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How closely related are financial satisfaction and subjective well-being? Systematic review and meta-analysis

Kayonda Hubert Ngamaba[a,*], Christopher Armitage[b], Maria Panagioti[b], Alexander Hodkinson[b]

[a] University of York, Heslington, United Kingdom
[b] University of Manchester

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ABSTRACT

Financial satisfaction is considered one of the determinants of Subjective well-being (SWB), yet the assumption that financial satisfaction is closely associated with SWB has not been tested across nations.

This first systematic review and meta-analysis examined the association between financial satisfaction and SWB and to test whether any association is affected by key operational and methodological factors.

Following Cochrane and PRISMA guidelines, a systematic (Web of Science, Medline, Embase, PsycINFO and Google scholar) search was conducted (January 1980–August 2019). Meta-analyses, meta-regressions and subgroup analysis using random-effects models were performed.

24 studies were included in the meta-analysis and the overall association between financial satisfaction and SWB was medium, significant and positive (pooled $r = 0.41$, 95% CI = 0.38–0.44; $Q = 7108$, I2 = 99.7%, $p < 0.001$). Univariate meta-regressions showed that studies conducted in countries that were more developed ($B = 0.14$, 95% CI: 0.05, 0.24, I2 = 79%, R2 = 51%), and had used multiple items ($B = 0.12$, 95% CI: 0.01, 0.18, I2 = 72%, R2 = 30%) instead of single were significantly associated with better financial satisfaction and greater SWB.

Our findings highlight the need for designing better tools to measure these core societal concepts; to improve financial satisfaction and hence SWB across the globe.

1. Introduction

Subjective well-being (SWB) is increasingly used as a valid and meaningful indicator of social progress alongside or instead of the gross domestic product (GDP) per capita and can be used to judge the impact of government policies (Greve, 2010; Hicks, Tinkler & Allin, 2013; Stiglitz, Sen & Fitoussi, 2009; Veenhoven, 2008). Identifying the strongest correlates of SWB is vital as a starting point in informing policies that support and boost SWB. Financial satisfaction is considered to be closely related to SWB (Diener & Chan, 2011; Kahneman & Deaton, 2010; Ng & Diener, 2014), yet this assumption has not been investigated across countries. The aim of the present research is to quantify the magnitude of the relationship between financial satisfaction and SWB and understand the factors that moderate the magnitude of this relationship.

To have a good understanding of the association between financial satisfaction and SWB, it is important to define the concept of well-being. Different terms have been used to define well-being, such as happiness, life satisfaction, quality of life and SWB. One view is that well-being refers to indicators of human development that include income, health state, education and environment where people live. For example, in 1990 the Human Development Index (HDI) was introduced as an alternative to GDP because of its capacity to incorporate an average of log income, health and educational outcomes (UNDP, 2014). Since 1990, further attempts have been made to revise GDP to take account of non-monetary factors to inform welfare choices (Greve, 2010). The Stiglitz commission proposed a need to shift emphasis from assessing social progress through measures of economic production to measuring people's well-being (Stiglitz et al., 2009). Another view is that well-being refers to the holistic assessment of an individual's daily living conditions to determine whether or not people have a good quality of life. This view of SWB refers to emotional experience (i.e., happiness) and one's life as a whole (i.e., life satisfaction) (Diener, Suh, Lucas & Smith, 1999; Kahneman & Deaton, 2010). Happiness is most closely associated with emotions, feelings or moods and life satisfaction is concerned with people's cognitive evaluations and judgments about their life, which might include evaluations of their work or personal relationships (Diener et al., 1999; Kahneman &

* Corresponding author.
E-mail address: kayonda.ngamaba@york.ac.uk (K.H. Ngamaba).

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Deaton, 2010).

To date, there has been little agreement on what the components of SWB are and what the predictors of SWB are. Different SWB frameworks have been suggested including the Easterlin's life domains of happiness (Easterlin, 2006), the ONS national well-being framework (Hicks et al., 2013), the World Happiness Report framework (Layard, Clark & Senik, 2016) and Gallup global well-being domains (Gallup-Healthways, 2015) which can be broadly classified as bottom-up and top-down approaches. These frameworks suggest that SWB depends on various measures of domain satisfaction such as financial satisfaction (Ng & Diener, 2014; van Praag, Frijters & Ferrer-i-Carbonell, 2003).

The association between financial satisfaction and SWB (i.e. happiness and life satisfaction) has been of great interest in the last decades (Hayes, 2014; Ng & Diener, 2014). Ng and Diener (2014) defined financial satisfaction as an individual's self-evaluation of their financial situation that is more akin to a psychological attribute rather than an objective economic indicator (Ng & Diener, 2014), p.329. Financial satisfaction is a state of being financially healthy and happy and refers to people's subjective evaluation of their financial situation (Lu & Patryk, 2019). Financial satisfaction is formed of many factors including income, financial knowledge, financial attitude and financial behaviour (Vehovec & Galic, 2017), and may have a major link with SWB (OECD, 2011). For example, positive financial behaviours such as maintaining emergency savings, planning for retirement were positively associated with financial satisfaction (Xiao, Tang & Shim, 2009). The presence of a partner in the household had a positive effect on financial satisfaction (Lu & Patryk, 2019) and married are happier compared to those who are divorced (Ngamaba, 2016, Oct). Marriage can increase household income and may provide social and emotional support to spouses (Diener & Chan, 2011; Kahneman & Deaton, 2010; Ng & Diener, 2014). Moreover, a cross-national study found a positive relationship between financial satisfaction and happiness; with 79 % of over 50 s report being either ‘quite happy’ or ‘very happy’ compared to 55 % who reported being satisfied with their financial situation (Hayes, 2014). Those who reported high levels of financial satisfaction were likely to report high levels of happiness. Moreover, the study reported that country level of development and low socio-economic status were strong predictors of both being dissatisfied with your household's financial situation and reporting being unhappy (Hayes, 2014). Nevertheless, the study failed to show how strongly related are financial satisfaction and SWB. Several theories have tried to explain the link between financial satisfaction and SWB. The absolute income hypothesis states that money can buy happiness because it can be exchanged for goods that will increase an individual's utility (Boyce, Brown & Moore, 2010), but has been criticised on the grounds that individuals base their decisions on the utility that they expect to derive from their choices (Diener & Oishi, 2000). Given that expected utility is often discrepant with actual utility, people's choices may not reflect true utility and therefore serve to undermine SWB (Kahneman & Deaton, 2010). Relatedly, according to *evolutionary modernization* theory, people's values and life strategies change in terms of a devalorisation of material concerns and a valorisation of post-materialist concerns as they move from subsistence to higher levels of economic and physical security (Inaba, 2009; Inglehart, 1997). Again, objective income data would not necessarily capture the influence of these processes on SWB whereas measures of financial satisfaction might do so. A large number of studies have shown that absolute and relative income plays an important role in influencing SWB. The relative income effect is sensitive to the definition of the reference group (Inglehart, Foa, Peterson & Welzel, 2008; Shu & Albert, 2016) (Diener, Ng, Harter & Arora, 2010). Nevertheless, longitudinal studies do not find a strong positive association between income and SWB (Diener, Inglehart & Tay, 2013; Fleche, Smith & Sorsa, 2011). Kahneman and Deaton have found that different components of SWB (e.g., life satisfaction and happiness) were associated differently with income as high income is more closely related to life satisfaction but not to emotional well-being (Kahneman & Deaton, 2010).

The aim of the present research is to undertake a systematic review and meta-analysis to examine how closely related are financial satisfaction and SWB. In addition, we will investigate the circumstances under which financial satisfaction is most closely related to SWB. To do so, four key methodological and conceptual limitations in the existing literature are addressed.

First, the terms of *happiness* and *life satisfaction* are often used interchangeably to assess SWB. Current evidence suggests that happiness and life satisfaction need to be assessed conjointly (Kahneman & Deaton, 2010). For example, daily interviews conducted with 1000 Americans found that married, well-educated people with high income reported greater satisfaction with their lives than the norm, but that the same people did not report being happier than the norm (Kahneman & Deaton, 2010). Recent studies have reported that the association between income and SWB was stronger when SWB was operationalised as life satisfaction rather than happiness (Diener et al., 2010; Kahneman & Deaton, 2010). The present study will explore whether the magnitude of the association between financial satisfaction and the two components of SWB (i.e. happiness and life satisfaction) differ. Second, items used to assess financial satisfaction differ as to whether they tap direct self-reported perceptions such as satisfaction with your household financial situation, or indirect self-report assessments, such as satisfaction with standard of living and affordability (Havasi, 2013). Direct self-reported measures include questions such as: “How satisfied are you with the financial situation of your household? If '1′ completely dissatisfied, and '10′ completely satisfied”. Indirect measures are assessed using questions such as: “How respondents felt about their household income these days on a 4-point scale, with 1= “living comfortably on present income,” 2 = “getting by . . .,” 3 = “finding it difficult . . .” and 4 = “finding it very difficult . . .”. Both direct and indirect self-reported use scales measuring negative and positive aspects. Previous studies might have used different terminology, but for the purposes of the present study, we have categorised these various concepts as either direct or indirect measures of financial satisfaction (Havasi, 2013; Lu & Patryk, 2019). When people were not asked a direct question to report their financial satisfaction but instead they were asked to self-report their satisfaction of household income or financial attitude, the measure was categorised as indirect (Havasi, 2013; Vehovec & Galic, 2017). The present study will investigate whether direct self-reported measures of financial satisfaction are more closely related to SWB than indirect measures of financial satisfaction. The third limitation under consideration concerns reporting the results of multivariate statistical analyses but neglecting to report univariate analyses of the association between financial satisfaction and SWB. The inclusion of covariates may weaken the observed association between financial satisfaction and SWB or multivariate techniques might be subject to suppressor effects or other statistical artefacts (Miller & Chapman, 2001; Smith, Ager & Williams, 1992). Nevertheless, some control variables are so important; for example, someone who is better educated may be happier and have a higher income. Thus, examining both univariate coefficients and multivariate regression coefficients will help to establish the robustness of the reported associations between financial satisfaction and SWB.

Fourth, the majority of studies investigating the association between financial satisfaction and SWB are conducted in developed nations because these countries have the financial resources to conduct research and participants are accessible in contrast to developing nations with poorer infrastructure. Nevertheless, the question arises as to whether people value their financial satisfaction and SWB in a similar way across countries further (Howell & Howell, 2008, Jul; Kahneman & Deaton, 2010; Ng & Diener, 2014). For example, according to *evolutionary modernization theory*, people's values and life strategies change as they move from subsistence to higher levels of economic and physical security (Inglehart, 1997). A recent study using the Gallup World

Poll found a stronger positive relation between financial satisfaction and SWB in richer nations (Ng & Diener, 2014) conflicting with earlier findings showing a stronger positive association between financial satisfaction and SWB in poorer than in richer nations (Diener et al., 2013). The positive association between financial satisfaction and SWB could be one way or the other education (Delhey, 2010; Newman, Delaney & Nolan, 2008; Ng & Diener, 2014). One possibility is that the financial satisfaction could be more closely related to SWB in poorer nations because income would provide basic needs such as food, health care, access to education (Delhey, 2010; Newman et al., 2008; Ng & Diener, 2014). Nevertheless, there are several reasons why financial satisfaction may also have a stronger impact on SWB in developed countries. Firstly, money is important in both developed and developing countries. Money is crucial in economically developed societies in order to live comfortably. The necessity of money in securing material goods and comforts in economically developed nations may result in financial satisfaction being more important for people's well-being in these nations. Other possibilities may explain why financial satisfaction is strongly associated with SWB in developed countries are the globalisation, access to the Internet and social comparison (Easterlin, 2003). While previous studies have suggested a positive association between financial satisfaction and SWB, it is important to investigate whether the magnitude of this association is moderated by country level of development. Many factors may affect the magnitude of the link between financial satisfaction and SWB such as the scale biases, location and the way the survey is conducted and how the question is asked. Ng and Diener (2014) argued that in poor agricultural societies, food and shelter may not necessarily be obtained directly with money but may be obtained via alternative means (e.g., barter trade, subsistence agriculture). For example, GWP used telephone interviews and a dichotomous scale to evaluate financial satisfaction and Likert scale to evaluate SWB. In contrast, WVS used a Likert scale to evaluate both financial satisfaction and SWB. Their face-to-face interviews are conducted by a locally trained researcher. Other issues when we comparing studies or nations are whether the study is a cross-sectional or longitudinal study. While cross-sectional studies can be done more quickly to first establish whether there are associations between financial satisfaction and SWB, it will be difficult to establish cause and effect if the study is not a longitudinal one. For example, a cross-sectional study investigating self-reported life satisfaction in 10 European countries found highly heterogeneous across similar countries because of different scales and benchmarks adopted by individuals when evaluating themselves (Viola, Danilo, Luca & Omar, 2014). Moreover, previous studies highlighted the weakness of happiness scales by suggesting that it is difficult to rank groups by average happiness (Diener et al., 2013, 1999). The present study will investigate whether the magnitude of the association between financial satisfaction and SWB is moderated by country level of development.

Finally, key operational and methodological factors such as recruitment procedure, lengths of the measurement instruments are key indicators of study quality that must be balanced against pressures to save time and money (Bridges & Holler, 2007). For example, while the general consensus is that multiple-item measures have better psychometric properties than single-item measures, single-item measures may be used due to practical constraints (e.g. respondent burden caused by longer survey) and it would be valuable to know whether this affects the findings (Baker, Hammarberg & Fisher, 2010). Similarly, whether participants are recruited using random or convenience sampling might affect the association between financial satisfaction and SWB and it would be valuable to know whether recruitment procedure affects the size of the relationship between financial satisfaction and SWB.

The present systematic review and meta-analysis aims to: (Annink, Gorgievski & Dulk, 2016) quantify the association between financial satisfaction and SWB; and (Arampatzi, Burger & Veenhoven, 2015) test whether the link between financial satisfaction and SWB is affected by key operational and methodological factors, including (a) the way in which SWB is assessed (i.e., happiness versus life satisfaction), (b) whether indirect self-report measures of financial satisfaction are more closely related to SWB than direct self-report measures, (c) the way in which financial satisfaction and SWB were measured (i.e., multiple items versus single item measures), (d) country level of development, and (e) Quality rating criteria such as sample recruitment (i.e., random versus convenience sampling).

2. Method

The present systematic review was conducted and reported according to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Clark, Etile, Postel-Vinay, Senik & Van der Straeten, 2005; Higgins & Green, 2011).

2.1. Search strategy and data sources

A systematic search of the following electronic databases was conducted: Web of Science, Medline, Embase, PsycINFO and Google Scholar. Systematic searches of the literature published between January 1980 and August 2019 were carried out and involved all possible combinations of two key blocks of terms: (Annink et al., 2016) SWB, happiness, life satisfaction, well-being; and (Arampatzi et al., 2015) financial satisfaction, satisfaction with standard of living, satisfaction with one's financial situation, what the household can afford and financial strain.

We identified additional eligible studies by checking the reference lists of the studies meeting the criteria of the systematic review. Scoping searches were conducted to test their sensitivity and yield against financial satisfaction and SWB. The search strategy in each of the databases is presented in the screening process (see Appendix 1).

2.2. Study selection

The results of the searches of each database were exported to Endnote database files and merged to identify and delete duplicates. The screening was completed in two stages. Initially, the titles and abstracts of the identified studies were screened for eligibility (see Fig. 1). Next, the full-texts of studies initially assessed as “relevant” for the review were retrieved and checked against our inclusion/exclusion criteria. The full-text screening was completed by one researcher and checked by a second researcher independently. Any disagreements were discussed in group meetings until consensus was reached.

2.3. Eligibility criteria

Studies were eligible for inclusion if they met the following criteria:

1. Original studies that employed quantitative research methods. Qualitative studies were excluded.
2. Included a measure of SWB (i.e., happiness or life satisfaction or both). Measures of happiness included: “Taking all things together, would you say you are (on a scale of 1 to 4): 1 = Not at all happy; 2 = Not very happy; 3 = Quite happy, and 4 = Very happy” (Ng, 2015). Measures of life satisfaction included questions such as; “All things considered, how satisfied are you with your life as a whole these days? On a scale of 1–10 if 1 = very dissatisfied and 10 = very satisfied” (Brown & Gray, 2016); We included in this review any studies that included happiness or life satisfaction or both. Studies that used outcomes other than happiness or life satisfaction were excluded because SWB is defined as an individual's affective (i.e., happiness) and cognitive (i.e., life satisfaction) self-evaluation (H. Brockmann, Delhey, Welzel & Yuan, 2009; Clark & Oswald, 2006; Vanhoutte, 2012).
3. Included a subjective measure of financial satisfaction such as satisfaction with standard of living, and satisfaction with one's

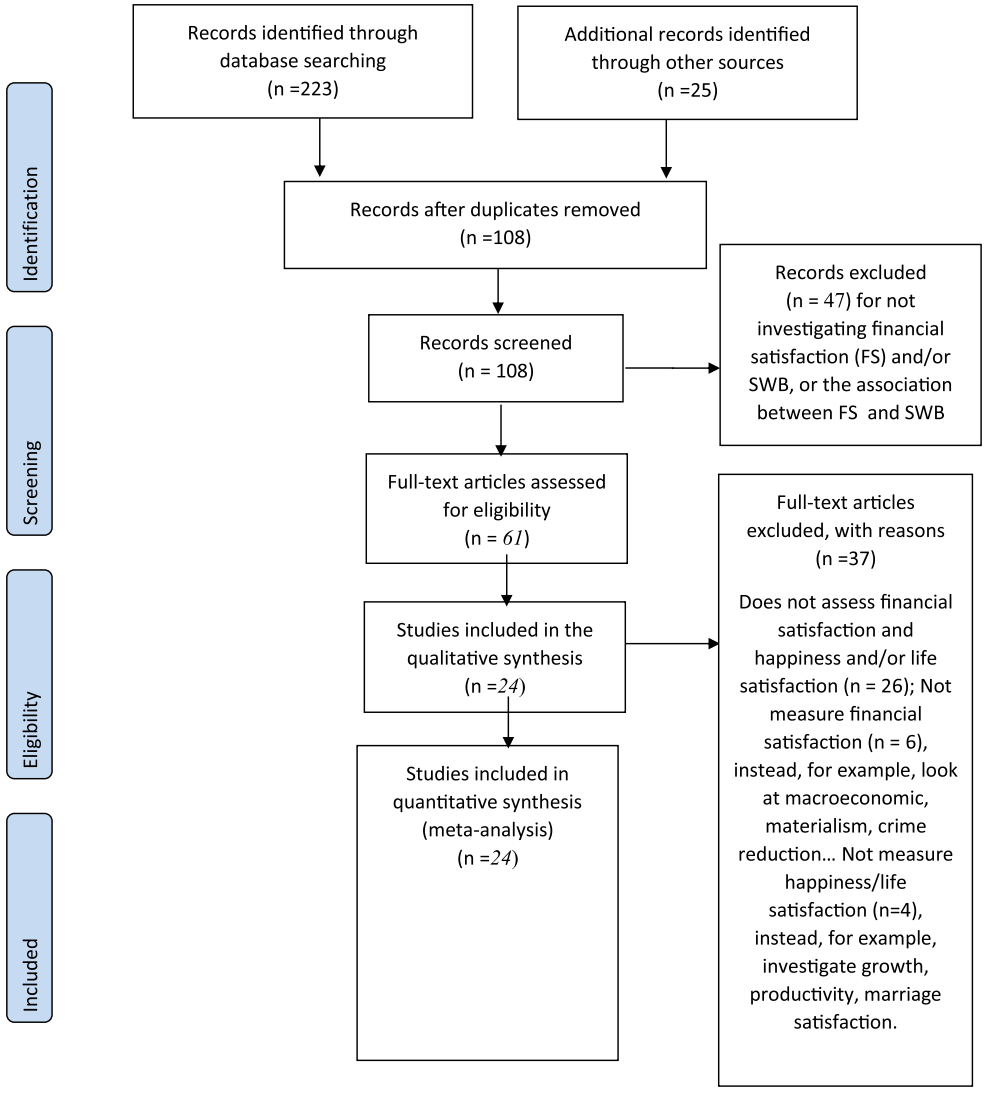


Fig. 1. PRISMA flow diagram (Moher, Liberati, Tetzlaff & Altman, 2009).

financial situation. For example: Could you please tell me on a scale of 1–10 how satisfied you are with your present standard of living, where 1 means you are very dissatisfied and 10 means you are very satisfied? Respondents were also asked whether there were times in the past year when they did not have enough money for food or for shelter (1 = yes, 0 = no) (Morrison, Tay & Diener, 2011); How satisfied are you with the financial situation of your household on a 10-point scale (1 = completely dissatisfied; 10 = completely satisfied) (Ng, 2015). Studies using Richins and Dawson's materialism measures were not included into the meta-analysis because the subscale "affordability to buy more things" was not dissociated with "success" and "centrality" (Lambert, Fincham, Stillman & Dean, 2009; Richins & Dawson, 1992; Roberts & Clement, 2007). Also, studies investigating job satisfaction were not included because they don't actually use life satisfaction or happiness (Hytti, Kautonen & Akola, 2013).

4. Provided quantitative data regarding the association between financial satisfaction and SWB.
5. Were published in a peer-reviewed journal or were working papers published by Academics or Governments. Reports from groups with potential vested interests (e.g., political groups) were excluded.

2.4. Data extraction

An excel file was devised for the purpose of data extraction. This extraction was piloted across five randomly selected studies and changes were made where necessary. Information about the following characteristics of the studies was extracted: first author's name and year of publication, country where the study was conducted and number of participants, happiness/life satisfaction instrument, financial satisfaction instrument, zero-order correlation of the association between financial satisfaction and happiness/life satisfaction, and beta standardised regression coefficient of the association between financial satisfaction and SWB after controlling for several factors such as income status, employment status, gender, education level, age, and marital status.

Data extraction was completed by the first and second author. Another researcher extracted data from three randomly selected studies. During the process of extraction, authors were contacted to provide zero-order correlations if their studies did not. Most cross-national studies reported the mean zero-order correlation or regression coefficient for all countries, but in cases where the mean zero-order correlation was not reported, we analysed each country separately (e.g., Horstmann, Haak, Tomsone, Iwarsson and Gräsbeck, 2012).

Table 1
Included studies and quality ratings: Financial satisfaction and subjective well-being.

Author & Year	Country	Particip	SWB Measures	Financial satisf. measures	Standardised effect sizes of association	SE of effect sized	Reg. Coeff	SE	Regression Methods	Measures**	Level of develop.	Indirect vs direct ***	Quality ratings*	Primary or Secondary study ****
Annink, 2016 (Annink et al., 2016)	31 European countries	9755	LS 1–5	Financial hardship1-5	0.44	0.008	0.30	0.02	Multilevel hierarch.	multi-items	developed	indirect	5	2nd: European Social Survey 2004 & 2010
Arampatzi, 2015 (Arampatzi et al., 2015)	28 EU	50,000	LS 1–4	Financial distress 1–4	0.58	0.003	0.782	0.028	Ordered probit	multi-items	developed	direct	5	2nd: Eurobarometer Survey
Borg, 2008 (Borg et al., 2008)	6 EU	2111	LS 13 items 0–26	Financial resources 4 items 1–5	0.29	0.020	–	–	Multiple linear reg	multi-items	developed	indirect	6	2nd: ESAW
Brockmann, 2009 (H. Brockmann, Delhey, Welzel & Yuan, 2009)	China	2000	LS 1–10	Financial satisfaction 1–10	0.6	0.014	–	–	Regression	single-item	Developing	direct	6	2nd: WVS 1990–2000
Brown, 2016 (Brown & Gray, 2016)	Australia	27,530	LS 0–10	Financial satisf 0–10	0.45	0.005	0.216	0.083	FE ord. logit	single-item	developed	direct	6	2nd: HILDA Survey
Chou, 2002 (Chou & Chi, 2002)	Hong Kong	2502	LS 18 items 1–5	Financial strain 3 items 1–3	0.38	0.017	–	–	Multiple reg.	multi-items	developed	indirect	6	2nd: General Household Survey
Diener, 2010 (Diener et al., 2010)	132 countries	136,839	LS 0–10	Satisfaction with stand. of living 0–1	0.4	0.002	0.94	0.018	Hierarch. Reg.	single-item	Worldwide	direct	6	2nd: Gallup World Poll
Ebrahim, 2013 (Ebrahim, Botha & Snowball, 2013)	South Africa	7300	LS 1–10	Perceived relative income 1–5	0.4	0.010	0.542	0.057	Ordered probit	single-item	Developing	direct	5	2nd: 2008 NIDS
Headey, 2008 (Headey, Muffels & Wooden, 2008)	Australia, Britain, Germany, Hungary & Netherlands	17,785	LS 0–10	Standard living 0–10	0.60	0.005	Not reported		OLS reg	multi-items	developed	direct	6	2nd: Australian HILDA
Horstmann, 2012 Latvia (Horstmann et al., 2012)	Latvia	260	LS 0–10	Satisfaction with income 0–10	0.39	0.053	0.252	0.01	Ordinal reg	single-item	developed	direct	5	Primary: ENABLE-AGE Survey
Horstmann, 2012 Sweden (Horstmann et al., 2012)	Sweden	288	LS 0–10	Satisfaction with income 0–10	0.23	0.056	0.079	0.011	Ordinal reg.	single-item	developed	direct	5	Primary: ENABLE-AGE Survey
Howell, 2013 (Howell, Kurai & Tam, 2013)	USA, Canada, UK	1438	LS 5 items SWLS 1–7	Financial security Afford to buy 1–10	0.49	0.020	0.36	0.018	Mediation reg	multi-items	developed	indirect	6	Primary: Snowball sampling & students
Johnson, 2006 (Johnson & Krueger, 2006)	USA	719	LS 3–18	Financial situation 0–10	0.45	0.030	0.24	0.018	Hierarch. Linear	multi-items	developed	direct	6	2nd: MIDUS twin sample
Longmire-Avital, 2012 (Longmire-Avital, Golub, Parsons,	USA	914	LS 0–10	Financial strain 1–5	0.36	0.030	0.26	0.018	Multi-variate reg	single-item	developed	indirect	5	Primary: AIDS ACRIA

(*continued on next page*)

Table 1 (*continued*)

Author & Year	Country	Particip	SWB Measures	Financial satisf. measures	Standardised effect sizes of association	SE of effect sixed	Reg. Coeff	SE	Regression Methods	Measures**	Level of develop.	Indirect vs direct ***	Quality ratings*	Primary or Secondary study ****
Brennan-Ing & Karpiak, 2012)														
Morrison, 2011 (Morrison et al., 2011)	128 countries	132,516	Cantril 1–10	Satisf with std of living (0–1)	0.38	0.002	0.14	0.01	Multilevel model.	single-item	Worldwide	direct	5	2nd: Gallup World Poll
Ng, 2014 (Ng & Diener, 2014)	158 countries	838,151	Cantril 0–10	Financial satisf 1–10	0.45	0.0001	–	–	Hierarch. Linear	single-item	Worldwide	direct	6	2nd: Gallup World Poll
Ng, 2015 (Ng, 2015)	Singapore	1972	Hap 1–4	Financial satisf 1–10	0.25	0.021	0.21	0.02	Multiple reg	single-item	developed	direct	5	2nd: WVS: Wave 6: 2012
Ngamaba, 2017 (Ngamaba, 2017 Apr)	59 countries	75,476	Hap 1–4	Financial satisf. 1–10	0.30	0.003	0.169	0.004	Multilevel RE	single-item	Worldwide	direct	6	2nd: WVS 2010–2014
Ngamaba, 2016 (Ngamaba, 2016 Oct)	Rwanda	3.030	Life satisfaction	Financial satisfy 1–10	0.585	0.012	0.319	0.02	Multilevel RE	single-item	developing	direct	5	2nd : WVS 2007, 2012
Peiro, 2006 (Peiro, 2006)	15 countries	18,000	Hap 1–4	Financial satisfaction 1–10	0.26	0.007	Not reported		Ordered logit	Single-item	developed	direct	5	2nd: WVS: 1995 to 1996
Praag, 2010 (Van Praag et al., 2010)	Israel	7500	LS 1–4	Financial satisf 0–10	0.44	0.0093	Not reported		Distri-bution	single-item	developed	direct	5	2nd: Israeli Social Survey: 2006
Rijken, 2008 (Rijken & Groenewegen, 2008)	Netherlands	1265	LS 1–5	Social depriv. Can afford 7 items 0–7	0.2	0.027	0.21	0.012	Mediation reg	multi-items	developed	indirect	5	2nd: PPCD
Xiao, 2009 (Xiao et al., 2009)	USA	1197	LS 1–5	Satisf with Finan Status 1–5	0.26	0.027	0.26	0.018	Structured model	single-item	developed	direct	5	Primary: sample of students - 2006
Zagorsky 2014 (Zagorski et al., 2014)	28 EU	26,257	Hap 1–10	Financial Sat (Annink et al., 2016; Arampatzi et al., 2015; Baker et al., 2010; Borg et al., 2008; Boyce et al., 2010; Bridges & Holler, 2007; H. Brockmann et al., 2009, 2009; Brown & Gray, 2016; Chan et al., 2005)	0.44	0.005	Not reported		Multilevel reg	multi-items	developed	indirect	6	2nd: Europeans' quality of life 2003

Note: SWB: subjective well-being; EU: European Union; "Hap 1–4″ means the study assessed Happiness on a 1–4 scale; "LS 1–5″ means the study assessed life satisfaction on a 1–5 scale.

* The quality rating score was calculated by awarding 1 point for each of the criteria: 1 for valid recruitment procedure, 1 for research design, 1 for subjective well-being and financial satisfaction measures, 1 if results reported, and 1 if the correlation coefficient of the association is reported.

** Studies that used two or more items to assess financial satisfaction or subjective well-being were classified as multi-items.

*** Direct self-reported measures include questions such as: "How satisfied are you with the financial situation of your household? If '1′ completely dissatisfied, and '10′ completely satisfied". Indirect measures are assessed using questions such as: "How respondents felt about their household income these days on a 4-point scale, with 1 = "living comfortably on present income," 2 = "getting by . . .," 3 = "finding it difficult . . ." and 4 = "finding it very difficult . . .".

**** A primary study did collect their own data. A secondary study did not collect their own data but used data collected by other specialised organisations such as World Value Survey, Gallup World Poll or European Quality of Life surveys.

2.5. Assessment of methodological quality

Studies were rated for their quality by one researcher and verified by another researcher using criteria adapted from guidance on the quality assessment tools for quantitative studies (Higgins & Green, 2011). Any disagreements were resolved by discussion. The quality review included assessment of the quality of the research design, population and recruitment methods, verified if the choice of the financial satisfaction measures and SWB measures were valid and reliable, determined if the outcome variable was clearly identified and if the analysis reported the association between financial satisfaction and SWB. These included assessments of the quality of the research that is presented in Table 1.

2.6. Meta-analysis procedures

To conduct the meta-analysis of the association between financial satisfaction and SWB, we followed several steps (Chan, Cheung & Chan, 2005). Firstly, meta-analysis of the sample correlations (rho) was performed. However, in some of the studies the exact correlations were not reported, so we used the regression 'beta' effect estimates and standardized all data using fisher z scores, so that analysis were carried out on the same scale. Because traditional methods are ill equipped to handle complex and unknown correlations amongst non-independent effect sizes, we performed sensitivity analyses with more advance meta-analytic methods such as robust variance estimation (Tipton, Johnson & Hedges, 2010) and structural equation modelling (Chan et al., 2005; Hong & Cheung, 2017; Mike, 2015).

After obtaining a pooled correlation of the association between financial satisfaction and SWB, we addressed the heterogeneity by estimating the proportion of effect size variance associated with various study features (Cohen, 1992; Page, Lipsey, Higgins, Pez & Pez, 2018). This was achieved by random-effects meta-regressions in a structural equation-modelling framework to assess each of the covariates in turn.

Two-stage meta-analytic structural equation modelling in the past has been very useful to overcome methodological artefacts (Mike, 2015). Nevertheless, a meta-analysis in structural equation modelling is often challenging because of several factors including the sample size, when each study involved in the meta-analysis contain a different set of variables or ignoring the sampling variation across studies. The pooled correlations of studies are treated as independent within studies and they are pooled separately across studies. The pooled correlation matrix is formed by averaging across different studies based on pairwise deletion. The statistical power and the standard errors of parameter estimates are all dependant on the sample size used, using different sample sizes can result in different inferences. To avoid the pairwise deletion in handling missing correlations, we contacted authors to provide their correlations if their studies did not. The multiple regression analysis predicts a correlation after controlling for several factors. However, the two-stage structural equation modelling could be unsuitable if each study involved in the meta-analysis contain a different set of variables (Mike, 2015). The third limitation of meta-analytic structural equation modelling is in ignoring the sampling variation across studies. Therefore, to address the heterogeneity, previous studies have suggested explorations through meta-regressions. Cochrane guidelines suggest that subgroup analyses may be done as a means of investigating heterogeneous results, or to answer specific questions about particular patient groups, types of intervention or types of study (Higgins & Green, 2011).

To conduct the meta-analyses of the association between financial satisfaction and SWB, we performed several steps.

We started by carrying out a meta-analysis of all 24 studies reporting the sample correlations between financial satisfaction and SWB. Then we used the standardised fisher's Z scores to estimate the size and direction of relationships in order to see whether the association differed between certain covariates.

The 95% Confidence Intervals (CI) associated with the sample correlations were calculated in STATA 15.1 (Evangelos, 2010). A random-effects model was used throughout, and the pooled sample correlation, the assessment of heterogeneity as well as the forest plots were computed using the 'metacor' package in R(26). Advanced meta-analytic robust variance meta-regression and structural equational modelling were performed with the 'robumeta' and 'metaSEM' package, respectively.

We focus our interpretation of the results in terms of effect sizes (Cohen, 1992). An effect size is a quantitative measure of the magnitude of an observable fact. According to Cohen's effect sizes, $r = 0.10$ is associated to a "small" effect size ("not so small as to be trivial", p. 159 (Cohen, 1992)), $r = 0.30$ is a "medium" effect size ("likely to be visible to the naked eye of a careful observer", p. 159 (Cohen, 1992)), and $r = 0.50$ is a "large" effect size ("the same distance above medium as small was below it", p.159 (Cohen, 1992)). To test whether the association between financial satisfaction and SWB varies across subgroups, we used Cohen's q Fisher's z transformation of r (Cohen, 1969). Cohen's q helps to deal will the Fisher Z – transformation, which is a way to transform the sampling distribution of Pearson's r (i.e. the correlation coefficient) so that it becomes normally distributed. The "z" in Fisher Z stands for a z-score. Fisher's z' is used to find confidence intervals for both r and differences between correlations. By convention, if z score values are greater than or equal to 1.96 or less than or equal to −1.96, the two correlation coefficients are significantly different at the 0.05 level of significance (suggesting a difference of correlation coefficients between two population groups) (Cohen & Cohen, 1983; Preacher, 2002).

To assess potential publication bias, we inspected the funnel plots and reported the significance of the Egger's test to assess small sample bias (an indicator of possible publication bias). Funnel plots were constructed using the metal funnel command, and the Egger test was computed using the meta-bias command in STATA (Harris & Sterne, 2009; Jac & Egger, 2001).

Heterogeneity in the context of meta-analysis refers to the variation in study outcomes between the analysed studies; in the present study, heterogeneity was assessed using both the Cochran's Q, which provides evidence whether or not heterogeneity is present and the I^2 statistic, which quantifies the percentage of variation across studies (Higgins & Green, 2011; Page et al., 2018). We addressed heterogeneity by running meta-regressions for several key covariates: developed countries versus developing countries; happiness versus life satisfaction, multiple items versus single items and random versus convenience sampling.

According to the World Bank, developed countries are defined as industrial countries, advanced economies with a high level of Gross National Income (GNI) per capita of 12,736 US dollars per year (estimated in July 2015). In contrast, developing countries are countries with low and middle levels of GNI per capita (less than 12,736 US dollars) (Nielsen, 2011; World Bank New Country Classifications 2016). Studies were conducted during different years; we classified the country level of development according to the estimate used when the data were collected because the World Bank adjusts their classification of developed and developing countries nearly every year (Nielsen, 2011; World Bank New Country Classifications 2016). Analysing the subgroup of developed versus developing countries was used to explore whether the country level of development affected the association between financial satisfaction and subjective well-being.

3. Results

We retrieved 248 studies. After removing duplicates ($n = 140$), 108 studies were assessed and 47 articles were excluded after reading the titles and the abstracts for not investigating financial satisfaction and/or SWB, or for not investigating the association between financial satisfaction and SWB. Sixty-one full-text articles were assessed against our criteria. Thirty-seven full-text articles were excluded for different

reasons such as: does not assess financial satisfaction and happiness and/or life satisfaction (n = 26); Not measure financial satisfaction (n = 6), instead, for example, look at macroeconomic, materialism, crime reduction… Not measure happiness/life satisfaction (n = 5), instead, for example, investigate growth, productivity, marriage satisfaction. Overall, 24 studies were included in the final analysis. The flowchart of the screening and selection process is shown in Fig. 1. [Fig. 1 near here]

3.1. Descriptive characteristics of the studies

Table 1 presents the main characteristics of the 24 studies included in the review. All studies were cross-sectional. Four studies were conducted in the USA, 11 studies were conducted in Europe and 9 studies were conducted elsewhere (see Table 1 for more details). All studies were published between 2006 and 2016. Participants were adults aged between 16 and 99 years. Sample sizes varied from 260 to 136,839 and recruited from groups including students, workers, self-employed, older people, patients and the general population.

Studies used data from a range of surveys such as the European Social Survey (Annink et al., 2016), World Value Survey (Ng, 2015), HILDA Survey (Brown & Gray, 2016), General Household Survey (Chou & Chi, 2002), Gallup Organisation (Ng & Diener, 2014), ENABLE-Age Survey (Horstmann et al., 2012), Panel of Patients with Chronic Disease (Rijken & Groenewegen, 2008), Israeli Social Survey (Van Praag, Romanov & Carbonell, 2010), and European Quality of Life Survey (Zagorski, Evans, Kelley & Piotrowska, 2014). Our search showed that the majority of studies were conducted in developed countries (n = 17), four studies were conducted worldwide and three studies were conducted in developing countries.

Different instruments were used to measure financial satisfaction and happiness/life satisfaction. For financial satisfaction: 17 studies used direct self-reported financial satisfaction versus 7 studies using indirect measures of financial satisfaction. On the other hand, for SWB, the majority of studies (n = 20) used life satisfaction to assess SWB and the remaining studies (n = 4) used happiness to assess SWB. Of a total of 24 studies, nine studies used multiple item scales and 15 studies used single-item scales. Only four studies used multiple items and the majority of studies (n = 20) used different single item Likert scales (e.g. 1–4, 1–5, 1–10).

3.2. Meta-analysis of the association between financial satisfaction and SWB

Twenty-four studies were included in the main meta-analysis and sub-groups were meta-analysed: country level of development, SWB measures, financial satisfaction measures and methodological quality.

3.3. Main meta-analysis: the overall association between financial satisfaction and SWB

3.3.1. Association effects

Fig. 2 presents the forest plot of the overall association between financial satisfaction and SWB across 24 studies. The pooled effect size from the random-effect meta-analysis was medium, significant and positive (pooled r = 0.41, 95% CI = 0.38 to 0.44; Q = 7108, I^2 = 99.7%, $p < 0.001$) suggesting that better financial satisfaction is moderately associated with greater SWB. As shown in Fig. 2, the effect sizes across all the studies were positive but varied significantly in magnitude (from r = 0.20 to r = 0.60). Similarly, using more advance meta-analytic methods such as, robust variance estimation (r = 0.42, 95% CI = 0.37, 0.47, I^2 = 94%, τ^2 = 0.1850, $p < 0.0001$) and structural equational modelling (r = 0.45, 95% CI = 0.39, 0.49, I^2 = 96%, τ^2 = 0.1892 $p < 0.0001$) showed consist results with the main analysis. In addition, sensitivity analysis revealed that τ^2 and subsequently the average effect sizes were relatively robust to different correlation values.

Univariate meta-regressions (Table 2) after controlling for several factors, including socio-demographic and economic factors, showed that studies conducted in countries that were more developed (B = 0.14, 95% CI: 0.05, 0.24, I^2 = 79%, R^2 = 51%), and had used multiple items (B = 0.12, 95% CI: 0.01, 0.18, I^2 = 72%, R^2 = 30%) instead of single were significantly associated with better financial satisfaction and greater SWB. The multivariable model including both covariates were also significant (X^{2_2} = 28.47, P = 0.031).

3.4. Small study bias

We found no evidence of funnel plot asymmetry, which might indicate publication bias for the main analyses (Egger test P = 0.11).

3.5. Subgroups analyses

Different subgroups analyses are presented below including SWB measures, the way financial satisfaction was measured, country level of development, multiple items versus single item measures, and random versus convenience sampling.

SWB measures: The pooled effect size for the association between financial satisfaction and life satisfaction was larger, pooled r = 0.41, 95% CI = 0.36–0.46, Q = 584.80, I^2 = 96.58%, $p < 0.001$ than the pooled effect size for the association between financial satisfaction and happiness: pooled r = 0.31, 95% CI = 0.22–0.41, Q = 57.69, I^2 = 93%, $p < 0.001$. The results of the Cohen's Q test confirmed that the correlation between financial satisfaction and life satisfaction was statistically significantly stronger than it was between financial satisfaction and happiness: Cohen's q = 15.63, $p < 0.05$.

The way financial satisfaction was measured: The pooled effect size for the association between SWB and indirect self-reported financial satisfaction was smaller, pooled r = 0.36, 95% CI = 0.20–0.49, Q = 360.23, I^2 = 96%, $p < 0.001$ than the pooled effect size for the association between SWB and direct self-reported financial satisfaction: pooled r = 0.40, 95% CI = 0.23–0.60, Q = 353.90, I^2 = 97%, $p < 0.001$. The magnitude of the correlation was significantly smaller amongst studies using indirect self-reported financial satisfaction than it was in studies using direct self-reported financial satisfaction: Cohen's q = 2.64, $p < 0.05$.

Country level of development: The pooled effect size for the association between financial satisfaction and SWB was larger in developing countries compared to the pooled effect size in developed countries: pooled r = 0.50, 95% CI = 0.26–0.74; Q = 50.00, I^2 = 96%, $p < 0.001$; developed countries: pooled r = 0.38, 95% CI = 0.33–0.44; Q = 575.78, I^2 = 97%, $p < 0.001$. The results of the Cohen's Q test confirmed that the magnitude of the correlation was statistically significantly stronger amongst studies conducted in developing countries than it was in developed countries: Cohen's q = 8.213, $p<0.05$.

Multiple items versus single item measures: The pooled effect sizes of the association between financial satisfaction and SWB was higher when multiple items were used to assess financial satisfaction and SWB than when single item measures were used: pooled r = 0.435, 95% CI = 0.30–0.57, Q = 120.25, I^2 = 97%, $p < 0.001$; single item measures: pooled r = 0.38, 95% CI = 0.33–0.43, Q = 576.14, I^2 = 97%, $p < 0.001$. The magnitude of the correlation was statistically significantly stronger amongst studies using multiple item measures than it was in studies using single item measures: Cohen's q = 6.72, $p < 0.05$.

Random versus convenience sampling: The pooled effect size for the association between financial satisfaction and SWB was higher amongst studies that recruited their participants using random sampling, pooled r = 0.44, 95% CI = 0.38 to 0.50, Q = 253.23, I^2 = 96%, $p < 0.001$, than the pooled effect size amongst studies that recruited their participants using convenience sampling: pooled r = 0.35, 95% CI = 0.29–0.41, Q = 344.23, I^2 = 96.22%, $p < 0.001$. The magnitude

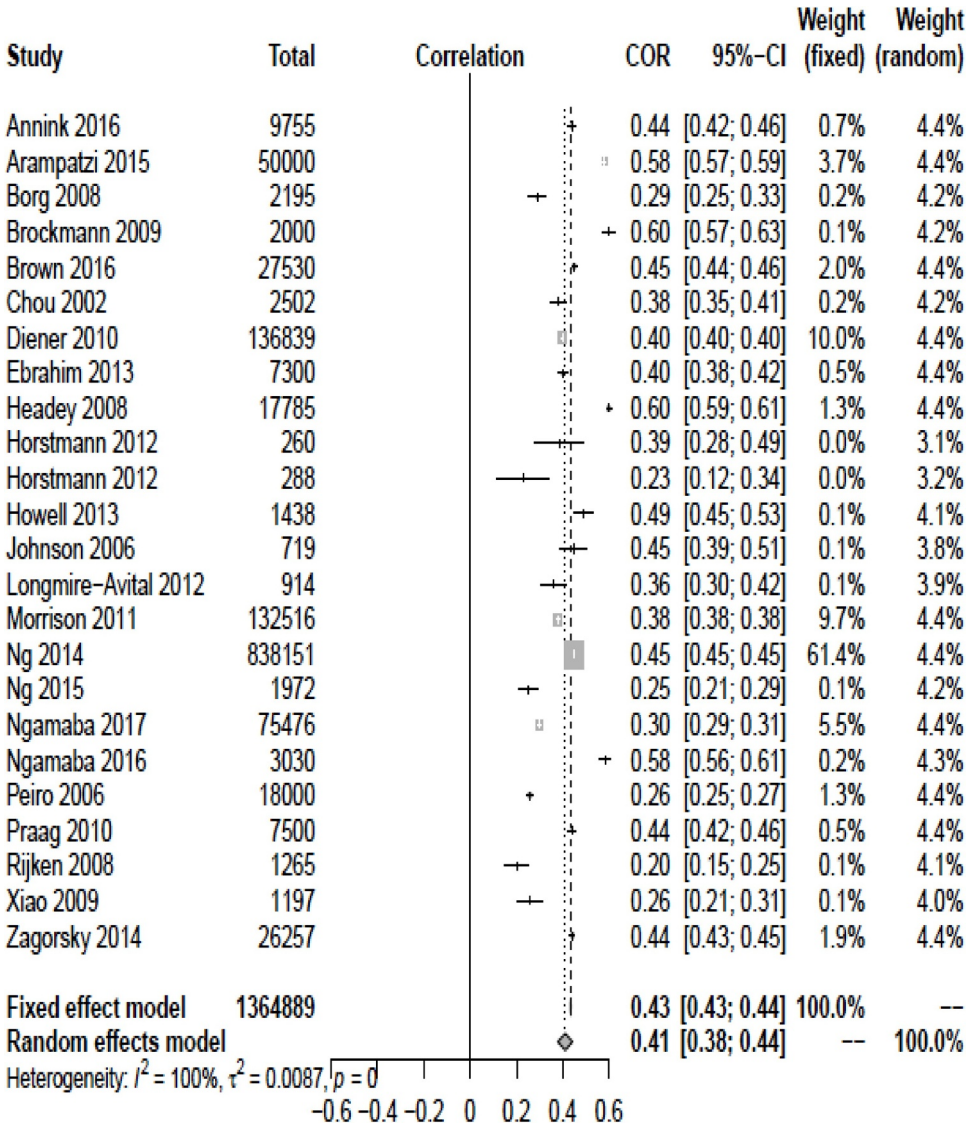


Fig. 2. Forest plot displaying the main meta-analysis of the association between financial satisfaction and subjective well-being across 24 independent samples. COR = Sample correlations of the relationship between financial satisfaction and SWB.

Table 2
Univariable and Multivariable meta-regression using structural equational modelling.

Covariate of interest	B (95% CI)	P value	I^2,%	τ^2 (95% CI)	R^2,%
Univariable:					
- SWB measures	0.079 (−0.03, 0.19)	0.157	55%	0.087 (−0.028, 0.168)	12%
- Financial satisfaction measure	−0.058 (−0.17, 0.05)	0.284	50%	0.093 (−0.018, 0.144)	2%
- Country level of development	**0.142 (0.05, 0.24)**	**0.031**	79%	0.125 (0.012, 0.186)	51%
- Multiple items versus single item	**0.124 (0.01, 0.18)**	**0.049**	72%	0.118 (0.008, 0.157)	30%
- Random vs convenience sampling	0.072 (−0.04, 0.19)	0.217	43%	0.071 (−0.002, 0.124)	13%
Multivariable:					
- Country level of development	**0.16 (0.08, 0.31)**	**0.025**	NA	τ_2^2 = 0.120 (0.021, 0.174)	48%
- Multiple items versus single item	**0.15 (0.05, 0.28)**	**0.042**	NA	τ_3^2 = 0.123 (0.001, 0.246)	
Model fit	X_2^2 = 28.47	0.031			

of the correlation was statistically significantly stronger amongst studies rating high quality such as random sampling than it was in studies rating low quality such as using convenience sampling: Cohen's $q = 13.21$, $p < 0.05$.

4. Discussion

The main finding of the present systematic review and meta-analysis is that financial satisfaction has statistically significant, medium-sized and positive relationships with both happiness and life satisfaction. This medium and positive association between financial satisfaction and SWB was reported at both levels: correlations and multivariate regression. Moreover, the robust variance estimation and structural equational modelling showed consist results with the main analysis. In addition, sensitivity analysis revealed that τ2 and subsequently the average effect sizes were relatively robust to different correlation

values. Univariate meta-regressions after controlling for several factors, including socio-demographic and economic factors, showed that studies conducted in countries that were more developed, and had used multiple items instead of single were significantly associated with better financial satisfaction and greater SWB. The multivariable model including both covariates were also significant.

In support of several existing theories, this review confirmed that SWB is significantly positively related to financial satisfaction. However, the medium size of this association does not suggest an absolute relationship or that these concepts are fully synonymous. Although opposing theories such as bottom-up and top-down approaches have been proposed to explain the relationship between financial satisfaction and SWB, there is little evidence to formally evaluate these theories in evidence syntheses. Longitudinal studies which would be able to test temporal effects in conjunction with factor analyses are needed to decide which approach is best supported by the research evidence.

One important finding is that the link between financial satisfaction and SWB was affected by quality criteria such as measured with multiple items instead of single items and the recruitment procedure (e.g., random sampling instead of convenience sampling). Higher quality studies elicited higher correlations between financial satisfaction and SWB (Kaplan, Chambers & Glasgow, 2014). One implication is that multiple items and random sampling should be used as the first option because of its better psychometric properties. However, in countries with fewer infrastructures or in a hostile environment, single item measures can be used when multiple items seem to be a burden for respondents due to the survey length (Fisher, Matthews & Gibbons, 2016; Gardner & Cummings, 1998).

This study found that the association between financial satisfaction and SWB was significantly stronger: (Annink et al., 2016) amongst developing countries as opposed to developed countries, (Arampatzi et al., 2015) when SWB was operationalized as life satisfaction as opposed to happiness, (Baker et al., 2010) when direct self-reported measures of financial satisfaction were used versus indirect self-report measures of financial satisfaction, (Borg et al., 2008) when multiple items were used to assess the financial satisfaction and SWB as opposed to single item measures, and (Boyce et al., 2010) when studies randomly sampled their participants versus studies that used convenience sampling.

Quantifying the association between financial satisfaction and SWB is important because decisions to allocate scarce resources to boost financial satisfaction are likely to compete with policies to reduce inequalities, support health care or provide social security. The present study found that the magnitude of the correlation between financial satisfaction and SWB was stronger amongst studies conducted in developing countries than it was in developed countries. This may suggest that financial satisfaction is more closely related to SWB in poorer nations because income would provide basic needs such as food, health care, access to education (Delhey, 2010; Newman et al., 2008; Ng & Diener, 2014).

Our findings support the *need theory* suggesting that financial satisfaction is positively associated in both developing and developed nations as people income is crucial to have a standard of living or to live comfortably (Ng & Diener, 2014). Nevertheless, income may have a greater impact on financial satisfaction in low-income countries as it provides basic needs such as food, health care, access to education (Inglehart, 1997; Ng & Diener, 2014; van Praag et al., 2003). As suggested by the *evolutionary modernization theory*, people's values and life strategies change as they move from survival to higher levels of economic and physical security (Inglehart, 1997). In developing countries, the external factor income may exert stronger effects on SWB, acting via its association with financial satisfaction (Diener et al., 2013). For example, David Hayes found that low socioeconomic status such as being unemployed; having low levels of education; self-categorising yourself as lower class and having no savings were strong predictors of both being dissatisfied with your household's financial situation and reporting being unhappy (Hayes, 2014). Overall, this finding is not surprising as previous studies have found a smaller correlation between income and SWB in developed countries compared to poor nations (Diener et al., 2013; Inglehart et al., 2008). This may suggest that the variation in both self-reported financial dissatisfaction and unhappiness can be attributed to the country that an individual lives. Previous studies reported that countries where those aged 50 and above report high levels of financial satisfaction were more likely to report high levels of happiness (Hayes, 2014).

4.1. Strengths, limitations and directions for future research

The major strength of this study is that it presents the results of the first systematic review, which investigated the relationship between financial satisfaction and SWB. A methodologically robust approach was utilised which fully adheres to contemporary guidance for conducting systematic reviews and meta-analyses of observational studies. This review emphasizes the need for future studies which will confirm the bottom-up or top line approaches and also will examine moderators of the association between SWB and financial satisfaction guided by existing theories in this area.

Nevertheless, it is worthwhile to highlight some limitations. First, we were not able to perform the two stage SEM analysis because the primary studies either (1) do not report the correlations for each pairwise factor, or (2) their primary objectives were not to look at the same suit of factors as other studies. Hence, we are not able to estimate the overall correlation estimate to perform the 2-stage SEM. Second, most studies investigating the association between financial satisfaction and SWB have been conducted in unrepresentative samples of largely "developed" nations such as the USA and European countries. Of 24 studies included in the present meta-analysis, four studies were conducted worldwide including developed and developing countries; three studies have been strictly conducted in developing countries, and 17 studies conducted in the developed world. This is problematic in terms of the representativeness for the purpose of global decision-making. Future research will add to the literature on financial satisfaction and SWB by estimating the likely impact the missing studies (i.e., developing countries) would have. The heterogeneity was high suggesting that there are large variations in the included studies; although we undertook systematic efforts to explore possible sources of heterogeneity using subgroup analyses, there might be additional variations which were not fully explored in this study. In this review, we only focused on peer-reviewed journals but we excluded grey literature. It is reassuring that we did not find evidence of funnel plot asymmetry, which might indicate publication bias (Jac & Egger, 2001). Third, all studies included in the present research were cross-sectional and therefore causality cannot be inferred. While cross-sectional studies were useful to establish the associations between financial satisfaction and SWB, it will be interesting to conduct longitudinal research to detect changes in the link between financial satisfaction and SWB. Moreover, studies upon which we have based our analyses were not primary studies (i.e., did not collect their own data), but were secondary analyses of data collected by other organisations such as World Value Survey and European Quality of Life surveys. Studies with more robust research designs, such as prospective cohorts (that follows over time a group of similar individuals) or stepped wedge clusters (a type of randomised controlled trial which is structured to reduce bias when testing new social interventions) are required to try and gauge causal relationships.

5. Conclusion

The study found that financial satisfaction is moderately and positively associated with SWB. This association is affected by the quality of the measures used for financial satisfaction and SWB and larger and stronger in developing countries. Our findings highlight the need for designing better tools to measure these core societal concepts and developing joint strategies to improve financial satisfaction and SWB across the globe.

Key-points

What is already known on this subject?

1. Improving subjective well-being (SWB) is fundamental to the role of most governments across the globe and so identifying the key factors that influence SWB could be vital to informing government policy.

What did this study add?

1. This paper is the first systematic review and meta-analysis investigating the relationship between financial satisfaction and SWB.
2. The study found that financial satisfaction is moderately and positively associated with SWB.
3. This association is larger and stronger in developing countries and when multiple items measures were used instead of single items.
4. Our findings highlight the need for designing better tools to measure these core societal concepts and developing joint strategies to improve financial satisfaction and SWB across the globe.

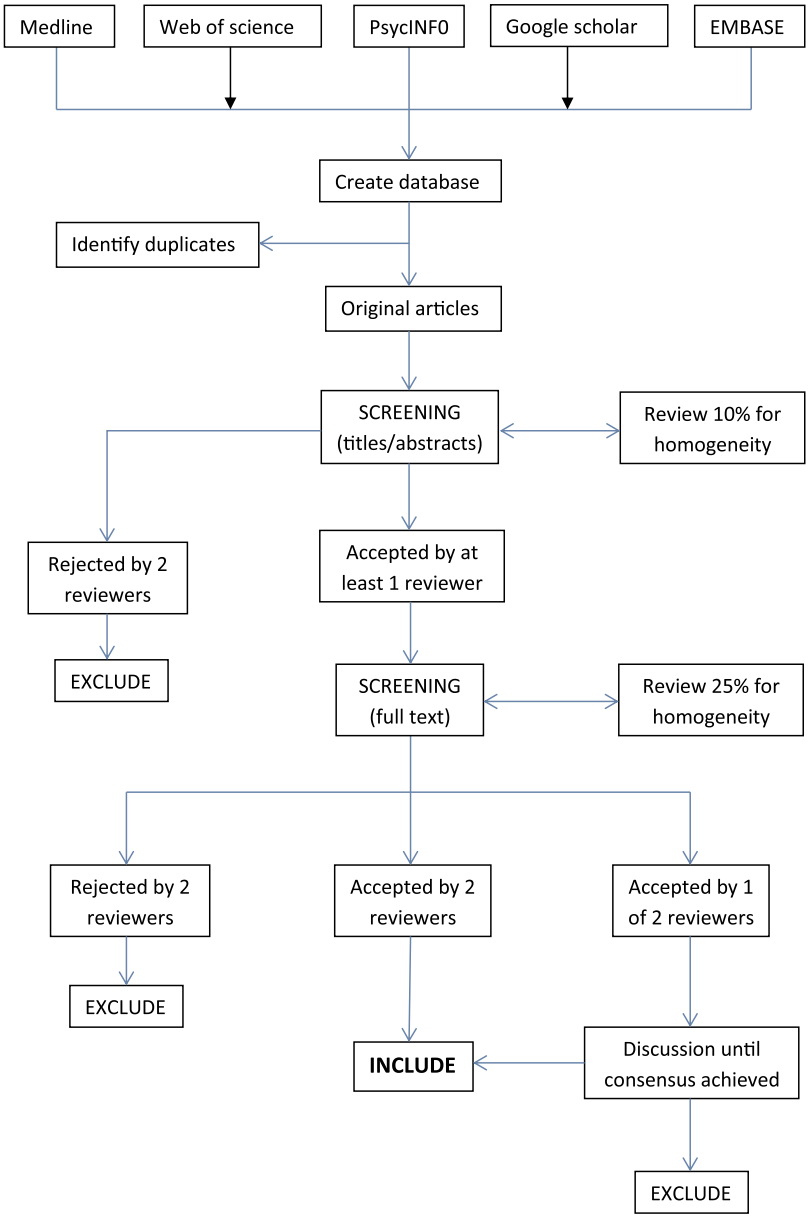
Compliance with Ethical Standards

1. Conflict of Interest: The authors declare that they have no conflict of interest.
2. Funding: This study was not funded
3. For this type of study, formal consent is not required.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.socec.2020.101522.

Appendix 1. Screening Process Financial satisfaction and SWB



References

Annink, A., Gorgievski, M., Dulk, L.D., 2016. Financial hardship and well-being: A cross-national comparison among the European self-employed. European Journal of Work and Organizational Psychology 25 (5), 645–657.

Arampatzi, E., Burger, M.J., Veenhoven, R., 2015. Financial distress and happiness of employees in times of economic crisis. Applied Economics Letters 22 (3), 173–179.

Baker, G.H.W., Hammarberg, K., Fisher, J.R.W., 2010. Long-term health, well-being, life satisfaction, and attitudes toward parenthood in men diagnosed as infertile: Challenges to gender stereotypes and implications for practice. Fertility and sterility 94 (2), 574–580.

Borg, C., Fagerstrom, C., Balducci, C., Burholt, V., Ferring, D., Weber, G., et al., 2008. Life satisfaction in 6 European countries: The relationship to health, self-esteem, and social and financial resources among people (aged 65-89) with reduced functional capacity. Geriatric Nursing 29 (1), 48–57.

Boyce, C.J., Brown, G.D.A., Moore, S.C., 2010, Apr. Money and happiness: Rank of income, not income, affects life satisfaction. Psychological Science 21 (4), 471–475.

Bridges, A.J., Holler, K.A., 2007. How many is enough? Determining optimal sample sizes for normative studies in pediatric neuropsychology. Child Neuropsychology 13 (6), 528–538.

Brockmann, H., Delhey, J., Welzel, C., Yuan, H., 2009a. The China puzzle: Falling happiness in a rising economy. Journal of Happiness Studies 10 (4), 387–405.

Brockmann, H., Delhey, J., Welzel, C., Yuan, H., 2009b. The China puzzle: Falling happiness in a rising economy. Journal of Happiness Studies 10 (August(4)), 387–405.

Brown, S., Gray, D., 2016. Household finances and well-being in australia: An empirical analysis of comparison effects. Journal of Economic Psychology 53, 17–36.

Chan, W., Cheung, M.W.L., Chan, W., 2005. Meta-analytic structural equation modeling: A two-stage approach. Psychological Methods 10 (1), 40–64.

Chou, K.-L., Chi, I., 2002. Financial strain and life satisfaction in Hong Kong elderly Chinese: Moderating effect of life management strategies including selection, optimization, and compensation. Aging & Mental Health 6 (2), 172–177.

Clark, A., Etile, F., Postel-Vinay, F., Senik, C., Van der Straeten, K., 2005. Heterogeneity in reported well-being: Evidence from twelve European countries. The Economic Journal 115 (502), C118–CC32.

Clark, A.E., .& Oswald, A.J. (.2006).The curved relationship between subjective well-being and age: PSE working papers no 2006-29.

Cohen, J., 1969. Statistical power analysis for the behavioral sciences. Academic Press, London.

Cohen, J., 1992. A power primer. Psychological Bulletin 112 (1), 155–159.

Cohen, J., Cohen, P., 1983. Applied multiple regression/correlation analysis for the behavioral sciences. NJ: Erlbaum: Hillsdale.

Delhey, J., 2010. From materialist to post-materialist happiness? national affluence and determinants of life satisfaction in cross-national perspective. Social Indicators Research 97 (1), 65–84.

Diener, E., Chan, M.Y., 2011. Happy people live longer: Subjective well-being contributes to health and longevity. Applied Psychology-Health and Well Being 3 (1), 1–43.

Diener, E., Inglehart, R., Tay, L., 2013 Jul. Theory and validity of life satisfaction scales. Social Indicators Research 112 (July(3)), 497–527.

Diener, E., Ng, W., Harter, J., Arora, R., 2010. Wealth and happiness across the world: Material prosperity predicts life evaluation, whereas psychosocial prosperity predicts positive feeling. Journal of Personality and Social Psychology 99 (1), 52–61.

Diener, E., Oishi, S., 2000. Money and happiness: Income and subjective well-being across nations. Culture and subjective well-being. The MIT Press, Cambridge, MA, USA, pp. 185–218.

Diener, E., Suh, E.M., Lucas, R.E., Smith, H.L., 1999. Subjective well-being: Three decades of progress. Psychological Bulletin 125 (2), 276–302.

Easterlin, R.A., 2003. Explaining happiness. Proceedings of the National Academy of Sciences of the United States of America 100 (19), 11176–11183.

Easterlin, R.A., 2006. Life cycle happiness and its sources - Intersections of psychology, economics, and demography. Journal of Economic Psychology 27 (4), 463–482.

Ebrahim, A., Botha, F., Snowball, J., 2013. Determinants of life satisfaction among race groups in South Africa. Development Southern Africa 30 (2), 168–185.

Evangelos, K., 2010. Metaan: Random-effects meta-analysis. The Stata Journal 10 (3), 395–407.

Fisher, G.G., Matthews, R.A., Gibbons, A.M., 2016. Developing and investigating the use of single-item measures in organizational research. Journal of Occupational Health Psychology 21 (1), 3–23.

Fleche, S., Smith, C., Sorsa, P., 2011. Exploring determinants of subjective Wellbeing in OECD countries. Evidence from the World Value Survey. OECD Economics Department, Paris.

Gallup-Healthways, 2015. In: The State of Global Well-Being: 2014 Country Well-Being Rankings. Franklin, USA. Gallup-Healthways Well-being Index.

Gardner, D.G., Cummings, L.L., 1998. Single-item versus multiple-item measurement scales: An empirical comparison. Educational and Psychological Measurement 58 (6), 898–915.

Greve, B., 2010. Introduction. In: Greve, B. (Ed.), Happiness and social policy in Europe. Edward Elgar, Cheltenham, UK, pp. 1–10.

Harris, R.J., Sterne, J.A.C., 2009. Updated tests for small-study effects in meta-analyses. The Stata Journal 9 (2), 197–210.

Havasi, V., 2013. Financial situation and its consequences on the quality of life in the EU countries. Social Indicators Research 113 (1), 17–35.

Hayes, D., 2014. What is the relationship between financial satisfaction and happiness among older people? In: An analysis using the World Values Survey 1981–2008. UK. International Longevity Centre - UK.

Headey, B., Muffels, R., Wooden, M., 2008. Money does not buy happiness: Or does it? a reassessment based on the combined effects of wealth, income and consumption. Social Indicators Research 87, 65–82.

Hicks, S., Tinkler, L., Allin, P., 2013. Measuring subjective well-being and its potential role in policy: Perspectives from the uk office for national statistics. Social Indicators Research 114 (1), 73–86.

Higgins, J.P.T., Green, S., 2011. Cochrane handbook for systematic reviews of interventions. The Cochrane Collaboration version 5.1.0 [updated March 2011].

Hong, R.Y., Cheung, M.W.L., 2017. Applications of meta-analytic structural equation modelling in health psychology: Examples, issues, and recommendations. Health Psychology Review 11 (3), 265–279.

Horstmann, V., Haak, M., Tomsone, S., Iwarsson, S., Gräsbeck, A., 2012. Life satisfaction in olderwomen in latvia and sweden—Relations to standard of living, aspects of health and coping behaviour. Journal of Cross-Cultural Gerontology 27, 391–407.

Howell, R.T., Howell, C.J., 2008 Jul. The relation of economic status to subjective well-being in developing countries: A meta-analysis. Psychological Bulletin 134 (July(4)), 536–560.

Howell, R.T., Kurai, M., Tam, L., 2013. Money buys financial security and psychological need satisfaction: Testing need theory in affluence. Social Indicators Research 110 (1), 17–29.

Hytti, U., Kautonen, T., Akola, E., 2013. Determinants of job satisfaction for salaried and self-employed professionals in finland. The International Journal of Human Resource Management 24 (10), 2034–2053.

Inaba, Y., 2009. Social capital and health in Japan: What has been confirmed and what has not. A commentary on Ichida and on Fujisawa. [References]. Soc Sci Med. 69 (4), 506–508. https://doi.org/10.1016/j.socscimed. Aug 2009.

Inglehart, R., 1997. Modernization and postmodernization: Cultural, economic, and political change in 43 societies. Princeton University Press, Princeton, New Jersey.

Inglehart, R., Foa, R., Peterson, C., Welzel, C., 2008, July Jul. Development, freedom, and rising happiness a global perspective (1981-2007). Perspectives on Psychological Science : A Journal of the Association for Psychological Science 3 (4), 264–285.

Jac, S., Egger, J.A., 2001. Funnel plots for detecting bias in meta-analysis: Guidelines on choice of axis. Journal of Clinical Epidemiology 54 (10), 1046–1055.

Johnson, W., Krueger, R.F., 2006. How money buys happiness: Genetic and environmental processes linking finances and life satisfaction. Journal of Personality and Social Psychology 90 (4), 680–691.

Kahneman, D., Deaton, A., 2010. High income improves evaluation of life but not emotional well-being. In: 107. pp. 16489–16493.

Kaplan, R.M., Chambers, D.A., Glasgow, R.E., 2014. Big data and large sample size: A cautionary note on the potential for bias. CTS-Clinical and Translational Science 7 (4), 342–346.

Lambert, N.M., Fincham, F.D., Stillman, T.F., Dean, L.R., 2009. More gratitude, less materialism: The mediating role of life satisfaction. The Journal of Positive Psychology 4 (1), 32–42.

Layard, R., Clark, A., Senik, C., 2016. The causes of happiness and misery. In: Helliwell, J.F., Layard, R., Sachs, J. (Eds.), World happiness report 2016. Sustainable Development Solutions Network, New York.

Longmire-Avital, B., Golub, S.A., Parsons, J.T., Brennan-Ing, M., Karpiak, S.E., 2012. Financial hardship and life satisfaction among aging African Americans with hiv. Journal of HIV/AIDS & Social Services 11 (4), 363–374.

Lu, F., Patryk, B., 2019. The determinants of subjective financial satisfaction and the moderating roles of gender and marital status. Family and Consumer Sciences Research Journal 47 (3), 237–259.

Mike, W.L.C., 2015. metaSEM: An r package for meta-analysis using structural equation modeling. Front Psychol. 5, 1521. https://doi.org/10.3389/fpsyg.2014.01521.

Miller, G.A., Chapman, J.P., 2001. Misunderstanding analysis of covariance. Journal of Abnormal Psychology 110 (1), 40–48.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G., 2009. Preferred reporting items for systematic reviews and meta-analyses: The prisma statement. PLOS Medicine 6 (7), e1000097. https://doi.org/10.1371/journal.pmed.1000097.

Morrison, M., Tay, L., Diener, E., 2011. Subjective well-being and national satisfaction: Findings from a worldwide survey. Psychological Science 22 (2), 166–171.

Newman, C., Delaney, L., Nolan, B., 2008. A dynamic model of the relationship between income and financial satisfaction: Evidence from Ireland. Economic and Social Review 39 (2), 105–130.

Ng, W., 2015. Processes underlying links to subjective well-being: Material concerns, autonomy, and personality. Journal of Happiness Studies 16 (6), 1575–1591.

Ng, W., Diener, E., 2014. What matters to the rich and the poor? Subjective well-being, financial satisfaction, and postmaterialist needs across the world. Journal of Personality and Social Psychology 107 (2), 326–338.

Ngamaba, K.H., 2016, October Oct. Happiness and life satisfaction in Rwanda. Journal of Psychology in Africa 26 (5), 407–414.

Ngamaba, K.H., 2017, Apr. Determinants of subjective well-being in representative samples of nations. European Journal of Public Health 27 (2), 377–382.

Nielsen, L., 2011. Classifications of countries based on their level of development: How it is done and how it could be done. In: IMF working paper: Strategy, policy, and review department. IMF.

OECD, 2011. In: I. Measuring financial literacy: Core questionnaire in measuring financial literacy: Questionnaire and guidance notes for conducting an internationally comparable survey of financial literacy. Paris. OECD.

Page, M.J., Lipsey, M.W., Higgins, J.P.T., Pez, L., Pez, J., 2018. Dealing with effect size multiplicity in systematic reviews and meta-analyses. Research Synthesis Methods 9 (3), 336–351.

Peiro, A., 2006. Happiness, satisfaction and socio-economic conditions: Some international evidence. Journal of Socio-Economic 35 (2), 348–365.

Preacher, K.J., 2002. Calculation for the test of the difference between two independent correlation coefficients [Computer software]. Vanderbilt University, Quantpsy.
Richins, M.L., Dawson, S., 1992. A consumer values orientation for materialism and its measurement: Scale development and validation. Journal of Consumer Research 19 (3), 303–316.
Rijken, M., Groenewegen, P.P., 2008. Money does not bring well-being, but it does help! The relationship between financial resources and life satisfaction of the chronically ill mediated by social deprivation and loneliness. Journal of Community & Applied Social Psychology 18 (1), 39–53.
Roberts, J.A., Clement, A., 2007. Materialism and satisfaction with over-all quality of life and eight life domains. Social Indicators Research 82 (1), 79–92.
Shu, C., Albert, P., 2016. Permanent income and subjective well-being. Journal of Economic Behavior & Organization 130, 298–319.
Skreblin Kirbis, I., Vehovec, M., Galic, Z., 2017. Relationship between financial satisfaction and financial literacy: exploring gender differences. Drustvena Istrazivanja 26 (2), 165–185. https://doi.org/10.5559/di.26.2.02.
Smith, R.L., Ager, J.W., Williams, D.L., 1992. Suppressor variables in multiple-regression correlation. Educational and Psychological Measurement 52 (1), 17–29.
Stiglitz, J.E., Sen, A., Fitoussi, J.-.P., 2009. Report by the commission on the measurement of economic performance and social progress. INSEE, Paris.
Tipton, E., Johnson, M.C., Hedges, L.V., 2010. Robust variance estimation in meta-regression with dependent effect size estimates. Research Synthesis Methods 1 (1), 39–65.
UNDP, 2014. Human development reports 2014. Human Development Index United Nations Development Programme.
van Praag, B.M.S., Frijters, P., Ferrer-i-Carbonell, A., 2003. The anatomy of subjective well-being. Journal of Economic Behavior & Organization 51 (1), 29–49.
Van Praag, B.M.S., Romanov, D., Carbonell, A.F.I., 2010. Happiness and financial satisfaction in Israel effects of religiosity, ethnicity, and war. Journal of Economic Psychology 31 (6), 1008–1020.
Vanhoutte, B., 2012. In: Measuring subjective well-being in later life: A review. Manchester. CCSR Paper 2012-06.
Veenhoven, R., 2008. Sociological theories of subjective well-being. In: Eid, M., Larsen, R.J. (Eds.), The science of subjective well-being. The Guilford Press, London, pp. 17–43.
Viola, A., Danilo, C., Luca, C., Omar, P., 2014. Do danes and italians rate life satisfaction in the same way? using vignettes to correct for individual-specific scale biases. Oxford bulletin of economics and statistics 76 (5), 643–666.
World Bank New Country Classifications[database on the Internet]. The World Bank Group (2016). Available from:http://data.worldbank.org/news/new-country-classifications-2015.
Xiao, J.J., Tang, C., Shim, S., 2009. Acting for happiness: Financial behaviour and life satisfaction of college students. Social Indicators Research 92 (1), 53–68.
Zagorski, K., Evans, M.D.R., Kelley, J., Piotrowska, K., 2014. Does national income inequality affect individuals' quality of life in europe? Inequality, happiness, finances, and health. Social Indicators Research 117 (3), 1089–1110.