Economic Characteristics and Subjective Well-Being

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Economic Characteristics and Subjective Well-being

"So we must exercise ourselves in the things which bring happiness, since, if that be present, we have everything, and, if that be absent, all our actions are directed toward attaining it."

Epicurus (*341 – †270 BC): Letter to Menoeceus[1]

Abstract: The primary objective of this study is to examine the relationship between economic characteristics and well-being as one of the components of quality of life. The study is based on microdata obtained from a representative EU-SILC 2013 survey covering the Slovak population age 16 and older. Subjective well-being is proxied by a score reflecting the general mood or affect, including depression, anxiety, and psychologic well-being. The estimated mean value of the total subjective well-being score is 70 (median: 73). The results presented in this study suggest that economic factors are strongly correlated with the level of subjective well-being. The findings propose positive and diminishing returns to income; unemployed people score on average approximately 9 points lower than those who are employed; people living in indebted households have a lower level of subjective well-being than those living in households without debts; and the ability to face unexpected financial expenses increases the level of well-being.

Keywords: well-being, EU-SILC, economic characteristics, Slovakia

1. Introduction

Questions regarding the quality of life emerged early in human civilisations; today, scientists consider the extent to which a person enjoys his or her life as a fundamental ingredient of that individual's life. The origins of research into well-being are associated with research into the quality of life, which can be traced back to the end of the 1960s.[2] Researchers focused mainly on welfare indicators; quality of life then was expressed in terms of congruence of the objective living conditions and their subjective assessment by people (Andrews and Withey, 1976).

Economic and social indicators, such as income and material well-being, political freedom and independence and social justice, amongst others, were the centres of interest. Later

[1] Translation: Hicks, R. D., 2016: Letter to Menoeceus: Epicurus. CreateSpace Independent Publishing Platform.
[2] However, quality of life, as a broader concept of well-being, was implicitly studied in socio-graphic studies even earlier (see e.g. Ogburn, 1946).

researchers started focusing on subjective indicators of the quality of life – subjective well-being and life satisfaction (Diener and Suh, 1997). In general, subjective well-being can be defined as a person's cognitive and affective evaluations of his or her life (Diener, Lucas and Oishi, 2002) or as a global assessment of a person's quality of life according to his or her set of criteria (Shin and Johnson, 1978). Similarly, Diener (1984) assumed that the extent to which people are satisfied with their lives is based on comparisons with a standard that is not prescribed; instead, each person creates his or her own. From the perspective of an individual, subjective well-being is based on individual judgments (Diener et al., 1985) and there is a clear relationship between subjective well-being and personality (Diener, Oishi and Lucas, 2003). Psychological well-being is also considered as an integral part of health within the World Health Organization (WHO) health definition: "*Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*" (WHO, 1946), which has not been amended since 1948. The WHO definition does not differentiate between the hedonic and eudaimonic concepts of well-being. Several studies assessing relationships between health and well-being have been published in recent years (see e.g. Vazquez et al., 2009).

There is a debate in the scientific literature regarding whether it is meaningful to differentiate between subjective well-bring and psychological well-being. According to some scientists, psychological and subjective well-being are distinct dimensions, while others believe they are different perspectives of the same construct (Chen et al., 2013). According to Diener (1984), subjective well-being is considered as *hedonic* and assessment is based on investigating pleasant emotions and moods, negative emotions and moods, and life satisfaction. Yet, according to Waterman (1993) and Ryan et al. (2008), psychological well-being is considered as *eudaimonic* and the assessment is based on the outcomes of positive goal pursuits such as self-acceptance, environmental mastery, purpose in life, positive relationships with others, personal growth, and autonomy (e.g. Ryff and Keyes, 1995). In this paper, we focus on the subjective perception of well-being, that is, the hedonic approach, and hence we use the term subjective well-being.

Although subjective well-being is predominantly in the centre of research by psychologists and economists, there's also an overlap to sociology. In sociology, there was a discussion whether research on subjective well-being belongs to sociological literature or not. The main reasons against its inclusion, as pointed out by Veenhoven (2008), is that sociology is about collectivities, while subjective well-being is an individual concept, and that sociology

explains social behaviour, whereas subjective well-being is only one of the variables in that context. Veenhoven (2004) suggests, however, that sociology should contribute to a better society, and the study of subjective well-being provides insights for a more liveable society. Kroll (2014) examines how sociology can contribute to the study of subjective well-being and how the study of subjective well-being can enrich sociology. He demonstrates how research on life satisfaction can shed new light and new perspectives on long-standing sociological theories. In sociology, the study of quality of life does not usually focus on specific qualities of life but rather on its overall quality (Veenhoven, 2007). The concept of quality of life should designate the desired outcome of social policies and programs (Schuessler and Fisher, 1985), and the primary objective of research in this area is to guide public policy (Veenhoven, 2007).

This study aims to contribute to the empirical sociological literature on subjective well-being in Slovakia, which, due to unavailability of representative data, is somewhat limited. One of the first studies assessing subjective aspects of well-being was published by Machonin (1994), who compared the differences between the Czech and Slovak republics after the fall of the communist regime and the split of Czechoslovakia. His study suggested that the subjective perception[3] of the post-communist transformation was on average more negative in Slovakia than in the Czech lands.[4] Later, Plichtová and Brozmanová (1997) examined to what extent the social representations of individual and community well-being were preserved under communism and compared the differences between generations. Subjective well-being in relation to the economic transition was re-assessed by Varnum (2008), showing that the level of subjective well-being of Central Europeans was higher in comparison to its level at the beginning of the post-communist period.

Hermanová (2014) summarized different approaches and theoretical models of quality of life and described the underlying trends of the conceptualization of the term in Slovak sociological literature. A more recent study by Džambazovič and Gerbery (2014) confirms the

[3] Before 1993 there was no Slovak equivalent to the English word 'well-being' in sociological and psychological research, nor was it translated into the Slovak language. Inspired by the German literature (*subjektives Wohlbefinden*), the term was introduced to the Slovak psychological literature by Džuka et al. (1993) and can be literally translated as 'subjective comfort' (*subjektívna pohoda* in Slovak).

[4] There also has been evidence of social scientists' growing interest about subjective well-being in the Czech Republic, where some have investigated the identification of determinants of subjective well-being on a representative sample of the Czech adult population from a psychological perspective (Šolcová and Kebza, 2005), compared different approaches to the measurement of subjective well-being (Večerník, 2012), discussed different methodological approaches to the examination of subjective working life quality (Vinopal, 2014), investigated macro- and micro- determinants of subjective well-being (Večerník, 2014), and examined the relationship between life and job satisfaction (Mysíková and Večerník, 2016).

role of the Erikson–Goldthorpe–Portocarero (EGP) class scheme and the subjective identification of social position as essential predictors of self-rated health and health measured regarding the presence of chronic illness. A different perspective is offered by Bahna and Džambazovič (2010) whose aim was to investigate the subjective identification of one's position within the stratification system of the Slovak society. From the economic viewpoint, subjective aspects of well-being have been studied mainly in terms of subjective poverty (see e.g. Želinský, 2014).

The goal of this study is to contribute to the empirical sociological literature on subjective well-being and to assess the importance of economic characteristics associated with subjective well-being in the Slovak population. Our goal is thus to fill an essential gap in the knowledge about the subjective well-being of the Slovak society and is based on a large representative sample of the Slovak population (N = 12,510). To our knowledge, no results of research studying the subjective well-being of the Slovak population involving such a large sample have been published so far. Apart from the characterisation of the Slovak population from the perspective of subjective well-being, the study analyses relationships between well-being and a set of economic variables. We employ fundamental demographic variables and self-reported suffering from chronic illness (which are believed to influence subjective well-being), as well as a set of economic characteristics in the regression analysis. In the case of quantitative variables (age and income), a non-linear relationship is considered to observe changes in the slopes describing the relationship. In accordance with the empirical literature, the following economic characteristics are considered: income, the main status of economic activity, indebtedness of household and the capacity to face unexpected financial expenses.

Economic, health status and personal/demographic characteristics can affect subjective well-being, and at the same time, subjective well-being can be affected by these characteristics. In this study, our ambition is not to identify the causal effects of the given sets of variables on subjective well-being but to describe the relationship between subjective well-being and these three sets of characteristics, with the focus on economic characteristics.

The rest of the paper proceeds as follows: The next section presents a review of the theoretical and empirical literature on the factors of subjective well-being and conceptualizes the relationships. In the third section, the data used and the measure of subjective well-being are described, the fourth section provides statistical analyses of subjective well-being including the regression analysis, and the last section offers discussion and concluding remarks.

2. Factors of Subjective Well-Being

Scientists across different disciplines have long tried to explore, describe and measure the subjective aspects of individual well-being. Once some of the approaches became standard and more or less accepted, scholars naturally shifted their focus on rigorously examining the relationship between subjective well-being and characteristics which may affect subjective well-being, as well as how the same characteristics can be affected by subjective well-being.

There is a vast empirical literature on the relationship between subjective well-being and its potential factors. Nevertheless, only a small proportion of studies provides evidence on causal relationship. In particular, from the perspective of reversed causality, the relationship between health and subjective well-being is one of the most discussed, as it is assumed to be bidirectional (Steptoe, Deaton and Stone, 2015). Studies of health and well-being show a strong relationship between the two phenomena (Levin and Chatters, 1998) with a negative impact of poor health on subjective well-being (Shields and Wheatley Price, 2005), whereas Larson (1978) was one of the first to propose reported well-being to be strongly related to health.

In this vein, Revicki and Mitchell (1990) argued that physical health status can be highly predictive of life satisfaction and psychological distress among rural elderly individuals. Strandberg et al. (2006) found that low cardiovascular risk in midlife was associated with better psychological well-being in the elderly, and similar effects of physical health on subjective well-being were reported by Kempen et al. (1997) and Cho et al. (2011).

The reversed causality, nonetheless, is shown in numerous randomized controlled studies in health and medical research. Fredrickson et al. (2000) conducted an experiment to test Fredrickson's (1998) broaden-and-build theory of positive emotions, arguing that positive emotions help downregulate the potentially health-damaging cardiovascular reactivity that lingers following negative emotions. Davidson et al. (2003) showed that mindfulness meditation had significant positive effects on brain and immune function. Moreover, a literature review by Pressman and Cohen (2006) suggested there was an association of trait positive affect (PA) and lower morbidity and of state and trait PA and decreased symptoms and pain. In this respect, Diener and Chan (2011) reviewed different types of evidence and argued that a high level of subjective well-being causes better health and longevity.

The study of a relationship between health and subjective well-being is not only important because of its bidirectionality but also because of the nature of subjective (psychological)

well-being per se. Subjective (psychological) well-being is an integral part of health as defined by WHO (1946) and has been shown to affect physical health, while physical health also has been shown to affect subjective well-being.

The study of characteristics associated with subjective well-being helps in understanding one of the channels of how specific factors (socioeconomic factors in this particular study) affect subjective well-being, which is further believed to affect health. A feedback loop depicted in Figure 1 represents this relationship, assuming that subjective well-being can affect some of the characteristics and that ultimately health can affect both subjective well-being and specific characteristics (formerly considered as factors).

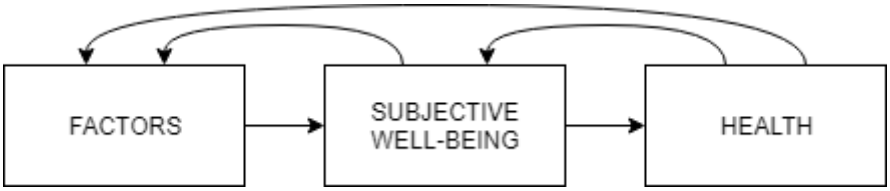

Figure 1: Subjective well-being and reverse causality

In Figure 1, factors represent potential determinants of subjective well-being, but because of the bidirectional relationship between factors and subjective well-being, we will not use the term 'determinants'. Although the relationship is bidirectional, in this study, we will consider subjective well-being as the dependent variable and investigate the relevance of these predictors for explaining its variation.

The literature offers several approaches to the classification of subjective well-being factors. Most studies focus on individual characteristics (as opposed to global/environmental characteristics) primarily because interventions aimed at enhancing people's subjective well-being are more naturally implemented at the individual level (and it is even impossible to intervene in specific environmental factors). Individual characteristics include biological, personality, demographic, economic and social characteristics, together with other personal circumstance and intentional activities. We will shortly review the literature on the main factors believed to drive subjective well-being and then focus on empirical findings regarding economic and demographic characteristics which are central to this study. At the end of this section, we summarize the review of the empirical literature by presenting a conceptualization of the relationship between subjective well-being and its potential factors.

Personality is one of the most influential predictors of emotional style, while extraversion, neuroticism, optimism and self-esteem have been shown to be the strongest personality traits

related to subjective well-being (Costa and McCrae, 1980; Scheier and Carver, 1992; Lyubomirsky, 2006). Individual social characteristics include most importantly stable social relationships with family, partners, friends and community (Diener, 1984). Other personal circumstances include aspects and activities such as religion[5] (Myers, 2000) and self-reported health status and presence/absence of chronic illnesses (Verbrugge, Reoma and Gruber-Baldini, 1994). Intentional activities such as behaviours (physical activity, meditation, volunteering), cognitions (gratitude and forgiveness) and motivations (setting feasible goals) also have been found to affect subjective well-being (Brown and Ryan, 2003; McCullough and Worthington, 1999; Mutrie and Faulkner, 2004; Sheldon and Houser-Marko, 2001; Tkach and Lyubomirsky, 2006).

From the perspective of economic factors, income can be considered the most important determinant of subjective well-being (Ferrer-i-Carbonell, 2005; Kaplan, Shema and Leite, 2008). Clark, Frijters and Shields (2008) conclude that there is a positive and concave-down relationship between income and well-being. Further, economic burdens resulting from the repayment of loans can be negatively correlated with well-being (Brown, Taylor and Price, 2005) and, apart from the objective factors, the subjective perception of one's own economic situation (e.g. from the perspective of facing unexpected expenses) also has been investigated (Hagerty, 1999; Rojas, 2004).

Income usually is strongly related to economic activity (McKee-Ryan et al., 2005; Surault, 2010) which, in terms of Dolan, Peasgood and White's (2008) classification, belongs to the set of socially developed characteristics, but for this paper we consider economic activity as a part of economic factors. Horowitz (2016) shows that job quality influences subjective well-being by improving social life, altering class identification, affecting physical health and increasing amounts of leisure time. Different job quality dimensions are connected to subjective well-being in different ways, however. Unemployment (as a form of economic inactivity) negatively affects subjective well-being; any depression arising from a low level of subjective well-being might lead to lower chances of getting or sustaining employment (Alexandre and French, 2001). Moreover, Burchell (2011) argues that unlike the case of long-term unemployment, in the case of an unexpected announcement of job insecurity there is no evidence of adaptation or improvements in psychological well-being, and subjective

[5] Studies investigating the relationship between well-being and churchgoing suggest that churchgoers enjoy higher level of affective well-being on Sunday than non-churchgoers and that the higher level is found also throughout the rest of the week (Lim, 2016).

wellbeing continues to deteriorate for at least a year. Education usually is believed to determine economic activity and income/wealth (Lemieux, 2006); empirical literature offers different conclusions regarding the impact of education on subjective well-being although the relationship usually is found to be positive (Blanchflower and Oswald, 2004b).

Personal and demographic characteristics such as gender, age, marital status and the type of location/degree of urbanisation can be considered as the most frequent characteristics studied by other authors (e.g. Wood, Rhodes and Whelan, 1989; Marks and Lambert, 1998; Frey and Stutzer, 2001; Rojas, 2004; Vetter et al., 2006; Brereton, Clinch and Ferreira, 2008; Kaplan, Shema and Leite, 2008; Moro et al., 2008; Surault, 2010). In the case of age, the literature suggests a quadratic relationship or a U-shaped curve between well-being and age. Blanchflower and Oswald (2008, 2009) performed an extensive cross-country study on the changes in well-being over the lifecycle and found substantial evidence for the U-shaped relationship regardless of whether control variables are used or not. Results for gender are ambiguous – some studies report that women have higher levels of subjective well-being (Alesina, Di Tella and MacCulloch, 2004) while others conclude there are no differences in well-being between the genders (Louis and Zhao, 2002). In contrast, Fuller et al. (2004) find that, in general, married men had on average higher level of psychological well-being than married women, yet the authors stress the importance of social/cultural context in this type of studies.

Ambiguous results also were reported in the relationship between geographical locations and well-being (compare e.g. Hudson, 2006; Shields and Wheatley Price, 2005). Yuan (2008) shows that emotional well-being is positively correlated with living in a higher percentage same-race neighbourhood, suggesting that neighbourhoods provide social and emotional resources to their residents, thus improving their well-being.[6] From a sociological perspective, maternal status and parenthood are important factors of subjective well-being, whereas, for instance, married parents had higher levels of psychological well-being than single parents. This suggests that parenting burdens (economic strain, household labour, childcare, etc.) were the main factors (Cunningham and Knoester, 2007). Further, Cast (2004) investigates how identification with self-as-parent influences individual and marital well-being and finds that new parents who are unable to verify their parent identity have lower levels of individual and

[6] This is in accordance with findings on discrimination and well-being: Perry, Harp and Oser (2013) explored the role of racial and gender discrimination in the stress process and they found that racial and gender discrimination increases risk for poor health and low well-being.

marital well-being, and suggests that parenthood itself is not necessarily detrimental to well-being. Moreover, Treanor (2016) finds that maternal emotional distress is more strongly correlated with financial vulnerability than with income. She further suggests that although financial vulnerability directly affects the well-being of older children, younger children are negatively affected through their mother's emotional distress.

Based on the empirical literature review, an attempt to provide a conceptual framework in the form of a summarized classification of potential factors affecting subjective well-being as an integral part of health is depicted in Figure 2.[7] The figure depicts the principal assumptions used in this study: Economic characteristics may influence subjective well-being, which in turn influences overall health. Due to the presence of reverse causality, however, health may affect subjective well-being and economic characteristics, while subjective well-being may affect specific economic characteristics. In addition to economic characteristics, there are numerous other individual characteristics which can affect subjective well-being as well as influence economic characteristics. Besides, there are global characteristics (denoted as 'environment' in Figure 2) which again can affect subjective well-being.

[7] Dolan, Peasgood and White (2008) provide a complex literature review on factors associated with subjective well-being and classify them into the following groups: income, personal characteristics, socially developed characteristics, spending time, attitudes and beliefs, relationships, and the wider economic, social and political environment. We believe that our approach to well-being factors classification is broader.

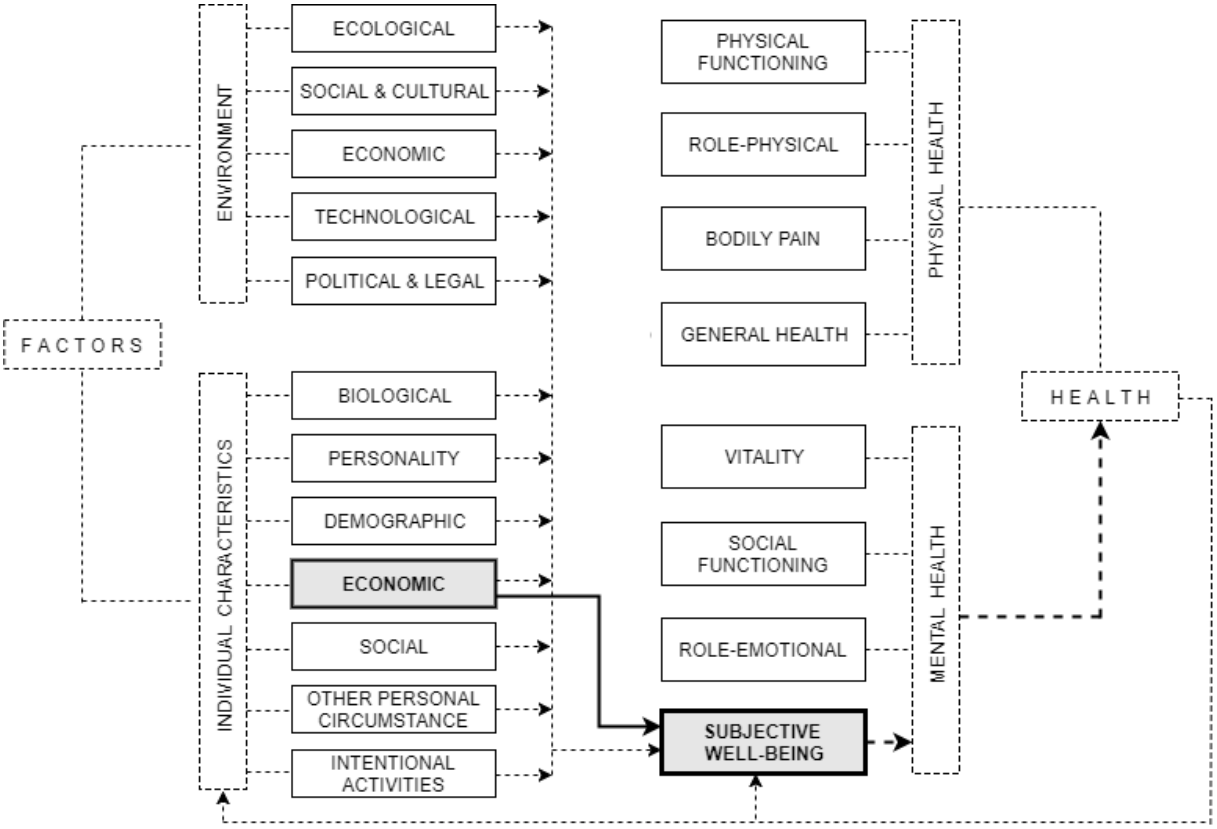

Figure 2: Factors of subjective well-being

Source: Authors, based on Caunt et al. (2013), Huppert (2009) and Ware (2004).

Notes: Several attributes of physical and mental health (in accordance with Ware (2004)) are considered, while subjective (psychological) well-being is denoted as mental health in the original study by Ware (2004). The figure indicates a potential feedback loop of individual characteristics, subjective well-being and health, while the relationship between economic characteristics and subjective well-being is central to our study.

The relationship among economic characteristics, subjective well-being and health can be illustrated using the following examples: 1) A person loses her job which may deteriorate her subjective well-being, and depression/anxiety from her sadness may result in health problems; 2) a disabled person is unable to find a proper job due to her disability; her continued unemployment may have adverse effects on her well-being and being disabled per se also may lower her subjective well-being; 3) some events in a person's life upset her, causing her subjective well-being to deteriorate, her working performance to decrease, and in an extreme case may result in becoming unemployed.

These simplified examples demonstrate inter-relationships among economic characteristics, subjective well-being and health, suggesting difficulty in claiming to what extent subjective well-being is a cause and to what extent it is a consequence of health status. More

importantly, there are numerous other characteristics (among others that also are confounders) that may influence subjective well-being, and at the same time some of them may be influenced by subjective well-being and they can be interrelated.

3. Methods

Data

The study is based on the European Union Statistics on Income and Living Conditions (EU-SILC) 2013 microdata (SO SR, 2014a). The data were collected in the first half of 2013, and the sample consisted of 5,929 households, of which 5,402 (13,286 people age 16 or older)[8] were included in the database (SO SR, 2014b).

The Measure

Self-assessment of subjective well-being is proxied by a subjective measure of psychological well-being, a component of mental health based on Mental Health Inventory (MHI-5), which is a brief questionnaire that can be used to screen for depressive symptoms (Yamazaki, Fukuhara and Green, 2003). The short MHI-5 version of subjective mental health assessment measures general mood or affect, including depression, anxiety and psychologic well-being as proposed by Stewart, Hays and Ware (1988). It was shown to be as good as other commonly used measures for subjective assessment of psychological well-being and health (Berwick et al., 1991). The selection of items intended to capture measurements of well-being is based on the Psychological General Well-Being Index[9] (PGWBI) developed in 1971 by Dupuy (1984).

Today, these five questions are part of the comprehensive questionnaire SF-36® Health Survey (version 2.0) consisting of 36 questions yielding an 8-scale profile of functional health and well-being scores (Ware, 2004). Most of the items used in SF-36 are based on instruments that have been used since the 1970s and 1980s (Stewart and Ware, 1992). The resulting variables reflect self-rated affects or emotions and aim at measuring psychological (subjective) well-being (Eurostat, 2012). The set of these five questions focusing on different aspects of well-being was included in the EU-SILC 2013 ad-hoc 'Well-Being' module (a set of supplementary variables highlighting unexplored aspects of social inclusion). Within the EU-SILC 2013 ad hoc module, the following questions were asked:

[8] Due to the subjective nature of the studied phenomenon, we decided not to use any data imputation techniques to impute the missing values.

[9] Despite the name of the index (The Psychological General Well-Being Index), it captures a cognitive component and positive/negative affect; hence using the terminology of this paper, it measures subjective rather than psychological well-being.

"During the last four weeks were you…

(A) … feeling very nervous?

(B) … feeling down in the dumps?

(C) … feeling calm and peaceful?

(D) … feeling downhearted or depressed?

(E) … happy?"

For each question, the respondents had to choose one of the answers: *(1) all of the time, (2) most of the time, (3) some of the time, (4) a little of the time, (5) none of the time, (6) do not know*.

Responses to items A, B and C were re-coded using the following transformation: 1 −> 0; 2 −> 25; 3 −> 50; 4 −> 75; 5 −> 100 and analogously in items C and E: 1 −> 100; 2 −> 75; 3 −> 50; 4 −> 25; 5 −> 0. Category 6 responses were treated as missing values in all items. The resulting score was calculated as an arithmetic mean across all dimensions, while, in accordance with Stewart, Hays and Ware (1988), a missing score was assigned only if all five items in the scale were missing. The score is thus a value between 0 and 100, with 100 representing the highest possible outcome, whereas according to Lavikainen, Fryers and Lehtinen (2006) a score of 56 or less indicates serious problems.

Statistical procedures

Assessment of the scale's internal consistency is based on Cronbach's standardised coefficient. Estimates of the well-being score characteristics are based on kernel density estimation (Ferraty and Vieu, 2006); estimates of skewness and kurtosis coefficients include Rimoldini's (2013) correction. Assessment of well-being score normality is based on skewness and kurtosis rule of thumb (coefficients between –1 and +1); the values are reported in Table 1.

Assessment of the relationship between subjective well-being score and economic characteristics is based on regression analysis. Due to the violation of homoscedasticity assumption (Breusch-Pagan test p-values < 0.001), robust (White) estimates of standard errors (Zeileis, 2004) and the corresponding p-values are reported. Multicollinearity is assessed by

the generalised variance inflation factors (Fox and Monette, 1992); and the results do not indicate the presence of multicollinearity in the model.[10]

All calculations and estimations were performed in R software (R Core Team, 2017) employing packages 'psych' (Revelle, 2015), 'lmtest' (Zeileis and Hothorn, 2002), 'car' (Fox and Weisberg, 2011) and 'sandwich' (Zeileis, 2004).

4. Results

Statistical Analysis of the Well-Being Score

Cronbach's standardised coefficient $\alpha = 0.84$ indicates a high level of internal consistency of the scale. Similar values were reported in other studies, for example in Australia (McCallum, 1995; Butterworth and Crosier, 2004), the United Kingdom (Jenkinson, Coulter and Wright, 1993; Burholt and Nash, 2011), the United States (McHorney, Kosinski and Ware, 1994), and China (Zhang et al., 2012).

The distribution of the subjective well-being score is presented by the sample characteristics: mean, median, mode, standard deviation, coefficients of skewness and kurtosis (Table 1). The mean value of the total score is approximately 70 (median: 73), which is consistent with the findings of other authors in different countries (see e.g. Burholt and Nash, 2011). From the viewpoint of subjective well-being dimensions, two of them contribute positively to the higher values of the overall score significantly more than the remaining three. Those are: 'feeling down in the dumps' and 'feeling downhearted or depressed'. The majority of Slovak population do not identify themselves as feeling down in the dumps (mean dimensional score of 81, median of 93, modal response: 'none of the time') or as feeling downhearted or depressed (mean dimensional score of 79.2, median of 77.4, modal response: 'none of the time').

Significantly lower values were reported regarding the 'positively sounding' dimensions: feeling calm and peaceful (mean: 66, median: 73, modal category: 'most of the time') and being happy (mean: 64, median: 72, modal category: 'most of the time'). These partial results thus suggest that people are more likely to respond 'none of the time' in case of a negatively formulated question (down in the dumps; depressed) than to respond 'all of the time' in the case of a positive formulation of a question (calm; happy). The lowest value is reported for

[10] Generalized variance-inflation factors (VIF) were calculated due to the presence of qualitative variables. All VIF values are from interval [1.0; 1.33], with the exceptions of age and age squared (VIF = 7.7), which indicates a very low level of collinearity among the explanatory variables. (Age is not correlated with any other variables, and thus does not affect interpretation of results, nor causes any computational issues.)

'being very nervous' dimension (mean: 61, median: 53, modal category: 'some of the time'). This thus indicates that the status of being nervous (i.e., showing emotional tension, restlessness, agitation, etc.) contributes the most to lowering the overall subjective well-being score.

{Insert Table 1 about here}

Pearson's correlation coefficients between the individual items and the total score (Table 2) range between 0.43 and 0.68 in the mutual correlations among the items and between 0.75 and 0.80 in the correlations between the items and the total score. Regarding correlations among the items, the highest correlation was between items B – the person was 'feeling down in the dumps' during the previous four weeks and C – the person was 'feeling calm and peaceful'.

{Insert Table 2 about here}

The basic characteristics of the subjective well-being total score distribution, classified according to the selected variables (gender, degree of urbanisation, region (NUTS 3 level), main economic activity status and highest education level) are reported in Table 3. The results indicate that the most significant differences in the level of subjective well-being were between the students (mean score 75.5) and unemployed (mean score 61.5). Relatively high differences were between those with a tertiary education as the highest attained (mean score 73.1) and other levels of education (68.8 for people with primary or lower education and 69.5 for those with secondary education). Statistically significant differences also were found in terms of gender, degree of urbanisation and region, although the magnitude of differences is relatively low, indicating these variables most likely will not contribute significantly to explaining variation in the total well-being score.

{Insert Table 3 about here}

Regression Analysis

Regression analysis is used to identify the nature of the relationship between the selected characteristics and subjective well-being considering three blocks of explanatory variables.

Economic characteristics represent the primary set of regressors of interest, and the following variables are included**:** main economic activity status – a dummy variable with four categories: 'at work' (reference category), 'unemployed', 'in retirement' and 'other inactive person' (of which around two-thirds account for students); income – natural log of equivalised

disposable income[11] (the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalised adults[12]); financial deprivation proxied by the capacity to face unexpected financial expenses – a binary variable with the reference value 'yes'; additional information on financial stress is acquired by assessing whether the respondent lives in an indebted household (binary variable with the reference value 'yes').

Furthermore, two sets of control variables are considered:

Health status is represented by a self-reported indication as to whether or not the respondent suffers from any chronic illness or condition.

Personal/demographical characteristics: gender – a dummy variable with the reference category 'male'; age and its square (to account for concave-down relationship); education – a dummy variable with three categories: 'primary and lower' (reference category), 'secondary' and 'tertiary'; marital status – a dummy variable with three categories: 'single' (reference category), 'married' and 'other' (separated, widowed, divorced); degree of urbanisation – a dummy variable with two categories: 'densely or intermediate populated area' (reference category) and 'thinly populated area'.

The basic characteristics of the variables considered in the regression are reported in Table 4.

{Insert Table 4 about here}

The results in Table 5 indicate that economic variables are in a statistically significant relationship with subjective well-being; controlling for health status and basic demographic characteristics does not significantly change the interpretation of the results – which is demonstrated by estimating partial regressions[13]. Except for the variable 'gender' (small differences between genders already were suggested by descriptive statistics in Table 3), all variables can be considered statistically significant and thus being in a statistically significant relationship with subjective well-being.

[11] The logarithmic transformation of income is used in this model to capture the curvilinear relationship between the subjective well-being score and income.
[12] Household members are equivalised by weighting each according to their age, using the modified OECD equivalence scale which assigns weight 1.0 to the first adult, 0.5 to the second and each subsequent person age 14 and older, 0.3 to each child under age 14.
[13] Economic status is the only variable with changes in the signs of coefficients: the 'in retirement' category coefficient sign changed from negative to positive and 'other inactive' from positive to negative. This can be explained mainly by controlling for self-reported health and age in the final model.

Results of five partial regressions are reported in column 1 of Table 5 (i.e. subjective well-being is always regressed on one regressor at a time, particularly income, economic status, indebtedness, ability to face unexpected expenses and chronic illness). The aim of these partial models is to demonstrate to what extent the magnitude of coefficients changed after adding other variables into regression. Column 2 of Table 5 reports the results of regressing all considered economic characteristics against subjective well-being. Comparing columns 1 and 2 suggests that the absolute magnitude of coefficients decreased. Nevertheless, all coefficients remained statistically significant, and signs did not change. In column 3, self-reported health status proxy is added to the model, which increases the quality of the model (measured by adjusted R^2 and AIC/BIC criteria) considerably. Columns 4 and 5 represent the influence of demographic and other personal characteristics in explaining the variation of the dependent variable (column 5 reports results for a model with regional dummies). Ultimately, in columns 6 and 7 estimates for the final models are reported (again, regional dummies in column 7). Estimates reported in column 7, i.e., the main model, are discussed in the next section.

{Insert Table 4 about here}

5. Discussion

According to the results shown in column 7 of Table 5, all economic characteristics considered in our regression model have a statistically significant influence[14] on the level of subjective well-being score.

The results suggest positive and diminishing returns to income, that is, an increase in income is associated with an increase in the total subjective well-being score, whereas the associated marginal increase in the total score diminishes. Such a finding is consistent with the findings of other authors (e.g. Clark, Frijters and Shields, 2007). The graphical visualization of the relationship between income and subjective well-being score is depicted in Figure 3 (a concave-down increasing function). The shape of the curve suggests a very steep increase in subjective well-being for persons living in households with yearly equivalised disposable income lower than 10,000 EUR, and the increase marginally diminishes for higher values of income. This translates into a finding obtained by other authors, suggesting that people living in relatively poorer households (in monetary terms) experience a higher increase in subjective

[14] By influence we mean statistical influence, not causal effect.

well-being as a result of income increase as to compared to people living in relatively wealthier households.

{Insert Figure 3 about here}

The economic status of a person is another important economic characteristic explaining variation in subjective well-being as suggested by the theoretical and empirical literature. Our findings suggest that the level of subjective well-being score of an unemployed person is on average 9.4 points lower than the score of an employed/self-employed person. These findings are congruous with other studies (e.g. McKee-Ryan et al., 2005) and they lead to a conclusion that unemployment has a significant impact on the creation of subjective well-being. Loss of employment can result in a negative downflow from the viewpoint of social status and perception of the future perspective, and ultimately it can lead to discomfort in well-being. The opposite direction is reported for retired persons – the level of their well-being score is on average 4.5 points higher than for employed/self-employed people.

Yet, one must keep in mind, that in the model we control for age and self-reported health. Not controlling for those two variables results in the negative influence of retirement on the subjective well-being score. These findings are consistent with the study by Alan, Atalay and Crossley (2008) who found that many more retired Canadians reported enjoying life more than before retirement than the converse. Nonetheless, involuntary retirement is believed to lead to decrease in the subjective well-being as argued by Bonsan and Klein (2012). The results further indicate a very low difference in subjective well-being score between employed people and other economically inactive people, such as students and house-persons.

The total score of people living in indebted households is on average 1 point lower than of those living in households free of debts. Although the magnitude of the influence of indebtedness on subjective well-being is rather low, this is still consistent with the meta-analysis performed by Tay et al. (2017) who found that 57 percent of studies reported a significant relationship between debt and lowered subjective well-being.

The capacity to face unexpected financial expenses is an indicator of the financial vulnerability of households predicting the financial stability of a household (Anderloni, Bacchiocchi and Vandone, 2012). Living in such households is another condition that significantly deteriorates the subjective well-being score on average by 3.4 points in comparison to people living in households that no do face such problems.

Our findings thus suggest that economic characteristics of household explain a significant proportion of variation in subjective well-being score. Translating our findings into a simple example: An *employed* person, *not indebted*; *having the capacity to pay unexpected expenses*; living in a household with equivalised disposable *income at national median level*; not reporting suffering from any chronic illness or condition; age *45* (mean age in sample); married; having attained secondary education; and living in a densely or intermediate populated area has a subjective well-being score on average 15 points higher than a similar person who is *unemployed, indebted,* and *without the capacity to pay unexpected expenses*. The estimated value of subjective well-being score for such a person is around 58 points, which is close to the 56-point threshold identified by Lavikainen, Fryers and Lehtinen (2006) indicating severe mental problems.[15]

Although economic characteristics are central to our study, following is a brief discussion of the statistical influence of demographic/personal characteristics and self-reported health status on subjective well-being score. A person without a chronic illness scores on average 5.6 points higher on the total well-being score than a person with a chronic illness. This finding is consistent with most studies examining health and well-being. As already discussed in Section 2, however, the relationship between (perceived) health and subjective well-being can be bidirectional, and our approach does not allow us to claim causality in either of the directions.

Education also plays an essential role in explaining subjective well-being; our results indicate that higher educational level is associated with a higher level of subjective well-being, which is one of the most typical relationships between education level and well-being (Witter et al., 1984; Blanchflower and Oswald, 2004b). Whilst there is only a 1-point difference between the scores of people with primary education and those with secondary education, people with a tertiary education score on average 2.6 points higher on the total well-being score. Comparing the results from columns 7 and 4 in Table 5 suggests, that controlling for economic characteristics, the statistical influence of education on well-being decreases considerably (2.3 vs. 1.1 points for secondary and 5.7 vs. 2.6 points for tertiary education) yet remains statistically significant.

As with other studies of a similar nature, one of our aims is to examine the nature of the relationship between the subjective well-being and age. Blanchflower and Oswald (2008)

[15] One must keep in mind, that the regression model estimated in this paper does not include any biological or personality characteristics which explain a considerable proportion of subjective well-being as argued in Section 2 of this study.

propose a U-shaped curve hypothesis, arguing that with increasing age the level of well-being first decreases (with a diminishing marginal change) and later starts to increase. Luhmann et al. (2012) offer a possible explanation for such a relationship reported in the empirical literature, suggesting that after a period following retirement, the retired may start to enjoy less stress and more time for family, friends and non-professional activities. Consequently, their subjective well-being score is higher than of those shortly after retiring from the job. Simonsohn (2017) shows, however, that testing the U-shaped relationship via quadratic regression is not a valid approach. He re-analysed data from a few published papers and found that authors appeared to arrive at false-positive U-shaped (or inverted U-shaped) relationships, indicating that monotonic effects were incorrectly interpreted as U-shaped because the authors relied on quadratic regression. As an alternative, Simonsohn (2007) proposes a procedure estimating a regression with two separate lines, one for 'low' and one for 'high' values of x while setting a break-point using the Robin Hood algorithm.[16]

As reported in column 7 in Table 5, both linear and quadratic terms are statistically significant, suggesting a U-shaped relationship between the subjective well-being score and age and indicating a hypothetical turn-point around age 66. Yet, applying the approach proposed by Simonsohn (2007), we do not fail to reject the U-shaped curve, suggesting a monotonic (non-increasing) relationship between subjective well-being score and age (see Figure 4).[17] Our findings are consistent with those of Van Landeghem (2012) who, using the 1984–2007 German Socio-Economic Panel data, found a convex pattern at least until after midlife passage of a lifecycle. Neither theirs nor our results, however, directly contradict the U-shaped curve hypothesis.

Our findings further suggest no statistically significant differences in well-being between men and women. Although the literature more often reports higher well-being levels for women, some studies obtain similar results to ours (see e.g. Louis and Zhao, 2002). Being married is associated with an increase in the level of subjective well-being (there is a 1.9-point difference between a single and a married person), which leads to an assumption that married people tend to have higher levels of well-being.

The last characteristic our study examines is the degree of urbanisation; our results suggest that people from thinly populated areas (i.e. rural areas) have on average higher levels of well-

[16] A U-shape curve is present if the two slopes are of opposite signs and, at the same time, are individually statistically significant.
[17] Our results are robust to changing the model specification (excluding the quadratic term, or using logarithmic transformation of age).

being than those from densely/intermediate populated areas. Rural areas in Slovakia are associated with lower levels of income and higher levels of unemployment; these are factors negatively affecting subjective well-being. Despite these negative factors, reported well-being levels in these disadvantageous locations are significantly higher. Dolan, Peasgood and White (2008) point out that because incomes are likely to be lower in rural areas, controlling for income may give a deceptive appearance of greater rural well-being, which may be the case here.

6. Concluding Remarks

It is difficult to measure subjective phenomena, yet a subjective approach is considered one of the neglected approaches to welfare concepts (Ravallion, 2014). In this empirical study, we present an assessment of subjective well-being among the Slovak population using a representative sample (N = 12,510). The presented results fill a gap in the knowledge about the overall level of the subjective well-being of the Slovak population. Most of the previous studies in this field focused on subjective poverty or were based on survey data on a particular subpopulation. Our aim is thus to contribute to sociological literature, in Veenhoven's (2004) fashion, by examining subjective well-being and thus providing insights to the quality of life of the Slovak society.

As subjective well-being can be proxied by several indicators reflecting its different dimensions, we had to make a choice on which domain of subjective well-being to focus. Numerous studies suggest a causal effect of subjective well-being on health, and thus we decided to use a subjective well-being indicator reflecting the general mood or affect, including depression, anxiety and psychologic well-being, i.e. predominantly psychological aspects of subjective well-being related to mental health and thus ultimately affecting the health status of an individual.

The mean value of the total score of subjective well-being is approximately 70.1 (median: 72.7), which is at the level reported by studies performed in different countries. The results indicate that the most significant differences in the level of subjective well-being are between the students (mean score 75.5) and unemployed (mean score 61.5), which again is consistent with the findings of other authors (Sun et al., 2016) and hence suggests external validity of this result.

We use regression analysis to quantify the relationship between subjective well-being and economic variables (controlling for basic demographic/personal variables and health status).

The findings propose positive and diminishing returns to income. Unemployed people score on average about 9.4 points lower than those who are employed, persons living in indebted households have lower levels of subjective well-being than those living in debt-free households, and the ability to face unexpected financial expenses increases the level of well-being. In general, our findings suggest that economic characteristics, controlling for demographic and personal characteristics, have a significant effect on the subjective well-being of individuals in Slovakia. Our findings thus are consistent with the results obtained by other authors in other countries.

The results of the regression analysis further suggest that difference in the subjective well-being score between genders is statistically insignificant, which is in contrary to most previous empirical studies showing that women on average have higher levels of subjective well-being than men (although some studies came to conclusions similar to ours). The regression analysis suggests a U-shaped relationship between subjective well-being score and age; however, an innovative procedure introduced by Simonsohn (2017) does not fail to reject this hypothesis suggesting that U-shaped curve was falsely identified and what we observe is a non-increasing curve.

The findings presented in this paper not only contribute to up-to-date information on the subjective well-being of the Slovak population, but they also have significant policy implications. Assessment of the well-being of a society based solely on aggregated economic indicators without any additional insights offers only limited opportunities for making correct policy decisions aimed at improving the level of the well-being of society.

This study also has some limitations. Variables such as personality and biological characteristics were not included in our analysis as the EU-SILC questionnaire does not ask for information on these items. Moreover, the study does not identify causal effects of the selected characteristics on subjective well-being; it only quantifies the relationship between them. The results obtained in this study can serve as a source of information for the future research of subjective well-being not only in sociology but also in the fields such as economics and psychology.

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Table 1: Characteristics of the Total Score and Individual Items Distributions

	Mean	*Median*	*Mode*	*S.D.*	*Skew*	*Kurt*	*N*
Total Score	70.05	72.65	75.08	16.61	–0.76	0.48	12,791
Being very nervous	61.21	53.05	49.89	21.74	–0.09	–0.10	12,517
Feeling down on the dumps	81.02	93.44	99.98	22.38	–0.92	–0.01	12,365
Feeling downhearted or depressed	79.18	77.42	99.99	22.59	–0.77	–0.28	12,230
Feeling calm and peaceful	65.57	73.12	74.92	19.22	–0.79	0.54	12,631
Being happy	64.19	72.45	74.93	19.72	–0.54	0.35	12,453

Table 2: Correlations Between the Total Score and Individual Items

	Total Score	*Item A*	*Item B*	*Item C*	*Item D*
Item A	**0.75** *(0.65)*				
Item B	**0.80** *(0.67)*	0.51 *(0.44)*			
Item C	**0.79** *(0.68)*	0.46 *(0.40)*	0.68 *(0.60)*		
Item D	**0.80** *(0.66)*	0.53 *(0.47)*	0.49 *(0.40)*	0.49 *(0.42)*	
Item E	**0.75** *(0.62)*	0.43 *(0.37)*	0.43 *(0.35)*	0.46 *(0.39)*	0.63 *(0.60)*

Note: Pearson's correlation coefficients together with Kendall's tau-b coefficients (in the parentheses) are reported. All coefficients are statistically significant (p-value < 0.0001)

Table 3: Sample Characteristics of the Subjective Well-Being Total Score Distribution

Variable	*Categories*	*Mean*	*Median*	*Mode*	*SD*	*Skew*	*Kurt*	*N*
Slovakia, total		70.05	72.65	75.08	16.61	–0.76	0.48	12,791
Gender ·	Male	70.40	72.90	75.40	16.50	–0.77	0.54	5,707
	Female	69.80	72.30	75.00	16.70	–0.75	0.43	7,084
*Degree of urbanisation****	Densely pop.	69.80	72.60	75.30	17.30	–0.82	0.61	3,093
	Intermediate pop.	68.90	71.40	75.00	16.70	–0.69	0.30	3,628
	Thinly pop.	70.90	73.10	75.10	16.10	–0.76	0.49	6,070
*Region (NUTS 3)****	Bratislava (capital)	70.26	73.07	77.99	16.77	–0.93	0.94	1,147
	Trnava	69.52	72.06	77.87	16.76	–0.69	0.25	1,300
	Trenčín	70.76	72.77	75.32	15.83	–0.80	0.66	1,733
	Nitra	69.73	72.49	75.67	16.96	–0.72	0.19	1,646
	Žilina	70.75	73.13	75.74	16.78	–0.72	0.36	1,472
	Banská Bystrica	71.30	73.71	83.19	16.10	–0.91	0.93	1,707
	Prešov	69.03	71.58	75.33	16.68	–0.64	0.23	1,948
	Košice	69.10	70.98	74.16	16.71	–0.65	0.28	1,709
Main economic activity status ***	Employed	71.32	73.70	75.01	15.34	–0.81	0.79	5,704
	Self-employed	70.46	72.47	74.65	15.39	–0.91	1.02	657
	Unemployed	61.53	62.22	69.13	18.97	–0.25	–0.43	848
	Student	75.51	76.77	75.21	14.59	–0.85	1.51	1,797
	Retired	69.01	71.51	74.92	17.02	–0.67	0.12	2,962
	Other inactive	65.39	68.16	76.17	18.90	–0.61	–0.21	823
Highest education level ***	Primary and lower	68.84	71.6	76.32	18.06	–0.72	0.23	1,980
	Secondary	69.49	72.05	74.93	16.55	–0.73	0.42	8,377
	Tertiary	73.11	75.03	75.95	15.08	–0.82	0.80	2,416

Note: Differences in the total score were tested using the Wilcoxon Rank-Sum Test (in case of variable gender) and the Kruskal-Wallis test (in case of other variables). [Parametric tests (one-way ANOVA and *t*-test) yield the same conclusions, although the differences between genders become statistically significant at 5% significance level.]

Indication of significance levels: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table 4: Characteristics of the Variables Used in Regression

Quantitative variables	*Mean*	*Median*	*Mode*	*SD*
Yearly eq. disp. income	7,402	6,760	6,246	3,348
Age	44.8	43.6	21.4	17.9
Qualitative variables [%]				
Gender	*Male*	*Female*		
	47.2	52.8		
Marital status	*Single*	*Married*	*Other*	
	31.2	52.9	15.9	
Highest education level	*Primary/lower*	*Secondary*	*Tertiary*	
	15.5	65.9	18.6	
Degree of urbanisation	*Densely and intermediate*	*Thinly populated*		
	53.2	46.8		
Chronic illness	*Yes*	*No*		
	30.5	69.5		
Main economic activity status	*Employed*	*Self-employed*	*Retired*	*Other inactive*
	50.9	8.4	22.9	17.8
Indebted household?	*Yes*	*No*		
	79.2	20.8		
Capacity to face unexpected financial expenses	*Yes*	*No*		
	61.5	38.5		

Table 5: Estimated Regression Models

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept		NA	48.805 (3.362)***	42.490 (3.214)***	84.268 (1.053)***	84.794 (1.161)***	57.911 (3.414)***	58.621 (3.507)***
ln(income)		5.185 (0.368)***	2.963 (0.368)***	2.641 (0.351)***			2.526 (0.350)***	2.479 (0.354)***
Status:	*unemployed*	–10.857 (0.685)***	–8.108 (0.707)***	–8.137 (0.697)***			–9.345 (0.684)***	–9.433 (0.686)***
	in retirement	–2.519 (0.360)***	–1.803 (0.368)***	1.657 (0.391)***			4.554 (0.616)***	4.452 (0.620)***
	other inactive	1.024 (0.396)**	2.230 (0.399)***	2.629 (0.382)***			–0.969 (0.483)*	–0.871 (0.486).
Indebted:	*NO*	0.758 (0.364)*	0.642 (0.358).	0.617 (0.354).			1.027 (0.348)**	0.989 (0.351)**
Expenses:	*NO*	–5.379 (0.306)***	–4.011 (0.315)***	–3.725 (0.310)***			–3.365 (0.308)***	–3.439 (0.310)***
Illness:	*NO*	7.255 (0.333)***		7.554 (0.356)***			5.735 (0.362)***	5.647 (0.364)***
Gender:	*female*				0.283 (0.292)	0.262 (0.293)	0.446 (0.285)	0.433 (0.286)
Age					–0.762 (0.060)***	–0.761 (0.060)***	–0.626 (0.063)***	–0.622 (0.064)***
Age^2					0.007 (0.001)***	0.007 (0.001)***	0.005 (0.001)***	0.005 (0.001)***
Mar. stat:	*married*				2.345 (0.475)***	2.344 (0.479)***	1.859 (0.451)***	1.842 (0.455)***
	other				–1.370 (0.644)*	–1.461 (0.649)*	–0.859 (0.617)	–0.946 (0.622)
Education:	*secondary*				2.291 (0.490)***	2.300 (0.492)***	1.086 (0.471)*	1.089 (0.473)*
	tertiary				5.568 (0.552)***	5.514 (0.555)***	2.675 (0.545)***	2.639 (0.547)***
Urb. deg.:	*thinly*				2.234 (0.286)***	2.213 (0.318)***	2.553 (0.278)***	2.440 (0.307)***
Regional dummies		NO	NO	NO	NO	YES	NO	YES
N		NA	12,791	12,656	12,772	12,643	12,638	12,510
Adj. R^2		NA	0.056	0.093	0.046	0.047	0.121	0.121
AIC		NA	107,239.5	105,589.9	107,205.3	106,081.4	105,046.2	103,949.5
BIC		NA	107,299.2	105,656.9	107,279.8	106,207.9	105,172.8	104,127.9

Note: Robust (White) standard errors are reported in parentheses. Column 1 reports coefficients of five partial regression models in which subjective well-being score is regressed only on one regressor at a time (log of income, economic status, indebtedness, ability to face unexpected expenses and chronic illness), thus the estimated intercepts, coefficients of determination, AIC and BIC are not reported but can be obtained from the authors upon request.

Indication of significance levels: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

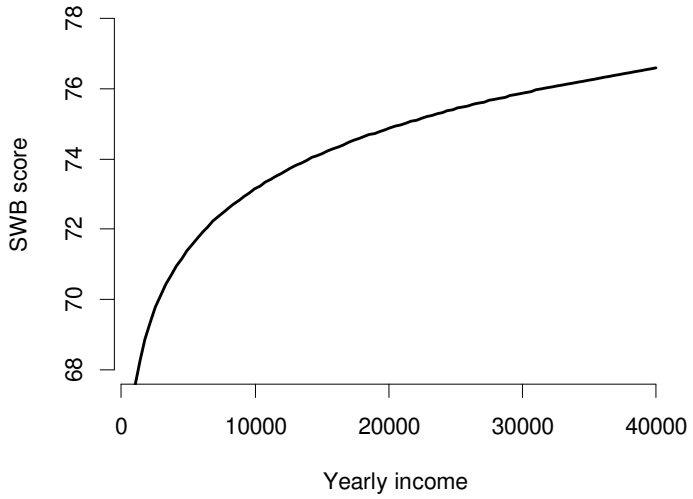

Figure 3: The Relationship Between Subjective Well-Being and Yearly Income

Note: The figure depicts the curvilinear relationship between subjective well-being (SWB) score and yearly income while holding constant other characteristics (an employed person, not indebted; with the capacity to pay unexpected expenses; not reporting suffering from any chronic illness or condition; married; attained secondary education; living in a densely or intermediate populated area; age 45 (mean age in the sample).

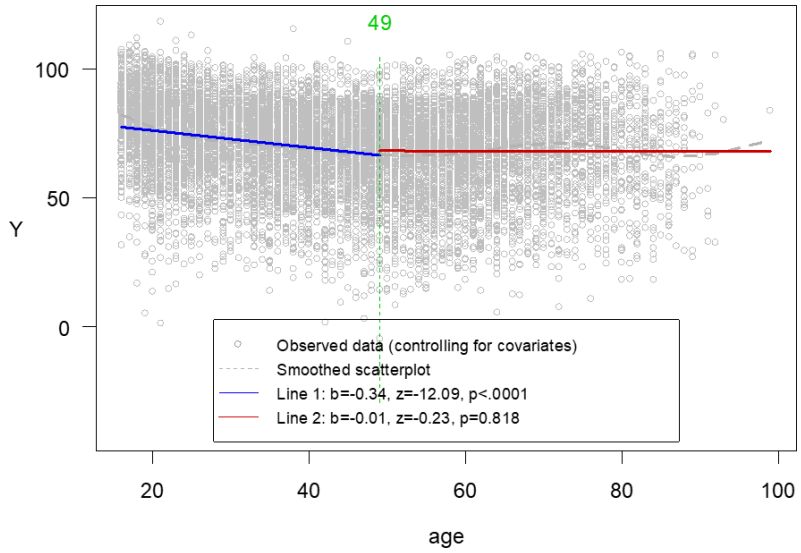

Figure 4: Test of U-Shaped Relationships with Quadratic Regressions

Source: Output of an R code developed by Simonsohn (2017)

Note: Each dot represents a respondent in the EU-SILC survey. Age 49 is identified as an optimized breakpoint. The slope of Line 1 is negative and statistically significant, however, the slope of Line 2 is not statistically significant, and thus this testing procedure does not fail to reject the U-shaped relationship between subjective well-being score (Y) and age.