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Reference Groups and Pensioners' Subjective Economic Well-Being in Europe

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Abstract This study contributes to the interdisciplinary debate over the effects of absolute and relative income on subjective well-being by introducing country-level measures of income into the analysis of pensioners' economic well-being. Both the relevance of alternative reference groups for different phases of old age, measured through median incomes, and the effect of general income inequality within countries are explored. Analyses are based on the cross-sectional components of the survey European Union Statistics on Income and Living Conditions from 2005 to 2011, containing information on 458,769 pensioners from 31 European countries. With the multilevel linear regression analysis method, the effects of different income measures are analyzed both at the individual and country levels. The main result shows that the average income level of pensioners within countries hold spillover effects strong enough to conclude other pensioners constitute a relevant reference point. Pensioners' high income level decreases individual income adequacy regardless of age. Results also indicated the labour market group having varying effects on different age groups. The general income inequality does not affect pensioners' subjective economic well-being.

1 Introduction

Different aspects of pensioners' well-being are becoming ever more important as the population in Europe is rapidly ageing. There is a relatively vast body of research exploring the subjective economic well-being of the elderly (e.g. Liang et al. 1980; Cutler et al. 1992; George 1992; Weidekamp-Maicher and Naegele 2007; Hsieh 2003; Litwin and Sapir 2009). One of the key findings of these studies is the increment of financial

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satisfaction with age. Older adults are more satisfied with their financial resources than young and middle-aged adults (George 1992). This phenomenon can be seen as paradoxal, since older adults' income is commonly lower than younger adults' income (Hansen et al. 2008). This disparity has drawn much attention, but we are still lacking an in-depth analysis to understand the effect of income on subjective well-being and more so, the role of income comparison to other groups. The measurement of relative income has been carried out at a very general level, including powerful pre-assumptions on pensioners' reference points and their stability over time. However, pensioners' reference groups can be suspected to shift over the course of time following retirement. This study contributes to the ongoing interdisciplinary debate over the effects of absolute and relative income on subjective well-being, with novel ways of measuring reference points at the country level.

Studies on pensioners' subjective economic well-being have typically viewed the phenomenon from the individual perspective. Analyses of reference income indicate that the role of comparisons might be of different importance for younger and older-age elderly people (Hsieh 2003), stressing the importance of a more detailed look at the phenomenon by age group. Wider analyses of subjective well-being, including information on the context of living, have shown country-level measures of income such as income inequality and average income to have an effect on different aspects of well-being beyond individual income. Through these types of analyses, researchers with multi-fold research setups have made conclusions on whether populations of different geographical areas work as reference groups for people. (Zagorski et al. 2014; Berthoud 2012). It thus seems essential to also take into account the relative income positions of population groups of interest within countries. For example, pensioners' absolute income level and purchasing power differ greatly between countries, but these differences still reflect only the general income level within countries. The pensioners' overall situation is better understood with a view to distribution in relation to people of working age and among pensioners (EU 2012). The average income of people aged 65+ can, for example, exceed or be a quarter less than the income of the working age population, and the top fifth earner can get income around two to five times higher than the lowest fifth earner of the same age in different European countries (Eurostat 2014). Through different mechanisms, these types of inequalities can have negative or positive spillover effects (Helliwell 2003) that may affect individuals' evaluations of income adequacy.

This article aims at widening the research on pensioners' subjective economic well-being to include contextual economic indicators in the analysis. Analysis by age group enables us to explore if reference groups can be grasped through average income levels of different population groups within countries, and if their content shift with ageing. This paper proceeds as follows: Sect. 2 reviews first the general discussion around comparisons and subjective well-being and then focuses more specifically on the role of relativity in the economic well-being of the elderly. Section 3 introduces the hypotheses and the means of answering them, i.e. the data, measures and methods. Section 4 presents the empirical results and Sect. 5 concludes and discusses the results.

2 The Role of Comparison in Subjective Economic Well-Being and the Elderly

Subjective well-being and its relativity has drawn a considerable amount of interest by economists, psychologists and sociologists since the start of the 2000s (e.g. Veenhoven and Vergunst 2013; Easterlin et al. 2011; Easterlin 2005; Layard et al. 2010; Stevenson and

Wolfers 2008; Veenhooven and Hagerty 2006; Hagerty and Veenhooven 2003). The idea of comparisons affecting evaluations of different domains of life is, however, not a new one. According to the classic theory of social comparison, people compare themselves in significant life domains to people who are similar in order to form a picture of themselves (Festinger 1954). Under the common area of scientific interest in subjective well-being, finances can be understood as one of the domains in which people feel both pleasant and unpleasant affects and make cognitive evaluations (Diener et al. 1999). Gerontological and thus oriented Quality of Life research focusing on the perspective of the elderly has typically viewed the phenomenon with concepts of perceived income adequacy (Litwin and Sapir 2009; Stoller and Stoller 2003; Hazelrigg and Hardy 1997) and financial satisfaction (Weidekamp-Maicher and Naegele 2007; George 1992). This article uses the concept of *subjective economic well-being* (see Cracolici et al. 2012), referring to households' evaluations of the adequacy of their economic resources to satisfy needs.

The common starting point of research exploring the link between income, relative income and well-being is the seminal work of Easterlin (1974), in which he concluded that income growth does not lead to a rise in happiness within nations, since the social comparison standards rise in conjunction with the wealth of nations. This is representative of the relative income theory, and it is based on the idea that social norms, social comparisons and reference values influence peoples' evaluations of their financial well-being. This weakens the relationship between absolute income and well-being, which would be observed based only on absolute income (Caporale et al. 2009). Financial satisfaction is a less comprehensive measure of well-being, but as it relates directly to economic well-being, it can, in fact, be assumed as more closely related to income change (Easterlin et al. 2011). The counterargument representing the absolute income theory suggests that income helps people meet basic universal needs, and therefore the relationship between income and happiness is not based on social comparison (Veenhooven 1991). However, after basic human needs have been satisfied, other factors than material well-being determine happiness. Income has an effect up to a certain threshold, beyond which utility remains largely invariant (Caporale et al. 2009). Both views have gained support in recent studies, although the scales tip in favour of relativity (e.g. Bartolini et al. 2013; Berthoud 2012; Layard et al. 2010; Caporale et al. 2009; Ferrer-i-Carbonell 2005).

In studies based on surveys, reference points are typically constructed by researchers using various methods. One common way of carrying out a survey is to ask respondents to compare their situation with defined groups, such as friends, neighbours, relatives, people of similar socioeconomic status, age and families within a country in general, and to also compare it to their own situation in the past (e.g. Layard et al. 2010; Hsieh 2003; Liang et al. 1980; Liang and Fairchild 1979). The actual measure of relative income is then usually derived from scaling the questionnaires' ready-classified verbal answering categories. Another way of operationalisation is to match individuals according to certain attributes such as household type, region of living, education, age, race, gender or a combination of these, and to relate the household income in one way or another to the indicator capturing the income of the defined reference group (e.g. Bartolini et al. 2013; Layard et al. 2010; Caporale et al. 2009; Ferrer-i-Carbonell 2005). At the other end of the spectrum, references have been made to residents within countries (e.g. Easterlin et al. 2011; Berthoud 2012) or even a wider geographical area (Litwin and Sapir 2009) and measured through more expansive indicators capturing different aspects in standards of living or distribution of income within countries or smaller areas. Either way, it is not certain that the reference points people apply in reality are equivalent to those constructed by researchers.

Different types of contextual-level measures of income have been shown to affect subjective well-being beyond absolute household income. Nevertheless, empirical studies yield mixed results. For example, income inequality has been proven to both increase and decrease overall subjective well-being and its financial domain. (Gori-Maia 2013; Rözer and Kraaykamp 2013; Zagorski et al. 2014; Verme 2011). The effect of income inequality may first be explained with its rise within the population, which signals mobility also for the individual in the future, and therefore leading to increasing satisfaction (Hirchman–Rothschild-mechanism) or secondly, with its rise in relation to a self-selected population group increasing relative deprivation and worsening life satisfaction (the Runciman–Yitzhaki-mechanism). There are various proposed causes behind the contradicting results, including e.g. different population groups having different perceptions of inequality due to cultural and other factors, and the inclusion of specific control variables into the analysis (Verme 2011). An example of the latter can be seen in a study by Zagorski et al. (2014), which showed that unequal distribution of income did not reduce subjective well-being or perceived income adequacy in Europe when controlling for GDP as an indicator of poverty. The importance of taking into account the level of national economic development is further stressed with the result of Berthoud (2012), showing European households in countries with low average incomes being less likely to report subjective financial strain than households with similar incomes in countries with high average incomes.

The key finding of the paradoxal relationship between age and income satisfaction found in studies focusing on the economic well-being of the elderly has been linked to several explanations. These include the adaptation or the accommodation of needs, aspirations and comparison standards to meet declining resources, life course events such as retirement and children leaving home followed by reduced financial needs, and cohort explanations as the present situation contrasted with the past (Hansen et al. 2008). However, studies have shown that economic indicators such as income, assets and debt are strong predictors of financial difficulty also among the elderly. Oldest-old and low-income elderly nevertheless remain contradictively content with their objectively low level of economic resources. (Litwin and Sapir 2009; Hansen et al. 2008). Other individual factors recognized as affecting the financial satisfaction of the elderly are the decreasing effects of living alone (Kautto et al. 2009), the number of household members to be supported (Stoller and Stoller 2003) and own grown-up children living in the household (De Santis et al. 2005), being a woman, lower education (Litwin and Sapir 2009), the positive effects of a working partner (Hansen et al. 2008) and perceived good health (Kautto et al. 2009; Hansen et al. 2008; Stoller and Stoller 2003).

The issue of relativity in economic well-being has been addressed also in studies of the elderly. The application of contextual-level income measures and the interpretation of relativity through them is rare in analyses of this framework, to say the least. As these studies are, with some exceptions (e.g. Hansen et al. 2008; Hsieh 2003), either based on national samples including only or restricted to old-age people, the reference points are thus often and naturally constructed around other old-age people. In studies using the General Social Survey (GSS) conducted by the National Opinion Research Center (NORC), comparisons are made against American families in general. In line with results common in the relative interpretation of subjective well-being, a relatively low income position has, in several studies, pointed to a decrease in economic well-being also for the elderly (Stoller and Stoller 2003; Hazelrigg and Hardy 1997; Liang and Fairchild 1979; Liang et al. 1980).

An interesting notion in the relativity of economic well-being is the possible shift in reference points with ageing. The effects of one's own past experiences and expectations

regarding the future have been taken into account in analyses, but this viewpoint lacks more thorough research, especially as the literature in the field of psychology points out social downgrading as particularly pronounced for the old-age population in domains of life where people experience problems (Heckhausen and Brim 1997). The relevance of relative deprivation as a mediator between income and financial satisfaction across different age groups was pointed out in a study by Hsieh (2003). His results indicated that social comparison affects financial satisfaction across all age groups, but its role is especially strong in the age bracket of 64–74, after which it loses relevance. As references were asked to be made against all American families, it could be suspected that for older people, the validity of this group as a reference could have disappeared. The possible transition in reference points could not yet be observed with only one defined reference point.

3 Aim, Data, Measures and Methods

3.1 Aim

The aim of this study is to explore the relevance of alternative reference groups at different ages after retirement and the relevance of income inequality to pensioners' subjective economic well-being with country-level income measures. The research concerns European countries. Pensioners' subjective economic well-being has typically been viewed from the perspective of individuals, with references constructed around other people of old age. Wider analyses, including information on the context of living, have shown that country-level measures of income affect different aspects of subjective well-being beyond individual income. The inclusion of information on the economic context of the country of residence also enhances our understanding of the individual evaluation of economic well-being for pensioners. This study focuses explicitly on the link between subjective and objective economic indicators within countries.

In this study the existence and validity of alternative reference groups is grasped and measured with relative income at country level. Reference groups are defined through average income for three different groups: the population, people in the labour market and pensioners. The interpretation of results contains the idea that if the average income of a specific group proves to have a statistically significant effect on subjective economic well-being, then this form of relative income is of importance and has external spillover effects strong enough to convey the idea that pensioners evaluate individual economic well-being in relation to the reference group at hand, beyond individual income. Thus, if a connection is established, then it is reasoned that pensioners compare themselves to that specific group. The validity of alternative reference groups at different ages after retirement is analyzed with interaction terms. Income inequality is defined as the income inequality within the whole population of a country. Similarly, if it proves to have a statistically significant effect on pensioners' subjective economic well-being, then it is reasoned to affect individual evaluations. The dispersion of income may be inexplicable for individuals, but as a broad structure of society, it may still have external spillover effects that affect daily evaluations of one's life. Several studies have explored the relationship between income inequality and subjective well-being at population level, but here the focus is on the population group of pensioners. Income inequality has been thought to increase the importance of social status and can be seen as a symbol of either superiority or

inferiority. As status differences widen, social position becomes an ever more important feature of one's identity. (Wilkinson and Pickett 2010).

The hypotheses to be tested are outlined as follows:

- The population does not act as reference group for the population group of pensioners (hypothesis No. 1)
- People in the labour market act as reference group for the youngest pensioners (hypothesis No. 2)
- For older pensioners, references shift towards other pensioners (hypothesis No. 3)
- Income inequality does affect pensioners' subjective economic well-being (hypothesis No. 4)

Hypotheses No. 1–3 are based on the result achieved by Hsieh (2003), which indicates that comparison to all families is relevant in the age bracket of 64–74 and irrelevant for older people. This result leads us to expect that the population might not work as a reference for pensioners at all ages when reference income is defined also at country level. It also leaves unanswered the question of a possible shift in older pensioners' references towards other pensioners. Hypotheses No. 1–3 are not expected to be exclusionary. It is plausible that people are affected simultaneously by different reference groups, but possibly to different degrees in different phases of old age. Hypothesis No. 4 is based on the mixed results regarding the effect of income inequality on subjective well-being within different populations. Because of the contradiction, it has been proposed (Verme 2011) that the effect might vary between different population groups. Pensioners typically have a lower income level than the working age population. Therefore they, as a population group, might be more affected by income inequality than some other population groups. Income inequality may not be a visible characteristic of a society, but it might still produce contradictions between age and income satisfaction.

3.2 Data

Empirical analyses are based on the survey The European Union Statistics on Income and Living Conditions (EU-SILC), which is the EU reference source for comparative statistics in income distribution and social exclusion at the European level (Eurostat 2015). It aims at collecting timely and comparable multidimensional microdata on income, poverty, social exclusion and living conditions. EU-SILC is based on a nationally representative probability sample of the population residing in private households within the country, irrespective of language, nationality or legal residence status. All private households and all persons aged 16 and over within the household are eligible. People residing in collective households and institutions are generally excluded. EU-SILC includes four types of data: (1) variables measured at household level (e.g. income adequacy), (2) information on household size and composition, (3) 'basic variables' (e.g. income, education, labour) measured at the person level and aggregated to the household level, and 4) 'detailed variables' (e.g. health) to be collected and analyzed at the person level.

This study exploits the cross-sectional components of EU-SILC from 2005 to 2011. The individual datasets pertaining to a given time have been stacked one on top of the other. A single individual is thus observed only once. The structure of the data is captured by the analysis method. EU-SILC also includes a longitudinal component with a follow-up period of 4 years, but it is not utilized here. The data includes 25 countries in the first year and 31 countries in the last year. Countries included in the data from 2005 onwards are: Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Germany, Denmark, Estonia,

Greece, Spain, Finland, France, Hungary, Ireland, Italy, Lithuania, Luxembourg, Latvia, Malta, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, Switzerland, United Kingdom, Iceland and Norway. Bulgaria joined in 2006, Romania and Switzerland in 2007, and Croatia in 2010.

Respondents have been categorized as belonging to three categories describing their self-defined current economic status: (1) *people in the labour market/the labour market group* (employees working full and part-time, self-employed working full or part-time,[1] unemployed) (2) *pensioners* (in retirement or early retirement or having given up business) and (3) *other* (pupils, students, people in further training, unpaid work experience, permanently disabled or/and unfit to work, in compulsory military community or service, fulfilling domestic tasks and care responsibilities, and other, inactive persons). Categories are not related to any specific age. As this study concerns the subjective evaluations of economic well-being, it is assumed that the respondent is the best person to evaluate his/her main activity status and therefore to evaluate his/her economic capabilities. European countries also differ in their pension legislation regarding the lowest pensionable age, and it would be difficult to point to a particular age as the beginning of old-age pension. The respondents aged over 16, each representing a household in different European countries, numbered 1552,554 in the original data. After excluding cases with missing information on at least one essential factor [basic activity status (n = 3738), gender (n = 6), subjective economic well-being (n = 3366) and household income less than one euro (n = 5822)] the research data included 1,539,898 respondents. The number of pensioners in the dataset is 458,769; people in the labour market number 858,387 and other inactive 222,742. This research focuses on pensioners' experiences. They are on average 71 years of age, 50 % of them are women, 50 % live in a relationship, 80 % perceive their health as at least mediocre, and most (59 %) of them have a secondary level of education.[2]

3.3 Measures

The idea of well-being measures in EU-SILC covers societal opportunities and individual capacities or resources, encompassing both objective living conditions and a subjectively reported sense of satisfaction (Atkinson et al. 2010). This study measures pensioners' evaluations of the adequacy of their economic resources to satisfy needs, through the concept of subjective economic well-being (see Cracolici et al. 2012).

The dependent variable representing the concept of subjective economic well-being is measured as the ability of households to make ends meet. The question is phrased as follows: "A household may have different sources of income and more than one household member may contribute to it. Thinking of your household's total income, is your household able to make ends meet, namely, to pay for its usual expenses?" Six-point ready-classified answer categories are: (1) with great difficulty, (2) with difficulty, (3) with some difficulty, (4) fairly easily, (5) easily and (6) very easily. The original scaling (ranging from 1 = great difficulty to 6 = very easily) of the responses to this question, forming the dependent variable, is applied in the statistical analysis. Individuals' answers concerning their economic well-being are assumed to be ordinally comparable among respondents. It is thus assumed that two individuals reporting the same level of well-being experience it at the same level. In order to allow comparisons across models using linear regression (see Mood

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[1] Separated from working full-time 2009 onwards.

[2] 0.80 % of the health and 3.5 % of the education information is missing.

Table 1 Pensioners' subjective economic well-being 2005–2011 (%)

	%	Freq.
Great difficulty	7.4	46,423
Difficulty	13.7	82,382
Some difficulty	28.5	136,981
Fairly easily	29.4	107,081
Easily	16.3	64,147
Very easily	4.7	21,755
Total	100.0	458,769

2010), the answering categories are also assumed to be equally spaced, however arbitrary an assumption that is.

Most of the pensioners felt either some difficulty or sense of ease in making ends meet between the years 2005 and 2011 (Table 1). The perceptions of adequacy vary to some extent by gender, age and relationship status, but to a larger extent by country. For example, 44 % of men versus 56 % of women, 57 % of those aged less than 65 years versus 48 % of those aged 75 or above, and 46 % of pensioners in a relationship versus 53 % of those not in a relationship evaluated their income as inadequate at some level. But most of the pensioners (at least 9/10) in certain Eastern European (BG, RO) and Baltic countries (LV, LT) had difficulties in making ends meet, whereas only a fifth or less of pensioners in certain Nordic countries, Luxembourg and Switzerland experienced the same. Altogether, pensioners' perceptions of the level of their economic well-being did not really differ from people in the labour market. The situation of other people, e.g. students and homemakers, was notably worse.

Country-level indicators of income (Table 2) serve as main focal predictors for subjective economic well-being. In this study, the central issue in the debate over the effects of relative income on well-being lies in the existence of alternative reference groups and in the measurement of relative income. Three different reference groups, (1) population, (2) people in the labour market and (3) pensioners, were defined to test the relevance of alternative reference groups and their relevance in different phases of old age. Each reference group is measured as the median of household income (see household income) of the specific group within countries. These group-specific relative income measures are labeled as *the population income, the labourmkt income* and *the pensioner income*. In order to facilitate the interpretation of interactions terms, these group-specific median incomes at country level are further centralized across their median by year. *Income inequality* is measured with the Gini coefficient counted within the whole population in a country by year. There are many ways of measuring income inequality and all the measurements are so closely related that it usually makes no difference which one you use (Wilkinson and Pickett 2010). Since the Gini coefficient is sensitive to the values at the bottom and/or top of the income distribution, these should be elaborated in a specific way in order to ensure comparability across countries. This is achieved by imposing bottom and top codes (winsorising) to provide a common calculation of lower and upper limits, following the guidelines by LIS (2011).[3] All the country- and individual-level measures of income and their constructions are presented in Table 2.

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[3] Before calculating the indicator, all households with negative incomes or incomes less than one euro were excluded. Income is coded top-to-bottom by applying the mean of equivalised household income to the lowest percentage of income distribution, and top-coded by applying ten times the unequivalised mean at the

Table 2 Individual- and country-level measures of income and income inequality 2005–2011

Variable	Content	Descriptive statistics			
		Median	SD	Min	Max
Individual level					
Household income, (pensioners), (€, pps)	Equivalised disposable household income. Income available for spending or saving after tax and other deductions. Adjusted for the size and composition of households with the modified OECD equivalence scale, where the first adult is assigned the weight of 1.0, the second and each subsequent person aged 14 and over the weight of 0.5, and each child under 14 the weight of 0.3. Source: EU-SILC's household income register	10,678	11,606	3	1,528,926
Country level					
Population income (€, pps)	The median of the country medians on household income for the population. Source: Own calculation on EU-SILC's household income register	14,299	5312	2772	28,273
Labormkt income (€, pps)	The median of the country medians on household income for the labor market group. Source: Own calculation on EU-SILC's household income register	16,190	5882	3323	30,364
Pensioner income (€, pps)	The median of the country medians on household income for the pensioners. Source: Own calculation on EU-SILC's household income register	12,162	4966	2422	30,457
Income inequality	Gini coefficient. Source: Own calculations on EU-SILC's household income register. Following the LIS guidelines, all households with negative incomes or incomes less than one euro are excluded, income is coded top-to-bottom by applying the mean of equivalised household income to the lowest percentage of income distribution, and top-coded by applying ten times the unequivalised mean at the top of the annual distribution by country	29	4	23	39

Variables, contents and descriptive statistics

In modelling procedure, all the group-specific country median incomes are further centralized across their median by year in order to facilitate the interpretation of interaction terms

Age is the most important *individual-level characteristic* in this analysis. Age is top-coded at 80+ by Eurostat. In order to capture the importance of alternative reference groups in different phases of old age after retirement, *age* is further categorized into three categories: (1) <65, (2) 65–74 and (3) 75+. One fifth of pensioners belong to the youngest age bracket, 42 % to the second, and 37 % to the third age bracket. These categories aim at capturing the distance from retirement and thereby the supposed relevance of different

Footnote 3 continued

top of the annual distribution by country. The Gini coefficient counted for this study and indicators counted by Eurostat are not identical.

reference groups. In addition to the vicinity of retirement, younger pensioners' households and other peers are more likely to include people in the labour market. These standpoints might hold their references more in cases of the labour market group. With ageing and an increasing distance from retirement, the references might shift more towards the situations of other pensioners. The categorization of age into three brackets also facilitates the interpretation of interaction terms between age and reference groups.

Other individual characteristics that have been recognized in previous studies to affect the financial satisfaction of the elderly serve as *individual-level controls*. *Household income* is the most central factor in the context of this study. It is proven to affect financial satisfaction of the elderly, even though its effect has been described as paradoxal (Hansen et al. 2008). The function of household income here is to measure households' absolute income level. It is calculated in terms of equivalised disposable household income, referring to income available for spending or saving after tax and other deductions, and adjusting for the size and composition of households.[4] Household income is further transformed into purchasing power parities and logarithmic scale. In order to make values comparable for each person, income is further centralized across the medium income of all households by year. The procedure of centralization around some mean number of the pooled data is applied also elsewhere in studies with comparative research settings (e.g. Zagorski et al. 2014; Litwin and Sapir 2009). Other individual controls are: *Relationship status* entailing information on a respondent's marital status and legality of union. It aims at distinguishing between pensioners living with a partner and those living alone. Pensioners (1) in a relationship are either married, registered partners, or in a consensual union without legal basis, and (2) not in a relationship, never married, divorced, separated, widowed and not in a consensual union without legal basis. *Education* is based on the ISCED classification. (1) The primary level includes pre-primary and primary levels, (2) the secondary level includes lower secondary education, (upper) secondary education and post-secondary non-tertiary education, and (3) the tertiary level includes the first stage of tertiary education (not leading directly to an advanced research qualification) and the second stage of tertiary education (leading to an advanced research qualification). And *perceived health* entails subjective evaluations of health. It is categorized as (1) good, entailing very good, (2) fair and (3) bad, entailing very bad.

3.4 Methods

The population of interest in this study consists of pensioners living in different European countries. The research data is structured hierarchically as the pensioners are grouped into countries and years. A good tool for exploring the effect of the economic context of the country of residence and the year of the survey on pensioners' subjective economic well-being is the multilevel linear regression analysis method. It allows for analysis of contextual factors while simultaneously also taking into account the factors at the individual level. Unlike regular regression models, cases at the lower level are not assumed to be independent. This leads to a more accurate estimation of standard errors. The multilevel modeling method is used due to the structure of data, which is organized at three levels. In this hierarchical structure, individuals represent the lowest level units (1) that are nested in

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[4] The household structure is taken into account by applying the modified OECD equivalence scale, which is the official equivalence scale applied to EU-SILC by Eurostat. The first adult is assigned the weight of 1.0, the second and each subsequent person aged 14 and over the weight of 0.5, and each child under 14 the weight of 0.3. Equivalised income is attributed equally to each member of the household.

years at the second level (2), that are further nested in superclusters composed of countries at the highest level (3). The numbering is according to Rabe-Hesketh and Skrondal (2012).

The three-level variance component model can be written as:

$$y_{ijk} = \beta + \zeta_{jk}^{(2)} + \zeta_{k}^{(3)} + \in_{ijk}$$

where $\zeta_{jk}^{(2)}$ is the random intercept for year j and country k, and $\zeta_{k}^{(3)}$ is the random intercept for country k. The superscripts denote the levels at which the random intercepts vary. Note that the random intercept for year is nested within countries in the sense that it does not take on the same value for a given year across all countries. Instead it takes on a different value for each combination of year and country. The error components $\zeta_{jk}^{(2)}, \zeta_{k}^{(3)}$ and $\in_{ijk}$ are assumed to have zero means and to be mutually uncorrelated so that their variances add up to the total variance.

The strategy in fitting the multilevel models is to build the final model in seven steps. First the partitioned variances are shown in model 0. Then, the effects of age and different controls at the individual level are included in the first model. The second model introduces the main effects of the relative income measures and the effect of income inequality at the country level. In models 3–5, the cross-level interaction effects between age and reference income are added one by one in order to test whether the relevance of alternative reference groups differ among age groups. And the final model, No. 6, presents the individual-level controls and all the effects of the cross-level interaction terms between age and reference income simultaneously.

4 Results

The second column of Table 3 presents an empty model (0) with variances partitioned into three levels. It shows that most of the variance in pensioners' subjective economic well-being is attributed to individual differences between pensioners within countries and years. Nevertheless, the intra-country correlation is .38 [0.728/(0.73 + 0.01 + 1.13)], indicating that 38 % of the total variance in pensioners' subjective economic well-being can be attributed to the country level. The application of the multilevel modeling method is thus valid. There is very little variation between years within countries. This lack of year effect is highly likely caused by the fact that ups and downs in the economy, like the downturn that started in Europe in 2008, do not have an immediate effect on pensioners' income. In most of the countries, pensions are not affected by changes in the general economy within countries.

In model 1, all the individual characteristics including age are added. Results on age show that it increases subjective economic well-being. Absolute income has the same and even more powerful (.65) effect in reinforcing the perception of income adequacy. The notion of paradoxality between age and income thus gains support. Results on the other individual characteristics confirm the findings of previous studies. Poor health, living alone and a lower level of education increase difficulties in making ends meet. Being a woman also increases economic difficulties to some extent.

In model 2, all the country-level relative income measures capturing the relevance of different reference groups and income inequality are added simultaneously. The main effect of population income yields a statistically non-significant effect on subjective economic well-being. Therefore it can be concluded that the whole population does not act as a valid reference group for pensioners of all ages. This confirms hypothesis No. 1.

Table 3 Multilevel linear regression analysis of pensioners' subjective economic well-being on individual characteristics, country characteristics, and cross-level interactions

	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Individual characteristics							
Age (ref: <65)							
65–74		0.10***	0.10***	0.11	0.11***	0.11***	0.10
75+		0.28***	0.28***	0.31***	0.31***	0.30***	0.30***
Gender (ref:man)		−0.08***	−0.08***	−0.08***	−0.08***	−0.08***	−0.08***
Relationship status (ref: in a relationship)		−0.12***	−0.12***	−0.12***	−0.12***	−0.12***	−0.12***
Education (ref: primary or less)							
Secondary		0.14***	0.14***	0.14***	0.14***	0.14***	0.14***
Tertiary		0.31***	0.31***	0.31***	0.31***	0.31***	0.31***
Perceived health (ref: good)							
Fair		−0.26***	−0.26***	−0.26***	−0.26***	−0.26***	−0.26***
Bad		−0.58***	−0.58***	−0.58***	−0.58***	−0.58***	−0.58***
Household income		0.65***	0.65***	0.65***	0.65***	0.65***	0.65***
Country-level income measures							
Income inequality			0.01	0.01	0.01	0.01	0.01
Population income			0.39	0.35	0.39	0.40	0.25
Labormkt income			−0.04	−0.04	−0.08	−0.04	0.10
Pensioner income			−0.74***	−0.74***	−0.74***	−0.78***	−0.78***
Cross-level interactions							
Population income*age							
65–74				0.02**			0.19
75+				0.09***			0.17
Labourmkt income*age							
65–74					0.02*		−0.21*
75+					0.09***		−0.14

Table 3 continued

	Model 0		Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Pensioner income*age														
65–74											0.02**		0.04	
75+											0.09***		0.06	
Constant			3.66***		3.38***		3.38***		3.38***		3.39***		3.39***	
Random-effects parameters		Std		Std		Std		Std		Std		Std		Std
Country variance	0.73	0.19	0.23	0.06	0.11	0.39	0.11	0.39	0.11	0.39	0.11	0.39	0.11	0.39
Individual-level variance	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
Residual variance	1.13	0.00	0.92	0.00	0.00	0.92	0.00	0.92	0.00	0.92	0.00	0.92	0.00	0.92

Dependent variable (SEW) = 1 = great difficulty … 6 = very easily

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Pensioners do not seem to make comparisons either with younger people who are still active in the labour market, as the labourmkt income also yields a non-significant effect. On the other hand, pensioners' average income level clearly affects the individual evaluation of income adequacy negatively. Everything else being equal, pensioners living in countries with a higher average income for pensioners evaluate individual income adequacy as more insufficient than pensioners living in countries with a lower average income for pensioners. This suggests pensioners' average income level having such strong spillover effects to conclude other pensioners as a valid reference group. The general income inequality within countries does not affect subjective economic well-being, as income inequality has a statistically non-significant effect on subjective economic well-being. This contradicts hypothesis No. 4. Sensitivity analyses excluding the effect of income inequality showed no changes in the results for different measures of relative income.

In models 3–5, the cross-level interaction effects between age and reference income are added one by one in order to separately explore whether comparisons with different references differ by age group. The main effects of relative income measures now represent the effect for the youngest group of pensioners aged under 65. Each of the measures show the coefficients for older age groups to differ statistically significantly from the youngest group. The population income increases income adequacy more for the older pensioners. As for the income of the labour market group, its effect is less negative for pensioners aged 65–74 and slightly more positive for the oldest group than for the youngest pensioners. Other pensioners' income clearly has a negative affect regardless of age, but the effect is little less for older pensioners. Separate analyses excluding the effect of income inequality produced approximately the same results.

The final model (No. 6) shows the effects of the cross-level interaction terms between age and reference income simultaneously. The pensioner income predicts a coefficient of −0.78 for pensioners aged under 65. With other interaction terms included, the coefficients for both of the older groups do not differ statistically significantly from the youngest pensioners. Thus pensioners of all ages compare individual income with other pensioners. This contradicts hypothesis No. 3. It is not only the older pensioners who set their references against other pensioners. The higher the pensioners' average income level in a country, the lower pensioners evaluate individual income adequacy, and vice versa. Results on the other measures of relative income are much weaker, but either way, they signal that the relevance of different reference groups differs with age. The average income of the labour market group has a positive effect for the youngest pensioners, whereas the effect is comparatively negative for pensioners aged 65–74, and less so for the oldest pensioners. Thus evidence leads us to identify people in the labour market to act as a reference group for the younger pensioners and to vaguely give support for hypothesis No. 2. The results regarding the effect of population income signal that a high population income level increases the individual income adequacy for all, but more so for older pensioners. This signals the population increasing its relevance as a reference for older pensioners. But as these results remain statistically non-significant, the conclusion of the population not acting as reference, yielded with the model including only main effects, has to be extended to separate age groups. The application of these different country-level income measures did not remove the age gradient present in subjective economic well-being. The economic context within countries does thus not explain the satisfaction paradox.

5 Conclusion and Discussion

This study widened the perspective in the analysis of pensioners' subjective economic well-being in Europe, from that of the individual to include also contextual economic factors at the country level. The main question dealt with the relationship between the evaluation of income adequacy and the shift in pensioners' reference groups in the course of time after retirement. The analysis also sought to provide answers for the paradox between age and income satisfaction. Empirical analyses were based on the survey The European Union Statistics on Income and Living Conditions (EU-SILC), which collects extensive information on different aspects of household living in 31 European countries. The multilevel linear regression analysis method was used to explore the effects of different income measures simultaneously at the individual and country levels. The results of the study aim at contributing to the interdisciplinary debate over the effects of income and reference income on happiness, focusing on pensioners, by its size an ever-prominent population group in Europe.

The main result of this study shows that pensioners of all ages compare their individual income with that of the other pensioners in a country. With relative income measured as the average income for different population groups, we expose that pensioners living in countries with a higher average income level for pensioners evaluate individual income adequacy as less sufficient than pensioners living in countries with a lower average income level for pensioners. Pensioners' higher income level decreases income adequacy to the same degree in each of the age groups. The average income level of pensioners thus holds spillover effects strong enough to conclude that other pensioners are a relevant reference group. Results also indicated the labour market group having varying effects on different age groups. However, the validity of this group as a reference has to be confirmed in further studies, as the statistical results were approximate. It also seems that the relevance of each reference group is evaluated separately. Against set hypotheses, one cannot conclude that references shift from the labour market group to pensioners in stages following retirement. The general income inequality did not affect subjective economic well-being and the country-level income measures did not explain the paradox between age and income satisfaction.

Results of this study further reinforce the interpretation of subjective economic well-being as comprising both the absolute income and relative income, which is the conclusion of several previous studies (Caporale et al. 2009; Gori-Maia 2013; Berthoud 2012; Layard et al. 2010 etc.). Individuals' economic resources, i.e. income increase and relative evaluations against other pensioners, mainly decrease the perception of income adequacy. The negative relationship between the average income level and citizens' individual experience within European countries has been stated also by Berthoud (2012). Now the connection has been confirmed to exist also within pensioners living in different European countries. This connection remains inexplicable within the context of this study, but results nevertheless point to the relative explanation of subjective economic well-being. Pensioners' high income level might, for example, increase expectations regarding consumption and therefore decrease individual economic well-being. Results also add to evidence in which income inequality in itself is proven not to affect the financial domain of subjective well-being, when the level of economic development of a country is controlled for (see Zagorski et al. 2014). All in all, this type of detailed look at a sub-sample of the population, with country-level measures of relative income, increases the understanding of factors underlying the evaluation of subjective well-being.

An important remark regarding the interpretation of the results concerns the assumption of linearity of the dependent variable. The degree of income adequacy is assumed to increase equally with original answering categories. Most likely this does not completely hold true in reality, and therefore the results can also be interpreted in terms of rank-regression. When reaching a conclusion on the link between income inequality and well-being, one should also recognize that different factors, such as the use of subsamples and choice of key regressors, might show different results as pointed out by Verme (2011). Also, the results refer only to European countries. They have been shown to differ from other countries at least in how income inequality affects well-being (Rözer and Kraaykamp 2013).

The results also indicate there is much more to be explained in the variance of pensioners' subjective economic well-being between countries. Differences might exist e.g. in the form of cultural factors, different forms of trust, and the supply of healthcare and social services for the elderly. The satisfaction paradox was also rather confirmed in this study. Reasons might include the lack of many other possible explaining factors, such as assets and wealth (Hansen et al. 2008). For further analyses on relative income and happiness, including various types of alternative reference groups into the analysis would be informative. These would include both concrete groups such as family, friends and other peers and neighbourhood residents in addition to past experiences and future expectations, but also more abstract income measures at the country level. And with the setting of proper longitudinal data, researchers should also be able to extract the effect of mortality (those well-off living longer) on the satisfaction paradox.

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