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ORIGINAL RESEARCH

Real Assets and Subjective Well-Being: Using a Novel Measure for Relative Effects

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Abstract
This paper examines the relationship between household real assets and life satisfaction in Slovakia, using microdata from the 2017 wave of the Household Finance and Consumption Survey (HFCS). We find a robust positive association between the value of real assets and life satisfaction. To assess whether this relationship is driven by relative, rather than purely absolute, effects, we make use of a unique feature of the Slovak HFCS: interviewer paradata. Specifically, we use interviewers' assessments of the respondent's dwelling quality relative to that of nearby homes. These paradata provide a new locally grounded reference point for evaluating positional effects – arguably with greater validity than conventional approaches based on arbitrarily defined comparison groups. We show that real assets function as positional goods, with downward comparisons exerting a stronger influence on well-being than upward ones. We estimate that approximately 7% of the total relationship between real assets and life satisfaction can be attributed to relative concerns.

Keywords Subjective well-being · Life satisfaction · Relative effects; Real assets · Housing wealth · Neighbourhoods · Survey data · Paradata

JEL Classification I30 · D60 · G51 · C26

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"A house may be large or small; as long as the neighbouring houses are likewise small, it satisfies all social requirement for a residence. But let there arise next to the little house a palace, and the little house shrinks to a hut."

Karl Marx (1847)

1 Introduction

Across economics, sociology and psychology, there is a widely held assumption that a higher income increases individuals' ability to satisfy their needs and aspirations, thereby improving their well-being. Based on this premise, numerous studies have investigated the relationship between income and subjective well-being. Subjective well-being typically describes how people experience the quality of their lives, encompassing both emotional reactions and cognitive judgments (Diener, 1984). One of the most commonly used measures of subjective well-being is life satisfaction.[1] A substantial body of research has demonstrated that life satisfaction tends to increase with income, whether measured at the individual or household level although the gains tend to diminish at higher levels of income (Clark, 2018).

However, income is not the only monetary dimension that likely influences well-being; wealth, including housing and other real assets, must also be considered (D'Ambrosio et al., 2020). While income measures an individual's capacity to consume within a specific period, wealth fulfils multiple functions: it generates income, provides economic security, and enables individuals to smooth consumption over their lifetime, with important consequences for economic and social behaviours at the individual level (Dietz & Haurin, 2003). Crucially, unlike earnings or income, housing and other real assets are visible and can easily be evaluated by peers, thus serving as direct sources of comparison and aspiration, potentially affecting individuals' life satisfaction.

Studies have shown a positive association between life satisfaction and household net wealth (Headey & Wooden, 2004). Wealth encompasses multiple dimensions – including real estate, financial assets, and business assets – which may each relate differently to well-being. The literature examining homeownership and life satisfaction generally finds that homeowners report higher life satisfaction compared to non-homeowners (e.g., Cheng et al., 2020; Gignac et al., 2024; Hu, 2013; Stotz, 2019; Zheng et al., 2020; Zumbro, 2014). Additionally, both ownership status and dwelling size appear to affect satisfaction levels. For instance, Bellet (2024) demonstrates a positive link between house size and housing satisfaction. Regarding financial assets, Brown and Gray (2016) and D'Ambrosio et al. (2009) report positive correlations between financial assets and life satisfaction.[2] D'Ambrosio et al. (2020) further indicate that net real estate wealth and business assets are positively asso-

[1] Life satisfaction, like the Cantril ladder, belongs to the category of cognitive (or evaluative) measures of subjective well-being. Cognitive here refers to the idea that such measures require individuals to assess their overall life or specific life domains.

[2] Previous studies investigating the relationship between happiness and financial assets suggest that this association depends on the asset's risk profile (e.g., Chen et al., 2020; Guven, 2009; Rao et al., 2016). For instance, Chen et al. (2020) find a positive effect of investing in risk-free assets and a negative effect of holding risky assets. Similarly, Rao et al. (2016) confirm a positive effect of risk-free assets (such as savings) on happiness, but they also identify a positive impact from owning risky assets (such as stocks).

ciated with life satisfaction, whereas credit debt has a negative impact. This aligns with findings by Brown et al. (2005), who report that unsecured debt, as opposed to secured debt, reduces psychological well-being. Similarly, Keese and Schmitz (2014) show that household debt negatively affects mental well-being, particularly when individuals explicitly recognise or label it as debt, thereby heightening its psychological impact (Greenberg & Mogilner, 2021).

A substantial body of literature also highlights that subjective well-being is affected by relative concerns and depends on comparisons with peers. These comparisons can have two distinct effects. On the one hand, numerous studies have documented negative *comparison* effects, whereby individual well-being decreases as outcomes (such as earnings or wealth) of the reference group improve. This phenomenon has been consistently observed across survey data (e.g., Brodeur & Flèche, 2019; Clark & Oswald, 1996; Clark et al., 2009; Ifcher et al., 2018; Luttmer, 2005; Neman, 2020; Shields et al., 2009), and experimental settings (e.g., Card et al., 2012; Ifcher et al., 2020). On the other hand, an *information* (or 'tunnel') effect may occur: observing peers with better outcomes can be interpreted positively as a signal of one's own potential future improvements, thus increasing current subjective well-being.[3]

But what about relative effects of wealth specifically? Using Australian data, Brown and Gray (2016) find that relative wealth indeed matters; however, the information effect generally dominates the comparison effect, meaning an individual's subjective well-being is positively influenced by others' wealth. This implies that individuals interpret the increased wealth of their comparison group primarily as a sign of promising future opportunities rather than as a source of positional disadvantage. D'Ambrosio et al. (2020) reach similar conclusions with German data. Conversely, Bellet (2024), using data from the United States, finds the opposite: comparison effects dominate, and an individual's housing satisfaction declines as neighbours' house sizes increase.

In this paper, we use microdata from the 2017 Slovak wave of the Household Finance and Consumption Survey (HFCS) to explore the relationship between the value of real assets and life satisfaction, examining specifically the extent to which relative considerations shape this relationship. Although the literature examining subjective well-being in relation to absolute and relative wealth is growing, our study makes a number of contributions. First, comparison effects have traditionally been captured by computing the mean or median within arbitrarily defined reference groups, usually selected based on similarity criteria such as age, educational attainment or region of residence. However, a recent study by Kudrna (2024) points out that the choice of reference group can dramatically influence conclusions regarding relative effects. Our paper addresses this issue by using a source of data often overlooked: the interviewer paradata. Specifically, we use the interviewers' assessments of respondents' dwelling quality relative to their immediate neighbours. By employing interviewer paradata, we arguably obtain a more valid and locally relevant evaluation of respondents' relative dwelling quality compared to conventional approaches. Second, the number of studies focusing on Central and Eastern European countries remains relatively limited. Yet this region is particularly relevant given its distinctive post-socialist legacies. In the region, real assets play a disproportionately significant role in household wealth due to large-scale privatisation, underdeveloped financial markets and limited portfolio diversification. Consequently, the absolute and relative effects of asset ownership on

[3] See Senik (2004) for an empirical illustration using Russian survey data and income.

life satisfaction may differ systematically from those observed in Western Europe. Thus, providing additional evidence from Central and Eastern Europe is essential to test the external validity and generalisability of hypotheses regarding absolute and relative wealth effects on life satisfaction.[4]

Our findings are as follows. First, we report a positive association between the value of real assets and life satisfaction. This association remains robust across a battery of robustness checks and is larger than the correlation between life satisfaction and either financial assets or household income. This result is consistent with the fact that real assets in Slovakia largely consist of housing, accounting for more than 90% of total household wealth on average. Around 90% of Slovak households own their dwellings, and the share of renters in Slovakia is significantly lower than in Western European countries such as Germany (Bover et al., 2016; Mathä et al., 2017). The significance of homeownership in Slovakia has deep historical roots: during socialism, the government of former Czechoslovakia actively encouraged homeownership among the population. This (cultural) emphasis on homeownership persisted after the fall of socialism, with Slovaks continuing to invest more heavily in housing and other real assets rather than financial assets such as shares or bonds. Beyond the fact that real assets are positively correlated with life satisfaction in Slovakia, the very nature of these assets may amplify comparison effects, as real assets (such as housing and real estate) are easily observable and accurately assessed by peers. Using interviewer paradata as an externally assessed and locally relevant measure of dwelling quality relative to neighbours, we find that living in a dwelling rated worse than the neighbourhood average significantly predicts lower life satisfaction. However, relative effects appear asymmetric: occupying a dwelling rated better than average does not correlate significantly with increased life satisfaction. Finally, we estimate that relative effects explain approximately 7% of the observed relationship between real assets and life satisfaction.

The remainder of the paper is structured as follows. Section 2 describes the conceptual framework and the empirical challenges. The data, variables and empirical strategy are described in detail in Sect. 3. Section 4 presents the estimated baseline results along with several robustness checks. Finally, Sect. 5 concludes and discusses the implications of the findings, limitations and directions for future research.

2 Conceptual Framework and Empirical Challenges

Our analysis builds upon the relative pay model of Card et al. (2012), but instead of focusing on wages, we consider individuals' real assets. Specifically, suppose each individual i holds a level of assets a_i and compares themselves to a reference level m. Unlike the typical labour-market context where information on co-workers' wages may be imperfect, we assume individuals observe m perfectly. This assumption is defensible in certain contexts where assets (such as residential property) are highly visible, making relative comparisons particularly salient.

[4] There is only a handful of studies analysing general determinants of life satisfaction in Central and Eastern Europe concerned with direct and relative income effects (see, e.g., Hayo and Seifert, 2003; Senik, 2008; Želinský, 2021); no study, however, addresses the asset-happiness relationship with the recent exemption of Banerjee and Tóth (2025).

Following Card et al. (2012), individual well-being (or satisfaction) S_i is the sum of the utility from absolute asset holdings and the effect of the individual's position relative to m. Formally, we write

$$S_i = u(a_i) + \alpha 1\{a_i > m\} + \beta 1\{a_i < m\} + e_i, \tag{1}$$

where $u(\cdot)$ captures utility from absolute assets, $1\{\cdot\}$ denotes an indicator function, and e_i represents unobserved factors. This specification allows for the possibility that being above the reference level m confers an effect (α) different from that of being below (β), and we remain agnostic about the sign and magnitude of these parameters. We also simplify by assuming that status enters solely through an indicator function rather than through the distance $a_i - m$. Although one could include the magnitude of the gap in the model, our empirical results (detailed in Sect. 4) indicate that the precise distance to the reference m does not significantly affect subjective well-being beyond the basic distinction of being above or below m. Consequently, focusing on these indicators does not diminish the validity of our conclusions regarding how relative position influences satisfaction.[5]

However, researchers do not directly observe m and must rely on an approximation $\widehat{m}$ in practice. This approximation may be derived from external datasets, broad neighbourhood averages, or survey questions that imperfectly reflect the individual's true reference group. Instead of using the correct indicator functions $1\{a_i > m\}$ and $1\{a_i < m\}$, an empirical analysis often substitutes $1\{a_i > \widehat{m}\}$ and $1\{a_i < \widehat{m}\}$ into a regression model such as

$$S_i = \gamma_0 + \gamma_1 a_i + \gamma_2 1\{a_i > \widehat{m}\} + \gamma_3 1\{a_i < \widehat{m}\} + \varepsilon_i. \tag{2}$$

When $\widehat{m}$ differs from m, any individual truly above m can be mistakenly classified as below it, and vice versa. This misclassification arises from treating $\widehat{m}$ as though it were the genuine threshold. If $\widehat{m}$ is randomly higher or lower than m, the resulting noise in the dummy variables tends to bias the estimated coefficients toward zero, weakening the role of relative asset position. However, if $\widehat{m}$ is systematically biased, the direction and magnitude of the bias in the estimated effects can become larger or even reversed.

One solution is to gather higher-quality data on the reference group itself, ensuring that any aggregate statistics (such as a median or mean) accurately capture individuals' actual comparisons. Another approach entails using instrumental variables that help isolate errors in m and improve the reliability of the threshold estimate, although these solutions are often exceedingly difficult to implement in practice. In this paper, we adopt a more direct and new solution by leveraging a unique data source – the *interviewer paradata* – which is usually not accessible by researchers during the data acquisition process. Specifically, in the dataset used here, interviewers assess each respondent's dwelling quality relative to that of the surrounding residences, generating an external observation of whether a_i is effectively above or below m. Such paradata reduce the risk of self-reporting biases, provide an externally

[5] Hence, this indicator-based formulation implies a particularly simple derivative with respect to a_i. For any $a_i \neq m$, the marginal effect of changes in a_i on S_i is given by $u'(a_i)$, because $1\{a_i > m\}$ and $1\{a_i < m\}$ remain constant for small changes in a_i within their respective domains. At $a_i = m$, the derivative is not defined in the usual sense because there is a discrete jump in satisfaction from crossing the threshold. In other words, our model posits that the marginal benefit of accumulating additional assets does not depend on how far above or below m one lies, only on whether one is above or below that threshold at all.

assessed and locally relevant view of the housing standard, and thus help pinpoint which individuals lie above $(a_i > m)$ or below $(a_i < m)$ the relevant threshold.

3 Data and Empirical Strategy

3.1 Household Finance and Consumption Survey

Our data come from the 2017 wave of the Household Finance and Consumption Survey (HFCS), conducted in the spring of that year by the National Bank of Slovakia in cooperation with the Slovak Statistical Office.[6] The HFCS is a nationally representative survey of households and individuals that collects detailed information on household assets, liabilities, incomes, consumption, and a wide range of demographic characteristics. While the survey was fielded in 2010, 2014, and 2017, only the 2017 wave includes data on respondents' self-assessed life satisfaction and other key variables necessary for our analysis.

Life satisfaction (LS) – a widely used measure of self-assessed subjective well-being (SWB) (Clark, 2016) – is captured by the question: *"On a scale from 0 to 10, how satisfied are you overall with your life?"* Each reference person in the household was asked to respond using an 11-point scale, where '0' indicates complete dissatisfaction and '10' indicates complete satisfaction. Similar life satisfaction questions are used in numerous other surveys (e.g., the British Household Panel Survey, the German Socio-Economic Panel, the World Values Survey), and are widely considered valid and reliable indicators of evaluative well-being (see, e.g., Clark, 2018).

The HFCS also provides detailed household-level information on income and wealth, including real assets (such as housing, other real estate assets, cars, valuables, and businesses), financial asset holdings, and both mortgage and non-mortgage debt. Dwelling characteristics are also recorded, including the type of dwelling (detached house, semi-detached house, or flat/apartment), the degree of urbanisation of the location (big city, town or suburban municipality, and rural village), and region of residence (Bratislava, Trnava, Trenčín, Nitra, Žilina, Banská Bystrica, Prešov, and Košice). In addition, the survey collects standard socio-economic and demographic information such as age, gender, education, marital status.

Crucially, the National Bank of Slovakia and the Slovak Statistical Office granted us access to the paradata (or metadata) collected during the Slovak HFCS. "Paradata" refers to auxiliary information on the survey process itself. In our case, this corresponds to a post interview questionnaire completed by HFCS interviewers. These data include assessments of the respondent's engagement with the interview (e.g., confidence and interest levels), documentation used during the interview, and a visual evaluation of the respondent's living conditions. Of particular importance for our analysis is the question: *"What is the dwelling quality of the respondent household compared to the dwellings of neighbours? 1: Worse; 2: About the same; 3: Better."* We use this variable to estimate the magnitude of the relative effect of real assets on life satisfaction.[7] In addition to these dwelling assessments, the paradata include information about the interviewers themselves, such as their age, educa-

[6] The HFCS is part of a broader European project coordinated by the European Central Bank (ECB): https://www.ecb.europa.eu/stats/ecb_surveys/hfcs/html/index.en.html.

[7] The use of interviewer ratings is supported by earlier research. For example, Patacchini and Venanzoni (2014) employed a similar set of interviewer observations to examine students' demand for housing quality.

tion, and years of experience. All interviewers received intensive training in HFCS data collection procedures and were instructed to adhere strictly to ECB guidelines. Given their experience and training, we assume that the interviewer ratings represent professional and unbiased judgments applied in a consistent manner.[8] Nevertheless, in our analysis, we document how these ratings relate to real asset values and we control for interviewer-level characteristics to ensure that our main findings are not driven by observed or time-invariant differences across interviewers.

As shown in Table 6 in the Appendix, the average interviewer had 18.39 years of experience, although this figure masks considerable heterogeneity (see Appendix Fig. 5).

3.2 Empirical Strategy and Estimation Sample

Our empirical analysis aims to estimate the relationship between the value of real assets and life satisfaction, and to assess the extent to which this relationship reflects relative, as opposed to purely absolute, considerations. To do so, we adopt a stepwise approach and we begin by estimating a baseline Ordinary Least Squares (OLS) regressions of the following form:

$$LS_i = \alpha + \beta_1 RA_i + \boldsymbol{X_i'}\boldsymbol{\gamma} + \varepsilon_i, \tag{3}$$

where LS_i denotes the life satisfaction of respondent i, measured on an 11-point scale from 0 to 10. RA_i is the value of real assets held by the household, transformed using the inverse hyperbolic sine (IHS) to account for negative values and skewness. $\boldsymbol{X_i}$ is a vector of control variables, including financial assets, debts, age, gender, education, household income, employment status, household composition, region fixed effects, dwelling type, and degree of urbanisation, and ε_i is the error term. This baseline model allows us to quantify the correlation between absolute real asset holdings and life satisfaction.

Next, we examine the potential role of relative real asset comparisons by incorporating interviewer ratings of dwelling quality. These ratings serve as a proxy for respondents' relative standing in their immediate local environment, capturing whether their dwelling is judged by the interviewer to be of 'better', 'worse', or 'about the same' quality as neighbouring dwellings. We include these ratings in the regression model as categorical variables, with 'about the same' as the reference category. This enables us to estimate the differential association of relative status – controlling for absolute asset holdings – with life satisfaction:

$$LS_i = \alpha + \beta_1 RA_i + \beta_2 Worse_i + \beta_3 Better_i + \boldsymbol{X_i'}\boldsymbol{\gamma} + \varepsilon_i. \tag{4}$$

To explore potential asymmetries in the effects of upward versus downward comparisons, we interpret the coefficients β_2 and β_3 separately. In further specifications, we also include interviewer-level controls (age, experience, education) and interviewer fixed effects to account for potential systematic differences in assessment styles or local housing markets.

We estimate Eqs. 3 and 4 using a sample of 2,149 Slovak respondents from the 2017 wave of the HFCS for whom paradata is available. Descriptive statistics for our estimation sample are presented in Table 1. Reflecting the historical importance of real assets

[8] Albacete et al. (2021) show that survey data quality is often influenced by interviewer characteristics, including their level of experience.

Table 1 Descriptive statistics of the estimation sample

Variable	Mean	SD	Min	Max
Dependent variable				
Life satisfaction	6.71	1.98	0	10
Relative dwelling quality compared to neighbours				
Better	0.12		0	1
About the same	0.77		0	1
Worse	0.11		0	1
Wealth variables (in level)				
Net wealth	103,564.32	162,705.27	−56,274.00	3,746,623.25
Real assets	104,265.66	155,425.70	0	3,649,848.25
Financial assets	8,530.73	21,428.11	0	339,000.00
Mortgage debt	8,232.62	22,875.85	0	197,644.00
Non-mortgage debt	999.45	3,826.54	0	100,000.00
Wealth variables (in IHS)				
Net wealth (IHS)	11.06	3.57	−11.63	15.83
Real assets (IHS)	11.26	2.66	0	15.80
Financial assets (IHS)	7.59	3.16	0	13.43
Mortgage debt (IHS)	2.22	4.40	0	12.89
Non-mortgage debt (IHS)	1.75	3.44	0	12.21
Socio-demographics characteristics				
Household income	20,154.49	27,554.38	0	744,000.00
Household (IHS)	10.31	0.84	0	14.21
Age	54.23	14.80	20.00	96.00
University education	0.21		0	1
Employed	0.59		0	1
Male	0.66		0	1
Household size	2.83	1.43	1	12.00
Children in the household	0.40		0	1
Married	0.62		0	1
Dwelling characteristics				
Type of dwelling				
Individual house	0.56		0	1
Semi-detached house	0.02		0	1
Flat	0.42		0	1
Degree of urbanisation				
City	0.23		0	1
Suburban area	0.34		0	1
Rural area	0.43		0	1

These numbers refer to our estimation sample made of 2,149 Slovak respondents from the 2017 HFCS. Survey weights and multiply imputed data are used. Respondents are almost evenly distributed across the eight regions in Slovakia (Bratislava, Trnava, Trenčín, Nitra, Žilina, Banská Bystrica, Prešov, and Košice)

Source: HFCS 2017 – National Bank of Slovakia

in Slovakia, real assets represent over 90% of total gross wealth in the sample. The average life satisfaction score is 6.71, with a standard deviation of 1.98. According to Fig. 1, most life satisfaction responses fall between categories 5 and 8. Turning to the paradata, we

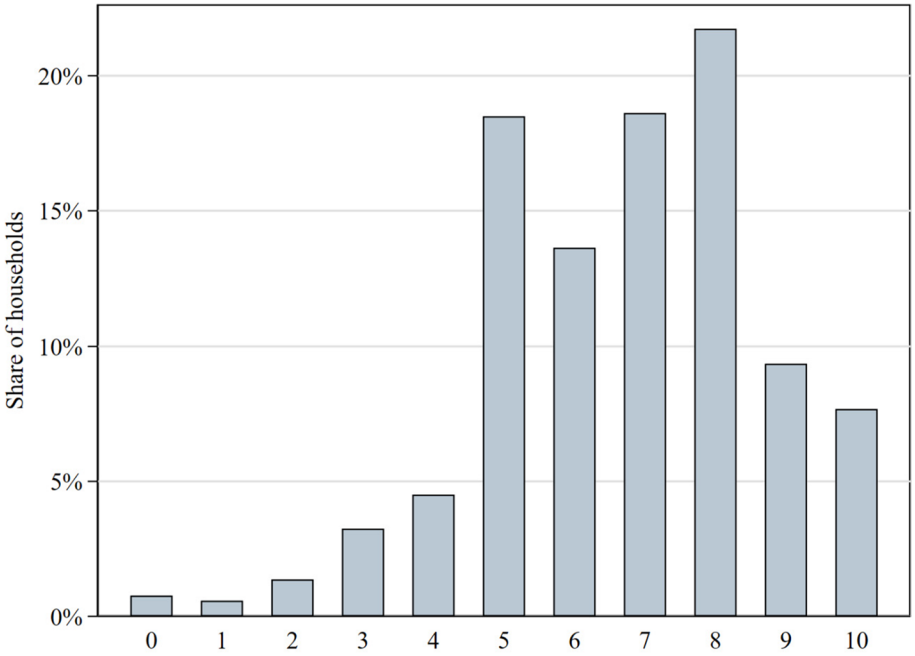

Fig. 1 Distribution of life satisfaction. Notes: These figures refer to our estimation sample made of 2,149 Slovak respondents from the 2017 HFCS. Survey weights and multiply imputed data are used. Source: HFCS 2017 – National Bank of Slovakia

observe that approximately three-quarters of dwellings are rated by interviewers as being of the 'same' quality as those of the respondents' neighbours, with the remainder split evenly between 'worse' and 'better'.

Our final remark on the data and econometric estimations is related to dealing with missing values for some of the variables due to item non-response (where respondents answered 'Don't know' or 'Refused to answer'). In the HFCS, the observations for which no valid response was obtained during the interview – mainly those relating to household assets, debts and income – were then multiply imputed during the data production stage.[9] The multiply imputed nature of the data allows to account for imputation uncertainty arising from item non-response, thus ensuring valid statistical inference for the entire population. Ignoring item non-response in econometric estimations might result in significant bias and a loss of efficiency. We follow the statistical procedure for obtaining unbiased point estimates (be it a simple mean or a regression coefficient) along with correct variance estimation outlined in Rubin (1987) and Little and Rubin (2002). In particular, we employ Stata's 'mi estimate' and 'mi beta' routines.

[9] Missing data in the HFCS are imputed by the Multiple Imputations by Chained Equations (MICE) technique. Further technical details on this aspect of the data and how to properly analyse such data could be found in ECB (2020).

4 Results

4.1 Baseline Results

Table 2 reports our baseline estimates. In specification (1), we estimate the bivariate association between net wealth (i.e., the sum of assets minus liabilities) after an IHS transformation and life satisfaction. Unsurprisingly, net wealth exhibits a positive and statistically significant estimate at the 1% level – a finding consistent with the existing literature (e.g., D'Ambrosio et al., 2020). In specification (2), we examine whether correlations between various components of net wealth and life satisfaction are also significantly different from zero. Both real and financial assets yield positive and significant estimates. Mortgage debt also shows a positive relationship, though at a considerably lower level of significance, while non-mortgage debts do not appear significantly associated with life satisfaction.

However, the coefficients presented above are likely confounded by omitted socio-demographic characteristics (such as age and income). To mitigate potential omitted-variable bias, we re-estimate specification (2) while controlling for an extensive set of observable characteristics. Results are presented in specification (3) of Table 2. Consistent with Gray (2014), mortgage and non-mortgage debts now attract negative coefficients, although these are not statistically significant at conventional levels. Introducing these controls reduces the estimate for financial assets, although it remains positive and statistically significant at the 1% level. Lastly, the correlation between real assets (expressed in IHS) and life satisfaction remains remarkably stable after the inclusion of controls. Additionally, our main control variables (e.g., age, income, and employment status) show correlations consistent with prior empirical research on socio-demographic determinants of life satisfaction (e.g., D'Ambrosio et al., 2020).

The estimate associated with real asset values in specification (3) likely confounds the effect of dwelling location: a neighbourhood of high quality is expected to simultaneously influence local housing market values and the life satisfaction of its residents. As we do not have precise information about the exact residential locations of HFCS respondents, we cannot perfectly control for the dwelling location effect. The best approach available is to control for regional fixed effects, dwelling type (independent house, semi-detached house, or flat), and the degree of urbanisation reported by HFCS respondents, which we do in specification (4). In line with our expectations, the estimated coefficient for real asset values is slightly smaller compared to that in specification (3).

Overall, the results presented in Table 2 suggest that real assets in Slovakia are strong predictors of life satisfaction. But is this the strongest predictor among wealth and income variables? Given that these variables have different distributions, it is more appropriate to consider beta-coefficients for comparison. We therefore use the standard deviations reported in Table 1 alongside the point estimates from Column (4) of Table 2. A one standard deviation increase in financial assets or gross income (both expressed in IHS) is associated with an increase in life satisfaction of approximately 0.27 and 0.22 points (calculated as 3.16×0.087 and 0.84×0.263, respectively). In comparison, a one standard deviation increase in real asset values (IHS) is associated with a 0.26-point increase in life satisfaction (2.66×0.096). The change in life satisfaction associated with real assets is therefore approximately 50% larger than the associations identified for income and similar to that for financial assets. This result indicates that real assets indeed are among the strongest predictor of life satisfaction

Table 2 Life satisfaction and real assets – OLS results

	Life satisfaction [0–10]			
	(1)	(2)	(3)	(4)
Net wealth (IHS)	0.111***			
	(0.023)			
Real assets (IHS)		0.118***	0.105***	0.096***
		(0.021)	(0.020)	(0.020)
Financial assets (IHS)		0.149***	0.094***	0.087***
		(0.019)	(0.020)	(0.019)
Mortgage debt (IHS)		0.024*	−0.015	−0.015
		(0.013)	(0.013)	(0.013)
Non-mortgage debt (IHS)		0.006	−0.008	−0.009
		(0.015)	(0.015)	(0.015)
Household income (IHS)			0.274***	0.263***
			(0.087)	(0.086)
Age			−0.129***	−0.127***
			(0.026)	(0.025)
Age squared			0.001***	0.001***
			(0.000)	(0.000)
University education			0.712***	0.651***
			(0.137)	(0.131)
Employed			0.409***	0.397***
			(0.152)	(0.149)
Male			−0.038	−0.029
			(0.133)	(0.131)
Household size			−0.177***	−0.184***
			(0.054)	(0.055)
Children in the household			0.349**	0.355**
			(0.158)	(0.157)
Married			0.481***	0.487***
			(0.145)	(0.139)
Semi-detached house				−0.339
				(0.393)
Flat				−0.228*
				(0.134)
Suburban area				−0.439***
				(0.169)
Rural area				−0.535***
				(0.179)
Constant	5.483***	4.186***	5.156***	6.005***
	(0.265)	(0.233)	(0.989)	(1.006)
Regional fixed effects	No	No	No	Yes
Adjusted R^2	0.042	0.125	0.189	0.205
Observations	2,149	2,149	2,149	2,149

These are linear regressions carried out using multiple-imputation techniques. Bootstrapped standard errors presented in parentheses are based on 1,000 replicate weights. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Source: HFCS 2017 – National Bank of Slovakia

among the income and wealth variables examined. However, is a 0.26-point change in life satisfaction large? According to Table 1, an increase of 0.26 points corresponds to roughly 13% of a standard deviation in life satisfaction – a substantial yet not implausibly high association.[10]

4.2 The Importance of the Relative Effect of Real Assets

4.2.1 The Risks of Arbitrarily Defined Reference Groups

Prior literature suggests that relative comparisons with neighbours, particularly concerning income or wages, significantly affect individual well-being (see, e.g., Luttmer, 2005; Noy & Sin, 2021). But do such comparisons also matter for real asset values? The standard approach in the literature involves researchers determining the most relevant reference group using sociodemographic characteristics, then comparing an individual's real asset value to the average or median of this group. However, this approach raises concerns. First, the choice of reference group is often arbitrary, and the observed effect of the relative measure may hinge critically on this choice. Second, because the relative measure itself is based on self-reported data, it can be affected by measurement error. If the error is non-random, it can substantially bias coefficient estimates. This concern is particularly relevant here, given that self-reported real asset values are often overstated (for instance, due to endowment effects – Waltl & Lepinteur, 2023).

To illustrate our argument, we employ a methodology inspired by specification curve analyses, reporting associations between life satisfaction and having real asset values at least 25% above or below the median using 32 distinct reference groups. Note that we use the median rather than the mean, as approximately 5% of respondents in our sample reported a real asset value of zero. Reference groups are defined based on three sets of criteria: geographical area (either same region × degree of urbanisation or region × degree of urbanisation × dwelling type), age range (5-year window, 10-year window, 20-year window, or no age window), and other sociodemographic variables (none, same gender, same education level, or same gender × same education level).

Specification curves for the coefficients associated with having real asset values at least 25% above and below the median across the 32 reference groups are presented in Panels A and B of Appendix Fig. 3, respectively. These estimates vary considerably, highlighting their sensitivity to how reference groups are defined. Three issues are particularly concerning. First, the sign of the coefficient changes depending on the specification. Second, there is no clear pattern consistently producing statistically significant estimates. Third, fewer than one-third of the regressions yield at least one significant estimate (in either Panel A or Panel B), and none produce significant estimates in both panels simultaneously.

4.2.2 The Advantage of Using Paradata

In contrast, the paradata at our disposal addresses several of the issues outlined previously. Since it explicitly uses the 'neighbours' as the reference group, the interviewer's rating of relative dwelling quality arguably captures precisely the group with whom real asset com-

[10] Appendix Table 5 reports pairwise correlations and variance inflation factors for the key variables used in our models, indicating that multicollinearity is not a concern.

parisons are most relevant. Beyond providing direct insight into locality, this measure also offers an evaluation free from biases potentially affecting homeowners, such as the endowment effect. Thus, the HFCS paradata has the potential to provide an accurate local and unbiased assessment of how respondents' dwellings rank relative to those of their immediate neighbours.

However, one might be concerned about the validity of the interviewer's relative dwelling quality rating. Below, we conduct a series of tests suggesting that this concern is unwarranted. First, we report in Table A.3 the associations between the real asset values reported by HFCS respondents and the interviewer's rating of relative dwelling quality, using a multinomial logit model. In a convergent validity test, we would expect higher real asset values to be positively associated with better interviewer ratings. Indeed, this is precisely what we find, irrespective of the control variables included. A one-unit increase in the real asset value (after an IHS transformation) is associated with a 1.8 to 2.5 percentage point higher probability of the interviewer rating the dwelling as relatively 'better' than its neighbours. Conversely, a reduction of the same magnitude in real asset values increases the probability of receiving a 'worse' rating. To complement these findings, Appendix Fig. 4 shows the kernel densities of real asset values by relative dwelling quality ratings. Consistent with our multinomial marginal effects, dwellings rated better than their neighbours are, on average, associated with higher real asset values. However, Appendix Fig. 4 also reveals overlapping densities, indicating that while absolute real asset values reported by respondents and interviewer ratings are correlated, they are not perfect substitutes – each provides distinct information (the former capturing absolute values, the latter capturing relative positioning).

Another potential concern is whether these interviewer ratings could be systematically associated with certain interviewer characteristics. Specifications (2) and (3) in Table A.3 address this possibility. Specification (2) controls for the interviewer characteristics available to us (education level, age, and experience). Among the nine estimated coefficients, only one reaches statistical significance, and even this is marginal. This reassures us that there is little to no systematic association between observable interviewer characteristics and their ratings.[11]

We now use the interviewer ratings to examine how relative real asset values relate to life satisfaction. We begin by considering Fig. 2, where we present average life satisfaction by the relative dwelling quality ratings. A clear positive relationship emerges between life satisfaction and interviewer-reported dwelling quality relative to neighbours. However, the change in life satisfaction across these categories does not appear to be linear: the difference in life satisfaction between respondents whose dwellings are rated 'better' and 'about the same' as neighbours is roughly six times smaller than the difference between those rated 'about the same' and 'worse'.

We then proceed with regression analyses to determine whether these associations persist after controlling for potential confounding factors. Results are presented in Table 3.

[11] Specification (3) includes interviewer fixed effects to account for time-invariant differences across interviewers. Doing so significantly improves the fit of the model (as revealed by the log-likelihood), suggesting that interviewer fixed effects indeed help predict relative dwelling quality ratings. One might then argue that there are substantial differences across interviewers in reporting style. However, this interpretation must be nuanced, as more than 95% of interviewers operate within a single region, meaning the interviewer fixed effects may also partly capture localisation effects. Although it remains challenging to fully disentangle dwelling location effects from interviewer influences, we acknowledge this concern raised by the interviewer fixed effects and will address it explicitly in our robustness checks.

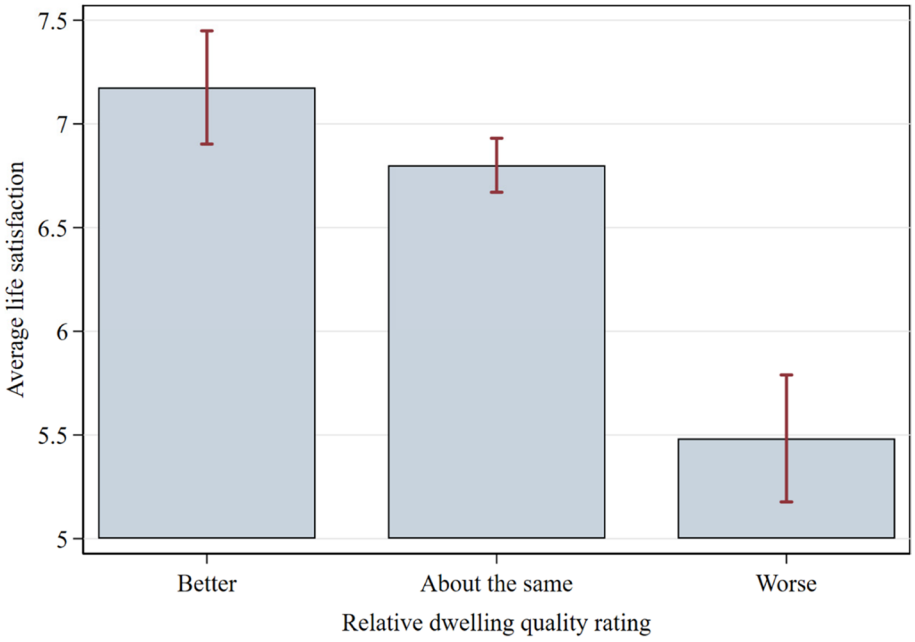

Fig. 2 Average life satisfaction per relative dwelling quality rating. Notes: These figures refer to our estimation sample made of 2,149 Slovak respondents from the 2017 HFCS. 95% confidence intervals are reported. Survey weights and multiply imputed data are used. Source: HFCS 2017 – National Bank of Slovakia

Column (1) reproduces our preferred specification from Table 2, showing that a one-unit increase in real asset values (after an IHS transformation) predicts a 0.096-point increase in life satisfaction. Column (2) reports the results from a specification where we control for interviewer ratings of relative dwelling quality, using 'about the same' as the reference category. Consistent with Fig. 2, respondents whose dwellings are rated as 'worse' than neighbours attract a negative and statistically significant estimate at the 1% level, while the category 'better' attracts a positive estimate (albeit with a p-value of 0.26). In Column (3), we further control for interviewer characteristics (years of experience, age, and education); results remain qualitatively unchanged.

This initial set of results suggests that real assets are positional goods and that comparisons regarding real assets appear to be asymmetric. Specifically, the association between life satisfaction and having a dwelling rated 'worse' than neighbours is approximately six times greater than for having a dwelling rated 'better', with the latter estimate not even reaching statistical significance. Moreover, the coefficient for real asset values decreases from 0.096 to 0.089 between Columns (1) and (3). Assuming that interviewer ratings of relative dwelling quality accurately capture positional effects, this implies that roughly 7% of the total association between life satisfaction and real asset values can be attributed to comparison effects. Note that potential noise in paradata due to random measurement error would attenuate the effect of relative comparisons. Consequently, one could consider that more than 7% – likely a lower bound estimate – of the total association between life satisfaction and real asset values can be attributed to relative effects.

Table 3 Life satisfaction, real assets and relative dwelling quality – OLS results

	Life satisfaction [0–10]								
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	Oprobit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Real assets (IHS)	0.096***	0.087***	0.089***	0.375***	0.098**	0.070***	0.085***		0.053***
	(0.020)	(0.020)	(0.020)	(0.084)	(0.043)	(0.016)	(0.024)		(0.010)
Real assets (log)								0.094***	
								(0.021)	
Relative dwelling quality compared to neighbours:									
Worse		−0.714***	−0.736***	−0.742***	−0.247	−0.795***	−0.663	−0.732***	−0.405***
		(0.152)	(0.153)	(0.178)	(0.366)	(0.132)	(0.409)	(0.153)	(0.078)
Worse × Real assets (IHS)							−0.008		
							(0.039)		
Better		0.162	0.154	0.132	0.147	0.275**	−0.978	0.152	0.101
		(0.143)	(0.142)	(0.149)	(0.703)	(0.136)	(0.870)	(0.142)	(0.071)
Better × Real assets (IHS)							0.096		
							(0.072)		
Interviewer controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interviewer fixed effects	No	No	No	No	No	Yes	No	No	No
Adjusted R^2	0.205	0.220	0.224	0.227	0.243	0.369	0.224	0224	
Observations	2,149	2,149	2,149	1,890	259	2,149	2,149	2,149	2,149

These are linear regressions carried out using multiple-imputation techniques. Bootstrapped standard errors presented in parentheses are based on 1,000 replicate weights. All regressions include the following controls: values of financial assets, mortgage and non-mortgage debt and household income (IHS-transformation used expect in the last column where a log-transformation has been used), gender, age, age squared, a dummy for tertiary education, household size, a dummy for the presence of children in the household, a dummy for married respondents, dummies for dwelling type, degree of urbanisation and region of residence. Interviewer controls include age, years of experience and a set of dummy variables for educational attainment. *$p<0.10$, **$p<0.05$, ***$p<0.01$

Source: HFCS 2017 – National Bank of Slovakia

We further leverage the homeownership status of respondents to validate our interpretation of these coefficients. If our estimates for real asset values and interviewer ratings indeed capture absolute and relative asset effects, respectively, we would expect significantly larger estimates among homeowners (due, for instance, to the endowment effect). To investigate this, we split our sample into homeowners and non-homeowners in Columns (4) and (5), respectively. Our results confirm this hypothesis: point estimates for both real asset values and dwelling quality ratings of 'worse' relative to neighbours are significantly larger for homeowners.

In the final four columns of Table 3, we return to the full sample and run a last series of robustness checks. Column (6) confirms that incorporating interviewer fixed effects does not invalidate our previous conclusions; if anything, it makes the positive effect associated with living in a dwelling rated 'better' than neighbours statistically significant. The interaction terms included in Column (7) between the interviewers' ratings and real asset values are not statistically different from zero, suggesting that the positional nature of real assets does not depend on their absolute value. This is also the case when we use a logarithmic transformation instead of an IHS transformation in Column (8). Finally, in Column (9), we use an ordered probit instead of an OLS estimator and our main conclusions remain unchanged.

4.3 Heterogeneity Analysis

The determinants of life satisfaction may vary according to individual socio-demographic characteristics (see Clark, 2018, for a review). Consequently, it is important to explore potential heterogeneity in these effects. Following Wooldridge (2010), we examine such heterogeneity by interacting our primary explanatory variables of interest (i.e., the comparison categories) with key socio-demographic factors (income, age, education, parenthood, and marital status).

The results of this exercise are presented in Table 4. None of the interaction terms attract statistically significant coefficients, suggesting that the effects of relative dwelling quality ratings do not depend on individual characteristics. In specification (1), we test whether the influence of real asset values and comparisons with neighbours differs between poorer and richer households (using median household income as the threshold). We find no significant difference, supporting the notion that real asset values and household income are neither complements nor substitutes in predicting life satisfaction. Similar results are obtained in specification (2) for respondents aged 50 and above (50 being the median age in our estimation sample).[12] Along similar lines, specification (3) shows no heterogeneity in effects based on higher education (defined by a tertiary education dummy). Lastly, parenthood and marriage could potentially amplify the impact of real asset values and subsequent comparisons with neighbours on life satisfaction. We account for this possibility in specifications (4) and (5). Although the interaction terms for parenthood are negative (for both 'Better' and 'Worse') and those for marriage are positive (for both categories), none of these coefficients are statistically significant at conventional levels.

[12] Alternative age thresholds yield similar findings and are available upon request. The age threshold of 50 is particularly interesting because Hochman and Skopek (2013) show that among individuals aged 50 and older, subjective well-being is more strongly associated with wealth in conservative and liberal welfare systems, whereas this effect is insignificant in social-democratic systems.

Table 4 Life satisfaction, real assets and relative dwelling quality – Heterogeneity analysis

	Life satisfaction [0–10]				
	(1)	(2)	(3)	(4)	(5)
Real assets (IHS)	0.087***	0.091***	0.090***	0.089***	0.089***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Relative dwelling quality compared to neighbours:					
Housing worse than neighbours	−0.925***	−0.652**	−0.810***	−0.651***	−0.771***
	(0.184)	(0.279)	(0.163)	(0.179)	(0.201)
Worse × High income	0.569				
	(0.361)				
Worse × Above 50		−0.121			
		(0.330)			
Worse × University			0.604		
			(0.490)		
Worse × Children				−0.268	
				(0.304)	
Worse × Married					0.073
					(0.307)
Housing better than neighbours	−0.062	−0.050	0.108	0.240	0.088
	(0.211)	(0.218)	(0.167)	(0.178)	(0.275)
Better × High income	0.351				
	(0.269)				
Better × Above 50		0.373			
		(0.283)			
Better × University			0.182		
			(0.272)		
Better × Children				−0.198	
				(0.276)	
Better × Married					0.087
					(0.310)
Adjusted R^2	0.226	0.223	0.224	0.223	0.223
Observations	2,149	2,149	2,149	2,149	2,149

These are linear regressions carried out using multiple-imputation techniques. Bootstrapped standard errors presented in parentheses are based on 1,000 replicate weights. All regressions include the following controls: values of financial assets, mortgage and non-mortgage debt and household income (all in the IHS), gender, age, age squared, a dummy for tertiary education, household size, a dummy for the presence of children in the household, a dummy for married respondents, dummies for dwelling type, degree of urbanisation and region of residence. Interviewer controls include age, years of experience and a set of dummy variables for educational attainment. *$p<0.10$, **$p<0.05$, ***$p<0.01$

Source: HFCS 2017 – National Bank of Slovakia

5 Conclusions

This paper makes several contributions to the literature on subjective well-being and wealth. First, it shifts attention from the well-studied role of income to the relatively understudied role of real assets in shaping life satisfaction. Second, it introduces a novel, data-driven approach to capturing relative wealth by using interviewer-based paradata rather than relying on arbitrary reference groups defined by demographic characteristics. This allows us to assess relative effects in a more localised and independently measured way. Finally,

we provide new evidence from a Central and Eastern European context – a region still underrepresented in the literature – highlighting how historical and cultural legacies of housing and homeownership continue to shape the economic and psychological lives of individuals.

Our findings provide insights for housing and social policy. First, policies aimed at improving housing quality may yield well-being gains that go beyond material living standards, especially for those living in disadvantaged neighbourhoods. For example, Glaeser (2019) recently questions the consequences of 'poor doors' in the context of segregation and opportunities. Second, the evidence that downward housing comparisons are particularly detrimental suggests that spatial inequality in housing conditions can carry psychological costs. Third, our findings underline the importance of considering both absolute and relative dimensions of wealth when designing policies aimed at improving subjective well-being. Measures that address housing disparities – such as targeted renovation programmes or affordable housing initiatives – may not only improve material conditions (Lindenthal, 2020) but also reduce the negative well-being effects associated with positional disadvantage in housing.

At the same time, our analysis has some limitations particularly those relating to policy implications. While our novel approach of using interviewers' paradata could identify relative effects within neighbourhoods, given that our context of housing is characterised by observability of asset characteristics, we cannot rule out other possible explanations and mechanisms in action. For example, it is possible that the paradata measure captures certain aspects of respondents' material circumstances more effectively than other available indicators. Furthermore, processes related to perceptions of fairness or disadvantage – concepts that are similar, but not identical, to social comparisons – may also be relevant. Furthermore, as our analysis relies on variables assessing subjective perceptions, namely the interviewer's subjective evaluation of housing and the interviewee's subjective reports of life satisfaction, our results may be subject to common method variance (CMV) bias. As emphasised by Lindell and Whitney (2001), CMV can lead to artefactual relationships that do not necessarily reflect the true underlying associations between constructs, thereby threatening the validity of the conclusions. However, assuming independence of interviewer and interviewee reported information, it is unlikely that CMV bias will be present. Nevertheless, we recognise the potential CMV bias as a limitation because our study does not explicitly deal with CMV.

The considerations above point to avenues for future research. Firstly, richer data infrastructures would enable more precise identification of mechanisms. Combining interviewer-level assessments with administrative data at the postcode or municipal level could help to distinguish social comparison processes from other contextual effects. Secondly, direct survey questions regarding comparison groups, perceptions of fairness or reference standards could complement the paradata-based approach, clarifying whether the observed relative effects are driven by social comparisons or alternative psychological mechanisms. Finally, longitudinal data would enable the examination of how changes in housing conditions and neighbourhood environments affect life satisfaction over time. These would allow researchers to address CMV bias concerns and provide stronger grounds for causal inference.

Appendix

Table 5 Multicollinearity diagnoses

	VIF	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
X1: Housing worse than neighbours	1.15	**1.00**	-0.13	-0.09	0.13	-0.21	-0.26	-0.08	0.05	-0.17	0.07	-0.10	-0.13	-0.04	-0.06	-0.05	-0.15	0.06	-0.15	-0.05	0.14
X2: Housing better than neighbours	1.10	-0.13	**1.00**	0.09	-0.07	0.08	0.11	0.07	-0.00	0.10	-0.06	0.07	0.05	0.09	0.06	0.03	0.12	0.01	-0.17	0.01	0.06
X3: Below reference group's assets	1.78	-0.09	0.09	**1.00**	-0.62	0.28	0.11	0.04	-0.02	0.13	0.01	-0.09	-0.01	0.12	0.12	0.03	0.15	-0.00	-0.22	0.00	0.05
X4: Above reference group's assets	1.93	0.13	-0.07	-0.62	**1.00**	-0.36	-0.14	-0.04	0.04	-0.12	-0.06	0.15	0.04	-0.08	-0.10	0.01	-0.16	0.02	0.13	0.03	-0.02
X5: Real assets (IHS)	1.43	-0.21	0.08	0.28	-0.36	**1.00**	0.33	0.17	-0.04	0.34	-0.07	0.16	0.15	0.16	0.14	0.05	0.25	-0.02	-0.13	0.01	-0.03
X6: Financial assets (IHS)	1.36	-0.26	0.11	0.11	-0.14	0.33	**1.00**	0.13	-0.05	0.38	-0.17	0.25	0.29	0.15	0.16	0.10	0.25	-0.00	0.03	0.04	-0.13
X7: Mortgage debt (IHS)	1.25	-0.08	0.07	0.04	-0.04	0.17	0.13	**1.00**	0.12	0.22	-0.38	0.10	0.34	0.10	0.20	0.30	0.08	-0.04	-0.02	-0.00	-0.03
X8: Non-mortgage debt (IHS)	1.10	0.05	-0.00	-0.02	0.04	-0.04	-0.05	0.12	**1.00**	0.06	-0.25	0.01	0.16	0.03	0.18	0.19	0.02	0.00	0.02	-0.02	0.01
X9: Gross income (IHS)	1.89	-0.17	0.10	0.13	-0.12	0.34	0.38	0.22	0.06	**1.00**	-0.24	0.26	0.42	0.26	0.42	0.27	0.39	-0.00	-0.04	0.03	-0.08
X10: Age	2.67	0.07	-0.06	0.01	-0.06	-0.07	-0.17	-0.38	-0.25	-0.24	**1.00**	-0.14	-0.68	-0.18	-0.41	-0.56	-0.13	0.01	-0.09	0.02	0.05
X11: Tertiary education	1.25	-0.10	0.07	-0.09	0.15	0.16	0.25	0.10	0.01	0.26	-0.14	**1.00**	0.20	0.05	0.02	0.08	0.09	0.00	0.07	0.00	-0.19
X12: Employed	2.36	-0.13	0.05	-0.01	0.04	0.15	0.29	0.34	0.16	0.42	-0.68	0.20	**1.00**	0.16	0.30	0.42	0.14	-0.01	0.07	0.01	-0.10
X13: Male	1.51	-0.04	0.09	0.12	-0.08	0.16	0.15	0.10	0.03	0.26	-0.18	0.05	0.16	**1.00**	0.30	0.14	0.59	-0.01	-0.14	-0.03	0.07
X14: Household size	2.74	-0.06	0.06	0.12	-0.10	0.14	0.16	0.20	0.18	0.42	-0.41	0.02	0.30	0.30	**1.00**	0.71	0.49	-0.00	-0.18	-0.07	0.13
X15: Children in the household	2.43	-0.05	0.03	0.03	0.01	0.05	0.10	0.30	0.19	0.27	-0.56	0.08	0.42	0.14	0.71	**1.00**	0.23	-0.01	-0.03	-0.03	0.02
X16: Married	1.90	-0.15	0.12	0.15	-0.16	0.25	0.25	0.08	0.02	0.39	-0.13	0.09	0.14	0.59	0.49	0.23	**1.00**	0.03	-0.15	-0.04	0.08
X17: Semi-detached house	1.05	0.06	0.01	-0.00	0.02	-0.02	-0.00	-0.04	0.00	-0.00	0.01	0.00	-0.01	-0.01	-0.00	-0.01	0.03	**1.00**	-0.14	0.02	0.01
X18: Flat	1.64	-0.15	-0.17	-0.22	0.13	-0.13	0.03	-0.02	0.02	-0.04	-0.09	0.07	0.07	-0.14	-0.18	-0.03	-0.15	-0.14	**1.00**	0.22	-0.52
X19: Suburban area	1.75	-0.05	0.01	0.00	0.03	0.01	0.04	-0.00	-0.02	0.03	0.02	0.00	0.01	-0.03	-0.07	-0.03	-0.04	0.02	0.22	**1.00**	-0.61
X20: Rural area	2.34	0.14	0.06	0.05	-0.02	-0.03	-0.13	-0.03	0.01	-0.08	0.05	-0.19	-0.10	0.07	0.13	0.02	0.08	0.01	-0.52	-0.61	**1.00**

Multicollinearity diagnoses carried out using multiple-imputation techniques and survey weights. Age squared is not considered here due to near perfect collinearity with age. Regional dummy variables are omitted from the correlation analysis due to space limitations

Source: HFCS 2017 – National Bank of Slovakia

Table 6 Descriptive statistics of interviewer characteristics

	Mean	SD	Min	Max
Interviewers' age	49.33	9.46	25.00	64.00
Interviewers' experience in years	18.39	12.32	0.00	41.00
Interviewers' education				
Secondary specialised vocational education (with diploma)	0.09		0.00	1.00
General secondary education (grammar school)	0.11		0.00	1.00
Secondary vocational education (with diploma)	0.49		0.00	1.00
University education (bachelor level)	0.01		0.00	1.00
University education (master level)	0.29		0.00	1.00

There are 137 interviewers who interviewed households in the HFCS 2017. They are approximately equally distributed across the 8 regions of Slovakia

Source: Statistical Office of the Slovak Republic

Table 7 Determinants of relative dwelling quality ratings – Marginal effects of a multinational logit

	Relative dwelling quality compared to neighbours		
	Better	About the same	Worse
	(1)	(2)	(3)
Specification 1:			
Real assets (IHS)	0.018***	-0.005	-0.014***
	(0.005)	(0.005)	(0.002)
Interviewer fixed effects		No	
Log-Likelihood		-1459.27	
Observations		2,149	
Specification 2:			
Real assets (IHS)	0.018**	-0.005	-0.013***
	(0.007)	(0.007)	(0.002)
Interviewer's university education	0.020	-0.033	0.013
	(0.023)	(0.029)	(0.022)
Interviewer's age	0.000	0.001	0.003*
	(0.002)	(0.003)	(0.001)
Interviewer's experience (years)	0.000	0.001	-0.002
	(0.001)	(0.002)	(0.001)
Interviewer fixed effects		No	
Log-Likelihood		-1,454.20	
Observations		2,149	
Specification 3:			
Real assets (IHS)	0.025**	-0.011	-0.014***
	(0.010)	(0.009)	(0.002)
Interviewer fixed effects	Yes	Yes	Yes
Log-Likelihood		-1,161.15	
Observations		2,149	

These are linear regressions carried out using multiple-imputation techniques. Bootstrapped standard errors presented in parentheses are based on 1,000 replicate weights. All regressions include the following controls: values of financial assets, mortgage and non-mortgage debt and household income (all in the IHS), gender, age, age squared, a dummy for tertiary education, household size, a dummy for the presence of children in the household, a dummy for married respondents, dummies for dwelling type, degree of urbanisation and region of residence. $*p<0.10, **p<0.05, ***p<0.01$

Source: HFCS 2017 – National Bank of Slovakia

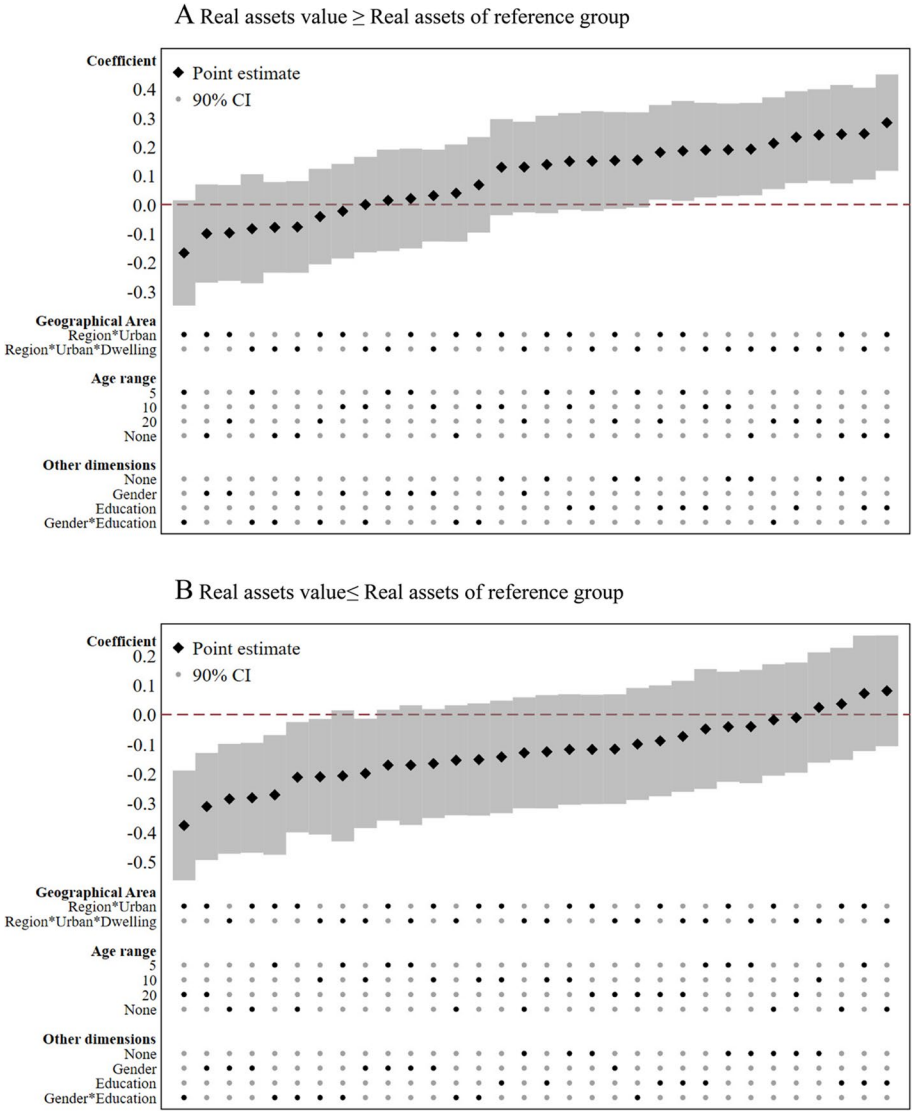

Fig. 3 Specification curves for relative effects of real assets using different reference groups. Source: HFCS 2017 – National Bank of Slovakia

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Data Availability This article uses microdata from the Slovak Household Finance and Consumption Survey (wave 2017), administered by the National Bank of Slovakia, which are not publicly available but can be obtained by filling out the following request form: https://nbs.sk/_img/Documents/PUBLIK/Ziadost_o_HFCS_udaje_form.pdf. It also uses interviewer-level data from the Statistical Office of the Slovak Republic, which are also not publicly available, but can be requested at info@statistics.sk.

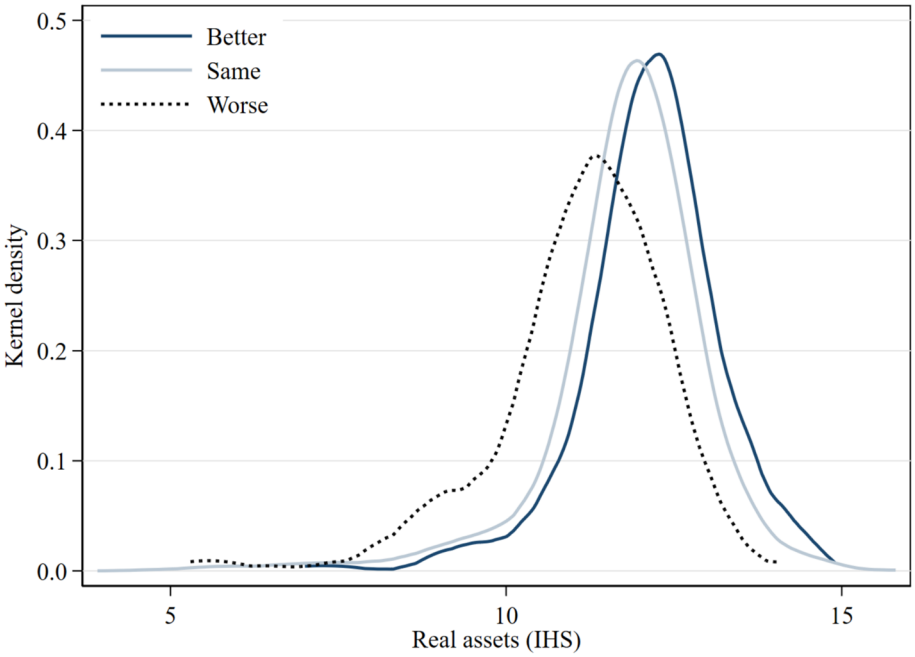

Fig. 4 Kernel density of real assets per relative dwelling quality ratings. Source: HFCS 2017 – National Bank of Slovakia

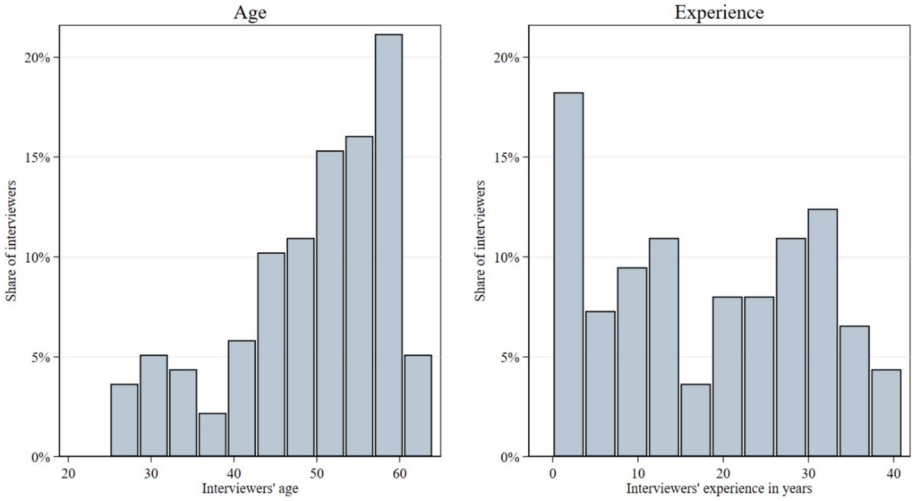

Fig. 5 Distribution of interviewers' characteristics. Source: Statistical Office of the Slovak Republic

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Declarations

Conflict of interest The authors declare that there is no conflict of interest with any financial organisations regarding the materials reported in this manuscript.

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