bank, Washington D.C.
- Atkinson A. B., 2003. Income inequality in OECD countries: Data and explanations. *CESifo Economic Studies*, 49(4), pp. 479-513.
- Azis, I., 2002. A New Approach to Modeling the Impacts of Financial Crises on Income Distribution and Poverty. *ADB Research Paper*. 35.
- Dollar, D. and Kraay, A., 2002. Growth is Good for the Poor. *Journal of Economic Growth*, 7(3), pp. 195–225.
- Balakrishnan, R., Steinberg, C. and Syed, M., 2013. The Elusive Quest for Inclusive Growth: Growth, Poverty, and Inequality in Asia, *IMF Working Paper*, 13/152.
- Baldacci, E., Guin-Siu, M. and De Mello, L., 2003. More on the Effectiveness of Public Spending on Health Care and Education: A Covariance Structure Model, *Journal of International Development*, 15, pp. 709–25.
- Bjornskov, C., 2008. The growth-inequality association: Government ideology matters. *Journal of Development Economics*. 87(2), pp. 300–308.
- Blundell R. and Bond S., 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87, pp. 115-143.
- Bourguignon, F., 2003. The Growth Elasticity of Poverty Reduction, in T. EICHER and S. TURNOVSKY, *Inequality and Growth*, MIT Press, Cambridge.
- Deininger, K. and SQUIRE, L., 1998. New Ways of Looking at Old Issues: Inequality and Growth. *Journal of Development Economics*, 57(2), pp. 259–287.
- Dobrescu, E., 2011. Sectoral Structure and Economic Growth. *Romanian Journal of Economic Forecasting*. 14(3), 5-36.
- Dollar, D. and Kraay, A., 2001. Trade, growth and poverty, *World Bank Policy Research Working Paper*, 2615.

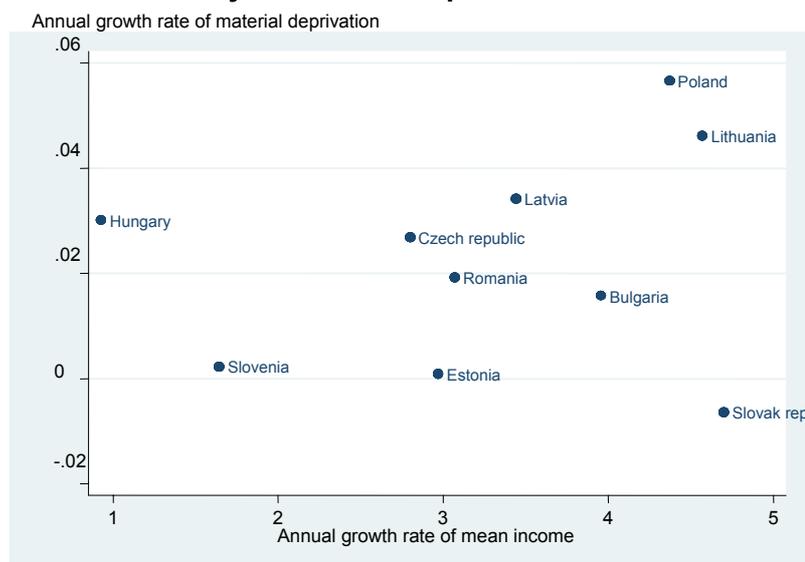
- Dollar, D. and Kraay, A., 2002. Growth is Good for the Poor. *Journal of Economic Growth*, 7(3), pp. 195-225.
- Fosu, A., 2011. Growth, inequality, and poverty reduction in developing countries: recent global evidence. *Brooks World Poverty Institute Working Paper* 147.
- Francois, J. F. and Rojas-Romagosa, H., 2005. The construction and interpretation of combined cross-section and time-series inequality datasets. *Policy Research Working Paper Series*, 3748, The World Bank.
- Ianchovichina, E. and Lundstrom, S., 2008. What Are the Constraints to Inclusive Growth in Zambia?. *The World Bank*.
- Jula, D. and Jula N. M., 2013. Economic growth and structural changes in regional employment. *Romanian Journal of Economic Forecasting*, 16(2), 52-69.
- Kakwani, N., 1993. Poverty and economic growth with application to Cote d'Ivoire. *Review of Income and Wealth*, 39, pp. 121-139.
- Kakwani, N., Silber, J., 2008. *Many Dimensions of Poverty*. Houndmills: Palgrave Macmillan, London.
- Klasen, S., 2003. In Search of the Holy Grail: How to Achieve Pro-Poor Growth, in B. Tungodden, N. Stern and I. Kolstad (eds.), *Toward Pro-Poor Policies: Aid, Institutions and Globalization*, Proceedings from the Annual World Bank Conference on Development Economics Europe Conference 2003, Washington, D.C.
- Klasen, S., 2004. Gender-related Indicators of Well-being", *WIDER Discussion Paper* 07, Helsinki.
- Quibria, M., 2006. Does Governance Matter? Yes, No or Maybe: Some Evidence from Developing Asia. *SMU Economics and Statistics Working Paper*, 2.
- Pritchett, L. and Filmer, D., 1999. What education production functions really show: a positive theory of education expenditures, *Economics of Education Review*, 18(2), pp. 223-239.
- Rauniyar, G. and Kanbur, R., 2009. Inclusive Growth and Inclusive Development: A Review and Synthesis of Asian Development Bank Literature. *ADB Working Paper Series*.
- Ravallion M. and Chen, S., 1997. What can new survey data tell us about recent changes in distribution and poverty?, *The World Bank Economic Review*, 11, pp. 357-382.
- Ravallion, M. and Huppi, M., 1991. Measuring changes in poverty: A methodological case study of Indonesia during an adjustment period. *The World Bank Economic Review*, 5, pp. 57-82.
- Raileanu Szeles, M. and Fusco, A., 2013. Item response theory and the measurement of deprivation: evidence from Luxembourg data, *Quality&Quantity*, 47(3), pp 1545-1560.

- Raileanu Szeles, M. and Marinescu, N., 2010. Real convergence in the CEECs, euro area accession and the role of Romania. *The European Journal of Comparative Economics*, 7(1), pp. 181-202.
- Rodrik, D.. 2000. Comments on Trade, Growth and Poverty by D. Dollar and A. Kraay. Harvard University.
- Sen, A.K., 1979. Issues in the Measurement of Poverty. *Scandinavian Journal of Economics*, 81, pp. 285-307.
- Sumner, A., 2003. From Lewis to Dollar and Kraay and Beyond: A Review and Stocktake of Fifty Years of Poverty, Inequality and Economic Growth. Paper prepared for the Economics, Finance and Development (EFD) Study Group meeting, London, 3 July 2003.
- Ștefănescu, S. V., 2011. About the accuracy of Gini index for measuring the poverty. *Romanian Journal of Economic Forecasting*, 14(3), 255-266.
- Asian Development Bank, 2006. *Key Indicators for Asia and the Pacific Countries*.

**ANNEX 1**

**Figure 4**

**Growth Elasticity to Material Deprivation Reduction**



**Figure 5**

**Growth Elasticity to Income Poverty Reduction**

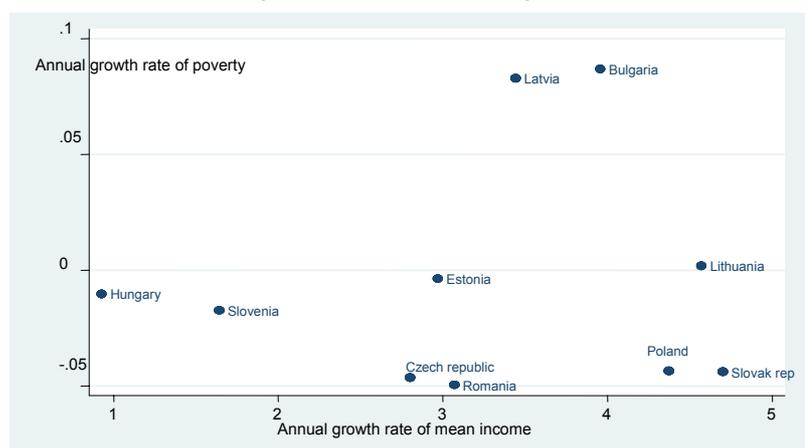
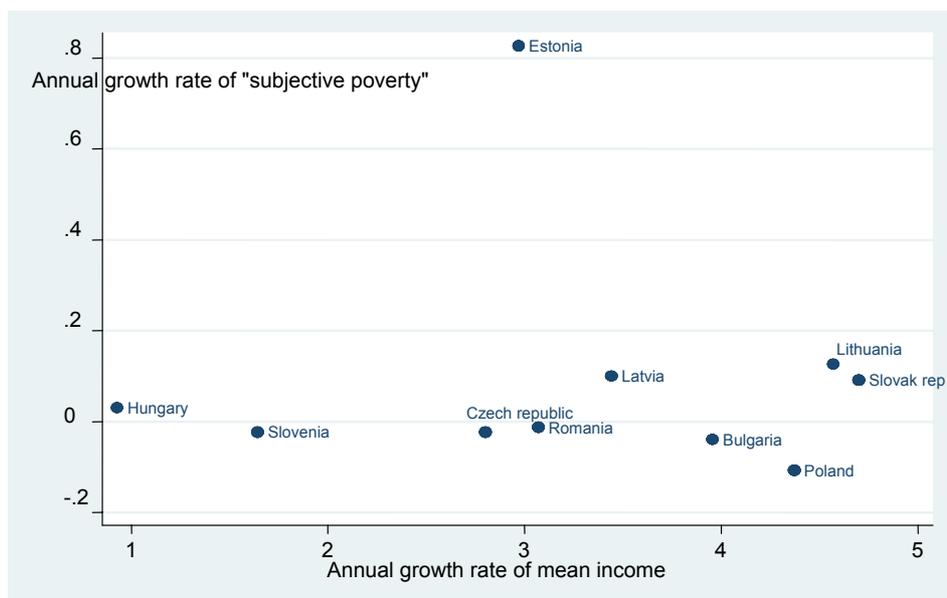


Figure 6

**Growth Elasticity to Subjective Poverty Reduction**



Note. Subjective poverty is measured here using the Eurostat indicator "Inability to make ends meet".