

Work Package 3 – Poverty and its socio-economic structure in Europe
**Material Deprivation– an Analysis of cross-
country Differences and European
Convergence**

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FP7 project ‘Combating Poverty in Europe: Re-organising Active Inclusion through
Participatory and Integrated Modes of Multilevel Governance’

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Foreword

Reducing poverty and social exclusion is one of the main challenges for ensuring social cohesion in Europe. The research project COPE – Combating Poverty in Europe: Re-organising Active Inclusion through Participatory and Integrated Modes of Multilevel Governance’ – analyses trends of poverty and social exclusion in Europe, and examines the dynamics of minimum income protection policies that potentially help alleviate the risk of poverty in Europe. A particular focus is on the situation of single parents, long-term unemployed and the working poor, who face particular risks of poverty and social exclusion. To what extent have minimum income policies functioned as last resort social security for these three groups, and in what sense can ‘active inclusion’ policies credited with protecting them from poverty and social exclusion?

Co-financed by the European Commission in the 7th Framework Programme, the COPE project unites researchers and stakeholders from six European countries, the UK, Italy, Poland, Sweden, and Norway. Having started in February 2012, COPE runs over a three-year period. COPE’s method is comparative – analysing developments in five European countries (Poland, Germany, UK, Sweden and Italy). Its focus is inherently multi-level, looking in turn at developments at European, national and local level.

1. Introduction

It is not only the availability of current monetary resources which determines a household's standard of living. Also other individual and societal factors impact on a household's material assets. For example public policies and the social stratification of a country predefine the opportunity structure of individuals to achieve certain standards of living and having.

Material deprivation has found a renewed importance with its inclusion into the poverty and social exclusion goal of the Europe2020 strategy, which is to reduce the number of person at risk of poverty by 20 million¹ (European Commission, 2012). Together with the indicator for workless households, material deprivation is thus the EU's tool for measuring social exclusion, defined as the process of excluding persons from the minimum way of life acceptable in their respective country (European Council, 1985). A broad body of literature has emerged in the recent past focusing on the measurement of material deprivation (Guio, Fusco & Marlier, 2009; Marlier, Cantillon, Nolan et al., 2009), the mismatch between material deprivation and income poverty (Nolan & Whelan 2011; Nolan & Whelan, 2010; Fusco, Guio & Marlier, 2010; Layte et al, 2001) and material deprivation of the persistently income poor (Till & Eiffe, 2010; Whelan, Layte, Maître, 2002). The high relevance of material deprivation stems from its characteristic as an outcome measure, which puts specific emphasis on the living conditions attained by a household. If only relative national poverty thresholds were regarded, the risk of poverty would seem to be rather similar among the whole EU27 (see Figure 1), masking great differences of living standards among the population (see e.g. Guio & Maquet, 2007; Layte, Whelan, Maître & Nolan, 2001; Fusco, Guio, Marlier, 2010). Fahey (2007) came to the simple yet theoretically well-founded conclusion that the high between country differences in the incidence of material deprivation within the EU are "empirically meaningful [...] in that they reflect the low living standards and strong sense of deprivation experienced by large parts of the population" (Fahey, 2007, p. 35). The same applies to the differences between material deprivation and relative income poverty, whose divergence becomes increasingly higher within the low income countries.

¹ While the policy aim of the EU2020 indicator for poverty and social inclusion is to achieve a reduction of 20 million persons in poverty, there is no burden-sharing among countries but each country has set its personal target and partly also its own methodology according to policy preferences. Three indicators are however regarded to be at the heart of this target, addressing different phenomena: The number of people at risk of poverty, the number of materially deprived people and the number of persons in a jobless household (EU Commission, 2012).

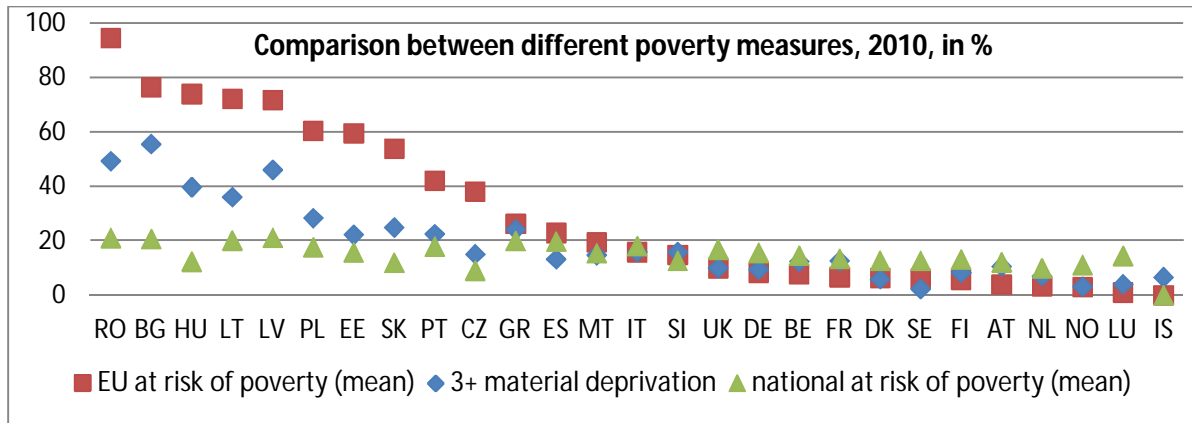


Figure 1: Comparison between 3+ material deprivation measures, national (households below 60% of the national median income) and EU (households below 60% of the EU median income) poverty line for 2010. Own calculations based on EU SILC 2010.

This mismatch between relative income poverty and material deprivation has risen to high policy relevance; however the focus has always been on the comparison of material deprivation and income *poverty*. This paper wants to add to the conducted research by assessing in how far the absolute income heights, enabling a better comparison across the European Union, will be apt to explain levels of material deprivation. The novelty of the approach adopted here is that, each household's income will be regarded in two ways: respective to the national background (relative income) and in absolute terms. Assuming that Fahey's findings hold, based on the high degree of between-country differences, it would be expected that absolute net income (in PPP allowing for a cross-European comparison) is able to explain the distribution of material resources better than the national income position. Starting from the question of divergence or convergence within the EU, this analysis fits in the line of the papers discussing the EU or national reference frame (Whelan & Maitre, 2009; Whelan & Maitre, 2012a) and is not intended to produce policy recommendations. While the aforementioned authors however focused on explaining economic stress through material deprivation, the central aim of this paper will be to analyse the impact of relative and absolute income measures on material deprivation and the mediation these explanatory factors receive through the national context. The whole analysis will be set in the framework of a multilevel analysis, as this will enable the analysis of the cross-country variance and allow controlling for macro factors, i.e. the social stratification of a country and the income level within a country, which are both highly related to the impact of absolute and relative income. By means of this multilevel analysis, it is to be revealed which groups of households are most susceptible to material deprivation: Is the heights of income itself the most precise predictor of a lack of material resources or is the income position within a specific country of higher importance, and how are the effects of these income measures mediated by the national

context? Overall, this analysis will serve to discover to what extent cross-country differences in material deprivation are enhanced or lowered by the national context.

This paper will proceed in the following way: First, the concept of material deprivation will be analysed from a theoretical and empirical view, thereupon the main hypothesis will be explained. As a second step, in order to achieve at first an understanding of current between and within country differences in the incidence of material deprivation, the study of Fahey (2007) is replicated in this paper for data from the EU SILC 2005 and 2010 cross-sectional data set. Therefore the degree of material deprivation within each income quintile of European welfare regimes will be discerned, which will help to reveal the latest developments especially within the Central and Eastern European Countries (CEEC). This analysis on the macro level will be complemented by a multi-level analysis, in which context factors such as the median income level as an indicator for the wealth of a country and the decile index (D5/D1) as a measure of inequality of income within a country will be controlled for. The conclusion will sum up the findings of the article.

2.1. Material deprivation

Material deprivation belongs to the approaches of multi-dimensional poverty, which were incorporated in the last decades in order to complement the purely monetary understanding of poverty². The concept of material deprivation was first developed by Townsend (1987), for whom it referred to a lack of “the material standards of diet, clothing, housing, household facilities, working, environmental and locational conditions and facilities which are orderly available in their society”. But most important, also to those people who “do not participate in or have access to the forms of employment, occupation education, recreation and family or social activities and relationships which are commonly experienced or accepted” (Townsend, 1987, p. 140). Poverty is thus regarded as a declination from the socially accepted way of living within a certain region. The term “social acceptability” which features high in the account of poverty as described by Townsend emphasises the relativity of the concept. It therewith differs from earlier accounts of poverty, which try to define absolute standards e.g. as a severe deprivation of basic social needs (Rowntree, 1901).

Material deprivation is part of the group of indirect or outcome approaches to poverty, as it is based on the observed satisfaction of needs (Fusco, Guio, Marlier, 2010). The advantages of

² For many years, income has been the indisputable dimension by which social arrangements have been described. Income is a direct tool for measuring poverty: An individual or household with a certain monetary endowment can choose to consume products and services according to own preferences (Mayerhofer & Bärlosius, 2001). The possible living conditions of a household can therefore in most cases be directly inferred from information about the height of their current income.

outcome approaches to poverty are that they “can bring out what it means to be poor” (Nolan/Whelan, 2010, p. 307). They can reveal the effect of long-term accumulation and depletion of monetary resources, e.g. as a result of long-term unemployment or in presence of special needs (Till & Eiffe, 2010; Guio & Maquet, 2007; Fusco, Guio & Marlier, 2010), as well as the impact non-monetary services and goods can have on a household’s living condition. To these sources of non-monetary income counts e.g. values of self-produced goods, non-cash employee income (except for company cars) or services provided by the state (e.g. childcare, imputed rent), which are not sufficiently included into monetary poverty calculations (Fusco, Guio & Marlier, 2010). Based on an analysis of material deprivation divergent effects of governmental services and family support can hence be revealed. Ringen (1988) suggested that the income approach takes the equality of opportunity into vision, while material deprivation focuses rather on equality of outcome. The choice between these two alternatives is purely ideological to him, as it is a decision between implying social or individual responsibility³. While on theoretical grounds, either measure can thus be argued for, from a methodological perspective, the choice of a single composite indicator for material deprivation valid for with and between country comparisons has proven increasingly difficult.

2.2. The EU’s concept of material deprivation

Being the EU’s key indicator for social exclusion, material deprivation is employed to identify those individuals whose material, cultural and social resources are insufficient to allow them to participate fully in their society (European Commission, 2004, p.10). The EU definition of material deprivation includes nine basic items. According to the weak definition, more than three out of these nine items have to be missing in order to be declared ‘deprived’, in the stricter version, the threshold raises to four and more. The following household goods or capacities are included: 1) the capacity to face unexpected expenses, 2) capacity to have a one-week annual holiday away from home, 3) capacity to afford a meal with meat, chicken and fish every second day, 4) the ability to keep the house adequately warm, 5) whether the household has arrears on mortgage, rent, utility bills, hire purchase instalments or loans; whether the household has 6) a washing machine, 7) a colour tv, 8) a telephone, 9) a car⁴.

³ A similar discussion between resources and outcome measurement has been brought about also by Sen’s (1992) work on capabilities and functionings. For him, the emphasis should be laid on the opportunity structure of a person. Not the actual functioning (the living conditions) are therefore to be measured but the opportunity a person has to realize functionings valuable to him.

⁴ These items do not constitute the whole width of what is included in the EU SILC household survey; however they depict the part most related with income poverty. Whelan and Nolan (2005) advocate an alternative index of three separate dimensions, namely consumption, household facilities and neighbourhood and environment.

Material deprivation is understood as the “enforced absence” of certain goods, the household would like to possess but cannot afford due to lack of resources (see e.g. Layte, Whelan, Maitre & Nolan, 2001, p.106). Differences of availability or preferences of certain goods are therewith held to be excluded from the definition of the deprived⁵. An important reason for the EU to include material deprivation into its indicators was that it offers a way of taking the different living standards within the EU12 and the Central and Eastern European countries (CEEC) into account, while at the same time it is not perceived as an absolute poverty measure, which the EU does not deem appropriate due to its relatively high level of wealth (European Commission, 2004).

Certain problems are nonetheless prevalent when using material deprivation as a poverty tool. Most importantly, the presumption that the same list of resources is of the same relevance in all European countries seems questionable. While the usage of no preference weighting enables a cross-country comparison, it is therewith assumed that the same set of standard goods is necessary to be an accepted part of society in all countries⁶. However, given the diverging living standards across Europe, the assumption that these goods and services assume exactly the same social importance throughout the EU countries does not hold.⁷

2.3 Cross-country variations in material deprivation

The central focus of the material deprivation measures is on goods and services, which can be afforded by every person in possession of a certain level of money⁸. Some, like the ability to pay for rent, utility bills, hire purchase instalments or loans or to face unexpected expenses

⁵ It can be argued that the assumption of an “enforced absence is flawed. Preferences still play a role, as a person spending a high part of his income on certain types of goods can still be lacking those goods deemed necessary for participating in society (Bärlosius & Ludwig-Mayerhofer, 2001). Also, the opportunity to use her or his resources in a way a person deems best, can be regarded as a capability in itself (Sen, 1992).

⁶ In addition to differential perceptions across Member States, it can also be questioned in how far all groups of individuals within a country have the same social perception. Differences could exist e.g. due to generation, location or family composition (Till & Eiffe, 2010). The elasticity of demand for consumer goods especially can thus be very high.

⁷ Guio, Fusco & Marlier (2009) as well as Dickes, Fusco and Marlier (2010) show a high level of congruence between the 27 national patterns of social perceptions, nonetheless it can be noted that annual holidays are only perceived as absolute necessities by more than half of the population in 12 Member States and also all of the households amenities are not perceived in all EU countries to constitute social needs (e.g. colour tv only in 19 countries, phone in 14 countries, car in 16 countries) (see Guio, Fusco & Marlier, 2009).

⁸ The operationalization of social exclusion by material deprivation excludes many variables highly valuable for a person to participate in society. The contact with friends and neighbours, the support in emergencies by family and friends as well as the ability to participate in cultural activities are far more likely to measure the social inclusion of a person (Böhnke, 2008). Also information on health, education, employment status and living conditions are neglected, although often identified as the central dimensions of living standard (Voges et al, 2003).

will be to a higher extent linked to the personal needs. Nevertheless it can be stated that the large amount of the index is constituted from goods unrelated to other factors than income. Given this high monetary focus, it is to be expected that the amount of income a household owns as well as the macro factors impacting thereupon will play an important role in determining the incidence of material deprivation on a country and specific income groups. The relationship between material deprivation and low income has however often been analysed solely using the income measure employed in the “at risk of poverty indicators” of the EU (Whelan & Nolan, 2010, p. 316). Even though it could be expected that not the income position in relation to the compatriots but the heights of income itself will be revelatory concerning the ability of a household to afford basic goods and services⁹. Also macro variables have rarely been taken into consideration, as most research on material deprivation focuses on individual level factors. The influence of structural variables like the national median income, the inequality index or variables describing the employment or social protection institutions¹⁰ within a country on material deprivation and their effect as a moderation factor require therefore further exploration.

Fahey (2007) has been one of the few authors to analyse material deprivation from a macro view. He set out to compare the degree of material deprivation within four groups of income countries within the EU, dividing them based on their GDP per capita. His analysis of EQLS 2003 data showed that between country differences were by far bigger than differences within the blocks of countries. Households from the highest income quintile in the cluster of countries with the lowest GDP (Turkey, Romania & Bulgaria) had a higher incidence of material poverty than households located in the poorest income quintile within the cluster with the highest GDP. Based on this finding, he concluded that the country a person lives in is more important for his material living conditions than his or her socio-economic status within this country. Whelan and Maitre (2009) repeated this exercise using EU SILC 2005 data, grouping the EU countries however according to the extended Esping-Anderson categorisation into five different welfare state regimes (Social-Democratic, Liberal, Corporatist, Southern European and Post-Communist). They assert Fahey’s conclusions, even

⁹ This problem could also be linked to the European poverty indicator. A European-wide poverty threshold (e.g. 60% of the EU-wide income) would be a better indicator to compare the living conditions across Europe. Given that Purchasing Power Parities are applied, the ability of a household to afford certain products could therewith be compared EU-wide, since the EU population would be taken as the base line not the income of the national population.

¹⁰ Nelson (2012) explored the effect of social assistance on the cross-country incidence of material deprivation. He discovered a highly significant relationship between these two factors. Since in his analysis, he however did not take into account further variables on the country level (such as GDP), it is questionable in how far multicollinearities due to omitted variable bias come into play here.

though their findings reveal that the fifth income quintile within the Post-Communist group is marginally better off than the first quintile within the Social Democratic country group. Layte, Whelan, Maitre & Nolan (2001) already give indications of important context factors apt to explain the cross-national differences in deprivation. For them the higher incidence of material deprivation in the Central and Eastern European Member States stems *“not only from variation in levels of affluence but from the extent to which potential disadvantage associated with factors such as class position are given free rein.* (p. 107) Not only the income level but also the degree of social protection and inclusion are for them thus of highest interest. Additionally Layte et al (2001) were the first to pay attention to the fact that macro variables may vary in their influence depending on the specific contextual policies in place in a certain country: *“Of greater sociological interest is the fact that such characteristics may also vary in their influence across different countries and the extent to which a particular socio-economic status not only provides information about current demands or resources, but also serves as a proxy for longer-term imbalances between obligations and economic capacity will be crucially influenced by the degree to which mechanisms that buffer the cash nexus are in place”* (p. 107).

The authors, who advanced most with the analysis of the variables on the country context were Whelan & Maître (2012b), who in their discussion paper “Understanding material deprivation in Europe: A Multilevel Analysis” tested the hypothesis that *“the consequences of being in a lower social class are crucially dependent on the level of GNDH in the respondent* (Whelan & Maître, 2012, p. 16).” To carry out this analysis they assessed how material deprivation is influenced by the impact of the Gini index and GNDH, the Gross National Disposable Income per Head, an indicator similar to the GDP per capita with the difference that indirect business taxes are not deduced. They revealed no significant impact of the Gini index but a highly significant influence of GNDH on material deprivation, which they explain through the following mechanism: The lower the average level of disposable income in a country, the sharper the consequences of an unfortunate socio-economic position will be, as social stratification is more pronounced in countries with a lower GNDH. According to Whelan and Maître (2012) *“the impact of factors such as social class, education, labour market experience, family size and marital disruption is significantly more powerful in countries with low average income levels”*. (p.22).

While the GDP (and in the same vein the GNDH) are revelatory concerning the wealth of a country and used as the key indicator of economic development and well-being, it is however not very closely related to the income of households within a country. While it includes

personal consumption expenditures and private investments, a much higher share is made up from government consumption expenditures and income from assets abroad. In a similar vein, the use of the Gini index can be criticized in the paper of Whelan & Maître (2012b) as it is a measure for inequality concentrating on the middle income distribution but not on the lower end, which is the one especially influenced by material deprivation. The contribution this paper wants to offer is thus to further explore the role of “mechanisms which buffer the cash nexus” (Layte, 2001) within the country context, while focusing thereby on country characteristics which more closely mirror the position of the lowest income decile and its position in respect to the middle income class. Therefore the paper analyses the role that median income level of a country and the decile index (D5/D1) have to offer in explaining cross-country differences in the association between material deprivation and relative and absolute income.

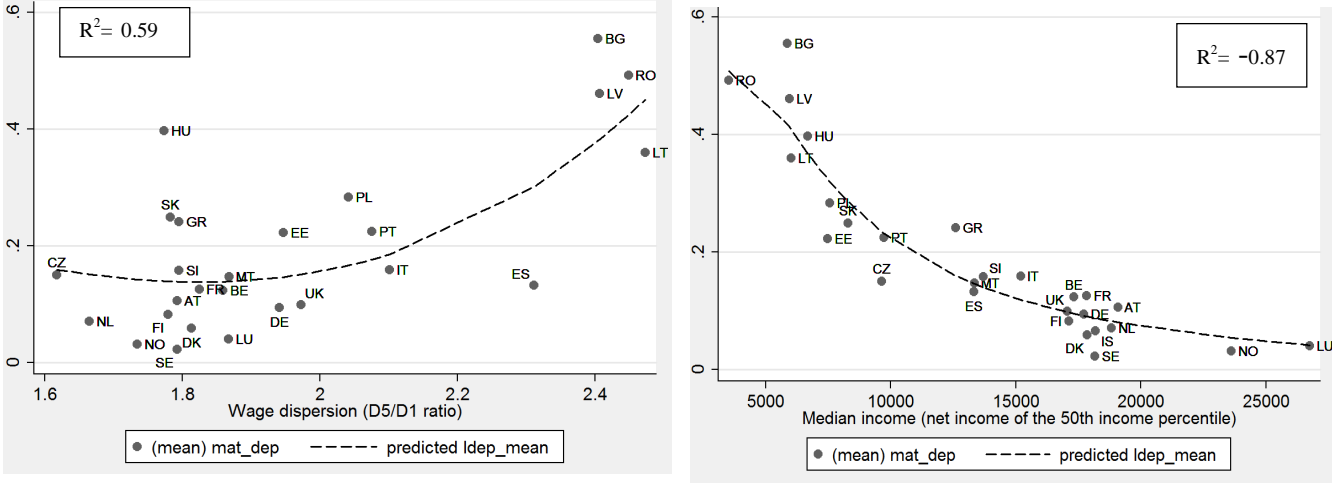


Figure 2: Relationship between the material deprivation score on a c

By means of this analysis the paper hopes to reveal more closely the influence of social stratification, which is only assumed in the paper of Whelan & Maitre (2012) as no direct or indirect influence of social inequality can in fact be established in the paper. This paper will proceed by firstly distinguishing the role of the national income position and the height of the individual income. Thereafter the focus will shift to the interaction between these household level income variables and the national level. Certain hypotheses have been formulated for each of these steps.

2.4.Hypothesis

Concerning the impact of income on material deprivation, it is important to note that the focus on consumer goods of the EU's material deprivation variable implies that not only the position of a household relative to his compatriots (relative income position) but also the height of income itself (absolute income position) and the country context impacting thereupon will likely assume high explanatory value. This paper follows Fahey's (2007) statement that the country position is more important in determining a household's material poverty status than the relative income quintile the household is located in, thus coming to the first hypothesis:

H1: The household's absolute income will be able to explain more of the deprivation status than the relative income position.

As a second step, the explanatory power of macro level variables will be examined. To describe the country context in an appropriate way, information about the median income of a country and the decile ratio are deemed most important, following the argumentation line of Layte et al. (2001), as those are two characteristics describing well the social stratification and social protection net in place within a country. The median income is deemed to be of higher explanatory value than the GDP (GNDH) as it is more closely related to the realities of the population within a country. From a high median income, conclusions can be drawn about the heights of the minimum income in terms of salary but also in terms of replacement rate for pensioners/short-term unemployed and social assistance expenditures. Higher median incomes can be explained in part through higher reservation wages: Households can rely on a certain income through social protection expenditures by the state (or through fixed minimum wages) and will therefore have no incentive to accept work below this secured income line. The higher the median income, the higher will thus be the income of the lower social-economic groups and the more resources these groups will be able to avail for in order to protect themselves against material deprivation¹¹. More specifically, it can be expected that in a country with high median income, a household will be able to attain an income sufficient to afford basic living conditions more easily than in a low income country.

On the other hand, in this paper a high role of social stratification and inequalities is expected. While Whelan & Maître (2012) were however unable to reveal an effect of the Gini index, this paper wants to focus on the lower part of the income distribution, focusing on the relation

¹¹ While the concept of median income is still rather wide, in that its level depends on the heights of income market and non-market income sources, it is more restricted than GDP, whose link to material deprivation could be established not only via higher salary/social security expenses but also through e.g. educational attainments and employment rates.

between median income and lower income group (D5/D1). This decile ratio is supposed to take the inequalities experienced by low income earners more into perspective than the Gini index and will be expected to be therefore of significant relevance. Countries with high D5/D1 ratio feature high inequalities, in that the net incomes of persons with low qualifications will be extremely removed from the incomes common in this country. It is to be expected that through this mechanism material deprivation is brought into existence in particular when the unfortunate income position exists for a longer period of time and no form of consumption smoothing is provided for by the state. Therefore it is expected that in a country with high inequalities, the risk of a household to be material deprived will increase.

H2: Countries with high levels of median income will be likely to have lower incidences of material deprivation, while countries with high inequalities (shown through the decile ratio) will be likely to have higher incidences of material deprivation, even when individual factors such as activation resources, health and income are controlled for.

As a last step, an examination of the interaction terms between the two income definitions with median income and the D5/D1 ratio will enable this article to come to certain conclusions about the appropriate policies to address material deprivation. When the macro factors assume a mediating role, this would mean that the role of income positions would change in specific policy context. Second order effects are especially expected between the D5/D1 ratio and the relative income position. An interaction would mean that households removed from the median income of their country would be particularly disadvantaged in countries where the distance between the lowest and the median income is high. Their individual position at the bottom of the income distribution of a country would thereby be exacerbated if high social stratifications are in place. This would therefore be a more direct proof of the thesis claimed by Whelan & Nolan that the high social stratification is a source of increased material deprivation levels for people of low monetary and social resources. If a specific association were distinguished, this would be moreover in the line of Muffels & Fourage's (2004) paper, who argue that the social inclusion policies within each state are important to lower material deprivation, as well as Layte et al (2001) paying special attention to the "*mechanisms that buffer the cash nexus*" (p.107).

A specific association between the absolute income and the decile ratio on the other hand would put a high emphasis on the reduction of income inequalities between the EU countries. From this it would follow that households with specific low incomes are the ones most deprived when they are located in highly unequal societies. As the Central and Eastern European Member States are the ones which are both showing low absolute household

income levels and high inequalities (particularly in Bulgaria, Romania, Hungary, Latvia and Lithuania), this would emphasize Fahey's claim for a "EU anti-poverty policy [that] is linked as much with the EU convergence project [...] as with social policy in the usual sense" (Fahey, 2009, p.35).

H3: *Second-order effects of the D5/D1 ratio are expected with the relative income position in particular. It is assumed that households in a relatively low income position (compared to their compatriots) will be relatively more deprived in countries with high inequalities than in countries with lesser inequalities. Additionally an interaction term between absolute income and the D5/D1 ratio is expected, putting a specific emphasis on those households with absolutely low income, located in the Eastern European Member States.*

An interaction between the median income level and relative income would mean that at higher levels of median income, the relative position of a household would become increasingly less important. A negative interaction could be expected because of a higher focus on inclusiveness in countries with median income. High median income as can – as deducted earlier – be traced back not only to higher salaries but also to higher replacement rates and social assistance expenditures. Such an effect could be expected due to the high representation of Scandinavian countries in the sample, usually characterised by a high national income, inclusive labour markets and high social protection expenses and services following Esping-Anderson (1990). On the other hand, we would not expect to observe a second-order effect between the median income level and absolute income. A second order effect would mean that higher median income would be beneficial to the lower income group in particular. As this would however increase the reservation wage of these groups, which would be contrary to the active labour market policy encouraged by most EU Member States, this process appears highly unlikely.

H4: *Second-order effect between the median income level and the relative income are expected, as the social policies and services of high-income countries within Europe has a particular pro-poor bias, benefiting low income groups in particular. An interaction effect between the median income and absolute income is however not expected.*

3. Data and methods

3.1.Data

The analysis of the material deprivation dimensions will be carried out using EU SILC, the official statistics on income and living conditions by the European Union. EU SILC provides

detailed information on all EU27 Member States plus Norway and Iceland. The article applies the original 3+ threshold definition of material deprivation¹², which is the measure included in the EU-2020 targets¹³. No weighting is applied to the individual items of the analysis, therewith a similar importance of all material deprivation variables throughout the EU is assumed. This is done since the main aim of this article lies precisely in analyzing the main differences in groups of households most vulnerable to material deprivation between countries. The analysis will be carried out at the household level, comprising 119409 cases.

3.1. Between country variation of material deprivation

Before the paper will turn towards the multi-level analysis, the change of between country variation of material deprivation is first to be established from 2005 to 2010 using EU SILC data. This will help to determine the changing importance of the country level for variations in relative income position in groups of welfare state types. Therefore we divide the EU countries into five categories: the Central Eastern European Countries (Latvia, Poland, Lithuania, Slovakia, Estonia, Hungary, Czech Republic, Slovenia), Mediterranean countries (Spain, Greece, Italy, Portugal, Malta, Cyprus), Liberal countries (United Kingdom, Ireland), Conservative countries (Austria, Belgium, Germany, France) and Scandinavian countries (Denmark, Finland, Island, Netherlands, Sweden). Since Romania and Bulgaria did not form part yet of the EU SILC in 2005, these countries are only included in the calculation of the 2010 figure. Norway and Luxembourg have been omitted since they represent extreme cases. The cluster quintiles were constructed based on the distribution of net income within the respective country cluster.

¹² The EU material deprivation measure constructed at the basis of EU SILC for 2010 differs from the Eurostat statistics in the case of four countries. Germany, the UK, Sweden and Norway display an around 1% lower mean for material deprivation.

¹³ Guio (2012) proposed a revision of the measure towards a 4+ threshold, which is now also more common in the official Eurostat publication. The difference between the rankings and analysis using either three or four item cut-off points are minor as the measure proves to be very robust.

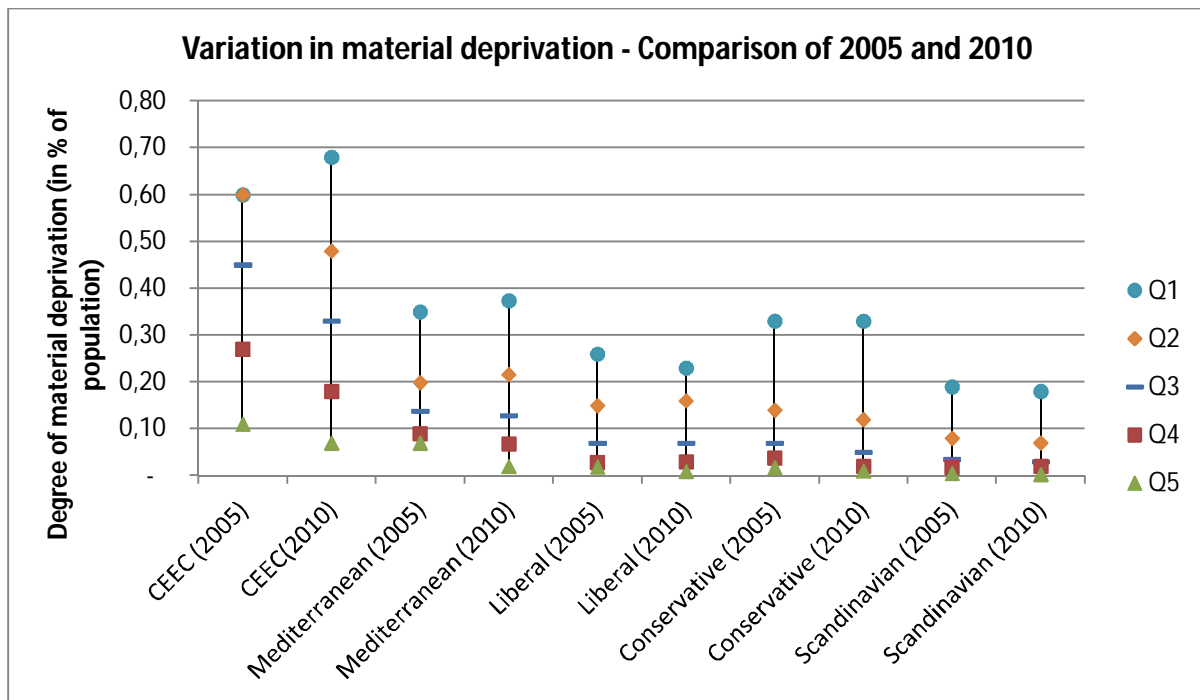


Figure 3: Change of the degree of material deprivation from 2005 to 2010 by income quintile and welfare state type. Note that 2010 data includes Romania and Bulgaria, while data for Ireland and Cyprus are missing. Source: Own calculation based on the EU SILC 2010 cross-sectional dataset.

Figure 3 describes the association between country group and level of material deprivation also presented by Fahey (2007) and Whelan and Maître (2009). While Fahey (2007) concluded that “the gaps in deprivation levels between the rich EU12 and the two poorest country clusters [...] are so low that there is little overlap between them”, we come to the conclusion that the differences within the current EU27 are not that pronounced. Although the incident of material deprivation varies still to a high extent depending on the fact if an individual lives in either a Central or Eastern European country as compared to the old EU12, top income positions (in the 4th or 5th quintile) are by far a better predictor of low material deprivation than the country a person lives in.

Compared to 2005 data (Fahey, 2007; Whelan & Maître, 2009) within country differences seem to be increasing, while between country differences in material deprivation are becoming less pronounced. While the living conditions of the different income quintiles in the old EU15 stay more or less similar, in the middle income quintiles (2-4 quintile) of the Central and Eastern European countries a pronounced decrease of material deprivation is visible, despite the addition of Romania and Bulgaria (not included in the 2005 dataset). Hence we can remark that the effect of wealth varies across country clusters. Only 29% of the households within the lowest quintile cluster face material deprivation, while 70% of households in the low income CEEC countries share this destiny. All in all, it is possible to conclude from this descriptive analysis that the realities of Europeans in different Member

States seem to have approximated from 2005 to 2010. An analysis at the macro level is however always exposed to the danger of committing an ecological fallacy. Processes going on within countries cannot be portrayed to a full extent and conclusions could be drawn which do not reflect causalities due to spurious relationships between factors on the macro level (Hox, 2010). In the following therefore a multi-level analysis will be carried out in order to analyse in-depth which groups of the European society are most susceptible to material deprivation, when factors on the macro level such as median income level and decile ratio are held constant. So far, few studies have taken a multilevel perspective or analysed the effect of income on material deprivation while controlling for variables at the macro level (Nelson, 2012; Whelan & Maître, 2012). Regimes of welfare states have been included and distinguished quite frequently (e.g. Nolan & Whelan, 2011; Muffels & Fourage, 2003), but only a small amount of studies has tried to reveal in how far the factors behind these welfare state differences influence and moderate the incidence of material deprivation on certain groups of households.

3.2. Analysing material deprivation with a multi-level model

The regression analysis will be carried out in the form of a multi-level model. Multi-level models are special models for analysis in which different levels are nested within each other; in this case the household level is nested within the state level, which creates the problem, that these observations are not independent from each other. The benefit to be drawn from multilevel models is that they take account of the correlated error-terms present in clustered data (due to the correlation of observations, violating the i.i.d. assumption¹⁴) by allowing intercepts and slopes of household-level data to vary across the regional and state parameters (Cameron & Trivedi, 2010). Without this specification the standard errors of the higher-level parameter effects, in this case the effects of the country level, would be lower than they should be. This would in turn increase the chance of rejecting the original hypothesis that there is no association between the dependent variables and the independent variables on these levels, while indeed the hypothesis is correct. The model will be constructed with the Stata-command for binary outcome analysis `xtmelogit`.

The random-intercept only model without any explanatory variables shows that a proportion

¹⁴ The i.i.d. assumption in regression analysis demands that observations are independently and identically distributed, meaning that they have been drawn by simple random sampling from a sole large population and must be mutually independent from one another (Stock & Watson, 2007, p. 128).

of 25.4% of the variance of the material deprivation status can be traced back to differences between countries. A quarter of the deprivation can therefore be explained through country-specific context factors and is not attributed to household characteristics. The following analysis in M1 to M5 are based on a random intercept model, which allows the intercepts to vary randomly, while still assuming fixed parallel slopes for all countries (Hans, 2006, p.17). In M1, individual level variables are added based on the existing standards of material deprivation literature (see e.g. Nolan & Whelan, 2011; Muffels & Fouarge, 2004; Fusco, Guio & Marlier, 2010). Earlier studies described the individual resource side to be the most influential on the material deprivation status (Muffels & Fouarge, 2004). The socio-economic status of a family, measured by means of educational attainment, occupational status as well as health¹⁵ are used to inform about these available activation resources¹⁶ of a family. Next to this, also the household composition is important for the occurrence of material deprivation as it describes the household's needs. Especially households with a high number of dependent children and those, in which the relation between in work persons and dependents is especially unfortunate (e.g. like single parents) feature a higher vulnerability due to increased needs¹⁷. All individual level variables included are highly significant and able to explain 13% of the model.

¹⁵ The health of the household head is one of the variables which has been added due to its pronounced importance in earlier studies. Till & Eiffe (2010) for example describe the change in health status as the “most striking result” because a deterioration or improvement in health lowers or increases the material deprivation to a highly visible extent.

¹⁶ Activation resources - a term often used in the discussion of material deprivation – refer to the capacity of a household to take up employment and therewith include themselves again actively within society.

¹⁷ Similarly, one could argue that households in which none of the adults is in work are especially vulnerable (Graaf-Zijl & Nolan, 2011).

		M0	M1		M2		M3		M4		M5		M6		M7	
MICRO LEVEL			ODDS	Z	ODDS	Z	ODDS	Z	ODDS	Z	ODDS	Z	ODDS	Z	ODDS	Z
Household composition	Single parent (Ref. 2+ parents, 0-2 children)		3.614***	37.34	2.502***	25.72	2.498***	25.68	2.492***	25.42	2.491***	25.41	2.395***	24.22	2.396***	17.29
Occupation (ISCO88)	Non-skilled manual (Ref. Skilled non-manual)		2.167***	26.39	1.751***	18.50	1.75***	18.48	1.76***	18.59	1.759***	18.58	1.714***	17.66	1.714***	17.65
Education	ISCED 0-2 (Ref. ISCED 5-6)		2.904***	33.23	1.961***	20.20	1.957***	20.15	1.966***	20.21	1.966***	20.21	1.916***	19.36	1.916***	19.36
Health	Very bad (Ref. Very good)		4.095***	27.11	4.329***	27.45	4.332***	27.46	4.283***	27.12	4.283***	27.12	4.218***	26.65	4.222***	26.67
Activity Status	Working		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
	Unemployed		5.278***	46.46	2.714***	25.86	2.708***	25.8	2.712***	25.69	2.713***	25.69	2.55***	23.88	2.553***	23.9
	Retired		0.729***	-13.70	0.625***	-19.54	0.624***	-19.55	0.625***	-19.45	0.625***	-19.45	0.611***	-20.1	0.611***	-20.13
	Other inactive		1.996***	22.06	1.323***	8.52	1.32***	8.45	1.313***	8.24	1.313***	8.23	1.257***	6.87	1.245***	6.85
Absolute income	Logistic net income						0.382***	-65.30			0.382***	-65.05			0.329***	-18.68
Relative income	Income/ national median				0.495***	-65.00			0.493***	-65.02			0.442***	-18.44		
MACRO LEVEL																
Median income level	z-standardised								0.429***	-7.14	0.749***	-2.65	0.421***	-8.13	0.846	-1.67
Median income * relative inc.													1.012	0.24		
Median income * absolute inc.															1.02	0.3
D5/D1 ratio	z-standardised								1.172	1.27	1.07	0.59	1.249*	1.69	1.229*	1.96
D5/D1*relative inc.													1.15*	2.75		
D5/D1*absolute inc.															1.212**	2.81
Intercept		0.196***	0.26***		0.039***		0.039***		0.040***		0.039***		0.041***		0.042***	
Random effects																
Absolute income															0.082***	
Relative income													0.046***			
N	26 countries	119409	119409		119064		119064		117957		117957		117957		117957	
McFadden R2			0.136		0.186		0.187		0.192		0.192		0.20		0.20	
ICC		0.254	0.267		0.289		0.10		0.081		0.07		0.066		0.058	
Total variance									3.583		3.538		3.567		3.577	
Between country var.		1.12	1.197		1.338		0.369		0.293		0.248		0.277		0.287	
Residual variance									3.29		3.29		3.29		3.29	
BIC		103076	89253		84089		84055		83278		83476		82795		82792	
Log likelihood		-51526	-44521		-41934		-41916		-41618		-41616		-41257		-41256	

Figure 5: Multilevel logistic regressions for material deprivation (binary) on the household level. *p/z < 0.05; **p/z < 0.001; * p/z < 0.0001**

Most interesting is the interpretation of M6 and M7, the random slope models with interaction terms. In the random slope models we allow the slopes of the relative or absolute income to vary respectively, in order to adjust the model to the reality of changing slopes, observed e.g. by Fusco, Guio & Marlier (2010). The random slope in both models is highly significant and able to bring the R2 up to 0.20. The ICC is again better in the model with absolute income, in which now only 0.58% (so 1/5 of the original cross-country variation) remain unexplained. When random slopes are adopted, the significance of the macro level variables increases. In both models, the D5/D1 ratio coefficient becomes significant again at the 5% level. In both models the correlation of the D5/D1 ratio coefficient with material deprivation is positive. There seems to be therefore certain proof in both models that rising inequality within a country seems to increase material deprivation directly. Concerning the median income per capita, a very interesting picture is revealed. While the relation between material deprivation and median income is significant when relative income is used, it becomes however insignificant when absolute income is applied which is able to describe the cross-country differences better. H2 seems to be therefore affirmed in the hypothesis related to the D5/D1 index but not as what regards the income level. The income level itself seems to be only of secondary importance, for the description of the impact of social stratification.

The interaction terms in the random slope model with relative income show that the influence of the relative income position in a country does not vary with increasing median income level. On the other hand however, there seems to be some influence of the D5/D1 ratio on the way the relative income influences the risk of material deprivation. With a 95% probability it is correct to assume that the D5/D1 ratio has a stronger impact when households with a relatively low income are considered. H3 can therefore only be affirmed. When the model with absolute income is portrayed, solely the interaction term with the D5/D1 ratio coefficient is significant, while the effect of the height of income does not vary dependent on the median income level. For the decile index, it is therefore possible to state that not only the effect of being in a relatively low income position increases within an unequal country, also the effect of being absolutely poor increases. The decile index thus has a higher effect on households with absolute low income. In the EU context this means that households in the Central and Eastern European States are disadvantaged twice. Following Fahey (2007), it is possible to conclude that the high indexes of material deprivation in the CEEC countries call for regional convergence policies.

Conclusion

The purpose of this paper was to analyse the impact of different concepts of income on material deprivation while controlling for the country context. First the paper followed Fahey (2007) and came to the conclusion that the differences within the current EU27 seem to have diminished from 2005 to 2010. Nevertheless, analysing the explanatory power of relative and absolute income in a multilevel model, absolute income assumes a significantly stronger explanatory power. The paper is able to confirm the hypothesis of Whelan and Maitre (2012) that material deprivation is especially prevalent for countries which feature a high degree of social stratification. In countries with a high D5/D1 ratio, the net incomes of persons with low qualifications will be extremely removed from the incomes common in this country, if this divergence to other income quintiles is high and the transition rate between those income quintiles not especially pronounced, this mechanism will lead to deprivation in a household. The national income seems to be of less relevance than shown by Whelan & Maitre (2012) and only features high in the first analysis because the group of households with low income is especially pronounced in less prosperous countries, with lower median income levels. When taking the interaction terms into consideration, it is moreover interesting to observe that a significant interaction term between absolute income and the inequality structure within a country exists. This indicates that persons with extremely low income (e.g. in the first EU income quintile) in countries with a rather unequal economic structure are suffering from material deprivation more than what would be proportional. Since these households are located especially in the Central and Eastern European countries, the European Structural Fund has an important role to play to meet the EU2020 targets.

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