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# Subjective Well-being, Income, and Ethnicity in Slovakia\*

Tomáš Želinský†

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## Abstract

This paper utilizes two measures of subjective well-being to test a hypothesis that a marginal increase in subjective well-being associated with a marginal increase in income is larger for poorer than for richer populations. This hypothesis is examined in the setting of Slovak Roma, who are poor in comparison to the non-Roma population. The results suggest that the correlation between income and satisfaction is greater for the lower-income group (the Roma) than for the higher-income group (majority population). Further, the correlation between income and emotional well-being does not differ between the two groups.

**Keywords:** Satisfaction; Emotional well-being; Roma; Income; Poverty.

**JEL Codes:** I31, J15.

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## INTRODUCTION

Previous research has examined numerous factors affecting subjective well-being, with income being among its important determinants. However, income is usually not a strong predictor of subjective well-being (Diener et al., 1993). As argued by Veenhoven (1991), the correlation between income and subjective well-being is higher in countries with lower income levels and weaker for countries with higher income levels. According to Tov and Diener (2009), this is consistent with Maslow's (1943) theory of the hierarchy of needs, suggesting that the effects of income on meeting basic needs are direct, because basic needs are highly salient. This hypothesis was empirically tested, e.g., by Oishi et al. (1999) who found that financial satisfaction was more strongly associated with overall life satisfaction in poorer countries than in richer ones.

Numerous studies have investigated differences in subjective well-being across cultures, most by comparing countries (see, e.g., an excellent collection of works by Diener, 2009). Only a small number of studies has focused on cultures/ethnicities within a country. For example, Biswas-Diener, Vittersø, and Diener (2005) examined three different cultures from three different countries: the Kenyan Maasai, the United States Amish, and the Greenlandic Inughuit. All of these populations lead materially simple lives and usually live separated from 'mainstream' societies. In this study, I aim to contribute to this stream of literature by examining differences in subjective well-being between cultures within one country: the Roma minority and the majority population in Slovakia.

Roma are the largest ethnic minority in Europe, and face multiple disadvantages including high rates of poverty and social exclusion, along with discrimination and prejudice. About 90 % of Roma live below the national income poverty line, while fewer than a third are in paid employment (FRA, 2014). According to a recent data set on incomes and living

conditions of Roma in Slovakia (OSGPRC, 2020), 85 % of Roma are at risk of monetary poverty and 57 % live in severely materially deprived households.

Numerous stereotypes are associated with Roma culture. The prevailing negative stereotypes held by the majority populations include being uneducated, lacking interest in school, being dirty and lazy, having negative attitudes to work, misusing the social system and being dependent on social benefits (Maučec, 2013; Podolinská, 2017). Such stereotypes are untruthful, and are a consequence of a lack of knowledge towards Roma communities, and is escalated by use of anti-Roma xenophobic rhetoric by some politicians (Carrera et al., 2017). In contrast, positive stereotypes often include beliefs by the majority that Roma are great musicians, love freedom and life, and enjoy simple life pleasures (Maučec, 2013; Council of Europe, 2006). Some of these stereotypes were examined by a 2011 UNDP/WB/EC survey (UNDP, 2014) using a random sample of Roma and non-Roma households in areas with high concentrations of Roma populations in twelve countries of Central and Eastern Europe. This data set suggests that 83 % of Roma and 85 % of non-Roma considered the statement “*Some people think that Roma are cheerful and enjoy life*” as justified or entirely justified. The proportions are even higher for the Slovak sample (95 % of Roma and 92 % of non-Roma).

Based on this empirical result, and in line with Diener and Diener’s (1996) hypothesis that most people are happy, this stereotype held by both the majority and the Roma themselves suggests that we can assume that they will report relatively high levels of subjective well-being despite low income and overall material deprivation. Nonetheless, this does not necessarily imply that Roma will enjoy the same (high) levels of subjective well-being as non-Roma. Kamberi, Martinovic, and Verkuyten (2015) examined the differences in subjective well-being between Roma and non-Roma from Central and Eastern Europe and

found that Roma had lower levels of subjective well-being. The authors attributed this difference to factors including lower health status, income, and educational attainments.

I contribute to empirical literature on the relationship between income and subjective well-being across cultures. I test the hypothesis proposed by Tov and Diener (2009) that a marginal increase in subjective well-being associated with a marginal increase in income is larger for the poorer subpopulation than for the rest of the society. I examine this hypothesis in the setting of poor Slovak Roma in comparison to the non-Roma population. The main contribution of this paper lies in examining the differences between two ethnicities in an economically developed country, in a setting in which a high proportion of the ethnic minority population (Roma) experiences very high levels of poverty and deprivation.

To test the hypothesis, I operationalize subjective well-being by two types of scores constructed using available data sets. Both variables are based on standard approaches to measuring subjective well-being (see, e.g., Warr, 1990, Diener, Lucas, and Oishi, 2002; Deci and Ryan, 2008). The first measure, *the satisfaction score*, is based on four different domains of life satisfaction and represents the cognitive dimension of subjective well-being. The second measure, *the emotional well-being score*, is based on a mental health inventory measuring general mood or affect and reflects the affective dimension of subjective well-being.

## **MATERIAL AND METHODS**

### *Description of Data*

This study is based on two sets of the cross-sectional 2018 European Union Statistics on Income and Living Conditions (EU-SILC) microdata. The first dataset (SO SR, 2019) serves as the official source of data for reporting income and living conditions statistics in Slovakia

coordinated by Eurostat. The second dataset (OSGPRC, 2020) aims to describe the living conditions of Roma living in marginalized communities in Slovakia and was collected upon the request of the Office of the Slovak Government Plenipotentiary for Roma Communities. Both datasets were collected by the Statistical Office of the Slovak Republic, using the same methodology.

The OSGPRC dataset includes only marginalized Roma households. The general EU-SILC survey collects data on the general population, but also includes a small number of observations of Roma families integrated within the majority population. Since information on ethnicity is not collected within the main (national) survey, it is impossible to identify observations of Roma households that are included. Nevertheless, I believe that the small number of such observations will not bias results generalized to the majority (non-Roma) population.

Both datasets include a module on well-being, with related variables collected for household members aged 16 and above. Two proxies are utilized in this study, each capturing different dimensions of subjective well-being.

The first measure of subjective well-being (SWB) is operationalized as an emotional well-being (EWB) score. The score is based on the MHI-5 Mental Health Inventory (Yamazaki, Fukuhara, and Green, 2003), and includes five items: feeling very nervous; down in the dumps; calm and peaceful; downhearted or depressed; happy. It measures general mood or affect, including depression and anxiety symptoms (Stewart, Hays, and Ware, 1988). The selection of items is based on the *Psychological General Well-Being Index* (Dupuy, 1984). Respondents were required to select one of the following categories: all of the time; most of the time; some of the time; a little of the time; none of the time. Responses were first

recoded: 'all of the time' = 0; 'most of the time' = 25; 'some of the time' = 50; 'a little of the time' = 75; 'none of the time' = 100 for 'feeling very nervous', 'feeling down in the dumps', and 'feeling downhearted or depressed'. For 'feeling calm and peaceful' and 'being happy' the reversed recoding was applied. The EWB score was calculated as an arithmetic mean across all dimensions. In accordance with the proposed methodology (Stewart, Hays, and Ware, 1988), a missing score was assigned only if all five items in the scale were missing. The EWB score is thus a value between 0 and 100, with 100 representing the highest possible outcome.

A similar methodology (also described by Cummins and Weinberg, 2014) is adopted to create a satisfaction score, the second measure of SWB utilized in this study. The module on well-being includes questions on four individual domains of satisfaction: satisfaction with financial situation; satisfaction with personal relationships; satisfaction with time use; satisfaction with job. Respondents were required to respond on a scale from 0 (not at all satisfied) to 10 (completely satisfied). In this case, responses were re-coded by multiplying them by the number 10, hence each dimension could reach a value between 0 and 100. Afterwards, using the same approach described above, the satisfaction score was calculated as an arithmetic mean across all four domains of satisfaction, while a missing score was assigned only if all four items in the scale were missing. Again, the satisfaction score is a value between 0 and 100, with 100 representing the highest possible outcome. Since job satisfaction is only reported for employed or self-employed individuals, I perform robustness checks with results excluding this dimension. The results are strongly robust to adopting either the score based on three or on four dimensions, due to an extremely high degree of correlation between them ( $r > 0.99$ ,  $p < .001$  for the Roma subsample and  $r = 0.98$ ,  $p < .001$  for the non-Roma subsample).

Relatively high values of Cronbach's standardised coefficient (EWB score:  $\alpha = 0.82$ ; SE = 0.002 for the non-Roma population and  $\alpha = 0.81$ ; SE = 0.004 for the Roma population; satisfaction score:  $\alpha = 0.72$ .; SE = 0.004 for the non-Roma population and  $\alpha = 0.70$ ; SE = 0.007 for the Roma population) indicate high levels of internal consistency of the scales. In addition, in Tables A1 and A2 (Appendix) I report construct validity assessment based on regression approach as suggested by Cummins and Weinberg (2014). The results suggest that the four domains together account for 53.1% (non-Roma sample) and 51.8% (Roma sample) of the variance in overall life satisfaction. These four domains contribute 18.8% and 20.4% (respectively) in unique variance, while 34.3% and 31.3% (respectively) is shared variance.

#### *The estimation strategy*

The main goal of this paper is to examine differences in a marginal change in subjective well-being resulting from a marginal change in income between Roma and non-Roma. Three types of models are estimated. In the first step, a regression model with income as the only right-hand-side variable is used. *Equivalised disposable income* is used, i.e., the total income of a household (after tax and other deductions), divided by the equivalised household size applying the modified OECD scale which gives a weight of 1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; and 0.3 to each child under 14.

Next, the model from stage one is controlled for standard household and individual characteristics. These include: age; gender; mean number of adults and children in the household; the highest attained level of education; basic economic status; home ownership status; number of rooms available to the household; ability to make ends meet; indication whether the individual lives in a severely materially deprived household; and reporting any



chronic health difficulties; degree of urbanisation (non-Roma sample) or type of settlement (Roma sample).

Since many of the characteristics of the Roma and non-Roma samples differ (e.g., the majority of Roma have completed primary education only and are at greater risk of deprivation), two types of models are estimated. In the ethnicity-specific models, the categories are constructed to reflect the particular structure of individuals of the respective ethnicity. In the common model, the same categories are used for both ethnicities. For a detailed description of variables and their categories, see the *Appendix*.

The models are estimated separately for each ethnicity and the main results are plotted jointly in the same plots. Where available, all observations were pooled into one dataset and a model with an interaction term (ethnicity \* income) was estimated. Results from this alternative specification are robust to the main results obtained from separate models for each ethnicity.

## **RESULTS**

The main objective of this study is to examine differences in reported subjective well-being between individuals from an ethnic minority, of which almost 85 % live in households with equivalised disposable income below the national poverty line, and individuals from the majority population. As outlined in the previous sections, I present two proxies for SWB: a satisfaction score and an emotional well-being score.

Although the two scores are significantly correlated ( $r = 0.494$ ,  $p < .001$  for the Roma subsample and  $r = 0.488$ ,  $p < .001$  for the non-Roma subsample), the moderate values of correlation coefficients below 0.6 suggest that each of the proxies captures somewhat different dimensions of SWB.

The shapes of the distributions (Figure 1) suggest that there are differences in mean SWB scores between Roma and non-Roma. The mean value of satisfaction score for the Roma ( $M = 60.2$ ,  $SD = 19.8$ ) is on average, 9.3 points ( $p < .001$ ) lower than the mean value reported for non-Roma ( $M = 69.5$ ,  $SD = 17.2$ ). Similarly, Roma ( $M = 67.1$ ,  $SD = 18.9$ ) report on average a 6.8-point-difference lower emotional well-being score ( $p < .001$ ) than non-Roma ( $M = 73.9$ ,  $SD = 15.7$ ).

**[Figure 1]**

The differences reported above do not take into account any additional characteristics. Roma are, however, at much greater risk of facing multiple disadvantages including low income and educational attainments, and higher levels of deprivation. Since this study aims to examine the relationship between SWB and income, I first estimate econometric models separately for the Roma and non-Roma subsamples while not controlling for individual/household characteristics (Panel A of Table 1).

As demonstrated by previous research, in this particular setting, a higher level of income is also associated with a higher level of SWB. The results further suggest that the slope between income and satisfaction estimated for the Roma sample ( $b = 2.69$ ,  $SE = 0.21$ ,  $p < 0.001$ ) is steeper than the slope estimated for non-Roma ( $b = 1.30$ ,  $SE = 0.06$ ,  $p < 0.001$ ) and that the difference is statistically significant ( $\Delta = 1.39$ ,  $SE = 0.22$ ,  $p < 0.001$ ). Changes in the income of Roma are, on average, associated with higher increases in satisfaction than in the case of non-Roma. However, the results indicate no statistically significant difference ( $\Delta = -0.19$ ,  $SE = 0.22$ ,  $p = 0.391$ ) in slopes between the Roma ( $b = 0.68$ ,  $SE = 0.22$ ,  $p = 0.002$ ) and non-Roma ( $b = 0.87$ ,  $SE = 0.06$ ,  $p < 0.001$ ) from the perspective of the relationship between income and emotional well-being.

**[Table 1]**

The nature of this relationship is visualized in Figure 2. While Roma have, on average, lower levels of emotional well-being independently of their income level (right panel), the same pattern does not hold for the relationship between income and satisfaction (left panel). The left panel of Figure 2 suggests that, for annual equivalised disposable income below 3,800 euro, Roma enjoy, on average, significantly lower levels of satisfaction than non-Roma. The result, however, reverses for annual equivalised disposable income above 6,300 euro. Nevertheless, this finding must be interpreted very cautiously, since apart from not controlling for further individual and household characteristics, approximately only 22 % of Roma live in households with annual equivalised disposable income exceeding 3,800 euro, and only 2 % exceeding 6,300 euro. Conversely, approximately only 6 % of non-Roma individuals live in households with annual equivalised disposable income of less than 3,800 euro.

### **[Figure 2]**

In order to account for individual and household characteristics, I further estimate models controlling for age; highest education level attained; home ownership status; number of rooms; ability to make ends meet; degree of urbanisation (non-Roma subsample) and settlement type (Roma subsample); material deprivation status; health status; main economic activity status; and number of adults and children in the household. I perform two partial analyses: using categories that are typical to one subpopulation and which are different from those of the other subpopulation (Panel B of Table 1); and using the same categories across both subpopulations (Panel C of Table 1). The rationale is to first present the relationship between income and SWB for a “typical” member of a subpopulation; and next, to obtain a more comparable set of results for similar individuals across the two ethnicities.

In the first scenario, the values of cardinal control variables are held constant at their means, while the categories of qualitative controls are held constant at the most frequent categories. In this case, ethnicity-specific values/categories are used, so the relationship between income and SWB corresponds to a typical individual of the respective ethnicity. Controlling for household/individual characteristics results in a weaker relationship between income and SWB than in the models without controls. The results again suggest that marginal changes in satisfaction score resulting from increased income are higher for Roma ( $b = 1.22$ ,  $SE = 0.27$ ,  $p < 0.001$ ) than for non-Roma ( $b = 0.43$ ,  $SE = 0.08$ ,  $p < 0.001$ ) and the difference is statistically significant ( $\Delta = 0.79$ ,  $SE = 0.28$ ,  $p = 0.005$ ). When assessing the relationship between income and emotional well-being, the slope for non-Roma decreases to 0.17 ( $SE = 0.07$ ,  $p = 0.010$ ) and becomes insignificant for the Roma subsample ( $b = -0.18$ ,  $SE = 0.26$ ,  $p = 0.489$ ). The difference between the slopes is also insignificant ( $\Delta = -0.36$ ,  $SE = 0.27$ ,  $p = 0.192$ ).

The analysis without control variables (Figure 2) suggested that, for income levels higher than a certain amount (somewhat lower value than the national poverty line), Roma enjoy higher levels of satisfaction than non-Roma. However, reporting the results for individuals with average/typical characteristics yields different conclusions. Holding the values at their means or most frequent categories (Figure 3) suggests that, at a given value of income, a member of the Roma minority with average/typical characteristics enjoys, on average, significantly lower levels of SWB than an “average” non-Roma individual. This result is consistent with simple averages and can be attributed to differences in further characteristics related to the material dimension of quality of life between Roma and non-Roma.

**[Figure 3]**

Next, in order to obtain comparable results on the relationship between income and SWB across the two ethnicities, I estimate regression models using exactly the same definitions of control variables. Slopes between income and SWB obtained from these regressions (Panel C of Table 1) are similar to those obtained in Panel B, suggesting that the results are robust to the definitions of control variables employed.

#### [Figure 4]

When holding the control variables constant at the same values/categories for both ethnicities (Figure 4), the results suggest that differences in SWB between ethnicities at a given level of income are not statistically significant. The results are robust to subjective well-being proxied either by satisfaction or by emotional well-being scores. These findings indicate that the role of income in predicting the perceived level of SWB does not depend on an individual's ethnicity. Individuals with the same set of characteristics enjoy similar levels of SWB at a given income, regardless of their ethnicity. These comparisons are based on results obtained for mean/modal values/categories across both ethnicities. For the sake of completeness, I further tested differences in coefficients between the Roma and non-Roma models. The results suggest that the models are similar in terms of estimated coefficients, though a few differences are identified. Nevertheless, keeping the variables fixed at the most differing categories does not lead to changes in the main result, suggesting that individuals with the same set of characteristics enjoy similar levels of subjective well-being at a given income, regardless of their ethnicity.

## **DISCUSSION AND CONCLUSIONS**

The first observation from this study is that, on average, Slovakian Roma enjoy lower levels of subjective well-being than non-Roma. However, the 9.3-point-difference in satisfaction scores and the 6.8-point-difference the of emotional well-being scores do not account for individual and household characteristics of respondents (Panel A of Table 1). The same

conclusion is drawn when examining the differences between poorer Roma and richer non-Roma groups using regressions and controlling for basic individual and household characteristics of respondents (Panel B of Table 1). Keeping in mind that the majority of Roma live in households at considerably higher risk of income poverty and material deprivation, this finding is consistent with previously published results. For example, Biswas-Diener and Diener (2001) interviewed people living in slums in Calcutta, India and concluded that the dwellers were “more satisfied than one might expect” (p. 329). The authors argue that this result is in line with theories of adaptation, with a basis in Helson’s (1947) adaptation-level theory. People adapt to long-term levels in their material well-being, thus do not necessarily report lower levels of subjective wellbeing even when living in poorer material conditions. As further suggested by Frederick and Loewenstein (1999), this is also in line with so called “desensitization”, i.e., adaptive processes that diminish the subjective intensity of the stimulus. In this vein, living in disadvantaged circumstances does not necessarily imply low perceived levels of subjective well-being.

Next, I examine the nature of the relationship between income and SWB for Roma and non-Roma populations. Previous research has demonstrated that the correlation between income and SWB is stronger among poorer populations (Diener and Biswas-Diener, 2002). The findings of this study support this hypothesis, suggesting that a marginal change in satisfaction scores associated with a marginal change in income is greater for the Roma than for the non-Roma. However, examining the marginal change in emotional well-being scores associated with a marginal change in income suggests no differences between the two ethnicities. One potential explanation is that the two SWB proxies utilized in this study capture different dimensions of subjective well-being. Results obtained in this study ultimately suggest that there are no differences in the slopes between the poorer Roma and the richer non-Roma populations. The second observation is that while the correlation

between income and satisfaction is greater for the lower-income group than for the higher-income group, the correlation between income and emotional well-being does not differ between the two groups.

The last of the findings is based on regression models controlled for basic household and individual characteristics (Panel C of Table 1). When holding the variables constant at the same values/categories for both partial models (for Roma and for non-Roma), the results suggest no significant differences in SWB between Roma and non-Roma (Figure 4). This finding is unambiguous in the case of emotional well-being scores along the whole interval of annual equivalised disposable income (right panel). From the perspective of satisfaction scores, the same result holds on average for individuals living in households with yearly equivalised disposable income below approximately 7,500 euro. This corresponds to most Roma and approximately half of non-Roma households. The last observation from this study is that the data suggests no differences in satisfaction between Roma and non-Roma living in households with yearly equivalised disposable income below 7,500 euro when other observables are kept constant at mean/modal values/categories. As further depicted in Figure 4, Roma with income exceeding this threshold seem to enjoy higher levels of satisfaction than non-Roma with the same income, with other characteristics held constant. However, we need to interpret this result very cautiously, since only a very small number of Roma observations with disposable income exceeding 7,500 euro is used to estimate this relationship.

These findings may be of interest to policymakers, since, on the one hand, increases in material well-being of the poor are associated with relatively steep increases in satisfaction. On the other hand, increases in material-wellbeing are not likely not associated with increases in the affective dimension of subjective well-being. Increases in income can lead to higher

levels of satisfaction, which is, however, not necessarily associated with improvements in positive affect. This requires further investigation of the relationship between satisfaction and emotional well-being.

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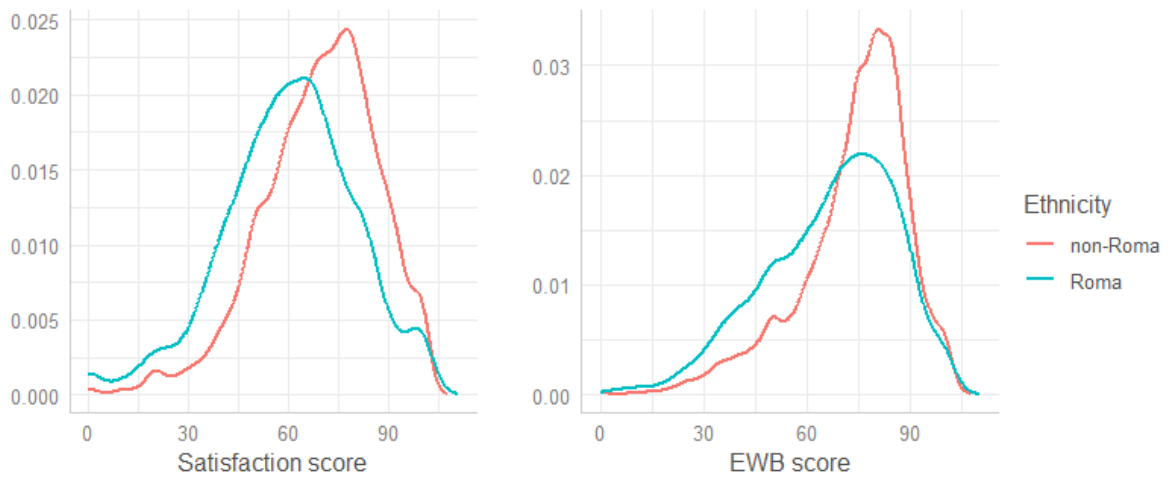
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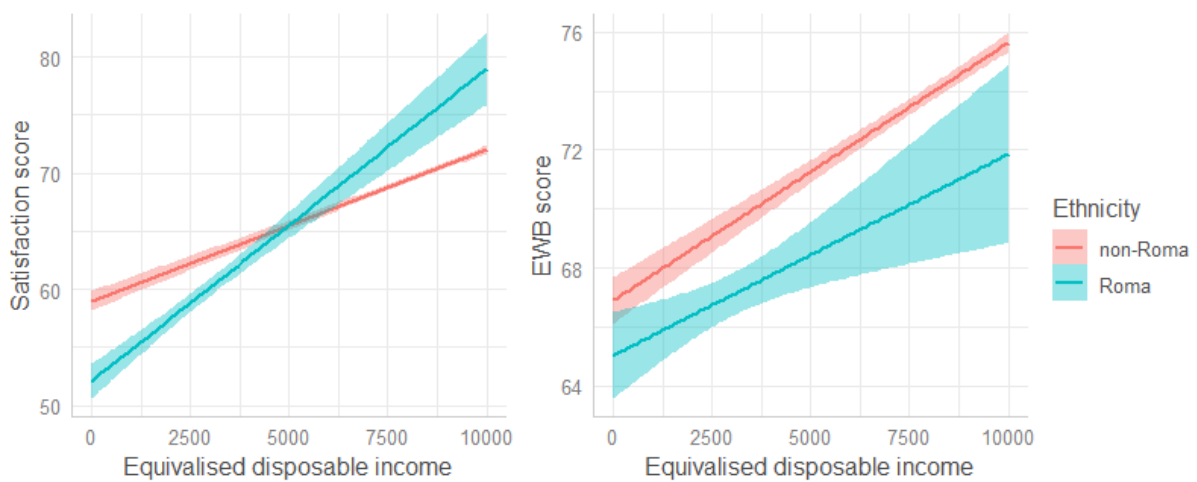
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## Figures and Tables

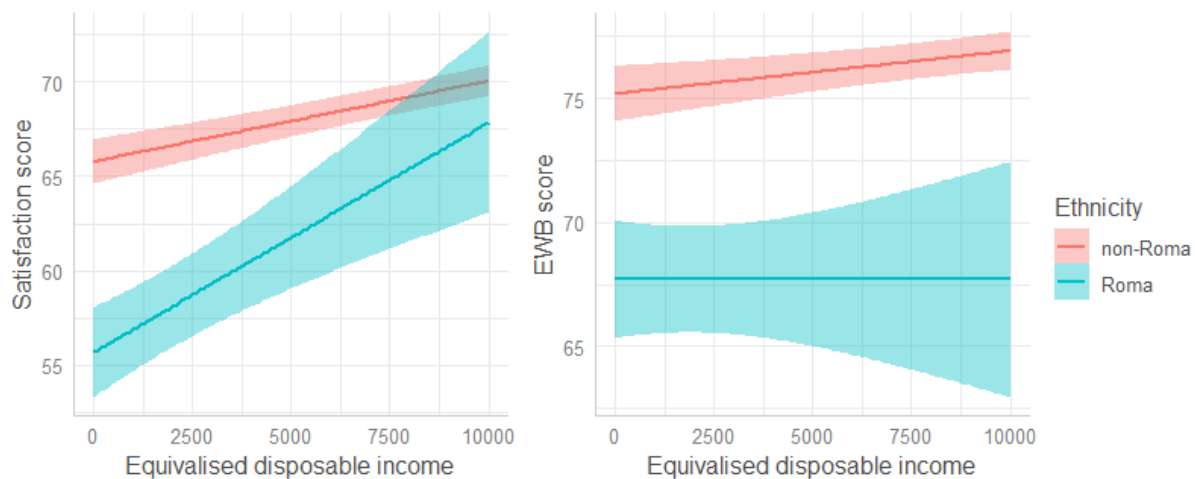


**Figure 1.** SWB scores broken down by ethnicity



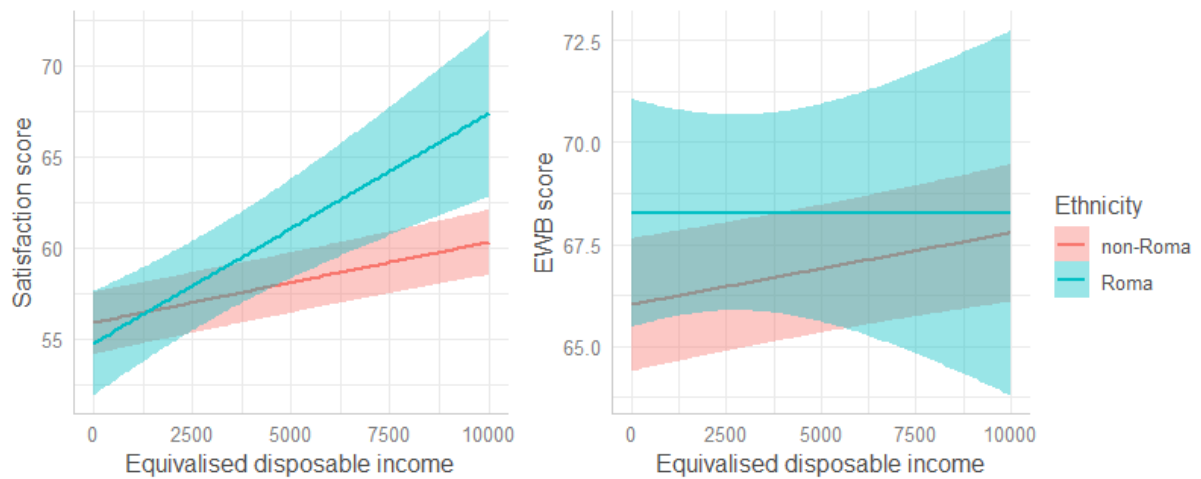
**Figure 2.** Relationship between income and SWB (not controlling for individual/ household characteristics)

Notes: The shaded area represents a 95% confidence interval based on robust SE.



**Figure 3.** Relationship between income and SWB (controlling for individual/ household characteristics using categories that correspond to a “typical” member of the respective ethnicity)

Notes: The figures report the relationship between income and SWB, while holding control variables at the following values/categories: Roma – mean age 27.5; primary education as the highest attained level; home ownership status: owner; mean number of rooms at home: 2; ability to make ends meet with great difficulty; living in a settlement at the edge of a village; living in a severely materially deprived household; basic economic status: unemployed; individual does not report chronic health problems; mean number of adults in the household: 2.5; mean number of children in the household: 3.25. Non-Roma - mean age 40 years; secondary education as the highest attained level; home ownership status: owner; mean number of rooms at home: 3.5; ability to make ends meet with some difficulty; living in rural areas (thinly populated areas); living in a household that is not severely materially deprived; basic economic status: employed; individual does not report chronic health problems; mean number of adults in the household: 2.67; mean number of children in the household: 1. The differences between genders are not statistically significant, and the figures are based on the reference category (male). Since the coefficient for equivalised disposable income in the right panel of the figure is not statistically significant, the estimated line is held constant. The shaded area represents a 95% confidence interval based on robust SE.



**Figure 4.** Relationship between income and SWB (controlling for individual/ household characteristics using the same definitions of variables for both ethnicities)

Notes: The figures report the relationship between income and SWB, while holding control variables at the following values/categories for both ethnicities: age 34 years; primary education as the highest attained level; home ownership status: owner; mean number of rooms at home: 2.5; ability to make ends meet with difficulty; living in a severely materially deprived household; basic economic status: economically inactive individual; individual does not report chronic health problems; mean number of adults in the household: 2.5; mean number of children in the household: 2. The differences between genders are statistically significant in the satisfaction score model (left panel); the figures are based on the reference category (male). Since the coefficient for equivalised disposable income in the right panel of the figure is not statistically significant, the estimated line is held constant. The shaded area represents a 95% confidence interval based on robust SE.

**Table 1.** Regression Analysis

		<i>Dependent variable:</i>					
		<i>Satisfaction score</i>			<i>EWB score</i>		
		<i>Roma</i>	<i>non-Roma</i>	<i>Diff (1)–(2)</i>	<i>Roma</i>	<i>non-Roma</i>	<i>Diff (4)–(5)</i>
		(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A</i>	Income (ths. euro)	2.686*** (0.205)	1.300*** (0.063)	1.386*** (0.215)	0.683** (0.215)	0.874*** (0.056)	–0.191 (0.222)
	Controls	No	No		No	No	
	R <sup>2</sup>	0.055	0.050		0.004	0.027	
	N	2,597	13,007		2,592	12,774	
<i>Panel B</i>	Income (ths. euro)	1.216*** (0.269)	0.426*** (0.077)	0.790** (0.280)	–0.183 (0.264)	0.173* (0.067)	–0.355 (0.273)
	Controls	Specific	Specific		Specific	Specific	
	R <sup>2</sup>	0.203	0.196		0.156	0.160	
	N	2,472	12,815		2,469	12,591	
<i>Panel C</i>	Income (ths. euro)	1.260*** (0.264)	0.441*** (0.076)	0.819** (0.275)	–0.170 (0.259)	0.176** (0.066)	–0.346 (0.268)
	Controls	Same	Same		Same	Same	
	R <sup>2</sup>	0.168	0.196		0.151	0.159	
	N	2,472	12,815		2,469	12,591	

Notes: The table reports regression coefficients (robust SE in parentheses). In Panel A, no control variables are used; in Panels B and C, the models are controlled for the following variables: age and age2; highest attained education level; home ownership status; number of rooms; ability to make ends meet; degree of urbanisation (Slovak subsample) and settlement type (Roma subsample); material deprivation status; health status; main economic activity status; number of adults and children in the household. In Panel B, control variables categories are adjusted to account for the structure of Roma/non-Roma characteristics (*Specific*). In Panel C, the same categories of control variables are used for both subsamples (*Same*). Columns 3 and 6 report differences in the slopes between Roma and non-Roma.

\*\*\* denotes  $p < 0.001$ , \*\*  $p < 0.01$ , and \*  $p < 0.05$

## **Appendix A.** Description of the right-hand-side variables

*Equivalised disposable income* [in thousands]: the total income of a household (after tax and other deductions), divided by the equivalised household size (applying the modified OECD scale which gives a weight of 1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; and 0.3 to each child under 14).

*Age* [in years]

*Gender* [1 = Male; 2 = Female]

*Number of rooms available to the household* [number of rooms; 10 represents 10 or more rooms]

*Ability to make ends meet*: Responses to the question: “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 necessary expenses?” Values: 1 = With great difficulty; 2 = With difficulty; 3 = With some difficulty; 4 = Fairly easily; 5 = Easily; 6 = Very easily.

*Deprivation status*: Indication whether a person lives in a severely materially deprived household (experience at least 4 out of 9 deprivation items: cannot afford i) to pay rent or utility bills, ii) keep home adequately warm, iii) face unexpected expenses, iv) eat meat, fish or a protein equivalent every second day, v) a week's holiday away from home, vi) a car, vii) a washing machine, viii) a colour TV, or ix) a telephone).

*Suffering from any chronic (long-standing) illness or condition*. The question was asked as: Do you have any longstanding illness or health problem? (YES/NO). As suggested by Eurostat, if in some languages the wording ‘longstanding illness or health problem’ was difficult to translate and implement, the following wording of the question could be



introduced: ‘Do you have any longstanding illness or longstanding health problem? By longstanding I mean illnesses or health problems which have lasted, or are expected to last, for 6 months or more’.

*Basic activity status:* Self-defined status grouped into four categories: 1 = At work (employee working full-time/part-time; self-employed working full-time/part-time); 2 = Unemployed; 3 = In retirement or early retirement; 4 = Other inactive person (pupil; student; further training; permanently disabled or/and unfit to work; in compulsory military or community service; fulfilling domestic tasks and care responsibilities; other inactive person).

*Number of adults:* Number of adults in the household.

*Number of children:* Household members younger than 18, or household members between 18 and 24 years old who are not economically active and live in the same household with at least one parent.

*Highest attained level of education [Roma sample]:* Levels: 1 = Up to stage one of primary education (ISCED=000 or 100); 2 = Stage two of primary education (ISCED=200); 3 = Higher levels (ISCED=300 or above).

*Highest attained level of education [non-Roma sample]:* Levels: 1 = Stage one or two of primary education (ISCED=100 or 200); 2 = Vocational (ISCED=35); 3 = Secondary (ISCED=400 or 500); 4 = Tertiary (ISCED=600 through 800).

*Highest attained level of education [pooled data]:* Levels: 1 = Up to stage one of primary education (ISCED=000 or 100); 2 = Stage two of primary education (ISCED=200); 3 = Vocational or secondary (ISCED=35 or 400); 3 = Higher (ISCED=500 through 800).

*Home ownership (tenure status) [Roma sample]:* 1 = outright owner; 2 = tenant or subtenant paying rent at prevailing or market rate, or accommodation is rented at a reduced rate (lower

price than the market price); 3 = Accommodation is provided free. (Data on owners paying mortgage was not collected.)

*Home ownership (tenure status) [non-Roma sample]:* 1 = outright owner; 2 = owner paying mortgage; 3 = tenant or subtenant paying rent at prevailing or market rate, or accommodation is rented at a reduced rate (lower price than the market price); 4 = Accommodation is provided free.

*Home ownership (tenure status) [pooled data]:* 1 = outright owner (including owner paying mortgage); 2 = tenant or subtenant paying rent at prevailing or market rate, or accommodation is rented at a reduced rate (lower price than the market price); 3 = Accommodation is provided free.

*Settlement type [Roma sample]:* 1 = at the edge of village; 2 = at the edge of town/city; 3 = inside village; 4 = inside town/city; 5 = segregated settlement outside a village; 6 = segregated settlement outside a town/city; 7 = dispersed among majority population.

*Degree of urbanisation [non-Roma sample]:* 1 = cities (densely populated areas); 2 = towns and suburbs (intermediate density areas); 3 = rural areas (thinly populated areas).

## Appendix B. Regression models

**Table A1.** Correlation matrix and regression of the four individual satisfaction domains against overall life satisfaction (non-Roma sample)

	Overall	Financial	Job	Time	Beta	$s_r^2$
	(1)	(2)	(3)	(4)	(5)	(6)
Financial	0.649				0.397 (0.010)	0.118
Job	0.560	0.589			0.163 (0.010)	0.018
Time	0.405	0.390	0.421		0.061 (0.009)	0.004
Relationship	0.489	0.335	0.395	0.366	0.266 (0.010)	0.049
$R^2$						0.531
Total explained unique variance						0.188
Total explained shared variance						0.343

Notes: Columns (1) – (4) reports correlation coefficients, column (5) reports regression coefficients of a satisfaction domain against overall life satisfaction. The  $s_r^2$  statistic (column 6) represents the proportion of unique variance contributed by each domain.

**Table A2.** Correlation matrix and regression of the four individual satisfaction domains against overall life satisfaction (Roma sample)

	Overall	Financial	Job	Time	Beta	$s_r^2$
	(1)	(2)	(3)	(4)	(5)	(6)
Financial	0.662				0.494 (0.044)	0.156
Job	0.535	0.512			0.210 (0.045)	0.027
Time	0.451	0.457	0.483		0.074 (0.042)	0.004
Relationship	0.383	0.288	0.328	0.384	0.182 (0.047)	0.018
$R^2$						0.518
Total explained unique variance						0.204
Total explained shared variance						0.313

Notes: Columns (1) – (4) reports correlation coefficients, column (5) reports regression coefficients of a satisfaction domain against overall life satisfaction. The  $s_r^2$  statistic (column 6) represents the proportion of unique variance contributed by each domain.

**Table A3. Regression results: Income (Roma sample)**

	<i>Dependent:</i>		
	<i>Satisfaction (4 items)</i>	<i>Satisfaction (3 items)</i>	<i>EWB</i>
Intercept	52.117 (0.743)***	52.066 (0.743)***	65.036 (0.730)***
Income	2.686 (0.205)***	2.620 (0.206)***	0.683 (0.215)**
N	2,597	2,597	2,592
Adjusted R <sup>2</sup>	0.055	0.052	0.004

Notes: The table reports regression coefficients, robust SE in parentheses. Satisfaction (4 items) represents well-being scores including the following dimensions: satisfaction with financial situation; satisfaction with personal relationships; satisfaction with time use; and satisfaction with job. Satisfaction (3 items) excludes the satisfaction with job dimension. EWB score is based on the following items: feeling very nervous; down in the dumps; calm and peaceful; downhearted or depressed; happy.

\*\*\* denotes  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , and  $\cdot$   $p < 0.10$

**Table A4. Regression results: Income (non-Roma sample)**

	<i>Dependent:</i>		
	<i>Satisfaction (4 items)</i>	<i>Satisfaction (3 items)</i>	<i>EWB</i>
Intercept	59.040 (0.548)***	59.070 (0.553)***	66.902 (0.502)***
Income	1.300 (0.063)***	1.273 (0.063)***	0.874 (0.056)***
N	13,007	12,999	12,774
Adjusted R <sup>2</sup>	0.050	0.048	0.027

Notes: The table reports regression coefficients, robust SE in parentheses. Satisfaction (4 items) represents well-being scores including the following dimensions: satisfaction with financial situation; satisfaction with personal relationships; satisfaction with time use; and satisfaction with job. Satisfaction (3 items) excludes the satisfaction with job dimension. EWB score is based on the following items: feeling very nervous; down in the dumps; calm and peaceful; downhearted or depressed; happy.

\*\*\* denotes  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , and  $\cdot$   $p < 0.10$

**Table A5.** Regression results: Controlling for ethnicity-specific variables (Roma sample)

	<i>Dependent:</i>		
	<i>Satisfaction (4 items)</i>	<i>Satisfaction (3 items)</i>	<i>EWB</i>
Intercept	81.306 (3.496)***	79.499 (3.509)***	92.128 (3.314)***
Income	1.216 (0.269)***	1.253 (0.270)***	-0.183 (0.264)
Age	-0.816 (0.147)***	-0.816 (0.148)***	-0.913 (0.165)***
Age <sup>2</sup>	0.009 (0.002)***	0.009 (0.002)***	0.010 (0.002)***
Gender = Female	-1.888 (1.116) *	-1.855 (1.120) *	-1.051 (0.766)
Education: Primary I	0.132 (0.949)	0.616 (0.946)	-2.037 (1.021) *
Higher	-3.443 (0.967)***	-3.524 (0.968)***	2.025 (1.061) *
Home ownership: Tenant	-1.938 (1.034) *	-1.964 (1.038) *	-1.568 (0.916) *
Free	-0.363 (0.350)	-0.310 (0.347)	-2.141 (1.056) *
Number of rooms	2.711 (0.963)**	2.928 (0.963)**	0.723 (0.359) *
Make ends meet: 2	8.279 (1.053)***	8.441 (1.052)***	1.747 (0.923) *
3	12.164 (1.495)***	12.013 (1.511)***	4.887 (1.049)***
4	14.966 (2.480)***	14.972 (2.525)***	8.759 (1.366)***
5	5.378 (4.570)	5.154 (4.570)	2.528 (2.102)
6	-5.071 (1.566)**	-5.067 (1.571)**	2.213 (5.878)
Settlement type: 2	-8.831 (1.384)***	-8.675 (1.394)***	-2.232 (1.462)
3	0.485 (1.278)	0.124 (1.290)	-2.267 (1.468)
4	-7.383 (1.052)***	-7.557 (1.055)***	2.262 (1.327) *
5	-3.538 (1.291)**	-3.904 (1.296)**	-2.050 (1.008) *
6	2.934 (1.357) *	2.972 (1.334) *	-1.207 (1.248)
7	-4.172 (0.827)***	-4.078 (0.827)***	2.049 (1.432)
Deprived HH = YES	-2.892 (0.933)**	-2.973 (0.941)**	-4.039 (0.821)***
Health problems = YES	-3.453 (1.166)**	-1.703 (1.179)	-8.917 (1.003)***
Activity: Unemployed	-2.234 (2.602)	-0.191 (2.623)	-2.251 (1.082) *
In retirement	-2.328 (1.190) *	-0.600 (1.205)	-4.134 (2.926)
Other inactive	-0.644 (0.426)	-0.607 (0.427)	-1.373 (1.160)
Humber of adults	0.032 (0.192)	0.016 (0.192)	-0.496 (0.399)
Number of children	-0.886 (0.752)	-0.996 (0.753)	-0.142 (0.196)
N	2,472	2,472	2,469
Adjusted R <sup>2</sup>	0.203	0.199	0.157

Notes: The table reports regression coefficients, robust SE in parentheses. Satisfaction (4 items) represents well-being scores including the following dimensions: satisfaction with financial situation; satisfaction with personal relationships; satisfaction with time use; and satisfaction with job. Satisfaction (3 items) excludes the satisfaction with job dimension. EWB score is based on the following items: feeling very nervous; down in the dumps; calm and peaceful; downhearted or depressed; happy. Categories of 'ability to make ends meet' variable: 1 = with great difficulties; 2 = with difficulties; 3 = with some difficulties; 4 = fairly easily; 5 = easily; 6 = very easily. Categories of 'settlement type' variable: 1 = at the edge of village; 2 = at the edge of town/city; 3 = inside village; 4 = inside town/city; 5 = segregated settlement outside a village; 6 = segregated settlement outside a town/city; 7 = dispersed among majority population. Reference categories for dummy variables: Education: two stages of primary school; Home ownership: owner; Ability to make ends meet: 1 = with great difficulties; Settlement type: 1 = at the edge of village; Activity: Employed.

\*\*\* denotes  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , and •  $p < 0.10$

**Table A6.** Regression results: Controlling for ethnicity-specific variables (non-Roma sample)

	<i>Dependent:</i>		
	<i>Satisfaction (4 items)</i>	<i>Satisfaction (3 items)</i>	<i>EWB</i>
Intercept	66.257 (1.864)***	66.909 (1.852)***	75.038 (1.796)***
Income	0.426 (0.077)***	0.414 (0.078)***	0.173 (0.067)*
Age	-0.422 (0.063)***	-0.459 (0.063)***	-0.412 (0.061)***
Age <sup>2</sup>	0.004 (0.001)***	0.004 (0.001)***	0.003 (0.001)***
Gender = Female	-1.032 (0.639)	-0.641 (0.640)	-0.022 (0.321)
Education: Vocational	0.616 (0.611)	0.633 (0.612)	-0.314 (0.633)
Secondary	2.519 (0.689)***	1.837 (0.689)**	0.656 (0.584)
Tertiary	0.837 (0.521)	0.601 (0.527)	1.502 (0.640)*
Home ownership: Mortgage	-0.152 (0.708)	-0.401 (0.713)	0.900 (0.463)*
Tenant	1.123 (1.595)	1.527 (1.571)	1.520 (0.681)*
Free	0.240 (0.154)	0.251 (0.154)	-2.891 (1.590)*
Number of rooms	5.493 (0.891)***	5.300 (0.893)***	0.327 (0.135)*
Make ends meet: 2	9.813 (0.855)***	9.659 (0.852)***	4.917 (0.893)***
3	15.288 (0.899)***	15.336 (0.899)***	8.600 (0.843)***
4	17.432 (1.113)***	17.188 (1.119)***	10.231 (0.875)***
5	22.250 (2.023)***	22.072 (1.998)***	12.090 (1.041)***
6	-0.030 (0.471)	-0.003 (0.474)	8.495 (2.239)***
Urbanisation: Intermediate	0.399 (0.498)	0.503 (0.500)	0.630 (0.438)
Thinly populated	-6.790 (0.906)***	-7.060 (0.909)***	0.593 (0.459)
Deprived HH = YES	-4.129 (0.437)***	-4.043 (0.432)***	-4.533 (0.867)***
Health problems = YES	-2.466 (0.909)**	-2.327 (0.909)*	-6.709 (0.436)***
Activity: Unemployed	6.563 (0.679)***	6.858 (0.679)***	-5.699 (1.002)***
In retirement	1.147 (0.673)*	1.178 (0.670)*	3.308 (0.668)***
Other inactive	-0.322 (0.216)	-0.239 (0.217)	-1.366 (0.638)*
Humber of adults	-0.148 (0.205)	-0.256 (0.206)	0.120 (0.169)
Number of children	-0.460 (0.348)	0.004 (0.349)	0.145 (0.189)
N	12,815	12,807	12,591
Adjusted R <sup>2</sup>	0.196	0.193	0.160

Notes: The table reports regression coefficients, robust SE in parentheses. Satisfaction (4 items) represents well-being scores including the following dimensions: satisfaction with financial situation; satisfaction with personal relationships; satisfaction with time use; and satisfaction with job. Satisfaction (3 items) excludes the satisfaction with job dimension. EWB score is based on the following items: feeling very nervous; down in the dumps; calm and peaceful; downhearted or depressed; happy. Categories of 'ability to make ends meet' variable: 1 = with great difficulties; 2 = with difficulties; 3 = with some difficulties; 4 = fairly easily; 5 = easily; 6 = very easily. Categories of 'degree of urbanisation' variable: 1 = cities (densely populated areas); 2 = towns and suburbs (intermediate density areas); 3 = rural areas (thinly populated areas). Reference categories for dummy variables: Education: Primary education (stage 2); Home ownership: owner; Ability to make ends meet: 1 = with great difficulties; Degree of urbanisation: 1 = Cities (densely populated areas); Activity: Employed.

\*\*\* denotes  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , and ·  $p < 0.10$

**Table A7.** Regression results: Controlling for the same set of variables (Roma sample)

	<i>Dependent:</i>		
	<i>Satisfaction (4 items)</i>	<i>Satisfaction (3 items)</i>	<i>EWB</i>
Intercept	76.954 (3.439)***	75.136 (3.455)***	90.997 (3.259)***
Income	1.260 (0.264)***	1.304 (0.265)***	-0.170 (0.259)
Age	-0.783 (0.149)***	-0.784 (0.149)***	-0.896 (0.165)***
Age <sup>2</sup>	0.008 (0.002)***	0.008 (0.002)***	0.009 (0.002)***
Gender = Female	-1.182 (1.090)	-1.156 (1.093)	-1.084 (0.768)
Education: Primary I	-0.167 (0.982)	0.289 (0.982)	-1.779 (1.000)*
Secondary	6.033 (5.165)	7.814 (5.026)	1.942 (1.059)*
Higher	-3.383 (0.888)***	-3.555 (0.888)***	2.351 (8.843)
Home ownership: Tenant	-1.741 (0.973) *	-1.831 (0.978) *	-1.507 (0.849)*
Free	0.210 (0.358)	0.259 (0.357)	-2.080 (1.005)*
Number of rooms	2.908 (0.979)**	3.109 (0.979)**	0.946 (0.359)**
Make ends meet: 2	8.126 (1.038)***	8.251 (1.037)***	1.794 (0.925)*
3	12.745 (1.541)***	12.575 (1.558)***	4.778 (1.036)***
4	13.598 (2.693)***	13.522 (2.720)***	8.907 (1.358)***
5	5.390 (4.859)	5.163 (4.836)	2.132 (2.053)
6	-4.586 (0.813)***	-4.514 (0.812)***	1.883 (5.714)
Deprived HH = YES	-2.826 (0.946)**	-2.901 (0.953)**	-4.199 (0.807)***
Health problems = YES	-3.926 (1.183)***	-2.186 (1.193) *	-8.952 (1.000)***
Activity: Unemployed	-2.508 (2.637)	-0.477 (2.655)	-2.438 (1.086)*
In retirement	-2.527 (1.207)*	-0.801 (1.219)	-4.112 (2.912)
Other inactive	-0.582 (0.444)	-0.537 (0.445)	-1.452 (1.167)
Humber of adults	-0.094 (0.193)	-0.115 (0.194)	-0.473 (0.399)
Number of children	-0.971 (0.764)	-1.084 (0.766)	-0.199 (0.194)
N	2,472	2,472	2,469
Adjusted R <sup>2</sup>	0.168	0.164	0.151

Notes: The table reports regression coefficients, robust SE in parentheses. Satisfaction (4 items) represents well-being scores including the following dimensions: satisfaction with financial situation; satisfaction with personal relationships; satisfaction with time use; and satisfaction with job. Satisfaction (3 items) excludes the satisfaction with job dimension. EWB score is based on the following items: feeling very nervous; down in the dumps; calm and peaceful; downhearted or depressed; happy. Categories of 'ability to make ends meet' variable: 1 = with great difficulties; 2 = with difficulties; 3 = with some difficulties; 4 = fairly easily; 5 = easily; 6 = very easily. Reference categories for dummy variables: Education: Stage two of primary education; Home ownership: owner; Ability to make ends meet: 1 = with great difficulties; Activity: Employed.

\*\*\* denotes  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , and \*  $p < 0.10$

**Table A8.** Regression results: Controlling for the same set of variables (non-Roma sample)

	<i>Dependent:</i>		
	<i>Satisfaction (4 items)</i>	<i>Satisfaction (3 items)</i>	<i>EWB</i>
Intercept	67.140 (1.798)***	67.632 (1.786)***	76.093 (1.746)***
Income	0.441 (0.076)***	0.420 (0.077)***	0.176 (0.066)**
Age	-0.434 (0.063)***	-0.466 (0.062)***	-0.418 (0.061)***
Age <sup>2</sup>	0.004 (0.001)***	0.004 (0.001)***	0.003 (0.001)***
Gender = Female	-6.638 (3.274)*	-6.537 (3.275)*	0.018 (0.320)
Education: Primary I	-0.394 (0.574)	-0.231 (0.575)	-4.381 (2.888)
Secondary	2.106 (0.665)**	1.424 (0.666)*	0.055 (0.570)
Higher	-0.444 (0.699)	-0.645 (0.705)	1.200 (0.630)*
Home ownership: Tenant	1.275 (1.602)	1.727 (1.581)	1.287 (0.670)*
Free	0.294 (0.145)*	0.313 (0.145)*	-2.832 (1.632)*
Number of rooms	5.545 (0.894)***	5.357 (0.896)***	0.365 (0.129)**
Make ends meet: 2	9.968 (0.858)***	9.792 (0.855)***	4.972 (0.897)***
3	15.490 (0.902)***	15.503 (0.901)***	8.734 (0.845)***
4	17.588 (1.110)***	17.325 (1.116)***	10.354 (0.878)***
5	22.439 (2.031)***	22.216 (1.999)***	12.139 (1.040)***
6	-6.766 (0.910)***	-7.019 (0.913)***	8.593 (2.238)***
Deprived HH = YES	-4.137 (0.436)***	-4.042 (0.432)***	-4.513 (0.867)***
Health problems = YES	-2.546 (0.910)**	-2.382 (0.909)**	-6.700 (0.435)***
Activity: Unemployed	6.514 (0.677)***	6.811 (0.677)***	-5.770 (1.005)***
In retirement	1.004 (0.668)	1.079 (0.666)	3.243 (0.667)***
Other inactive	-0.397 (0.213)*	-0.285 (0.214)	-1.484 (0.638)*
Humber of adults	-0.109 (0.202)	-0.236 (0.204)	0.063 (0.166)
Number of children	-0.402 (0.346)	0.042 (0.347)	0.190 (0.189)
N	12,815	12,807	12,591
Adjusted R <sup>2</sup>	0.196	0.193	0.159

Notes: The table reports regression coefficients, robust SE in parentheses. Satisfaction (4 items) represents well-being scores including the following dimensions: satisfaction with financial situation; satisfaction with personal relationships; satisfaction with time use; and satisfaction with job. Satisfaction (3 items) excludes the satisfaction with job dimension. EWB score is based on the following items: feeling very nervous; down in the dumps; calm and peaceful; downhearted or depressed; happy. Categories of 'ability to make ends meet' variable: 1 = with great difficulties; 2 = with difficulties; 3 = with some difficulties; 4 = fairly easily; 5 = easily; 6 = very easily. Reference categories for dummy variables: Education: Stage two of primary education; Home ownership: owner; Ability to make ends meet: 1 = with great difficulties; Activity: Employed.

\*\*\* denotes  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , and \*  $p < 0.10$