Improving Consumer Finance Measures: Evidence from Linked Survey and Administrative Data

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Administrative microdata. Results based on calculations by the authors in project number 10040 using non-public microdata from Statistics Netherlands. Under certain conditions, these microdata are accessible for statistical and scientific research. For further information: Microdata: Conducting your own research | CBS.

Abstract

Consumer finances are a central construct in marketing research, yet measurement practices remain fragmented, with limited guidance on when income versus subjective measures are most appropriate. To address this empirically, the authors use a unique dataset linking household survey data on subjective financial well-being to observed household income from high-quality administrative tax registries. Across the domains of consumption behavior, financial vulnerability, and wealth accumulation, the results show that subjective financial well-being explains more variance in appraisal-based outcomes (including affordability perceptions, hardship indicators, and retirement adequacy) while income explains more variance in resource-based outcomes (such as expenditure, debt, and net wealth). This pattern, termed *financial measure-outcome alignment*, holds across alternative operationalizations of subjective consumer finances, the inclusion of demographic controls and response tendencies, and measurement timing. The findings further extend beyond administrative tax data to self-reported survey-based income measures when common sources of measurement error are addressed, suggesting that the observed pattern reflects construct differences rather than data quality. The authors translate these findings into a practical decision framework, available as an app, to guide researchers in selecting appropriate financial measures based on their research objectives and data availability.

Keywords: Income, Consumer Finances, Financial Well-Being, Administrative Data, Measurement, Measure Selection

Consumer finances are a key construct in marketing because they help explain a wide range of consumer decisions and behaviors that are central to both research and managerial practice. Researchers have examined how consumer finances shape decisions (Brancatelli et al. 2022; Dias, Sharma, and Fitzsimons 2022; Hamilton et al. 2019; Salisbury et al. 2023; Scholdra et al. 2022), how they are influenced by choice architecture (e.g., Hershfield, Shu, and Benartzi 2020; Soman and Cheema 2011), or control for consumer finances when studying other topics, ranging from happiness to news consumption (e.g., Liu, Dalton, and Mukhopadhyay 2024; Yan, Miller, and Skiera 2022). In practice, consumer finance data are used to segment customers, tailor promotions, and inform pricing strategies.

In consumer research, income is the most commonly used proxy for consumers' financial circumstances. It is attractive due to its availability, actionability for segmentation and targeting, and its face validity as a measure of purchasing power. Despite its widespread use, however, income is often treated as a background demographic control rather than as a substantive construct of theoretical interest, representing a missed opportunity for theory development and empirical insight. Moreover, there is little standardization in its measurement, with a wide range of operationalizations and limited justification for measurement choices in prior work (Table 2). Together, these observations point to an opportunity for the field to develop greater intentionality in how income is positioned and measured in marketing and consumer research.

Simultaneously, a growing literature on constructs such as financial satisfaction (Briers and Laporte 2013), subjective financial constraints (Dias, Sharma, and Fitzsimons 2022; Hamilton et al. 2019; Paley, Tully, and Sharma 2019), perceived wealth (e.g., Sussman and Shafir 2012; Tully and Sharma 2022), and subjective financial well-being (e.g., Brüggen et al. 2017; Netemeyer et al. 2018) suggests that income does not map one-to-one onto consumer behavior. Consider two households with identical incomes and assets, one in an affluent

neighborhood where visible consumption is high, the other where spending norms are modest. The first may perceive itself as financially constrained and the second as well-off, leading to different consumption and saving decisions. Consumer decision-making thus not only depends on available resources but also on how individuals perceive their financial situation (Tully and Sharma 2022). Consistent with this reasoning, subjective indicators of consumer finances provide incremental explanatory power for consumption-related outcomes (e.g., De La Rosa and Tully 2022; Dias, Sharma, and Fitzsimons 2022). This growing body of work expands the conceptualization of consumer finances and broadens the measurement possibilities available to researchers. Yet, in practice, subjective financial well-being measures are much less frequently used than income-based measures, pointing to a need for clearer guidance on when to use them.

Although researchers studying consumer finances can use both income-based and subjective measures, little guidance exists on which is most appropriate for a given research context, or whether the choice matters. While income captures the financial resources available, perceptions of one's financial situation can shape behavior in ways that go beyond resource availability, suggesting the two measures may relate to different outcomes differently. A comparison across a broad range of outcomes can provide empirical guidance on when each measure is most informative. We therefore ask: When are income-based versus subjective measures of consumer finances better for explaining consumer behavior?

In this article, we provide empirically grounded guidelines for measuring consumer finances. Specifically, we compare income-based and subjective financial measures across three key domains: consumption behavior, financial vulnerability, and wealth accumulation. Rather than advocating one type of measure over another, we identify when each is most informative. Because inadequate measurement can lead to flawed interpretations and

inappropriate recommendations regarding consumer decision-making, improving these measures is critical for advancing insights into consumer behavior.

Our analyses rely on a unique dataset that combines administrative records and detailed self-reported panel survey data. Observed income measures are derived from Dutch administrative sources. These registries serve as the foundation for official government statistics and are highly accurate, as they draw information directly from objective sources such as local governments, banks, and insurers (Bakker 2012; Bakker, Van Rooijen, and Van Toor 2014). Moreover, Dutch citizens are legally required to report changes in their personal situation (Bakker, Van Rooijen, and Van Toor 2014). We enrich these administrative data with survey data from the LISS panel, a nationally representative and randomly recruited sample, which includes self-reported income as well as measures of financial satisfaction and subjective financial well-being (SFWB).

Using this rich dataset, we proceed in two steps to assess whether income or subjective financial measures better explain consumer behavior. First, we examine how observed income from administrative tax registration data and validated subjective financial well-being scales relate to various outcome measures across consumption behavior, financial vulnerability, and wealth accumulation. The comparison provides a basis for measure selection: the relative explanatory value of income and SFWB varies systematically with the nature of the outcome. Across domains, SFWB generally explains more variance in appraisal-based outcomes: how households assess their ability to afford everyday goods, cope with unexpected expenses, and prepare for retirement. Income explains more variance in resource-based outcomes including total expenditure, expenditure on clothes and memberships, debt, and net wealth.

Second, we assess whether observed differences between income and subjective measures are driven by methodological artifacts rather than substantive effects. We rule out that the stronger relationship between SFWB and appraisal-based outcomes is driven by its

operationalization. Further, we provide evidence against the interpretation that these associations reflect common method or common timing bias by correcting for positive dispositions (e.g., optimism) and by exploiting temporal separation between SFWB measures and the outcomes of interest. To assess whether income's stronger relationship with resource-based outcomes depends on access to high-quality administrative data, we evaluate the performance of self-reported income and demonstrate the effects of respondent-induced (e.g., misreporting) and researcher-induced (e.g., income brackets) sources of measurement error. We show that the alignment pattern largely replicates using survey-based income, especially if common sources of measurement error are addressed.

This paper makes two main contributions. First, we provide empirically grounded guidance for selecting measures of consumer finances. While prior work has studied both income and subjective financial measures, the literature provides limited guidance on when each measure is most appropriate. We address this gap by systematically comparing the two measure types across a broad range of outcomes and show that the nature of the outcome should drive measure selection. Building on research showing that financial perceptions shape behavior beyond resource availability (De La Rosa and Tully 2022; Dias, Sharma, and Fitzsimons 2022; Hamilton et al. 2019; Tully and Sharma 2022), we demonstrate that subjective financial well-being is more strongly associated with appraisal-based outcomes, while income better captures resource-based outcomes, which reflect financial quantities rather than respondents' evaluations of their financial situation. This pattern holds across outcome domains. We term this pattern *financial measure-outcome alignment* and use it as a principle for measure selection. Further, we translate this principle into a decision framework on *what to measure when*. By explicitly linking outcome types to financial measures and offering recommendations for improving commonly used consumer finance measures, this framework provides researchers with a basis for selecting and operationalizing measures of

consumer finances, whether these measures are central to the research question or included as control variables. In doing so, it addresses a key gap in the literature and enables more transparent, empirically grounded, and reproducible measurement choices.

Second, we make a methodological contribution by using linked administrative and survey data as a benchmarking strategy for validating financial measures. Having access to observed income from administrative records alongside self-reported measures using validated scales lets us assess how widely used subjective and income measures behave against a high-quality reference point. Despite income's widespread use in marketing and consumer research (e.g., Brancatelli et al. 2022; Scholdra et al. 2022), it is rarely scrutinized as a focal construct. We document substantial measurement error in self-reported income and show that simple, scalable adjustments, specifically winsorization and improved coverage of categorical income brackets, reduce this error. These adjustments offer practical guidance for researchers working in data-constrained settings. For subjective measures, we contribute to ongoing debates about the construct validity of subjective financial well-being (Brüggen et al. 2017; Netemeyer et al. 2018). Prior work has argued that subjective measures can provide incremental explanatory power over income (De La Rosa and Tully 2022; Dias, Sharma, and Fitzsimons 2022) but offers limited insight into the conditions under which this occurs. By benchmarking against administrative income data, comparing multiple subjective scales and constructs, accounting for response tendencies, and exploiting temporal separation between measures, we provide systematic evidence that subjective financial well-being captures a dimension of consumers' financial lives that is not reducible to income alone. Taken together, these analyses provide a more empirically grounded understanding of how income and subjective consumer finance measures differ, and how each can be appropriately applied.

Literature

Table 1 presents a typology of constructs and definitions commonly used in consumer finance research. It distinguishes two main categories of financial measures: financial resource measures, which reflect factual financial aspects such as income or savings, and subjective evaluation measures, which capture how individuals perceive and evaluate their financial situation. These two types of measures are not interchangeable and offer distinct insights into consumer behavior and outcomes (Tully and Sharma 2022).

Table 1: Constructs and Measures in Consumer Finance

Construct	**Consumer Finance Measures**				
Description	A quantification of a consumer's / household's financial characteristics.				
Measure Type	**Resource-based**			**Subjective Evaluation**	
Description	A measure of an individual's / household's condition that is independent of judgment (e.g., income)			The way an individual perceives and evaluates a condition (e.g., financial satisfaction)	
Data Source	**Observed**	**Self-Report**		**Self-Report**	
Description	A measure of consumer finances that is externally observed	A measure of consumer finances that is reported by a consumer		A measure of consumer finances that is reported by the consumer	
Examples	*Income filed in tax registers or savings in a bank account*	*Self-reported income or savings*		*Subjective Financial Well-Being or financial satisfaction*	
Response Type	**Continuous**	**Categorical**	**Continuous**	**Single Item**	**Scale**
Description	Can take any value within a range	Distinct categories	Can take any value within a range	Single question measuring a construct	(Validated) set of items measuring a construct
Examples	*Disposable income in $*	*Disposable income in categories (1) $0-$500… (9) > $5000*	*Disposable income $_____*	*How satisfied are you with your financial situation?*	*I feel on top of my day-to-day finances*

Financial Resource Measures

Financial resource measures refer to measures that capture a household's financial position based on quantifiable resources, such as income, wealth, assets, liabilities, or financial transactions.[1] Financial resource measures play a key role in consumer finance research as they reflect the economic resources available to individuals and households, which

[1] The literature also labels such measures objective financial measures (Erner et al. 2016). We use "financial resource measures" instead, because the term objective may conflict with how it is measured. As Table 2 shows, resource measures are frequently self-reported.

shape consumer behavior in several ways. They define the household budget constraint, shape the resources available for consumption, saving, and investment and thus purchasing power (e.g., Deaton 1992; Du and Kamakura 2008; Mas-Colell, Whinston, and Green 1995; Rubin, Riney, and Molina 1990). Beyond budget constraints, they also function as signals of financial standing, influencing access to credit, financial products, and other economic opportunities. Over time, they shape exposure to financial risks and opportunities, for example, through accumulated wealth or debt positions. Financial conditions have accordingly been linked to consumer outcomes including consumption, saving, and financial decision-making (Kappes, Gladstone, and Hershfield 2021; Moorhouse et al. 2023; Orhun and Palazzolo 2019).

Financial Resource Measures: Measurement and Use in Practice

Financial resource measures are operationalized through a range of fact-based measures capturing different aspects of a consumer's financial position (Erner et al. 2016). These include measures such as income or savings (e.g., Greninger et al. 1996), credit scores (Erner et al. 2016) and financial ratios such as the ratio between household income and assets (Greninger et al. 1996; Rutherford and Fox 2010). In addition, banking data, including payment issues, and the ability to cover unexpected expenses, are increasingly used to reflect a household's financial standing (Comerton-Forde et al. 2022).

Financial resource measures can be obtained either through observation (e.g., tax records, bank statements) or self-report. While self-reported data are widely used due to their accessibility, they are prone to various sources of error (Headey, Muffels, and Wooden 2005; Prati 2017). For example, self-reported income may be affected by recall difficulties, social desirability, or intentional misreporting. Even if individuals are motivated to provide thorough answers to survey questions about income, they may focus on salient amounts such as wages while overlooking less salient sources like investment income or spousal earnings (Headey, Muffels, and Wooden 2005; Tully and Sharma 2022). Furthermore, financial matters are often

viewed as private or even taboo, which can discourage full disclosure and result in missing or distorted responses (Tourangeau and Yan 2007).

Subjective Financial Measures

Subjective financial measures capture how individuals perceive and evaluate their own financial situation. These measures encompass a wide range of constructs, with subjective financial well-being as one of the most prominent. It captures how individuals experience their financial situation more comprehensively than single-item measures. Its relevance is underscored by empirical studies showing effects on overall well-being are comparable in magnitude to major life domains such as job satisfaction, physical health, and relationship quality (Netemeyer et al. 2018). It is commonly defined as "the perception of being able to sustain current and anticipated desired living standards and financial freedom" (Brüggen et al. 2017, p. 2), reflecting not only how individuals feel about their current finances but also their perceived ability to meet future needs and goals (Netemeyer et al. 2018).

Subjective financial measures relate to consumer behavior through a different set of mechanisms than income. Rather than reflecting what resources are available, they reflect how individuals interpret and experience their financial situation. Tully and Sharma (2022) propose that subjective perceptions of financial resources are constructed through multiple psychological routes, including comparative evaluations (e.g., relative to peers or past experiences), identity-based considerations (e.g., what one's financial situation implies about the self), and self-perception processes. These routes give rise to cognitive and affective responses, such as perceived scarcity, stress, or control, that directly shape behavior. Beyond these psychological mechanisms, subjective measures also capture experiential dimensions that are not fully determined by resource levels, including current money management stress and expectations about future financial security, both of which are closely tied to decision making under constraints and intertemporal trade-offs (Netemeyer et al. 2018). In doing so,

they incorporate goals and expectations, such as desired living standards and perceived financial freedom, that shape both preferences and behavior (Brüggen et al. 2017). Together, these mechanisms suggest that individuals with similar financial resources may arrive at very different subjective assessments, and consequently, different (financial) behavior.

Subjective Financial Measures: Measurement and Use in Practice

Subjective financial measures are typically assessed through surveys that ask respondents to reflect on how they perceive or feel about their financial situation (e.g., Netemeyer et al. 2018; Strömbäck et al. 2017). These may include single-item questions on financial satisfaction or validated multi-item scales that capture different dimensions of financial health or financial well-being (e.g., Botha and De New 2021; Netemeyer et al. 2018). While these concepts differ in scope and emphasis, they are closely related and sometimes even used interchangeably in the literature.

Compared to financial resource measures, subjective measures do not require detailed recall of numerical information and may therefore be less prone to recall bias or misreporting concerns. Moreover, because they reflect lived experience and internal judgment, they may provide more direct insight into financial behavior and decision-making. That said, subjective measures are not without their own limitations. For instance, responses may be influenced by respondents' current mood or general response tendencies.

Although interest in subjective financial measures is growing, studies rely on a variety of measures and scales, which complicates comparability across studies. Nevertheless, subjective measures provide a valuable lens on consumer finances by capturing how individuals experience and interpret their financial lives.

The Use of Consumer Finance Measures in Marketing Research

Table 2 summarizes our review of 64 articles published in the *Journal of Marketing,* the *Journal of Marketing Research,* the *Journal of Consumer Research*, and *Marketing*

Science that measure consumer finances.[2, 3] The analysis reveals substantial variation in the operationalization of financial measures, with little standardization across studies. Among the 199 measures reviewed, we identified 99 unique financial measures, including numerous unique operationalizations of both financial resources and subjective financial well-being. Some variation is expected, because studies may target different aspects of consumer finances. Yet the extent of variation is striking even within a single construct: income alone was measured using 52 distinct operationalizations. This lack of consistency underscores the need for greater empirical guidance in the measurement of consumer finances.

Table 2: Summary of Literature Measuring Consumer Finances in Marketing Research

Characteristic	Finding
Number of articles	64
Resource measures only	51
Subjective evaluation measures only	1
Subjective evaluation and resource measures	12
Number of financial measures	199
Number of unique measures	99
Measure type (% of all financial measures)	
Resource measure	68.8%
Subjective measure	31.2%
Data source (% of all financial measures)	
Self-reported	86.9%
Observed	7.5%
Indirect (census / aggregate)	4.5%
Not reported / other	1.0%
Subjective evaluation measures (% of articles with a subjective measure)	
Financial constraints	23.1%
Consumer Financial Protection Bureau Financial Well-Being Scale	15.4%
Current Money Management Stress	15.4%
Subjective wealth perceptions	15.4%
Expected Future Financial Security	7.7%
FWB Index	7.7%
Financial slack	7.7%
Satisfaction with income	7.7%
Subjective income bracket	7.7%
Perception of spare money	7.7%
Subjective consumer debt	7.7%
Subjective poverty perceptions	7.7%
Resource measures (% of resource measures)	
Income	83.9%
Other (e.g., wealth, debt, credit score)	16.1%
Measurement level of income measures (% of income measures)	
Household	61.7%
Individual	1.7%
Population (census)	3.5%
Not reported	33.0%
Income definition used for income measures (% of income measures)	

[2] A detailed description of our literature search is reported in Web Appendix A.

[3] Consumer finances can be studied from both an observer-focused perspective (i.e., how consumers judge the consumption of others across income / SES; e.g., Hagerty and Barasz 2020; Olson et al. 2025) and an actor-focused perspective (i.e., how consumers' own financial standing relates to their decisions). The present research focuses on the latter by examining how consumers' own financial situation relates to consumption behavior, financial vulnerability, and wealth accumulation.

Gross income	3.48%
Disposable income	4.35%
Not reported	92.17%
Response type for self-reported income measures (% of self-reported income measures)	
Continuous	5.26%
Categorical	50.53%
Other (e.g., first continuous, then categorical)	2.11%
Not reported	42.11%
# Brackets used for categorical income measures (% of categorical income measures)	
3	2.08%
5	10.42%
6	4.17%
7	6.25%
8	8.33%
9	6.25%
10	4.17%
11	2.08%
12	22.92%
13	2.08%
16	2.08%
17	4.17%
20	2.08%
Not reported	22.92%

Note. This table reviews articles in the Journal of Marketing, Journal of Marketing Research, Journal of Consumer Research, and Marketing Science from 1990-2026. Unique measures are defined by the combination of broad measure category, response type, number of brackets, measurement level, data source, and income definition. Subjective scales are reported at the article level to avoid inflation from multi-study papers that use the same scale across studies; because an article may adopt several scales, these percentages sum to over 100%

We draw several observations from this review. First, financial resource measures dominate this literature. Fifty-one articles used only financial resource measures, 12 used both financial resource and subjective measures, and only one used subjective measures alone. Among financial resource measures, self-reported income is the most commonly used financial measure (84%). However, self-reports are prone to measurement error, which may bias parameter estimates (Moore, Stinson, and Welniak 2000). For example, continuous income measures may contain extreme outliers, making it difficult to distinguish between true high-income households and respondents who may have mistakenly reported annual income as monthly income. Such misreporting may result in distorted associations between income and key outcome variables, undermining the validity of empirical findings.

To mitigate such issues, many researchers use categorical income measures. While this reduces the risk of extreme outliers, it introduces other limitations, such as right-censoring at higher incomes (Brancatelli et al. 2022). Moreover, the number of categories varies widely across studies, ranging from 3 to 20 brackets, which affects the granularity and comparability

of results. In both categorical and open-ended income questions, respondents may be unwilling or unable to provide accurate financial information. This can lead to missing values or misreporting (Headey, Muffels, and Wooden 2005), particularly when questions concern household- rather than individual income. For instance, more than one-third of couples are unable to accurately estimate their partner's salary (Fidelity Investments 2024). Such inaccuracies introduce noise and can weaken the explanatory power of financial variables.

Compounding this problem is the frequent lack of clarity in how income is defined. If income is not clearly defined in the survey, differences in responses may reflect differences in interpretation rather than true variation in financial status. Researchers often do not specify whether they are measuring gross or disposable income (92.17% of measures do not report this) or whether the reported income refers to the individual or household level (33% of measures do not report this). In many cases, definitions and operationalizations are not included in the main article and must be inferred from appendices, pre-registrations, or replication packages. This makes it difficult to compare findings across studies and to assess whether differences in results reflect substantive variation or differences in measurement.

Given the limitations of self-reported income, researchers may turn to subjective consumer finance measures, which are often less prone to missing data and may better capture individuals' lived financial experiences. However, as our review shows, the use of subjective measures remains limited and fragmented: only 13 of the 64 articles included a subjective measure, and across these we identified 12 distinct measures. This lack of standardization reduces the potential for theoretical convergence and hinders efforts to understand how subjective financial well-being functions across contexts. It also remains unclear how these various subjective measures relate to each other or to consumer financial resource measures.

An important question in consumer finance research is how the choice of financial measure relates to the outcome under investigation. While prior work distinguishes between

measures of financial resources and measures of financial perceptions, it remains unclear how these different types of measures are used in relation to the outcomes they aim to explain. Theoretical justification for the construct used to measure consumer finances is often lacking. Instead, measures appear to be used heterogeneously across contexts and outcomes, suggesting that selection is often driven by convention, availability, or precedent rather than which measure of consumer finances best fits the outcome. Establishing a clearer conceptual link between financial measures and the outcomes they are intended to explain is therefore critical for both theoretical development and empirical validity.

Methodology

To address the measurement challenges identified in the literature, we use a unique dataset linking household survey data on subjective financial well-being to observed household income from high-quality administrative tax registries. This allows us to (1) examine the relationship of subjective financial well-being versus observed household income across key consumer research domains (consumption, financial vulnerability, and wealth accumulation), and (2) evaluate to what extent this relationship is driven by methodological artifacts versus the construct (income vs. subjective consumer finances).

Data

We use data from the LISS (Longitudinal Internet Studies for the Social Sciences) panel administered by CentERdata (Tilburg University, The Netherlands) to gain insight into self-reported consumer finances and behavior. The LISS panel is a representative panel of approximately 7,500 Dutch individuals who participate in monthly Internet surveys. The panel is based on a true probability sample of households drawn by stratified simple random sampling without replacement from the Dutch population register. Households that could not otherwise participate are provided with a computer and Internet connection. A longitudinal survey is fielded annually, covering various domains, including health, work, education,

income, housing, and personality (Scherpenzeel and Das 2010). We use data from Wave 14 of the LISS Core Study on Income, which was fielded between June and July 2021, to measure self-reported income and several measures of consumer behavior. We also fielded a survey to a subset of the LISS panel to gain additional data on subjective financial well-being.

Next, through a unique respondent identifier, we link the survey responses to microdata from Statistics Netherlands, which contains information about respondents' income and assets based on administrative data. The components used to measure observed consumer finances are derived from the Dutch Tax Administration (which includes banking data), the Education Executive Agency of the Dutch Ministry of Education, Culture, and Science (abbreviated in Dutch by DUO), the Institute for Employee Insurance (UWV), and the Basic Registration of Persons. It should be noted that there is no perfect alignment in the timing of the measures. The observed financial measures were gathered from registry data in December 2021. The survey on subjective financial well-being took place in September of that year, and the LISS Core Study was fielded in June and July 2021.

Participants

Participants were recruited through the LISS panel. We report on two samples. First, we include respondents to the LISS Core Study on income; second, a subset of the LISS panel who also participated in our survey on subjective financial well-being (LISS SFWB survey). The LISS Core Study received 5,063 responses in 2021, reflecting 77.9% of invited participants. Of these respondents, 4,995 have demographic data. Our SFWB survey recruited individuals from the working-age population (25-65 years old) from the LISS panel. In total, 1,227 respondents participated in the SFWB survey, corresponding to a response rate of 84.6% among those randomly selected from the eligible LISS panel members; of these, 1,222 have demographic data. Table 3 presents the characteristics of both samples.

Table 3: Demographic Characteristics per Sample

	LISS CORE (n = 4,995)	LISS SFWB survey (n = 1,222)
	M (SD) / %	M (SD) / %
Age	53.45 (18.66)	48.43 (11.42)
Male	46.87%	50.41%
Education		
1. Primary education	7.21%	3.70%
2. Secondary education	28.96%	20.99%
3. Intermediate vocational education	24.44%	28.72%
4. Higher vocational education	26.24%	30.95%
5. University education	13.15%	15.64%
Household Size	2.44 (1.30)	2.39 (1.30)
Urbanization level	2.90 (1.42)	2.97 (1.44)

Note. Urbanization reflects the household's living area and is measured on a five-point scale ranging from 1 = extremely urban to 5 = not urban. The LISS Core Sample is representative of the Dutch population aged 16+, whereas the LISS SFWB survey is restricted to the working-age population (25-65). Hence, differences in demographic characteristics of the samples are expected by design.

Matching to Administrative Data

Of the 4,995 LISS Core respondents with demographic data, we linked 4,456 (89.2%) to the registry data; of the 1,227 SFWB survey respondents, we linked 1,104 (90.0%), of whom 1,103 have household income data. Web Appendix B reports a comparison of respondents who could or could not be matched. We did not find any meaningful differences in subjective financial well-being measures, demographic characteristics (age, gender, household size, education level, urbanity), and self-reported household and individual income based on whether a match was possible or not.

Participants are included in the analyses based on data availability, to maximize statistical power. For example, the sample size is larger when correlating self-reported income (LISS Core Study) with observed income from administrative data, compared to correlations of subjective financial well-being (LISS SFWB Survey) to observed income.

Measures

Observed income

We observe household disposable income in the administrative data. Table 4 describes the measure. A complete overview of how income is defined in these administrative records is provided in Web Appendix C.

Self-reported income

We use measures of household disposable income from the LISS core study. Respondents are first asked to indicate their income on a continuous scale. If they state that they are not able to provide this number, they are redirected to categorical response options. Because the categorical options are shown only to respondents who decline the continuous question, we obtain a categorical income measure for the full sample by recoding the continuous responses into the same brackets. Table 4 provides descriptions of the exact items and scale-points used, as well as descriptive statistics of the self-reported income variables.

Table 4: Observed and Self-Reported Disposable Household Income Measures

Measure	***Description / Survey item***	**M**	**SD**	**Median**	**P5**	**P95**	**n**
Observed							
Household Disposable Income	*Gross income minus income transfers paid (e.g., alimony), social security premiums, and taxes. See Web Appendix C for details.*	€53,254	€29,470	€48,562	€18,261	€102,053	4450
Self-Reported							
Household Disposable Income Continuous	*What was the total net income of your household over the period from 1 January 2021 to 31 December 2021?* ** The total net income means the sum of all net incomes of all members of the household. Net income means the income after the deduction of taxes and social premiums*	€39,990	€30,396	€35,918	€3,100	€84,000	1982
Household Disposable Income Categorical	*You have indicated that you do not know the total net income of your household for 2021. Can you perhaps indicate, then, within what limits lies the total net income of your household in the period from 1 January 2021 to 31 December 2021?* *1. less than 8,000 euros; 2. 8,000 – 16,000 euros; 3. 16,000 – 24,000 euros; 4. 24,000 – 36,000 euros; 5. 36,000 – 48,000 euros 6. 48,000 – 60,000 euros; 7. 60,000 euros or more*	4.34	1.74	4	1	7	3084
Household Disposable Income Continuous Winsorized	*See household disposable income continuous. Winsorized at 1st and 99th percentiles.*	€39,241	€25,946	€35,918	€3,100	€84,000	1982

Note. M refers to mean, and SD refers to the standard deviation. P5 and P95 refer to the 5th and 95th percentiles of the distribution. Sample sizes are based on LISS panelists that can be linked to administrative data.

Subjective financial well-being

We use four operationalizations of subjective consumer finances (Table 5). Whereas there are many ways of measuring subjective financial well-being, as illustrated in Table 2, we focus on empirically validated scales. We incorporate three multi-item, validated measures of subjective financial well-being in our own survey, administered to a subset of the LISS panel. All three scales were originally developed in English; we translated them into Dutch for administration in the LISS panel. First, we include a brief unidimensional scale. Specifically, we used the 5-item *Reported Financial Well-Being* scale developed by Botha and De New (2021). It assesses financial well-being based on respondents' personal perception and includes items reflecting both current and expected future financial well-being. Participants rate the applicability of each item to their financial situation on a 5-point scale. We use this as the focal measure of subjective financial well-being in our analyses.

Second, we administer the perceived financial well-being scale developed by Netemeyer et al. (2018), which is based on the Consumer Financial Protection Bureau Scale. This measure consists of two subscales: *Current Money Management Stress* (CMMS) and *Expected Future Financial Security* (EFFS). Each subscale includes five items rated on a 5-point scale. Finally, we include a 1-item measure of financial satisfaction from the LISS Core Study on income. This question is frequently used in large-scale surveys to provide a quick and intuitive assessment of individuals' subjective evaluation of their financial situation.

Outcome measures

Finally, we collect an extensive set of outcome measures across three domains relevant to consumer research: consumption, financial vulnerability, and wealth accumulation (Table 6). Within each domain, we distinguish resource-based outcomes, which capture financial quantities such as spending, debt, or wealth, from appraisal-based outcomes, which capture

the household's own evaluation of its financial situation. This distinction concerns the construct, not the data source: resource-based outcomes can be self-reported or observed.

The consumption domain captures how households allocate resources to everyday goods and services, measured with both resource-based and appraisal-based measures. Resource-based measures capture self-reported spending on clothes, memberships, and leisure, and include a total expenditure measure capturing spending across both fixed and variable expenses[4]. Appraisal-based measures capture perceived affordability of clothes, memberships, and meals out. Finally, we include an affordability index that aggregates affordability perceptions across six behaviors (buying clothes, replacing furniture, going on holiday, heating the home well, eating out regularly, and paying for memberships).

The financial vulnerability domain captures households' financial fragility and difficulty meeting financial obligations. In this domain, the resource-based measures capture observable signs of financial vulnerability, including benefit dependency and debt, based on registry data. Benefit dependency is defined as the share of total household income derived from government benefits. Debt is the total outstanding household debt as registered in administrative records, including mortgage debt. The appraisal-based measures capture whether households perceive themselves as struggling to meet financial obligations. These include the ability to cover an unexpected expense of €500 or more without getting into debt, and a financial problem index. The financial problem index is a hybrid measure summing five self-reported indicators of financial strain. The index contains both items describing concrete financial events (e.g., visit by debt collector in last month) and subjective assessments of financial capacity (e.g., ability to quickly replace broken items).

The wealth accumulation domain captures households' current wealth positions and their ability to build financial resources over time. The resource-based measures are based on

[4] To reduce the impact of extreme outliers, all numerical expenditure variables are winsorized for analyses.

registry data and capture actual wealth positions and accumulation, including net wealth, net wealth increase, and the asset-to-income ratio. Net wealth increase is calculated as the change in net wealth between 2021 and 2022. The asset-to-income ratio reflects the amount of liquid wealth a household holds relative to its annual income. For example, a household with an annual income of €50,000 and €25,000 in savings has an asset-to-income ratio of 0.5. The appraisal-based measures in the wealth accumulation domain reflect how households assess their current and future financial situation, including perceived saving capacity and retirement adequacy. Correlations between all key variables are reported in Web Appendix D.

Table 5: Subjective Consumer Finance Measures

Subjective Financial Well-Being Measure	**Items**	Range	α	M	SD	Median	P5	P95	n
1. Reported Financial Well-Being (Botha and De New 2021)	• *I can enjoy life because of the way I'm managing my finances* • *I could handle a major unexpected expense* • *I feel on top of my day-to-day finances* • *I am comfortable with my current levels of spending* • *I am on track to have enough money to provide for my financial needs in the future.*	1-5	.874	3.69	0.76	3.80	2.40	5.00	1103
2. Current Money Management Stress (Netemeyer et al. 2018)	• *Because of my money situation, I feel I will never have the things I want in life.* • *I am behind with my finances* • *My finances control my life* • *Whenever I feel in control of my finances, something happens that sets me back* • *I am unable to enjoy life because I obsess too much about money*	1-5	.873	2.07	0.78	2.00	1.00	3.40	1102
3. Expected Future Financial Security (Netemeyer et al. 2018)	• *I am becoming financially secure* • *I am securing my financial future* • *I will achieve the financial goals that I have set for myself* • *I have saved (or will be able to save) enough money to last me to the end of my life.* • *I will be financially secure until the end of my life.*	1-5	.858	3.18	0.77	3.20	2.00	4.40	1102
4. Financial Satisfaction (LISS panel)	• *How satisfied are you with your financial situation?*	0-10	/	7.10	1.74	7.00	4.00	10.00	4341

Note. α refers to Cronbach's alpha. M refers to mean, and SD refers to the standard deviation. P5 and P95 refer to the 5th and 95th percentiles of the distribution.

Table 6: Operationalization and Descriptive Statistics of Outcome Measures

Variable	Description	Range	M	SD	Median	P5	P95	n
Consumption								
Expenditure: Clothes	Self-reported monthly spending on clothing, winsorized	/	€90.97	€84.44	€60	€0	€250	746
Expenditure: Memberships	Self-reported monthly spending on memberships, winsorized	/	€83.39	€59.38	€75	€14.50	€175	860
Expenditure: Leisure	Self-reported monthly spending on leisure activities, winsorized	/	€123.79	€119.78	€100	€0	€400	727
Expenditure: Total	Self-reported monthly spending on fixed and variable expenses, winsorized	/	€1,983	€1,040	€1,831	€710	€3,625	919
Affordability: Clothes	Can the household afford to buy new clothes regularly? (1 = yes, 0 = no, cannot afford)	0-1	.923	.267	1	0	1	3847
Affordability: Memberships	Can the household afford memberships (e.g., sports club, associations)? (1 = yes, 0 = no, cannot afford)	0-1	.945	.228	1	0	1	2953
Affordability: Dinner out	Can the household afford to eat out at a restaurant regularly? (1 = yes, 0 = no, cannot afford)	0-1	.908	.289	1	0	1	3651
Affordability index	Sum of items household indicates to be able to afford (1 = yes, 0 = no, cannot afford): buying new clothes, replacing furniture, going on holiday, heating the home well, eating out regularly, paying for memberships.	0-6	5.135	1.280	6	2	6	3910
Financial Vulnerability								
Benefit dependency	% of total household income derived from government benefits	/	6.47%	18.63%	0%	0%	52%	4456
Debt	Total debt (includes mortgage debt, student loans, and other debts such as consumption debt)	/	€115,166	€156,106	€68,068	€0	€360,792	4450
Unexpected expense	Perceived capacity to cover an unexpected essential expense of €500 or more without getting into debt or contracting a loan (very easy – very hard)	1-7	2.253	1.727	1	1	6	3930
Financial problem index	Sum of financial problems experienced (1 = experienced, 0 = not): unable to quickly replace things that break; needed loan to cover necessary expenses; arrears on payments; visited by debt collector; needed financial support from family/friends	0-5	0.113	0.371	0	0	1	3934
Wealth Accumulation								
Net wealth	Total worth of liquid wealth, obligations, shares, housing wealth, entrepreneurial wealth, and other assets minus total debt	/	€278,417	€1,055,135	€166,474	-€7,823	€857,401	4450
Net wealth increase	Increase in net wealth from 2021 to 2022	/	€66,795	€215,793	€58,429	-€18,663	€224,674	3688
Asset-to-income ratio	Liquid wealth divided by household disposable income	/	1.465	4.219	.646	.039	5.036	4450
Perceived saving capacity	Self-reported assessment of household ability to save	1-5	3.695	1.027	4	2	5	3934
Retirement adequacy	Self-reported perceived retirement adequacy	1-5	3.108	0.931	3	1.333	4.333	1087

Note. M refers to mean, and SD refers to the standard deviation. P5 and P95 refer to the 5^{th} and 95^{th} percentiles of the distribution.

Results

When to Use Income Versus Subjective Financial Well-Being

To address our central research question, we compare the extent to which household disposable income[5] and SFWB explain variation across three domains: consumption, financial vulnerability, and wealth accumulation. For each outcome, we estimate separate single-predictor regressions and compare adjusted R^2 values, which capture the proportion of variance in each outcome explained by a given predictor. Full regression tables, bootstrapped confidence intervals around the difference in adjusted R^2, and demographic-controlled replications are reported in Web Appendix E.

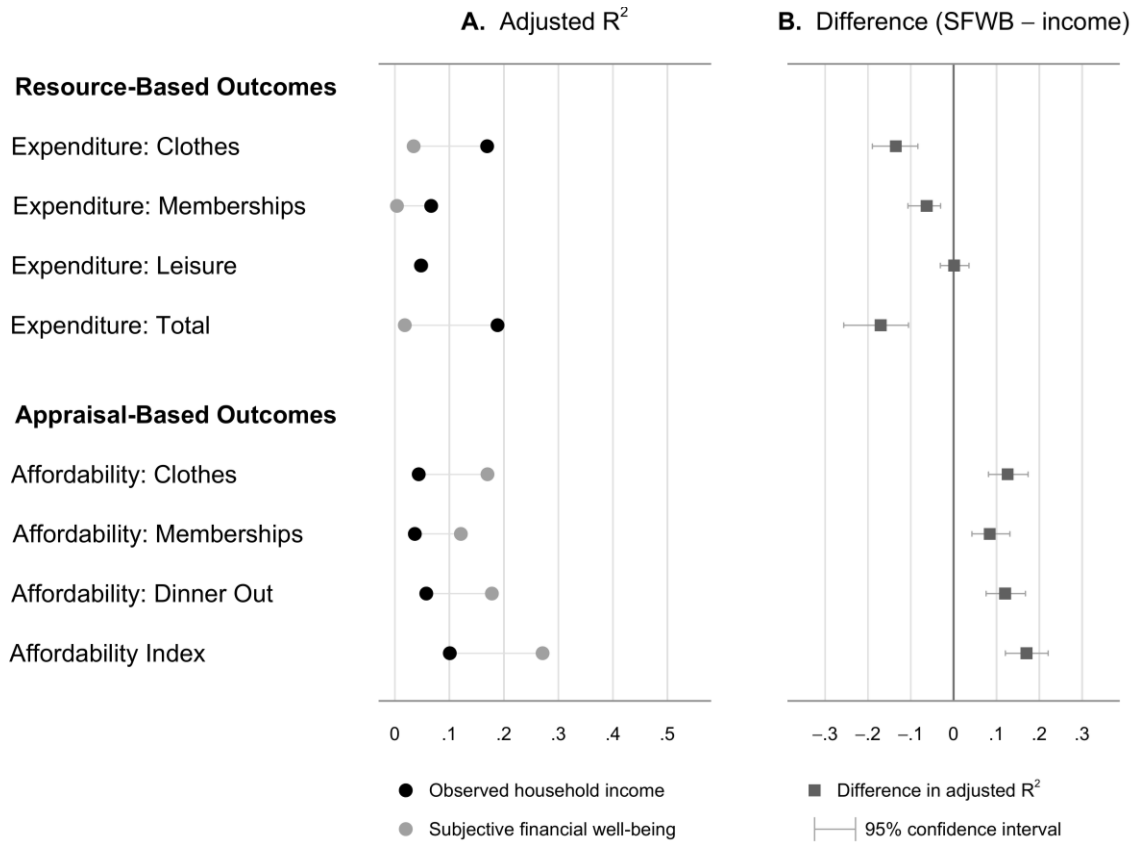
Consumption

We first examine the consumption domain using affordability perceptions and resource-based expenditures (in euros). Figure 1 Panel A plots the adjusted R^2 for income and SFWB per outcome; Panel B plots the difference in explained variance (SFWB - income) with 95% percentile bootstrap confidence intervals.

For resource-based measures, income is generally the stronger predictor (adj. R^2_{INCOME} = .048–.188 vs. adj. R^2_{SFWB} = .004–.049). Interestingly, this does not extend to affordability perceptions, even though these items mirror the same spending categories. For affordability perceptions, SFWB explains more variance across all categories (adj. R^2_{SFWB} = .121–.271 vs. adj. R^2_{INCOME} = .037–.101). The general divergence between resource-based and appraisal-based measures replicates when controlling for demographics (Web Appendix E, Figure W1). These results suggest a measure–outcome alignment: income explains more variance in resource-based outcomes, SFWB in appraisal-based outcomes. Leisure expenditure is an exception: explanatory power is low for both predictors (adj. R^2_{SFWB} = .049 vs. adj. R^2_{INCOME} = .048).

[5] We use household disposable income as the focal income measure. Household-level income generally explains more variance in resource-based outcomes than personal income across all three domains (see Web Appendix E, Table W5).

Figure 1: Adjusted R^2 for SFWB and Income: Consumption Domain



Note. Panel A: adjusted R^2 from separate single-predictor OLS regressions of each outcome on administrative household disposable income or SFWB. Panel B: difference in adjusted R^2 (SFWB - income) with 95% percentile bootstrap CIs (5,000 resamples); positive values indicate SFWB explains more variance.

Financial vulnerability

We next examine whether the financial measure-outcome alignment pattern, where income is more related to resource- and SFWB to appraisal-based outcomes, extends to financial vulnerability measures. Figure 2 displays the adjusted R^2 for each outcome.

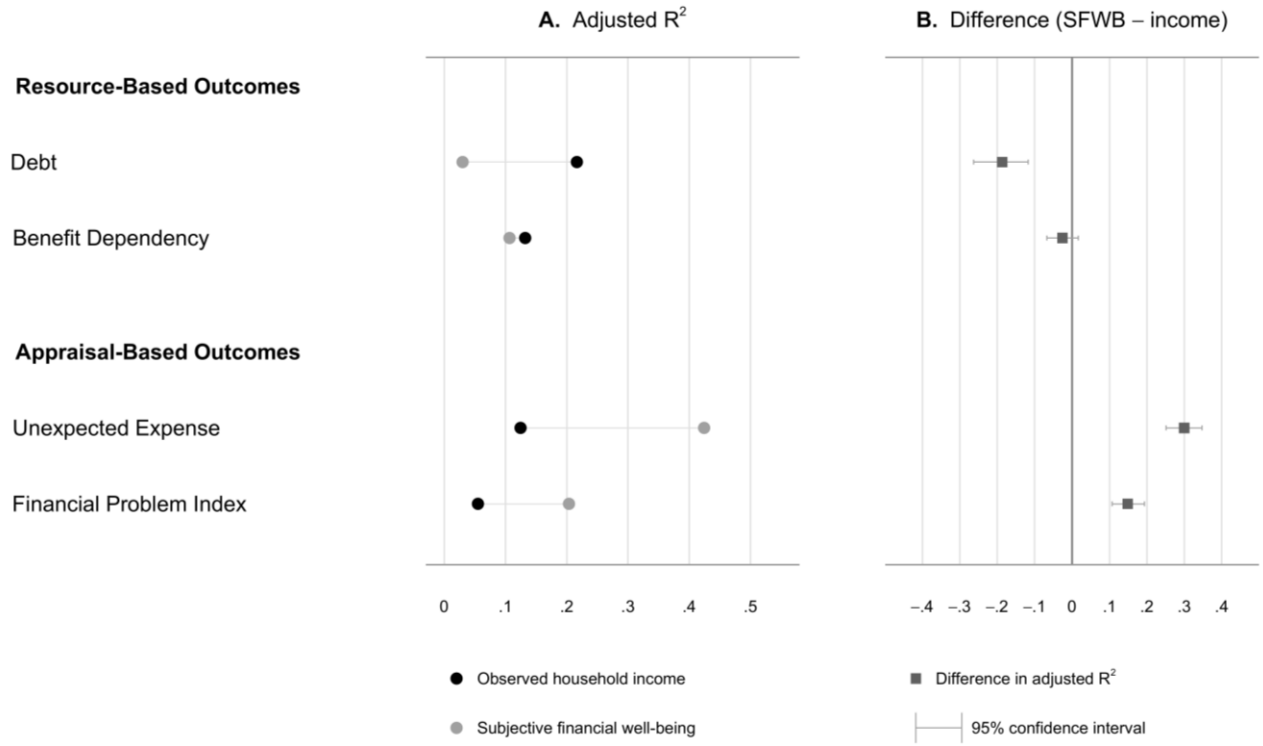
For the administrative debt measure, income is the stronger predictor (adj. R^2_{INCOME} = .216 vs. adj. R^2_{SFWB} = .030), consistent with the broader pattern in which income better explains resource-based outcomes.

For benefit dependency, the difference in explained variance is small, and the bootstrapped confidence interval includes zero (Web Appendix E, Table W9), though the difference is consistent with the alignment pattern (adj. R^2_{SFWB} = .107 vs. adj. R^2_{INCOME} = .132). Although benefit receipt is determined by income-based eligibility criteria, how

households evaluate their financial situation may also play a role, which could account for the similar explanatory power of the two measures.

Consistent with the pattern that SFWB better explains appraisal-based outcomes, SFWB explains more variance in the ability to cover an unexpected expense (adj. R^2_{SFWB} = .424 vs. adj. R^2_{INCOME} = .125). For the financial problem index a hybrid measure that includes both experienced financial problems, such as being visited by a debt collector, as well as evaluations, such as the perceived ability to quickly replace broken items, subjective financial well-being explains more variance (adj. R^2_{SFWB} = .204 vs. adj. R^2_{INCOME} = .055). At the item level, we find that variance in the index is driven primarily by the subjective items. The pattern is thus consistent with the alignment observed for other appraisal-based outcomes.

Figure 2: Adjusted R^2 for SFWB and Income: Financial Vulnerability Domain



Note. Panel A: adjusted R^2 from separate single-predictor OLS regressions of each outcome on administrative household disposable income or SFWB. Panel B: difference in adjusted R^2 (SFWB - income) with 95% percentile bootstrap CIs (5,000 resamples); positive values indicate SFWB explains more variance.

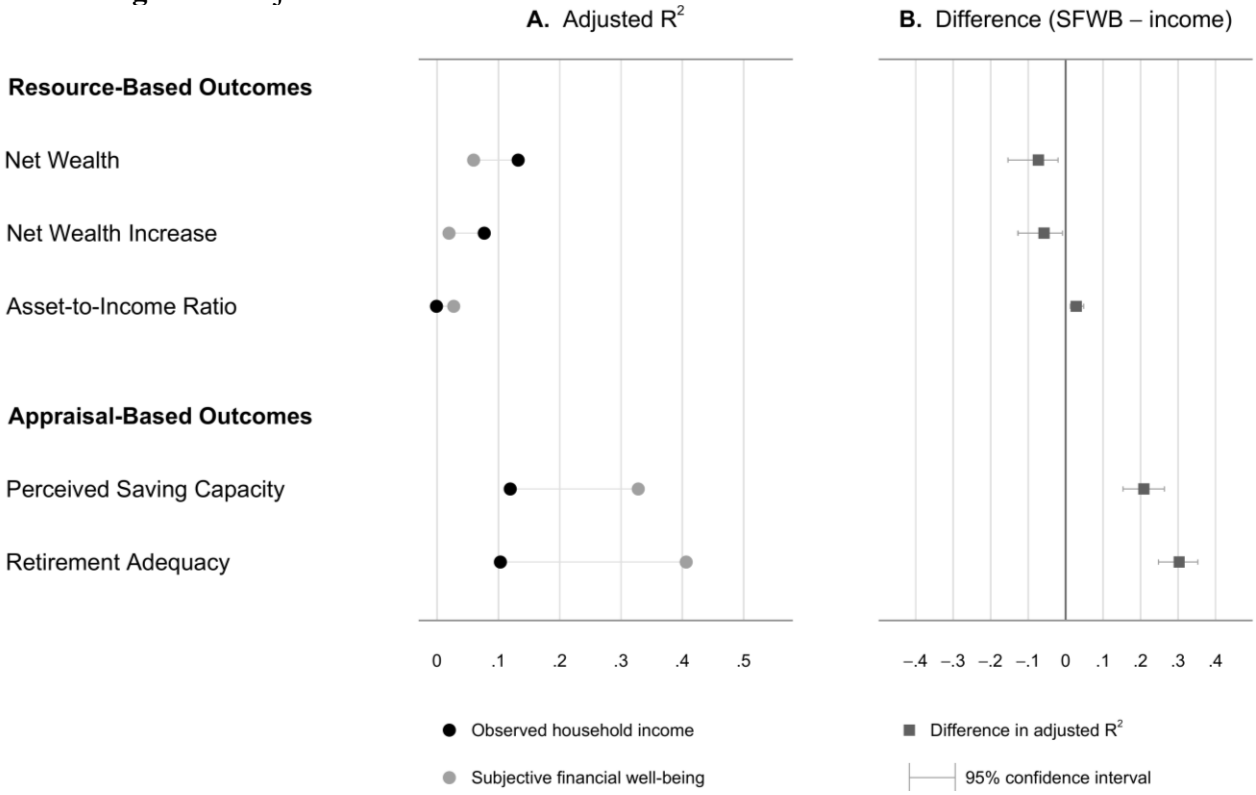
Wealth accumulation

Finally, we examine how income and SFWB relate to longer-term financial outcomes, and whether financial measure-outcome alignment in prior domains extends to wealth

accumulation. Figure 3 displays the adjusted R^2 for each outcome. The results in the wealth domain are broadly consistent with the pattern observed in the prior domains.

In terms of resource-based outcomes, income is the stronger predictor of net wealth (adj. $R^2_{INCOME} = .132$ vs. adj. $R^2_{SFWB} = .060$) and the increase in net wealth (adj. $R^2_{INCOME} = .077$ vs. adj. $R^2_{SFWB} = .019$). For the asset-to-income ratio, the adjusted R^2 remains low for both predictors, and SFWB explains modestly more variance than income. Because this ratio captures accumulated assets relative to current income rather than absolute income level, it may align more closely with how households subjectively assess their financial position, though given the low overall variance explained by either predictor, we treat this as inconclusive. As before, SFWB explains more variance than income for appraisal-based outcomes, including self-reported perceived saving capacity (adj. $R^2_{SFWB} = .328$ vs. adj. $R^2_{INCOME} = .119$) and retirement adequacy (adj. $R^2_{SFWB} = .406$ vs. adj. $R^2_{INCOME} = .103$).

Figure 3: Adjusted R^2 for SFWB and Income: Wealth Accumulation Domain



Note. Panel A: adjusted R^2 from separate single-predictor OLS regressions of each outcome on administrative household disposable income or SFWB. Panel B: difference in adjusted R^2 (SFWB - income) with 95% percentile bootstrap CIs (5,000 resamples); positive values indicate SFWB explains more variance.

Overall, the pattern is consistent across domains: neither income nor SFWB is uniformly the stronger predictor. Instead, their relative performance depends on the type of outcome rather than the substantive domain, with income explaining more variance in resource-based outcomes and SFWB in appraisal-based ones. This holds for 15 of the 17 outcomes examined, and for 14 of these the confidence interval excludes zero. Where the pattern does not hold, explanatory power is generally low for both predictors.

We also assess whether combining income and SFWB in a single model improves explained variance (Web Appendix E, Tables W10-W11). For most outcomes, the difference between the two individual measures exceeds the gain from combining them. Including an interaction term between income and SFWB modestly improves explained variance for some appraisal-based outcomes, but measure selection remains the more consequential decision. Benefit dependency and leisure expenditure are exceptions, where neither measure dominates individually, and the combined model offers larger gains in explained variance.

Our analyses so far reveal a measure–outcome alignment, in which SFWB better explains appraisal-based outcomes and income better explains resource-based outcomes. We next examine what drives this pattern. The alignment could reflect genuine differences between the constructs, or it could reflect how each measure is operationalized. For SFWB, the stronger association with appraisal-based outcomes may reflect shared method variance rather than a substantive relationship: because SFWB and appraisal-based outcomes are both self-reported, their association could be inflated by common response tendencies or by contemporaneous reporting within the same survey wave. For income, the results are based on administrative records that are unavailable in most research contexts, making it important to assess whether income's stronger relationship with resource-based outcomes reflects a property of the construct or the precision of administrative measurement. If the pattern is driven by the construct rather than the data source, it should be recoverable using self-

reported income measures, especially if common sources of measurement error are adequately addressed. If the pattern persists after addressing these concerns, this would suggest that the explanatory power of a measure is substantively linked to the type of outcome it is used to explain. We address each concern in turn.

Methodological Explanations for SFWB's Association with Appraisal-Based Outcomes

We address three potential artifact explanations for why SFWB better explains appraisal-based outcomes[6]: dependence on a specific measure of subjective finances, dispositional response tendencies, and common survey timing.[7]

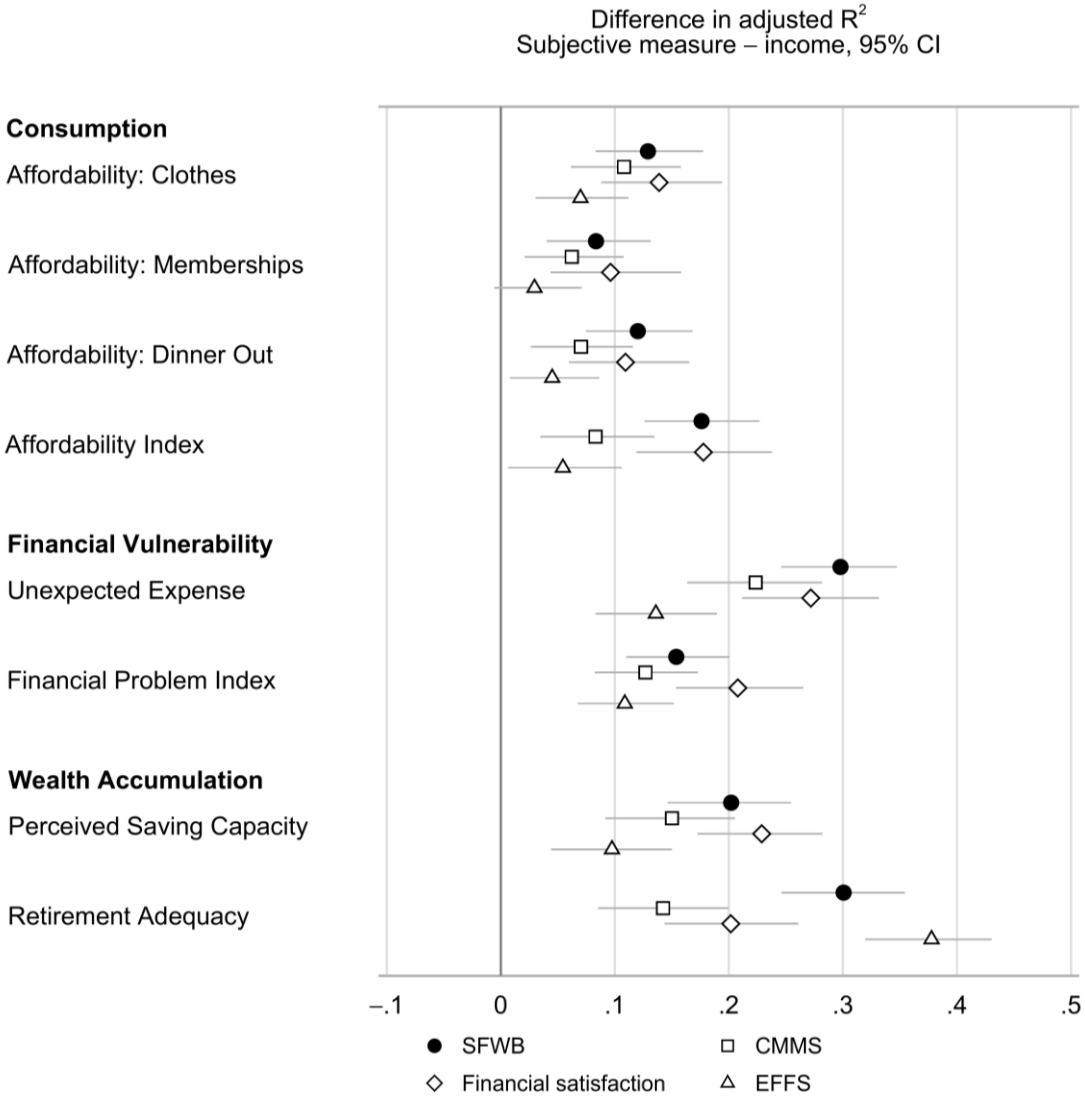
Alternative operationalization of subjective finances

If SFWB's stronger relationship with appraisal-based outcomes reflects a substantive difference rather than an artifact of a particular scale, it should replicate across operationalizations. We re-estimate all comparisons using three alternative measures: financial satisfaction (LISS panel), Current Money Management Stress, and Expected Future Financial Security (both Netemeyer et al. 2018). The magnitude of explained variance differs across scales, but all four measures explain more variance than income for appraisal-based outcomes (Figure 4).

[6] SFWB may also explain more variance if appraisal-based outcomes are not empirically distinct from SFWB. Discriminant validity analyses following Pieters, Baumgartner, and Pieters (2026) provide no indication that this explains the pattern (Web Appendix F).

[7] Because the methodological concerns apply specifically to SFWB and appraisal-based outcomes, we report these analyses in the main text. The corresponding analyses for resource-based outcomes lead to the same conclusions (Web Appendix G).

Figure 4: Difference in Adjusted R^2 Between Subjective Consumer Finance Measures and Income for Appraisal-based outcomes



Note. Difference in adjusted R^2 (subjective measure - income) from single-predictor OLS regressions with various operationalizations of subjective consumer finances, with 95% percentile bootstrap CIs (5,000 reps). Positive values indicate the subjective measure explains more variance than income.

Dispositional response tendencies

A further concern is that SFWB's stronger relationship with appraisal-based outcomes reflects stable individual differences in dispositional positivity or negativity rather than a substantive construct-level association. Individuals high in dispositional positivity, such as those high in optimism, self-esteem, or affect, may report both higher SFWB and more

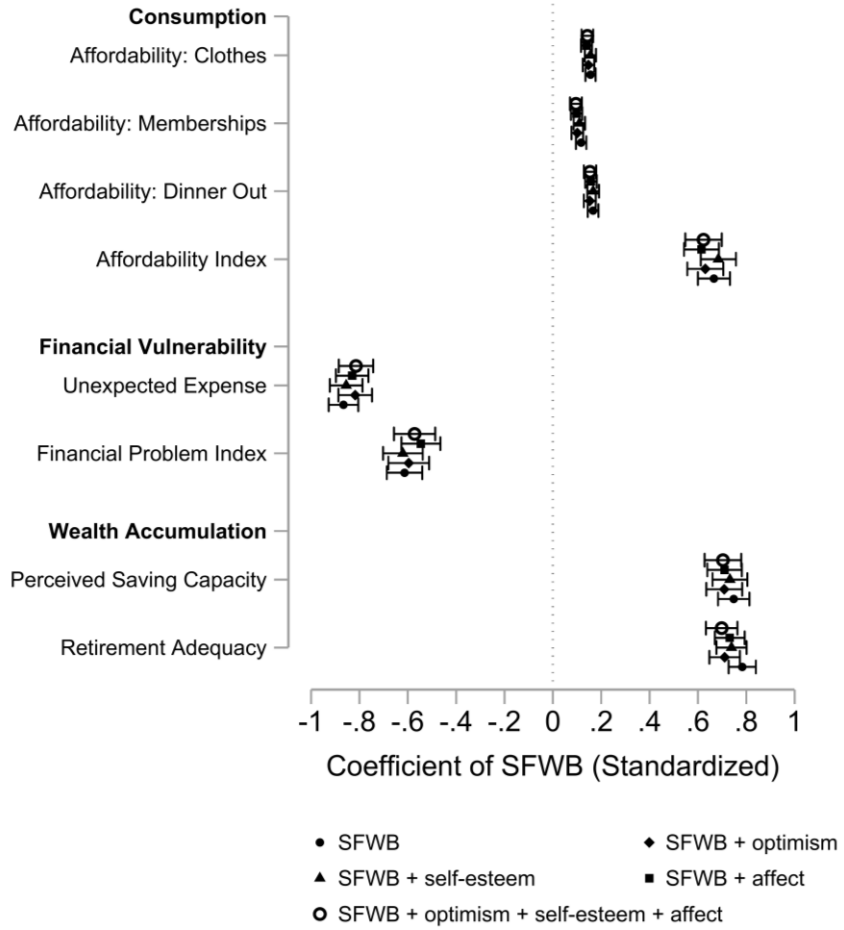
positive appraisals independently of their actual financial situation, inflating the observed association between the two (Podsakoff et al. 2003, 2024; Watson and Clark 1984).[8]

To assess whether disposition-based response tendencies account for the alignment pattern, we re-estimate all regressions controlling for optimism (Scheier, Carver, and Bridges 1994), self-esteem (Rosenberg 1965), and affect, measured as trait mood in the LISS panel (7-point scale on how the respondent feels in general, ranging from very bad to very good).

Figure 5 displays the standardized regression coefficients of SFWB for each appraisal-based outcome, estimated with and without disposition controls. We report coefficients rather than adjusted R^2 here because the question is whether SFWB's association with each outcome attenuates after controlling for disposition, rather than overall explained variance. SFWB coefficients remain largely unchanged across all specifications, indicating that controlling for dispositional response tendencies does not substantively alter SFWB's associations with appraisal-based outcomes.

[8] These variables represent theoretically plausible sources of common method variance in this context (Podsakoff et al. 2003, 2024) and correlate substantially with SFWB ($r_{optimism}$ = .440, 95% CI = [.392; .484]; $r_{self\text{-}esteem}$ = .404, 95% CI = [.355; .450]; r_{affect} = .400, 95% CI = [.351; .446]).

Figure 5: Coefficient Plot of Standardized Regression Coefficients of SFWB per Appraisal-based Outcome Controlling for Dispositional Response Tendencies



Note. Coefficients of standardized SFWB with 95% CIs. Continuous outcomes are standardized; affordability items are binary.

Survey timing

Common timing bias refers to associations driven by momentary circumstances, such as mood, rather than stable underlying relationships. We address this concern both procedurally and empirically.

Procedurally, for most appraisal-based outcomes, SFWB and the outcome were not measured in the same survey wave. Affordability indicators, the ability to cover an unexpected expense, the financial problem index, and perceived saving capacity were collected in June 2021, three months before SFWB (September 2021), consistent with recommendations to separate predictor and criterion measures (Podsakoff et al. 2003).

Empirically, we address this concern by replicating all comparisons using outcome data collected in June 2022, approximately one year after the original outcome wave (and

nine months after SFWB administration). If common timing bias inflated SFWB's associations, its explained variance would attenuate when outcomes are measured a year later. Rather, we find that for appraisal-based outcomes, SFWB's adjusted R^2 in 2022 is generally similar to the original wave (Table 7).

Table 7: Adjusted R^2 of SFWB for Appraisal-Based Outcomes Measured in 2021 and 2022

Year of Outcome Measure	2021		2022	
Variables	*Adj. R^2*	*n*	*Adj. R^2*	*n*
Consumption				
Affordability: Clothes	.170	1034	.171	898
Affordability: Memberships	.121	817	.148	708
Affordability: Dinner out	.178	1006	.156	880
Affordability index	.271	1045	.256	910
Financial Vulnerability				
Unexpected expense	.424	1048	.414	911
Financial problem index	.204	1048	.186	912
Wealth Accumulation				
Perceived saving capacity	.328	1048	.268	912
Retirement adequacy	.406	1090	NA[a]	

a. The retirement adequacy scale was not measured in 2022.

Taken together, the alignment pattern is consistent across operationalizations, across outcomes collected prior to SFWB, and in a replication using outcomes measured one year later. This makes a methodological artifact account unlikely and indicates that SFWB's stronger association with appraisal-based outcomes reflects a substantive difference in what income and subjective financial measures capture about consumer behavior.

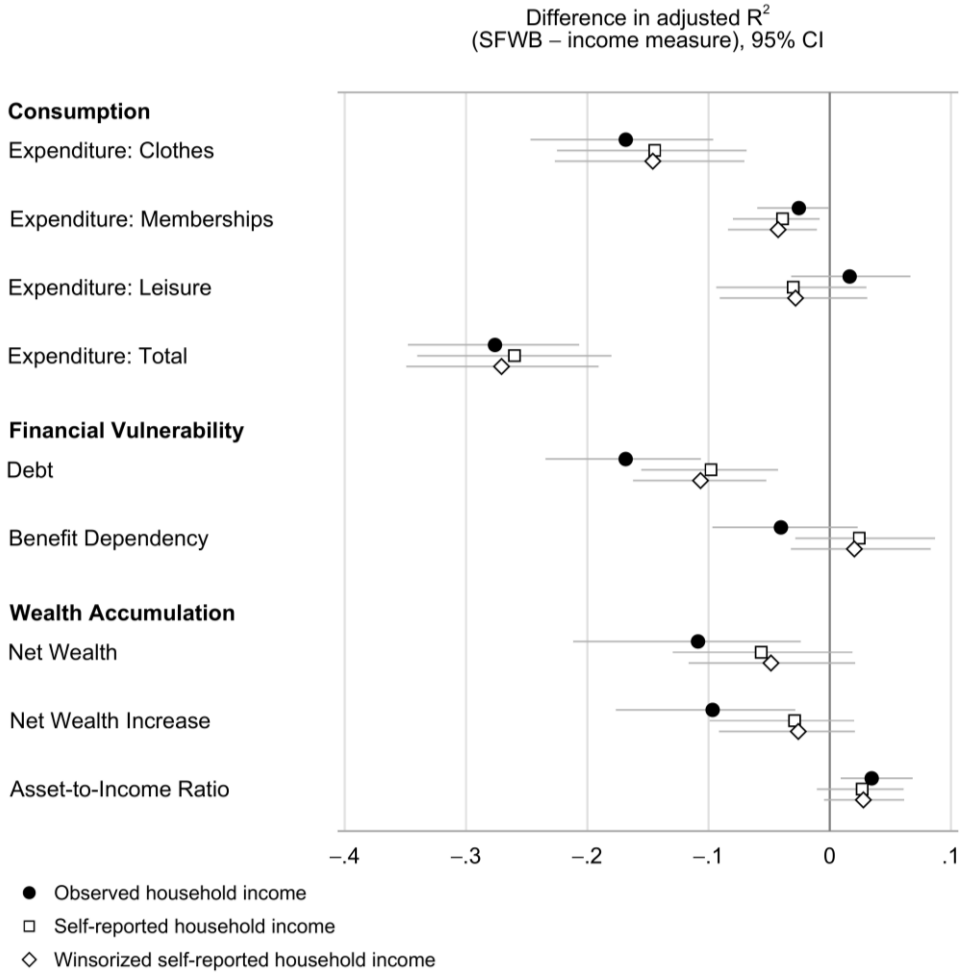
Methodological Explanations for Income's Association with Resource-Based Outcomes

The pattern in which income explains more variance than SFWB for resource-based outcomes could reflect the precision of administrative data sources rather than a substantive property of income. We first test whether the pattern replicates using self-reported income. Next, we analyze whether the relationship between self-reported income and behavior depends on who reports income (i.e., the person responsible for household finances or not) and how the income question is designed. For completeness, Web Appendix G repeats these analyses for the more appraisal-based outcomes.

Replicating with self-reported income

We examine whether the alignment pattern holds when administrative income is replaced with self-reported household income (raw and winsorized). We restrict the sample to SFWB respondents who reported continuous income, so that all income measures are compared on the same respondents. As Figure 6 shows, the pattern largely replicates: self-reported income continues to explain more variance than SFWB for expenditure and debt, although the differences are generally somewhat smaller than with observed income. For the wealth domain, the differences point in the same direction but are smaller, and their confidence intervals include zero. Overall, self-reported income preserves the direction of the alignment pattern, with some loss of precision relative to administrative income.

Figure 6: Difference in Adjusted R^2 Between SFWB and Observed and Self-Reported Income for Resource-Based Outcomes



Note. Difference in adjusted R^2 (subjective measure - income) from single-predictor OLS regressions with observed and self-reported household income, with 95% percentile bootstrap CIs (5,000 reps). Negative values indicate income explains more variance than SFWB.

Respondent-induced measurement error

Prior work suggests that household members differ systematically in financial knowledge and decision-making involvement (Ward and Lynch 2019), which may translate into differences in reporting accuracy. We therefore examine whether the finding holds across levels of responsibility for household finances. We split results by those who indicate that they are primarily responsible for financial decisions and those who indicate that this responsibility is shared or mostly their partner's.

Table 8 reports the explained variance in outcome variables across both groups. Generally, self-reported income explains less variance in the outcomes when the respondent is not mainly responsible for household finances. Still, income explains more variance than SFWB for expenditure, debt, and net wealth for this group.

Table 8: Comparison of Adjusted R^2 for Self-Reported and Observed Income and SFWB by Responsibility for Household Finances

	Primarily responsible for household finances (n = 539)			Not primarily responsible for household finances (n = 519)		
Variables	Adj. R^2 household disposable income	Adj. R^2 self-reported income winsorized	Adj. R^2 SFWB	Adj. R^2 household disposable income	Adj. R^2 self-reported income winsorized	Adj. R^2 SFWB
Consumption						
Expenditure Clothes	.203	.145	.051	.127	.188	.004
Expenditure Memberships	.033	.078	.006	.044	.018	-.002
Expenditure Leisure	.064	.132	.052	.035	.064	.052
Total Expenditure	.262	.273	.025	.094	.208	.006
Financial Vulnerability						
Debt	.211	.123	.015	.108	.062	.015
Benefit Dependency	.187	.088	.141	.062	.076	.028
Wealth						
Net Wealth	.180	.166	.074	.098	.078	.043
Net wealth Increase	.141	.081	.020	.026	.022	.009
Asset-to-Income Ratio	-.001	-.002	.030	-.001	.011	.025

Note. Each cell reports the adjusted R^2 from a separate single-predictor regression.

Categorical income measures: number of brackets and coverage

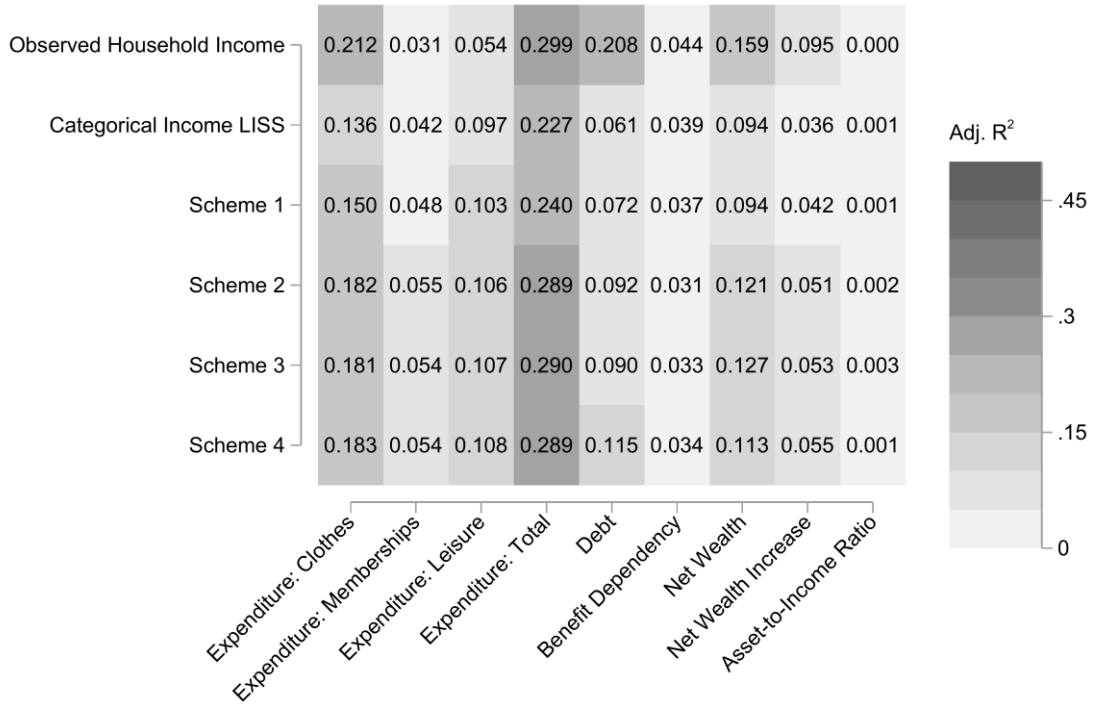
Researchers may prefer categorical income formats for practical reasons, including lower item nonresponse and reduced cognitive and privacy burden on respondents (Tourangeau and Yan 2007). However, as collapsing continuous income into brackets discards information, we explore how the use of categorical income affects the relationship between income and consumer outcomes. To keep samples comparable, we use respondents who provided self-reported continuous income and recode their answer into categorical brackets. Rows 1 and 2 of Figure 7 show the adjusted R^2 for each outcome using observed income and the LISS categorical income measure. Categorical income generally explains less variance than observed income. To further understand these differences in explained variance we systematically vary two design features: the number of brackets and the coverage of the income distribution.

We first ask how many brackets are needed to preserve the information in continuous observed income. We recode continuous self-reported household income into 2 to 50 equal-sized brackets and regress observed household disposable income on each categorized version. Explained variance increases with the number of categories but plateaus around 11 for household disposable income ($R^2adj = .330$, see Web Appendix G, Figure W7); gains beyond this point are negligible. A clear loss occurs only at very coarse groupings (e.g., 2–3 categories), indicating that surveys should include enough brackets to capture meaningful variation rather than relying on broad groupings (e.g., low/middle/high).

We next ask whether bracket design affects how much variance categorical income explains in the outcomes of interest. To separate the role of distributional coverage from the number of brackets, we design four income schemes (see Web Appendix G for details, Table W15). Schemes 1-3 all use 11 equal-width brackets but vary where the top-coded category begins: €60,000, matching the ceiling of the original LISS measure; €100,000, approximately

the 95th percentile of observed income; and €150,000, approximately the 99th percentile. Scheme 4 instead uses observed-income deciles, dividing respondents into roughly equal-sized income groups. Extending coverage from the LISS ceiling to the 95th percentile generally increases explained variance across outcomes, while extending further to the 99th percentile yields negligible improvement. The quantile-based scheme performs comparably to the 95th- and 99th percentile schemes. These comparisons suggest that distributional coverage matters more than how brackets are spaced within the range: researchers designing categorical income measures should ensure that brackets span a sufficient range of the income distribution (i.e., up to the 95th percentile) rather than focusing only on the number of categories.

Figure 7: Heatmap of Outcomes with Different Coding of Categorical Income Measures



Note. Each row shows adjusted R^2 from regressing the outcome on an income measure. All rows except observed income recode continuous self-reported income into brackets. Categorical Income LISS uses the brackets of the original LISS categorical question (7 brackets, top-coded at €60,000). Schemes 1-3 use 11 equal-width brackets, top-coded at €60,000 (LISS ceiling), €100,000 (≈P95 of observed income), and €150,000 (≈P99). Scheme 4 uses observed-income deciles. The sample (LISS respondents reporting continuous income) is larger than the SFWB sample, so adjusted R^2 values differ from other figures.

Across all robustness checks, we find little support for methodological explanations of financial measure-outcome alignment. The results are largely robust across the use of self-reported and categorically measured income.

Discussion

Using a unique data set that combines administrative records and detailed panel survey data, we systematically compare income-based and subjective financial measures across outcomes and document a pattern of financial measure-outcome alignment. Household income generally explains more variance in resource-based outcomes, such as expenditure, debt, and net wealth. In contrast, SFWB generally explains more variance in appraisal-based outcomes that require households to evaluate their own financial situation, such as affordability perceptions, hardship indicators, and perceived retirement adequacy. For some outcomes, such as benefit dependency, both financial status and subjective experience may play a role, and the distinction between measure types is less clear-cut. Our findings indicate that income and subjective financial measures are not interchangeable proxies for financial standing but instead capture distinct aspects of consumer finances. Researchers should therefore deliberately choose which measure to use, depending on the outcome under investigation.

Income is the most widely used financial measure in consumer research, but little guidance exists on when it is the most appropriate measure to include. Our results suggest that income's explanatory value is concentrated in outcomes where resource availability is a more direct determinant, consistent with its role as an approximation of purchasing power and budget constraints (Mas-Colell, Whinston, and Green 1995). This association is not limited to administrative data: when administrative benchmarks are unavailable, self-reported income can explain similar variation in behavior when common sources of measurement error are addressed through simple and scalable adjustments, such as winsorization and improved coverage of categorical income brackets.

Subjective financial well-being is less commonly used than income, but our results indicate that it is the more informative measure when the outcome involves households' own assessments of their financial situation. This is consistent with prior work showing that subjective financial perceptions are influenced by comparative evaluations, personal goals, and affective responses such as stress and perceived scarcity, and shape consumer behavior in ways not fully accounted for by income (Brüggen et al. 2017; De La Rosa and Tully 2022; Gladstone and Bellezza 2026; Tully and Sharma 2022). This pattern holds across operationalizations of subjective consumer finances, is robust to tests for common method bias and when there is temporal separation between measures and outcomes. As our benchmark is income from administrative tax registries, SFWB's stronger relationship with appraisal-based outcomes cannot be attributed to measurement error in income.

The alignment between measure type and outcome type may seem intuitive in hindsight, but theory would not necessarily predict the alignment pattern. For instance, if SFWB captures information beyond income, we would expect SFWB to explain more variance than income across outcome types. Conversely, from a conventional economic perspective, one would expect income to explain substantial variance in appraisal-based outcomes as well. Further, the alignment pattern is not yet reflected in current measurement practice, where financial measures are selected with limited standardization and little consistency in operationalizations across studies. Our results suggest these measurement decisions have meaningful consequences: the primary gains in explanatory power come from aligning the financial measure with the nature of the outcome, rather than from combining measure types. For researchers working with limited survey space or secondary data, this implies that selecting the right measure matters more than adding additional measures. Importantly, our findings do not suggest that one financial measure is inherently superior to another. Rather, they highlight the importance of making a conscious and informed choice

about which measure best fits the research objective. To support this choice, we offer a decision framework and accompanying app (Figure 8 and https://consumer-finance-measures.vercel.app) that recommends a measure based on the researcher's objectives and data availability. By combining guidance on *which* measure to use with guidance on *how* to measure it, the framework facilitates more informed and transparent measurement decisions, improves comparability across studies, and enables researchers to match their measures to the underlying theoretical construct of interest.

Theoretical and Managerial Contributions

Our study makes several contributions to marketing literature, managerial practice, and public policy. First, we provide systematic, empirically grounded guidance for selecting measures of consumer finances. Although prior research has developed a wide range of resource-based and subjective financial measures, it provides limited guidance on when each is most appropriate. Our literature review documents substantial fragmentation in current practices: operationalizations vary widely, financial measures are rarely matched with the outcomes they are intended to explain, and key measurement details are often not reported. By systematically comparing the two measure types across domains of consumption, financial vulnerability, and wealth accumulation, we show that the nature of the outcome provides a basis for measure selection, a pattern we term financial measure-outcome alignment. This pattern also has implications for interpreting prior findings. Studies using income-based measures to predict appraisal-based outcomes, or subjective financial measures to predict resource-based outcomes, may have underestimated the role of consumer finances due to measure-outcome mismatch rather than weak underlying relationships.

Second, we make a methodological contribution by demonstrating that the choice between income and SFWB is not the only decision that matters; how these measures are implemented also affects what can be learned from them. For income, sources of

measurement error in self-reported data are well documented (Micklewright and Schnepf 2010; Moore, Stinson, and Welniak 2000), yet rarely addressed in practice. Consistent with this literature, we find that winsorizing extreme values in continuous measures improves the correspondence between self-reported household income and administrative records. We show that simple, scalable design choices can substantially improve the informational value of self-reported income for consumer outcomes. For categorical measures, coarse categorizations and limited top-coding reduce explanatory power, whereas sufficiently granular brackets (≥10) with broad distributional coverage can approach the performance of continuous income as observed in registry data. More broadly, our findings underscore the need to report financial measures with sufficient detail to make their operationalization transparent and findings comparable across studies.

Our analyses further show that, for categorical income measures, where cut points fall within the target distribution matters. Building on this finding, we develop a procedure that anchors income brackets to published distributions for the population being studied and updates them as the distribution changes. This updating matters: In the United States, for example, an income cut point of $157,000 marked the top 10% of households in 2014 but, if left unchanged, would classify about 25% of households as above that threshold in 2024. Outdated cut-points can therefore compress income variation. Our app automates the procedure (see Web Appendix H for details).

For subjective financial well-being the fragmentation documented in our review is less consequential than it may appear: the alignment pattern holds across operationalizations tested, including subjective financial well-being, financial satisfaction, current money management stress, and expected future financial security. This indicates that the choice among (validated) subjective measures is less critical than the choice between resource-based and subjective measures in the first place.

The alignment principle and decision framework have direct implications for marketing practice, most notably that income should not serve as the default segmentation variable for all finance-related questions. As outlined in Figure 8, income-based measures are well suited for studying outcomes tied closely to resource levels, such as consumer spending. However, when the objective is to understand whether consumers perceive a product as affordable or feel financially secure, income-based segments can be misleading: a high-income consumer who feels financially constrained may behave more like a lower-income consumer who shares that perception. For such outcomes, SFWB provides a more informative basis for segmentation. While collecting subjective financial measures may require more consumer input, brief validated SFWB scales are available, and recent work demonstrates that subjective financial measures can be embedded in digital touchpoints such as financial management apps and linked to behavioral data (Gladstone and Bellezza 2026). The decision framework also applies when financial measures are included as covariates rather than as focal variables. Researchers often default to including income as a financial covariate. However, for appraisal-based outcomes, including SFWB may increase statistical power for detecting the effect of interest, if SFWB is more strongly correlated with the dependent measure (Meyvis and Van Osselaer 2018). Aligning the measurement approach with substantive research objectives can thus yield more actionable consumer insights, reduce misclassification in financial segmentation, and produce findings that are more comparable across studies, markets, and time periods.

Limitations and Future Research Directions

The findings and recommendations of this study should be interpreted in light of several limitations. First, our measures were not all collected at the same point in time. Administrative income reflects annual earnings, subjective financial well-being is assessed at a single survey wave, and the outcome variables are drawn from different waves of the LISS

panel and the administrative records. As a result, the temporal distance between predictor and outcome varies across analyses. However, the consistency of the alignment pattern across outcomes measured at different time points suggests that the findings are unlikely to be driven by a specific timing configuration. Relatedly, as our measures are collected annually, we are not able to observe shifts in consumer finances within individuals over time (e.g., over the pay cycle). Examining how subjective financial well-being and income explain consumer behavior at different moments in time is a useful direction for future research.

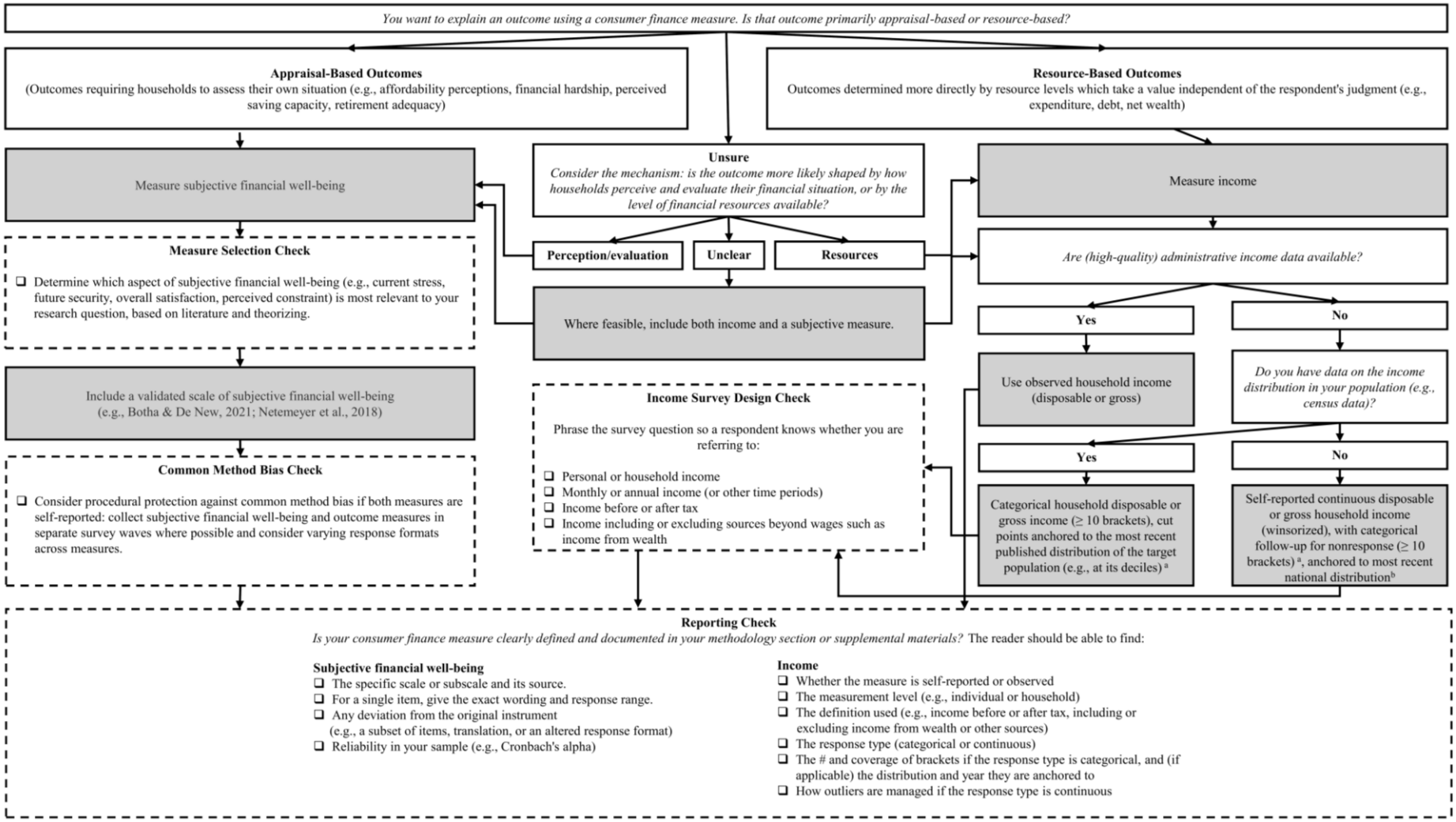
Second, our findings should be interpreted in light of the institutional context. The use of Dutch data is motivated by the ability to link administrative tax records to survey responses, and by the high quality of the Dutch administrative data, drawn directly from objective sources such as local governments, banks, and insurers (Bakker 2012; Bakker, Van Rooijen, and Van Toor 2014). At the same time, the Netherlands is a wealthy, Western European country with relatively low income inequality and a well-developed social safety net. Future research could examine how the strength of the alignment pattern varies across institutional contexts.

Third, our variables represent a sample rather than an exhaustive set of consumer outcomes, even within consumption, financial vulnerability, and wealth accumulation. It remains an open question whether the alignment pattern extends to outcomes further removed from the financial domain, such as private-label choice (Brancatelli et al. 2022; Dubé, Hitsch, and Rossi 2018), enjoyment of consumption experiences (e.g., Olson et al. 2025), or behavioral measures like alcohol consumption (e.g., Joo et al. 2021). More broadly, our study focuses on how consumers' own financial standing relates to their own behavior, whereas a related stream of research examines how income inequality and socioeconomic status shape judgments of consumption and spending decisions (e.g., Hagerty and Barasz 2020). Future

research could integrate these perspectives by examining whether subjective financial indicators similarly relate to how consumers evaluate their own or others' consumption.

Finally, although our study documents a financial measure-outcome alignment pattern, it cannot directly test why it emerges. We therefore outline several potentially complementary explanations for why the relative explanatory power of income and SFWB differs across outcome types. First, resource-based outcomes such as expenditures and wealth may be more directly constrained by available income (e.g., Deaton 1992; Du and Kamakura 2008; Rubin, Riney, and Molina 1990), leaving less room for perceptions to matter. Households with limited resources simply have less scope to spend, save, or build wealth. Appraisal-based outcomes, in contrast, are less directly bounded by income, as they reflect households' judgments of whether their resources are sufficient, for example relative to competing needs or future goals. Second, SFWB may capture aspects of a household's financial life that income does not, such as financial obligations or expectations about future financial security (Brüggen et al. 2017; Netemeyer et al. 2018). These aspects may matter more for such judgments of sufficiency than for how much households can spend or accumulate. Third, the benchmark against which resources are evaluated may rise as resources grow: for example, higher income need not translate proportionally into greater retirement adequacy if expected needs or desired living standards increase. This would weaken the link between income and appraisal-based outcomes, but not its link with resource-based outcomes. Examining discrepancies between resource-based and appraisal-based outcomes within the same domain, such as between the perceived affordability of a consumption category and expenditures in that category, could provide further insight into these explanations. Future research using experimental or longitudinal designs could help disentangle the relative role of these accounts and move beyond establishing that the alignment pattern exists to explaining when and why it emerges.

Figure 8: Decision Framework for Measuring and Reporting Consumer Finances



[a] We suggest an even spread across the distribution as a default, but additional cut points may be more informative depending on the outcome of interest (e.g., toward the bottom when studying debt, toward the top when studying wealth accumulation).

[b] National statistical offices in many countries publish household income deciles. Where none is available, brackets should aim to approximate the population's income range using domain knowledge or prior work.

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Web Appendices for

Improving Consumer Finance Measures: Evidence from Linked Survey and Administrative Data

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WEB APPENDIX A

LITERATURE REVIEW

This web appendix details our literature search on the measurement of consumer finances. We searched the Web of Science Core Collection for articles published from 1990 onward containing the terms “income” OR “financial well-being” OR “financial wellbeing” OR “economic well-being” OR “financial satisfaction” OR “financial constraint” OR “financial hardship” OR “financial stress” OR “financial strain” OR “financial scarcity” OR “financial distress” OR “financial vulnerability” OR “financial security” OR “financial insecurity” OR “subjective wealth” OR “perceived wealth”, restricting results to the “Journal of Consumer Research” or “Journal of Marketing Research” or “Journal of Marketing” or “Marketing Science”. Because we are interested in the dominant measurement approaches in the field, we focus on these outlets, which publish much of the influential and seminal work on consumer finances. The search, last updated in May 2026, yielded 123 records.

After reviewing these articles, we excluded those that did not *measure* consumer finances, for example, editorials, commentaries, conceptual papers, or papers that used terms such as ‘income’ or ‘financial well-being’ without measuring them. Examples included papers that defined financial well-being as a game pay-off, measured the estimated income of others, or merely reported that participants were sampled from a particular income group. After these exclusions (n = 59), 64 articles remained in our corpus for further analysis.

We then conducted a full-text review to assess in detail how consumer finances were measured. When this information was not provided in the methods or notes of the main paper, we consulted online supplemental materials or preregistrations, where available.

WEB APPENDIX B

COMPARISON OF MATCHED VS. NON-MATCHED SURVEY RESPONDENTS

Not all panelists consent to matching their survey data to administrative records. To assess whether our matched sample differs from unmatched panelists in observable characteristics, we compare respondents who could versus could not be linked to the administrative records. We run independent samples t-tests or Chi-square (χ^2) tests to compare the two groups on demographics, self-reported income (household disposable income and personal gross income, reported continuously), and subjective financial well-being indicators. As displayed in Table W1, we find no meaningful differences in subjective financial well-being measures, demographic characteristics (age, gender, household size, education level, urbanity), or self-reported household and individual income by match status, alleviating concerns of selection in our sample.

Table W1: Comparison of Respondents based on the Possibility of Matching Survey Data to Registry Data

	Non-Matched	Matched	Non-Matched	Matched	Difference	Difference	Difference	Difference
	n	n	Mean / %	Mean / %		SE	*t*-value / χ^2	*p*-value
Demographics								
Age	539	4,456	54.755	53.290	1.464	0.851	1.72	.086
Male	539	4,456	43.79%	47.24%	-3.45 pp		$\chi^2 = 2.31$	.129
Household Size	539	4,456	2.332	2.448	-0.116	0.060	-1.95	.051
Education Level	539	4,441					$\chi^2 = 6.89$	.142
1. Primary education			7.61%	7.16%	0.45 pp			
2. Secondary education			30.24%	28.80%	1.44 pp			
3. Intermediate vocational education			23.19%	24.59%	-1.40 pp			
4. Higher vocational education			23.01%	26.64%	-3.63 pp			
5. University education			15.96%	12.81%	3.15 pp			
Urbanity of Dwelling	532	4,434	2.974	2.893	0.081	0.065	1.25	.216
Income								
Self-Reported Personal Income, Gross Monthly (€, Continuous)	277	2,659	2,642.87	2,774.52	-131.64	234.33	-0.56	.575
Self-Reported Household Income, Net Annual (€, Continuous)	174	1,982	40,708.40	39,990.20	718.19	2,864.38	0.25	.802
Subjective Financial Well-Being Indicators								
Reported Financial Well-Being	122	1,100	3.636	3.688	-0.051	0.073	-0.70	.482
Current Money Management Stress	122	1,099	2.180	2.067	0.113	0.074	1.53	.127
Expected Future Financial Security	122	1,099	3.218	3.181	0.037	0.073	0.50	.616
Financial Satisfaction	504	4,293	7.046	7.099	-0.053	0.083	-0.65	.518

Note. Non-matched refers to respondents who did not consent to matching their survey responses to administrative data, or respondents for whom no definitive match could be determined. pp refers to the percentage point difference between the samples. For differences in means, we report the results of an independent samples t-test. For differences in percentages, we report the results of a χ^2 test comparing the distribution of categorical variables between samples.

WEB APPENDIX C

DEFINITIONS OF INCOME, ASSETS, AND LIABILITIES

The components used to measure income, assets, and liabilities are derived from the Dutch Tax Administration, The Education Executive Agency of the Dutch Ministry of Education, Culture and Science (abbreviated in Dutch by DUO), the Institute for Employee Insurance (UWV), and the Basic Registration of Persons. Below, we provide further details on how the variables are defined and how data are collected.

Income

In this paper, we use the definitions of income from Statistics Netherlands. *Disposable household income* is defined as gross household income (income from work of all household members plus income out of wealth) minus alimony payment, income and health insurance premiums tax on income and wealth plus gross transfers received (unemployment benefits, social benefits, pension benefits, child benefits, rent allowance and care allowance). Income from work includes wages and salaries of employees plus the attributed pay for self-employed people and family members working in the family business. Income from wealth includes the sum of income from financial assets, income from real estate, and income from other property, minus interest paid. The aforementioned income components are derived from the official Dutch government register[9]. Received or paid child alimony and parental contributions for children living away from home are not observed and excluded from the disposable income definition.

Net Wealth

Net wealth equals assets minus liabilities. Assets are mainly bank balances, shares, real estate, and business capital. Liabilities include debts incurred for the home and consumer

[9] The Dutch Government register is the official databases maintained by the Dutch government to keep track of important information about individuals, such as personal identification, residence, citizenship, property and taxes. In the U.S., for example, this information is spread across the Social Security Administration (SSA), county-level property records, and Internal Revenue Services (IRS).

credit. Own homes and other real estate are valued at market value. *Assets* are defined as bank and savings credits, securities, real estate, enterprise capital and other assets and contain:

1. *Financial assets*
    - Banks and savings credits, i.e., all money placed or kept in a bank account, including foreign deposits
    - Securities, i.e., sum of bonds and shares. Bonds relate to the market value of negotiable instruments serving as evidence for debt. Shares relate to the market value of shares in corporations, mutual funds and other investment funds
2. *Real estate*: sum of principal residence and other real estate
    - Principal residence: property owned and used as main residence
    - Other real estate: include, for example, second homes, holiday homes, or investment properties
3. *Enterprise capital:* Balance of assets and liabilities belonging to the business of self-employed (own unincorporated enterprise)
4. *Substantial interests*: Substantial share in equity in incorporated businesses
5. *Other assets:* Includes cash, movable property leased or used as investment, trust assets, shares in undivided estate, or assets encumbered with usufruct or limited ownership

Debts or Liabilities are defined as the sum of principal residence loans, education and other loans and contain:

1. *Principal residence loans*: Loans for the purpose of constructing, purchasing or improving the owner-occupied residence. The money saved intended to repay the mortgage is partly included
2. *Education loans*: loans to cover study expenses
3. *Other loans*: includes bank account overdrafts, consumer durable loans, other real estate loans, financial asset loans, or tax debts

WEB APPENDIX D

CORRELATION TABLES KEY VARIABLES

Table W2 presents the correlations between the different self-reported and observed measures of personal and household income and subjective financial well-being in the LISS SFWB Survey. Table W3 reports the correlations for the same constructs in the full LISS panel. Finally, Table W4 reports the correlations for the outcome measures.

Table W2: Pairwise Correlations between Consumer Finance Measures in SFWB Sample

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Observed household disposable income	-						
(2) Self-reported household disposable income continuous	.705	-					
(3) Self-reported household disposable income categorical	.576	.876	-				
(4) Self-reported household disposable income winsorized	.703	.996	.894	-			
(5) Reported Financial Well-Being	.314	.351	.364	.353	-		
(6) Current Money Management Stress (R)	.229	.299	.326	.302	.711	-	
(7) Expected Future Financial Security	.274	.328	.320	.333	.717	.504	-
(8) Financial Satisfaction	.360	.362	.376	.363	.633	.603	.532

Note. (R) indicates that we reverse scored current money management stress, so higher scores indicate higher financial well-being.

Table W3: Pairwise Correlations between Consumer Finance Measures in LISS Sample

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Observed household disposable income	-						
(2) Self-reported household disposable income continuous	.560	-					
(3) Self-reported household disposable income categorical	.544	.794	-				
(4) Self-reported household disposable income winsorized	.616	.949	.891	-			
(5) Reported Financial Well-Being	.314	.351	.364	.353	-		
(6) Current Money Management Stress (R)	.229	.299	.326	.302	.711	-	
(7) Expected Future Financial Security	.274	.328	.320	.333	.717	.504	-
(8) Financial Satisfaction	.217	.257	.306	.289	.633	.603	.532

Note. (R) indicates that we reverse scored current money management stress, so higher scores indicate higher financial well-being.

Table W4: Pairwise Correlations between Outcome Measures

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Afford Clothes	-															
(2) Expenditure Clothes	.186	-														
(3) Afford Memberships	.495	.142	-													
(4) Expenditure Memberships	.048	.195	.038	-												
(5) Afford Dinner Out	.530	.173	.546	.048	-											
(6) Expenditure Leisure	.213	.326	.168	.149	.185	-										
(7) Affordability index	.648	.257	.684	.114	.713	.279	-									
(8) Total Expenditure	.072	.418	.125	.374	.158	.344	.213	-								
(9) Debt	.065	.194	.061	.168	.084	.194	.154	.398	-							
(10) Unexpected Expense	-.430	-.258	-.418	-.078	-.461	-.303	-.540	-.231	-.151	-						
(11) Benefit Dependency	-.285	-.25	-.299	-.094	-.288	-.191	-.309	-.241	-.131	.330	-					
(12) Problem Index	-.419	-.189	-.385	-.079	-.43	-.169	-.431	-.156	-.083	.528	.275	-				
(13) Net Wealth	.107	.150	.097	.101	.113	.112	.153	.055	.136	-.230	-.046	-.132	-			
(14) Perceived Saving Capacity	.318	.246	.311	.065	.335	.29	.405	.208	.151	-.575	-.283	-.378	.179	-		
(15) Net Wealth Increase	.049	.143	.062	.037	.074	.077	.105	.149	.273	-.140	-.051	-.071	.720	.106	-	
(16) Asset-to-income Ratio	.041	-.018	.03	-.032	.039	.039	.051	-.058	-.032	-.113	-.033	-.064	.133	.033	.054	-
(17) Retirement Adequacy	.380	.196	.308	.012	.368	.261	.463	.175	.234	-.538	-.332	-.356	.250	.486	.154	.163

WEB APPENDIX E

SUPPLEMENTARY ANALYSES FOR THE COMPARISON OF INCOME AND SUBJECTIVE FINANCIAL WELL-BEING

This appendix reports the detailed results underlying the results presented in the main text. We use household disposable income as the focal income measure throughout the main analyses; Table W5 confirms that household-level income generally explains more variance in resource-based outcomes than personal income across all three domains.

All remaining models are single-predictor OLS regressions estimated on the subsample for which both household disposable income and SFWB are observed, without demographic controls unless otherwise noted. Tables W6–W8 report full regression output by domain. Table W9 reports bootstrapped 95% confidence intervals around the difference in adjusted R^2 between income and SFWB models. Figures W1-W3 replicate all analyses with demographic controls (gender, age, household size, education level, and urbanity). Tables W10 and W11 report explained variance when income and SFWB are entered jointly, with and without an interaction term, without (W10) and with (W11) demographic controls.

Table W5: Adjusted R^2 by Income Measure: Personal Gross Income, Household Gross Income, and Household Disposable Income

	Adj. R^2 household disposable income	Adj. R^2 household gross income	Adj. R^2 personal gross income
Consumption			
Expenditure Clothes	.169	.178	.079
Expenditure Memberships	.067	.062	.020
Expenditure Leisure	.048	.057	.043
Total Expenditure	.188	.204	.123
Afford Clothes	.044	.047	.031
Afford Memberships	.037	.037	.031
Afford Dinner out	.058	.062	.049
Affordability index	.101	.108	.086
Financial Vulnerability			
Debt	.216	.211	.083
Benefit Dependency	.132	.135	.093
Unexpected Expense	.125	.142	.134
Problem Index	.055	.061	.053
Wealth Accumulation			
Net Wealth	.132	.130	.036
Net wealth increase	.077	.078	.021
Asset-to-income Ratio	-.001	.001	.000
Perceived Saving Capacity	.119	.147	.148
Retirement Adequacy	.103	.122	.127

Note. Each cell reports the adjusted R^2 from a separate single-predictor regression of the outcome on the indicated income measure, using observed administrative income.

Table W6: Regression Results for Income and SFWB: Consumption Domain

	Expenditure clothes		Expenditure memberships		Expenditure leisure		Total Expenditure		Afford Clothes		Afford memberships		Afford Dinner out		Affordability Index	
Household disposable income	.413		.250		.224		.415		.063		.051		.075		.324	
	(.033)		(.032)		(.037)		(.028)		(.009)		(.009)		(.010)		(.030)	
SFWB		.230		.086		.269		.167		.156		.117		.167		.666
		(.044)		(.041)		(.044)		(.039)		(.011)		(.011)		(.011)		(.034)
Constant	-.014	-.021	.007	-.003	.003	-.024	.018	.007	.897	.892	.923	.918	.886	.880	.009	-.009
	(.034)	(.037)	(.033)	(.034)	(.036)	(.036)	(.030)	(.033)	(.009)	(.009)	(.009)	(.009)	(.010)	(.009)	(.030)	(.027)
Obs.	746	746	863	863	727	727	922	922	1,034	1,034	817	817	1,006	1,006	1,045	1,045
R^2	.170	.036	.068	.005	.049	.050	.189	.019	.045	.171	.038	.122	.059	.179	.102	.272
Adj. R^2	.169	.034	.067	.004	.048	.049	.188	.018	.044	.170	.037	.121	.058	.178	.101	.271

Note. Standardized OLS regression coefficients with standard errors in parentheses. Each outcome is regressed separately on household disposable income and SFWB. All continuous variables are standardized prior to estimation.

Table W7: Regression Results for Income and SFWB: Financial Vulnerability Domain

	Debt		Benefit Dependency		Unexpected Expense		Problem Index	
Household disposable income	.430		-.477		-.374		-.255	
	(.025)		(.037)		(.031)		(.032)	
SFWB		.208		-.550		-.866		-.613
		(.035)		(.048)		(.031)		(.037)
Constant	.074	.072	.272	.277	.050	.071	.079	.094
	(.026)	(.029)	(.038)	(.039)	(.031)	(.025)	(.033)	(.030)
Obs.	1,103	1,103	1,103	1,103	1,048	1,048	1,048	1,048
R^2	.217	.031	.133	.107	.125	.425	.056	.204
Adj. R^2	.216	.030	.132	.107	.125	.424	.055	.204

Note. Standardized OLS regression coefficients with standard errors in parentheses. Each outcome is regressed separately on household disposable income and SFWB. All continuous variables are standardized prior to estimation.

Table W8: Regression Results for Income and SFWB: Wealth Accumulation Domain

	Net Wealth		Net wealth increase		Asset-to-income Ratio		Perceived Saving Capacity		Retirement Adequacy	
Household disposable income	.123		.185		-.0001		.360		.318	
	(.009)		(.021)		(.002)		(.030)		(.028)	
SFWB		.106		.120		.011		.748		.783
		(.013)		(.027)		(.002)		(.033)		(.029)
Constant	-.076	-.077	.028	.026	.003	.003	.033	.014	.005	-.004
	(.010)	(.010)	(.022)	(.022)	(.002)	(.002)	(.031)	(.027)	(.029)	(.023)
Obs.	1,103	1,103	952	952	1,103	1,103	1,048	1,048	1,090	1,090
R^2	.133	.060	.078	.021	.000	.028	.120	.329	.104	.407
Adj. R^2	.132	.060	.077	.019	-.001	.027	.119	.328	.103	.406

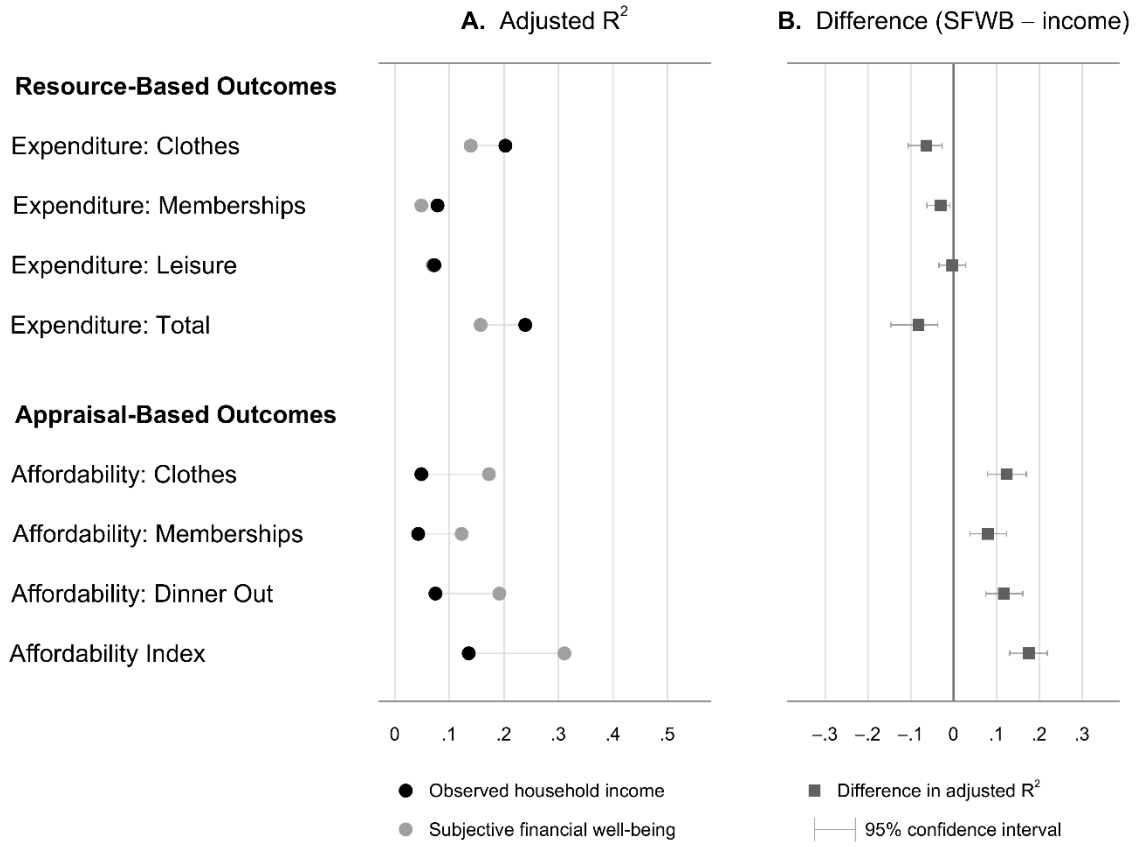
Note. Standardized OLS regression coefficients with standard errors in parentheses. Each outcome is regressed separately on household disposable income and SFWB. All continuous variables are standardized prior to estimation.

Table W9: Bootstrapped Confidence Intervals for the Difference in Adjusted R^2 Between Income and SFWB

	Adj. R^2 income	Adj. R^2 SFWB	Difference in adj. R^2	95% CI of difference		n
Consumption						
Expenditure Clothes	.169	.034	-.135	-.190	-.084	746
Expenditure Memberships	.067	.004	-.063	-.107	-.031	863
Expenditure Leisure	.048	.049	.001	-.031	.036	727
Total Expenditure	.188	.018	-.170	-.257	-.105	922
Afford Clothes	.044	.170	.126	.082	.174	1,034
Afford Memberships	.037	.121	.084	.043	.131	817
Afford Dinner out	.058	.178	.120	.076	.168	1,006
Affordability index	.101	.271	.170	.121	.221	1,045
Financial Vulnerability						
Debt	.216	.030	-.187	-.263	-.118	1,103
Benefit Dependency	.132	.107	-.026	-.067	.017	1,103
Unexpected Expense	.125	.424	.300	.251	.347	1,048
Problem Index	.055	.204	.149	.107	.194	1,048
Wealth Accumulation						
Net Wealth	.132	.060	-.073	-.154	-.020	1,103
Net wealth increase	.077	.019	-.058	-.127	-.008	952
Asset-to-income Ratio	-.001	.027	.028	.013	.048	1,103
Perceived Saving Capacity	.119	.328	.209	.153	.263	1,048
Retirement Adequacy	.103	.406	.303	.247	.352	1,090

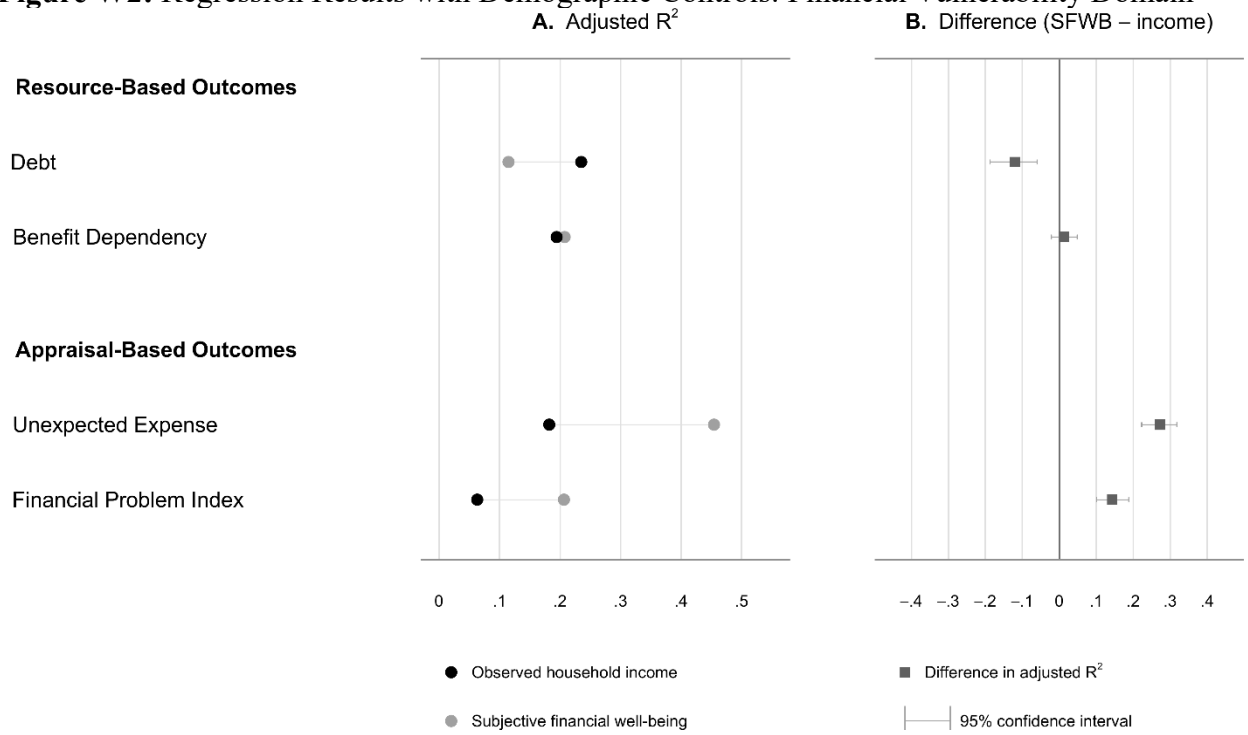
Note. Each row reports adjusted R^2 from separate single-predictor regressions of the outcome on household disposable income and SFWB. The difference is computed as adj. R^2(SFWB) minus adj. R^2(income); positive values indicate SFWB explains more variance. Confidence intervals are percentile-based, using 5,000 bootstrap replications.

Figure W1: Regression Results with Demographic Controls: Consumption Domain



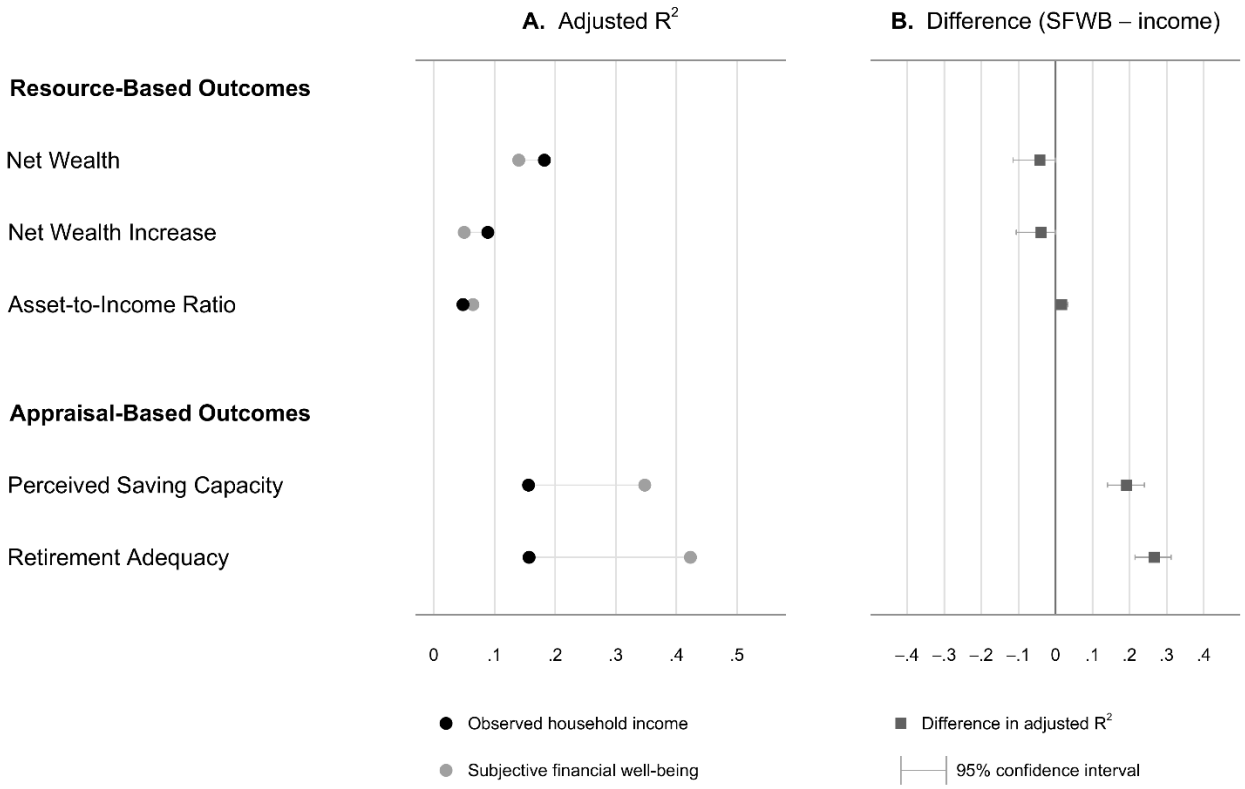
Note. Panel A: adjusted R^2 from separate single-predictor OLS regressions of each outcome on administrative household disposable income or SFWB controlling for gender, age, household size, education and urbanity. Panel B: difference in adjusted R^2 (SFWB - income) with 95% percentile bootstrap CIs (5,000 reps); positive values indicate SFWB explains more variance.

Figure W2: Regression Results with Demographic Controls: Financial Vulnerability Domain



Note. Panel A: adjusted R^2 from separate single-predictor OLS regressions of each outcome on administrative household disposable income or SFWB controlling for gender, age, household size, education and urbanity. Panel B: difference in adjusted R^2 (SFWB - income) with 95% percentile bootstrap CIs (5,000 reps); positive values indicate SFWB explains more variance.

Figure W3: Regression Results with Demographic Controls: Wealth Accumulation Domain



Note. Panel A: adjusted R^2 from separate single-predictor OLS regressions of each outcome on administrative household disposable income or SFWB controlling for gender, age, household size, education and urbanity. Panel B: difference in adjusted R^2 (SFWB - income) with 95% percentile bootstrap CIs (5,000 reps); positive values indicate SFWB explains more variance.

Table W10: Adjusted R^2 for Income, SFWB, and Combined Models

	Adj. R^2 household disposable income	Adj. R^2 SFWB	Adj. R^2 income + SFWB	Adj. R^2 income + SFWB + interaction income * SFWB
Consumption				
Expenditure clothes	.169	.034	.170	.177
Expenditure memberships	.067	.004	.066	.070
Expenditure leisure	.048	.049	.071	.071
Total expenditure	.188	.018	.187	.190
Afford clothes	.044	.170	.176	.202
Afford memberships	.037	.121	.128	.157
Afford dinner out	.058	.178	.189	.230
Affordability index	.101	.271	.295	.343
Financial Vulnerability				
Debt	.216	.030	.217	.222
Benefit dependency	.132	.107	.182	.252
Unexpected expense	.125	.424	.446	.475
Problem index	.055	.204	.211	.268
Wealth Accumulation				
Net wealth	.132	.060	.151	.153
Net wealth increase	.077	.019	.079	.080
Asset-to-income ratio	-.001	.027	.030	.029
Perceived saving capacity	.119	.328	.356	.356
Retirement adequacy	.103	.406	.421	.421

Note. Cells report the adjusted R^2 from separate OLS regressions of each outcome on the predictors indicated by the column.

Table W11: Adjusted R^2 for Income, SFWB, and Combined Models with demographic controls

	Adj. R^2 household disposable income	Adj. R^2 SFWB	Adj. R^2 income + SFWB	Adj. R^2 income + SFWB + interaction income * SFWB
Consumption				
Expenditure clothes	.203	.139	.206	.209
Expenditure memberships	.078	.049	.077	.081
Expenditure leisure	.072	.069	.092	.094
Total expenditure	.239	.157	.238	.240
Afford clothes	.049	.173	.175	.203
Afford memberships	.043	.123	.126	.153
Afford dinner out	.074	.192	.198	.237
Affordability index	.136	.311	.320	.364
Financial Vulnerability				
Debt	.235	.115	.234	.238
Benefit dependency	.194	.208	.244	.306
Unexpected expense	.182	.454	.465	.495
Problem index	.063	.206	.211	.268
Wealth Accumulation				
Net wealth	.182	.140	.194	.196
Net wealth increase	.089	.050	.089	.090
Asset-to-income ratio	.048	.064	.067	.067
Perceived saving capacity	.156	.348	.371	.372
Retirement adequacy	.157	.423	.434	.434

Note. Cells report the adjusted R^2 from separate OLS regressions of each outcome on the predictors indicated by the column. All four specifications also include demographic controls (gender, age, household size, education level, and urbanity).

WEB APPENDIX F

DISCRIMINANT VALIDITY OF THE SUBJECTIVE FINANCIAL WELL-BEING AND OUTCOME MEASURES

The alignment pattern could reflect substantive differences between SFWB and the appraisal-based outcomes, or it could arise because the measures are not empirically distinct. If an SFWB measure and an outcome capture largely the same underlying construct, a strong association between them would partly follow from this overlap. We therefore assess whether the three multi-item SFWB measures are empirically distinct from the appraisal-based outcomes, using the two-step procedure of Pieters, Baumgartner, and Pieters (2026).

Step 1 compares the factor correlation (φ) with a perfect correlation. Step 2 compares φ, separately for the predictor and the outcome, with the correlation between each construct and its own observed measure, given by the square root of its congeneric reliability (CR). The procedure yields four possible conclusions: neither criterion is met (1), only the phi criterion is met (2), the CR criterion is also met for one of the constructs (3), or it is met for both constructs (4). We estimate all models by maximum likelihood in Stata and test the discriminant validity indices (DVIs) against zero using Wald statistics with delta-method standard errors. Following Pieters, Baumgartner, and Pieters (2026), we report two-sided 95% confidence intervals and one-sided *p*-values, and base conclusions on whether the confidence interval excludes zero.

For each predictor-outcome pair, we estimate φ in a separate confirmatory factor model, which corrects the correlation for measurement error. Pieters, Baumgartner, and Pieters (2026) require φ to come from a well-fitting model. In the initial models, some items were related more or less strongly than the model assumed: two EFFS items on lifelong financial security with each other, and the SFWB item on day-to-day money management with the items on unexpected expenses and future needs. We therefore add correlations between the error terms of these items and treat these correlations as error when computing CR. The resulting models

fit acceptably according to CFI (.947 to .992) and SRMR (.021 to .065). RMSEA, however, exceeds .08 for four pairs: SFWB with retirement adequacy, unexpected expense, and the financial problem index, and EFFS with retirement adequacy. The results for these pairs should therefore be interpreted with caution. We note that for each of these outcomes, CMMS yields a well-fitting model and the same conclusion.

Pieters, Baumgartner, and Pieters (2026) develop their procedure specifically for multi-item reflective scales, such as the three SFWB measures and retirement adequacy. For the remaining outcomes, we adapt how φ and reliability are estimated, so these results rest on additional assumptions. Specifically, we make three adaptations: 1) The affordability index consists of six binary items, including the three affordability items analyzed separately in the main text. Because all items ask whether the household can afford a specific expense, we treat them as reflecting a common appraisal of the household's financial capacity. We model the index as a reflective factor and treat the items as continuous, so that CR is estimated as for the other measures.[10] 2) The capacity to cover an unexpected expense of €500 and perceived saving capacity are each measured with a single item. We estimate their test-retest reliability by adding the 2022 measurement as a second indicator, with loadings and error variances constrained to be equal to those of the 2021 measurement. 3) We cannot estimate the error for the financial problem index, as it is a formative index that combines different financial events and appraisals, therefore we enter it as an observed composite. For this measure, Step 2 then rests on one comparison rather than two, so this adapted procedure yields three conclusions instead of four, with Conclusion 3 the highest attainable.

[10] As a robustness check, we estimate this model with a probit link (gsem), which accounts for the binary response format but yields a reliability on the scale of the latent responses underlying the items. The conclusions are the same.

Table W12 shows that the phi criterion is met for all fifteen pairs (DVI_1 = .191 to .563), and the CR criterion is met for both constructs in all twelve pairs in which both comparisons can be evaluated (Conclusion 4)[11].

For the financial problem index, the predictor-side comparison is met for all three SFWB measures (DVI_{CR} = .445 to .481), yielding Conclusion 3 (the highest attainable under the adapted procedure). Because φ is not corrected for measurement error in the index, these values may overstate discriminant validity. They would remain positive unless the reliability of the index were below .26, .25, and .24 for SFWB, EFFS, and CMMS (φ^2/CR_P).

Overall, although the SFWB measures differ in how closely their content relates to specific outcomes, the conclusions are consistent across measures and provide little indication that a lack of discriminant validity drives the alignment pattern.

[11] The conclusions are unchanged when the residual covariances are removed, except for SFWB and perceived saving capacity, where the confidence interval narrowly crosses zero (DVICR = .049, 95% CI [−.001, .100]). Because the alignment pattern for this outcome also holds for EFFS and CMMS (main text, Figure 4), which meet the criterion in both specifications, a lack of discriminant validity is unlikely to explain it.

Table W12: Discriminant Validity of the Subjective Financial Well-Being Measures and Outcomes

Pair	CR_P	CR_O	φ	Step 1: DVI_1 [95% CI] (*p*)	Step 2: DVI_{CR} predictor [95% CI] (*p*)	Step 2: DVI_{CR} outcome [95% CI] (*p*)	Concl.
Subjective Financial Well-Being (SFWB)							
Retirement adequacy	.901	.884	.721	.279 [.241, .317] (<.001)	.228 [.190, .267] (<.001)	.220 [.182, .257] (<.001)	4/4
Affordability index	.898	.884	.588	.412 [.355, .469] (<.001)	.360 [.303, .417] (<.001)	.352 [.297, .408] (<.001)	4/4
Financial problem index	.904	-[b]	.482	.518 [.468, .569] (<.001)	.469 [.419, .519] (<.001)	-	3/3[b]
Unexpected expense	.902	.808[a]	.809	.191 [.159, .223] (<.001)	.141 [.107, .174] (<.001)	.090 [.057, .123] (<.001)	4/4
Perceived saving capacity	.904	.641[a]	.734	.266 [.221, .312] (<.001)	.217 [.172, .262] (<.001)	.067 [.017, .118] (.005)	4/4
Expected Future Financial Security (EFFS)							
Retirement adequacy	.798	.884	.757	.243 [.206, .280] (<.001)	.137 [.101, .172] (<.001)	.184 [.147, .220] (<.001)	4/4
Affordability index	.766	.884	.465	.535 [.467, .602] (<.001)	.410 [.343, .477] (<.001)	.475 [.408, .541] (<.001)	4/4
Financial problem index	.779	-[b]	.437	.563 [.509, .617] (<.001)	.445 [.392, .499] (<.001)	-	3/3[b]
Unexpected expense	.778	.808[a]	.611	.389 [.338, .440] (<.001)	.271 [.221, .321] (<.001)	.288 [.237, .338] (<.001)	4/4
Perceived saving capacity	.777	.641[a]	.608	.392 [.335, .449] (<.001)	.274 [.218, .330] (<.001)	.193 [.133, .254] (<.001)	4/4
Current Money Management Stress (CMMS)							
Retirement adequacy	.878	.885	.563	.437 [.389, .485] (<.001)	.374 [.327, .421] (<.001)	.378 [.331, .425] (<.001)	4/4
Affordability index	.883	.884	.495	.505 [.442, .568] (<.001)	.445 [.383, .507] (<.001)	.445 [.383, .507] (<.001)	4/4
Financial problem index	.878	-[b]	.456	.544 [.493, .596] (<.001)	.481 [.431, .532] (<.001)	-	3/3[b]
Unexpected expense	.881	.808[a]	.699	.301 [.259, .343] (<.001)	.239 [.199, .280] (<.001)	.199 [.158, .241] (<.001)	4/4
Perceived saving capacity	.881	.641[a]	.663	.337 [.286, .388] (<.001)	.275 [.226, .325] (<.001)	.138 [.083, .193] (<.001)	4/4

Note. φ is the absolute factor correlation. $DVI_1 = 1 - φ$; $DVI_{CR} = \sqrt{CR} - φ$, reported for the predictor (P) and outcome (O). Residual covariances: EFFS items 4 and 5; SFWB item 3 with items 2 and 5 (Table 5 order), specified in all pairs with that predictor. [a]Test-retest reliability of the 2021 item, from a model treating the 2021 and 2022 measurements as parallel indicators. [b]Observed composite without an error term; φ is the correlation between the SFWB factor and the observed index, not corrected for its measurement error, and the outcome-side criterion is not defined, so the adapted procedure yields three conclusions rather than four.

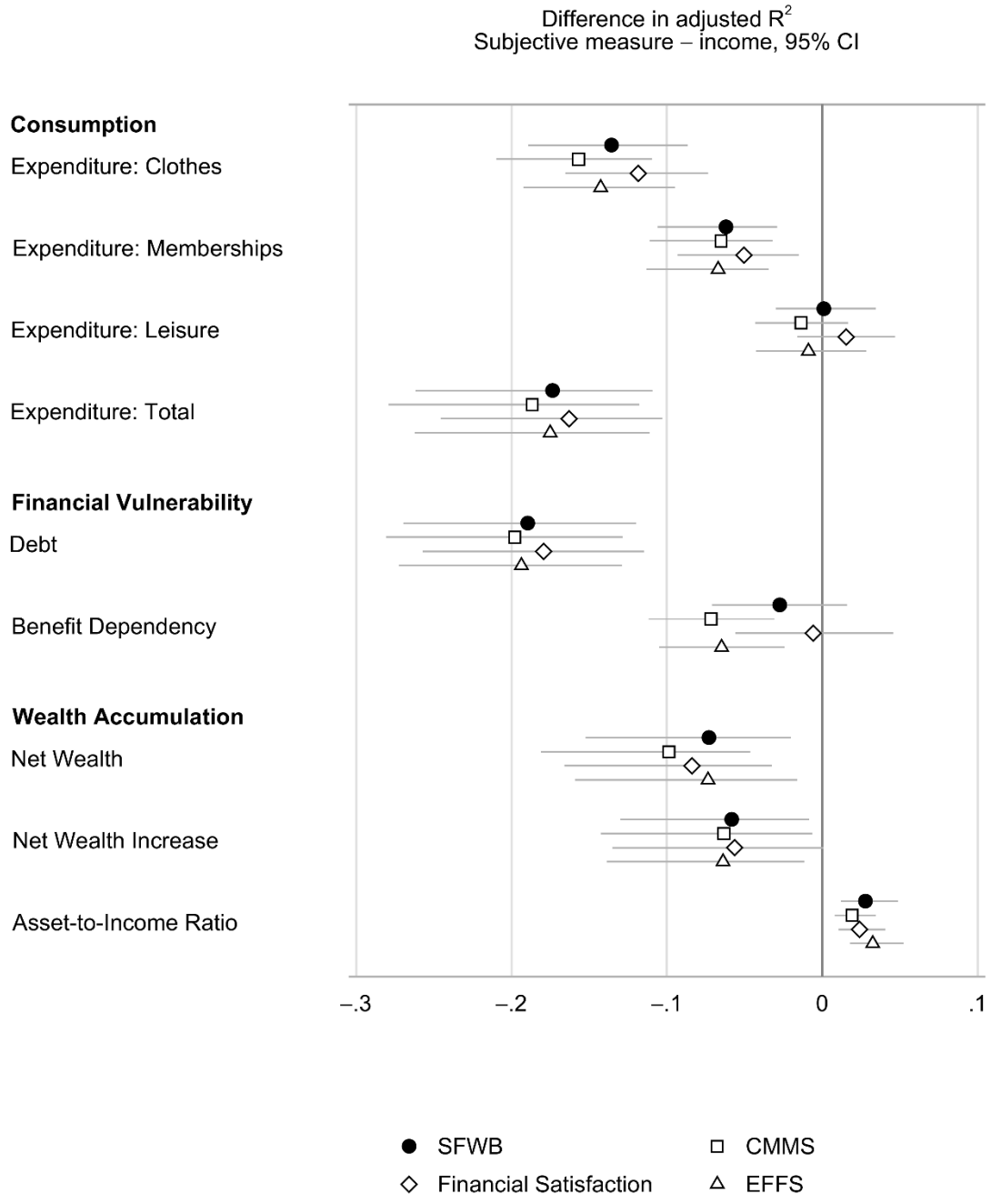
WEB APPENDIX G

SUPPLEMENTARY ROBUSTNESS ANALYSES FOR RESOURCE-BASED AND APPRAISAL-BASED OUTCOMES

The main text examines whether the larger explained variance of SFWB for appraisal-based outcomes holds beyond methodological artifacts; Figures W4–W5 and Table W13 replicate these checks for resource-based outcomes. The main text also examines whether income's advantage holds beyond administrative data quality, focusing on resource-based outcomes; Figure W6 and Table W14 replicate these checks for appraisal-based outcomes. Finally, we provide additional detail for the categorical income analyses: Figure W7 shows the explained variance in observed income by the number of categories used to categorize self-reported income, Table W15 reports the categorical income bracket schemes used in the coverage analysis, and Figure W8 reports the results of these schemes for appraisal-based outcomes.

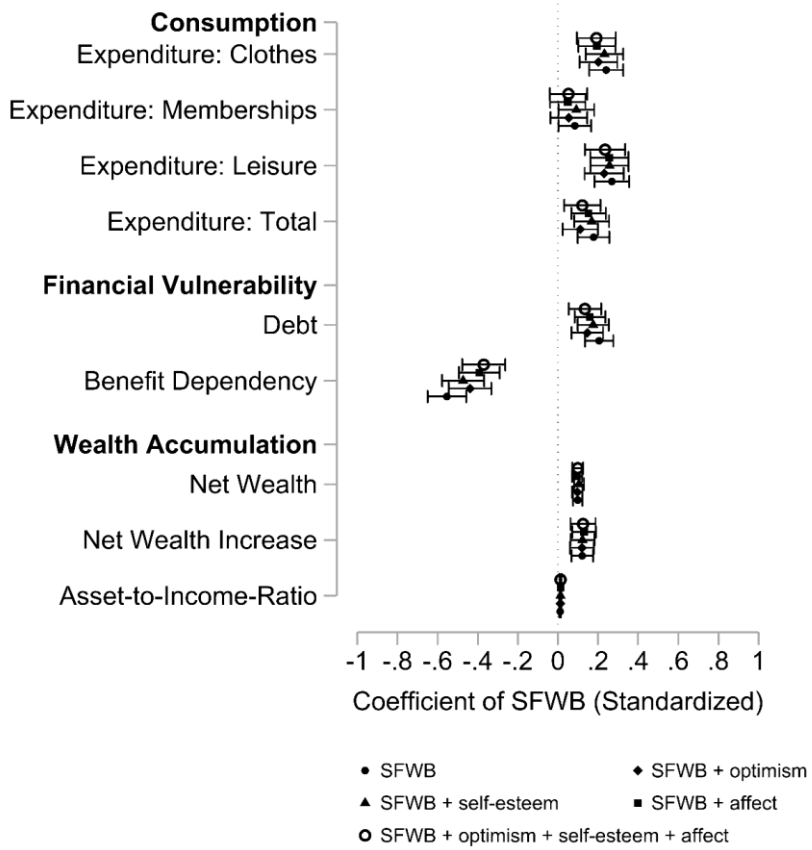
Alternative SFWB Measures, Response Tendencies, and Survey Timing: Resource-Based Outcomes

Figure W4: Differences in Adjusted R^2 between Subjective Measure and Income for Alternative Operationalizations of SFWB: Resource-Based outcomes



Note. Difference in adjusted R^2 (subjective measure - income) from single-predictor OLS regressions with various operationalizations of subjective consumer finances, with 95% percentile bootstrap CIs (5,000 reps). Positive values indicate the subjective consumer finance measure explains more variance than income.

Figure W5: Standardized Regression Coefficients for SFWB Controlling for Dispositional Response Tendencies: Resource-Based outcomes



Note. Figure displays standardized SFWB coefficients with 95% CIs.

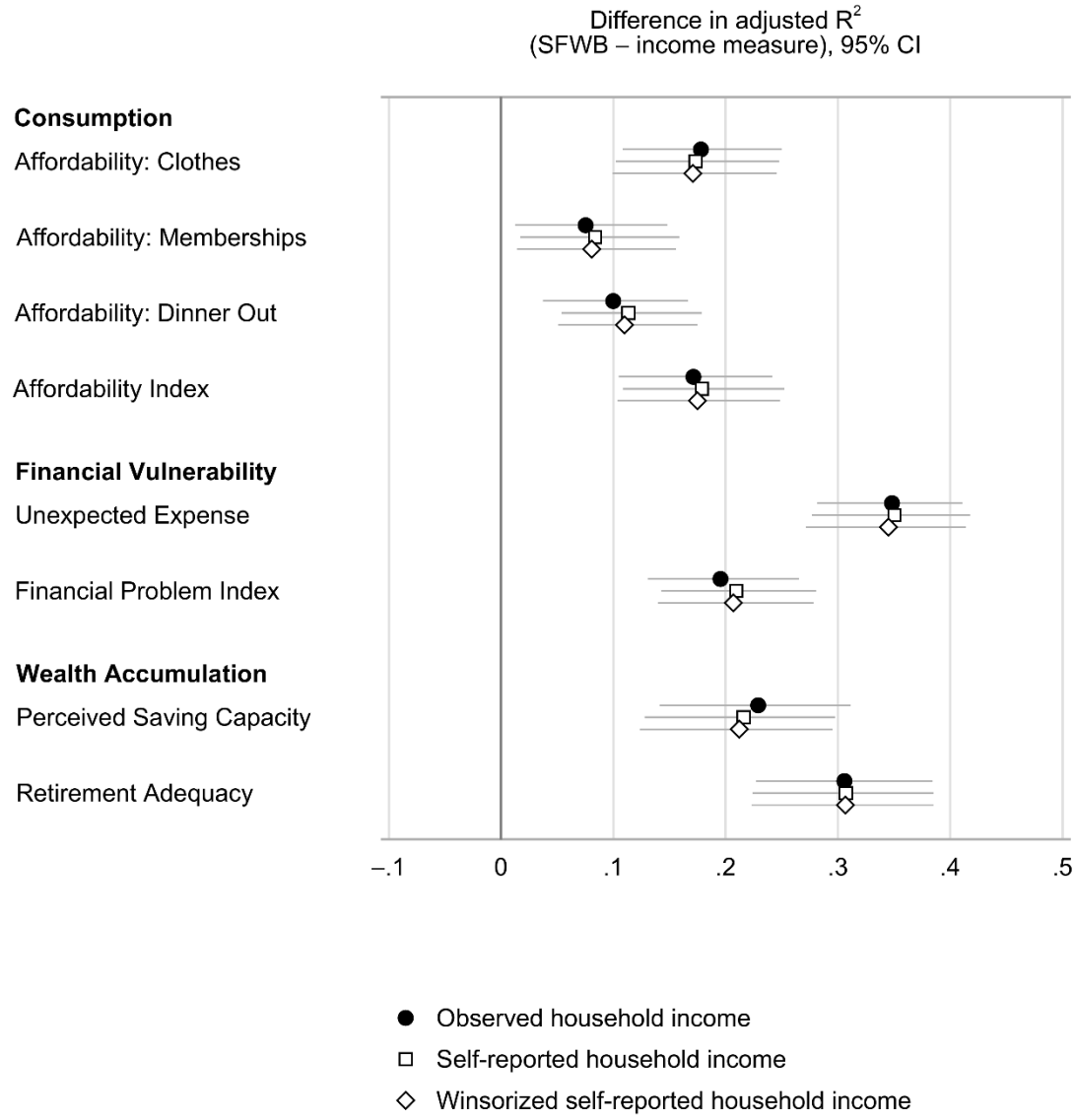
Table W13: Temporal Stability of SFWB Associations: Replication with 2022 Outcome Data for Resource-Based outcomes

	Adj R^2 SFWB 2021	Adj R^2 SFWB 2022	n 2021	n 2022
Debt	.030	.037	1,103	952
Benefit dependency	.107	.096	1,103	952
Net wealth	.060	.073	1,103	952
Asset-to-income ratio	.027	.038	1,103	952

Note. Each column reports the adjusted R^2 from a single-predictor regression of the outcome on SFWB. The 2021 column uses outcomes measured concurrently with the main analyses; the 2022 column uses outcomes measured one year later. Expenditure measures are omitted because they were collected only in 2021. Net wealth increase is omitted because it is defined as the change from 2021 to 2022.

Self-Reported Income and Responsibility for Household Finances: Appraisal-Based Outcomes

Figure W6: Difference in Adjusted R^2 Between SFWB and Observed and Self-Reported Income: Appraisal-Based Outcomes



Note. Difference in adjusted R^2 (SFWB - income) from single-predictor OLS regressions with observed and self-reported household income, with 95% percentile bootstrap CIs (5,000 reps). Negative values indicate income explains more variance than SFWB.

Table W14: Adjusted R^2 by Responsibility for Household Finances: Appraisal-based outcomes

	Responsible (n = 539)			Not responsible (n = 519)		
	Adj. R^2 household disposable income	Adj. R^2 self-reported income winsorized	Adj. R^2 SFWB	Adj. R^2 household disposable income	Adj. R^2 self-reported income winsorized	Adj. R^2 SFWB
Afford clothes	.055	.050	.213	.015	.044	.105
Afford memberships	.036	.053	.146	.016	.023	.069
Afford dinner out	.071	.067	.203	.016	.047	.119
Affordability index	.117	.101	.302	.058	.097	.203
Unexpected expense	.133	.125	.483	.083	.123	.313
Problem index	.060	.064	.248	.020	.032	.121
Perceived saving capacity	.124	.152	.359	.084	.147	.271
Retirement adequacy	.086	.112	.417	.061	.087	.368

Note. Each cell reports the adjusted R^2 from a separate single-predictor regression. "Responsible" includes respondents who report being primarily responsible for household financial decisions; "Not responsible" includes respondents who report shared or partner-led responsibility.

Categorical Income: Number of Brackets and Bracket Schemes

Figure W7: Correspondence of Self-Reported and Observed Income by Number of Brackets

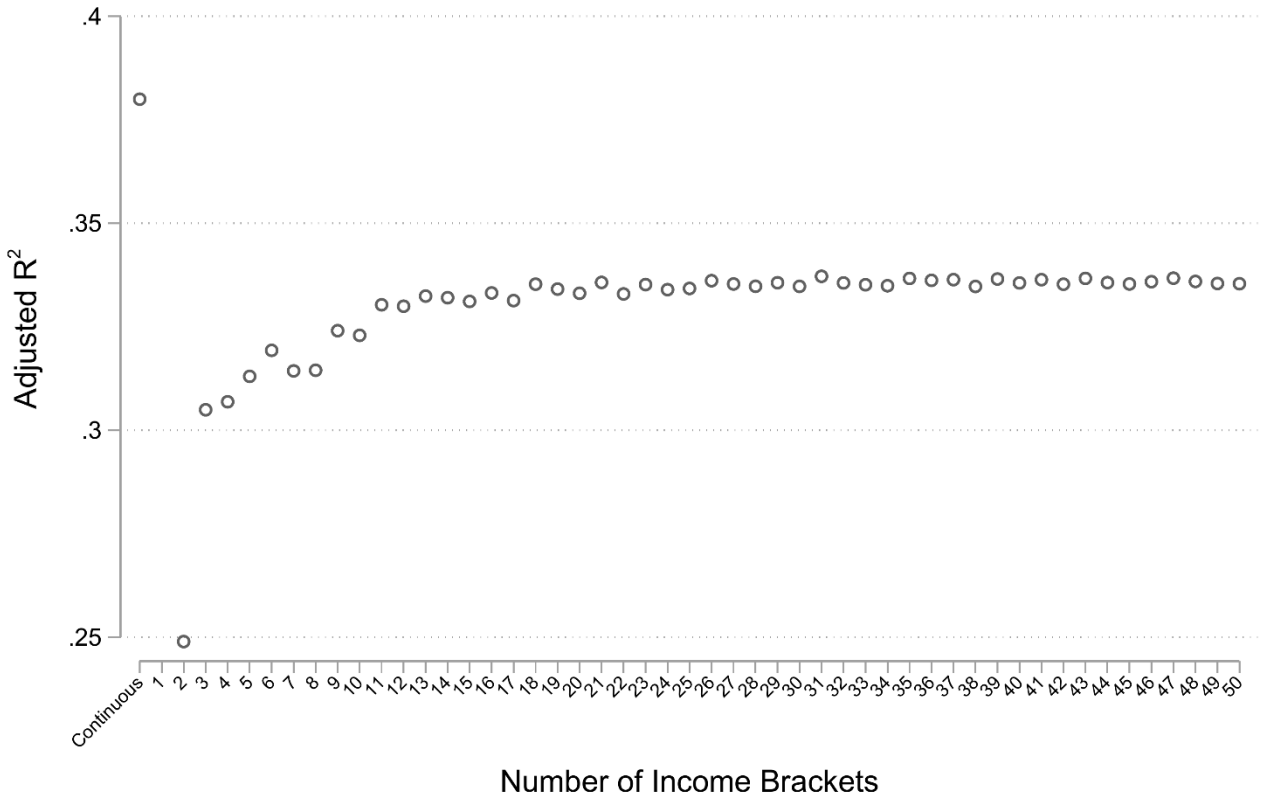
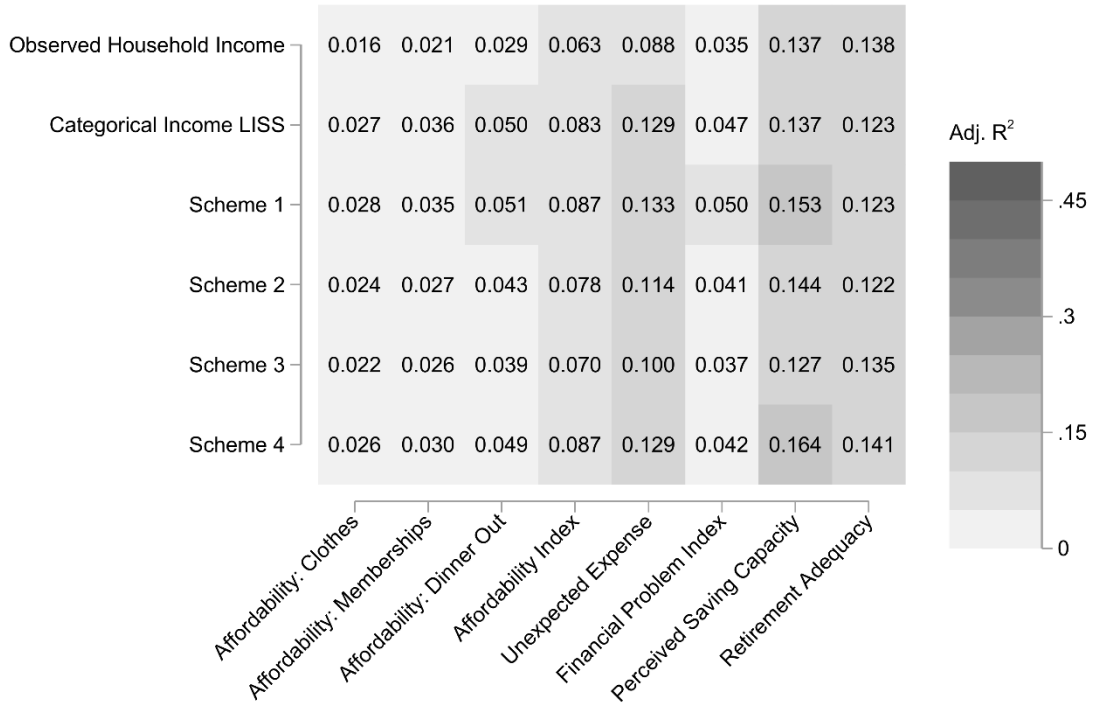


Table W15: Categorical Income Bracket Schemes Used in Coverage Analysis

	Scheme 1 (LISS top-code)	Scheme 2 (P95)	Scheme 3 (P99)	Scheme 4 (Deciles)
1	€0 – €6,000	€0 – €10,000	€0 – €15,000	€0 – €22,500
2	€6,000 – €12,000	€10,000 – €20,000	€15,000 – €30,000	€22,500 – €29,500
3	€12,000 – €18,000	€20,000 – €30,000	€30,000 – €45,000	€29,500 – €35,500
4	€18,000 – €24,000	€30,000 – €40,000	€45,000 – €60,000	€35,500 – €41,000
5	€24,000 – €30,000	€40,000 – €50,000	€60,000 – €75,000	€41,000 – €48,000
6	€30,000 – €36,000	€50,000 – €60,000	€75,000 – €90,000	€48,000 – €55,500
7	€36,000 – €42,000	€60,000 – €70,000	€90,000 – €105,000	€55,500 – €63,000
8	€42,000 – €48,000	€70,000 – €80,000	€105,000 – €120,000	€63,000 – €73,000
9	€48,000 – €54,000	€80,000 – €90,000	€120,000 – €135,000	€73,000 – €89,000
10	€54,000 – €60,000	€90,000 – €100,000	€135,000 – €150,000	€89,000 +
11	€60,000 +	€100,000 +	€150,000 +	-

Note. Schemes 1–3 use equal-width bins. Scheme 4 uses observed income deciles rounded to nearest €500. Top category captures ~13% (Scheme 1), ~5% (Scheme 2), ~1% (Scheme 3), and ~10% (Scheme 4) of respondents.

Figure W8: Adjusted R^2 for Alternative Categorical Income Bracket Schemes: Appraisal-based outcomes



Note. Each row shows adjusted R^2 from regressing the outcome on an income measure. All rows except observed income recode continuous self-reported income into brackets. Categorical Income LISS uses the brackets of the original LISS categorical question (7 brackets, top-coded at €60,000). Schemes 1-3 use 11 equal-width brackets, top-coded at €60,000 (LISS ceiling), €100,000 (≈P95 of observed income), and €150,000 (≈P99). Scheme 4 uses observed-income deciles. The sample (LISS respondents reporting continuous income) is larger than the SFWB sample, so adjusted R^2 values differ from other figures.

WEB APPENDIX H

CONSTRUCTING A POPULATION-ANCHORED CATEGORICAL INCOME QUESTION

The categorical income analyses in the main text demonstrates that the quality of a categorical income measure depends not only on having a sufficient number of response categories, but also on how the category cut points are positioned relative to the income distribution of the population under study. This appendix translates that insight into concrete survey questions that researchers could field, using Dutch households, U.S. households, and a subgroup of older U.S. households as illustrations. These examples are intended to promote more deliberate and context-sensitive income measurement rather than to prescribe a single optimal format. The appropriate specification of an income question will ultimately depend on the characteristics of the target population and the specific research context.

Principles. Two principles guide the procedure. First, a categorical income measure should contain a sufficient number of response categories, with cut points calibrated to the income distribution of the target population. Second, the cut points should be updated periodically, because income distributions shift over time. For example, in the United States, an income cut point at $157,000 corresponded to the 90th percentile in 2014 but is now closer to the 75th percentile. Because researchers often reuse income questions from earlier studies or adopt measures from published work, brackets that were well positioned when originally designed may become substantially less informative over time. Default income questions provided by commonly used survey platforms may satisfy neither principle.[12]

[12] For example, a commonly used income question distinguishes only six categories: < $25,000; $25,000–49,999; $50,000–74,999; $75,000–99,999; $100,000–149,999; > $150,000. The limited number of brackets may obscure meaningful variation in income. This loss of information may be compounded by the placement of the cut points. In the 2024 U.S. household income distribution, the cut point for the highest category, $150,000, corresponds approximately to the 74th percentile. Consequently, about 26% of households fall into a single category even though households around the 75th and 90th percentiles may differ substantially in their consumption and financial behavior.

Procedure. The procedure consists of four steps: obtain the income distribution of the target population, formulate a question that matches the relevant income definition, convert the deciles of that distribution into response brackets, and re-derive the amounts when the question is reused. We illustrate each step below.

Step 1: Obtain the income distribution. In both the Netherlands and the United States, the national statistical office publishes the distribution of household income.[13] For the Netherlands, we use disposable household income for private households; for the United States, we use money income measured before taxes for all households. Because household income in the Netherlands is commonly discussed and reported on a monthly basis, we report monthly amounts alongside annual amounts. Where a source reports a binned distribution rather than percentiles, cut points can be taken from the band boundary closest to each decile.

Table W16: Household income deciles, Netherlands and United States, 2024

Percentile	NL (annual, disposable, in €)	NL (monthly, disposable, in €)	U.S. (annual, pre-tax, in $)
P10	20,900	1,742	19,900
P20	27,500	2,292	34,510
P30	33,500	2,792	49,520
P40	39,900	3,325	65,100
P50	47,600	3,967	83,730
P60	57,300	4,775	105,500
P70	68,500	5,708	135,000
P80	81,600	6,800	175,700
P90	102,100	8,508	251,000

Step 2: Write a question that matches the income definition.

The Dutch question asks for net income, whereas the U.S. question asks about gross income, because in each case that is both the concept respondents can reasonably be expected to report and the one for which a corresponding income distribution is published. The wording specifies the main components of each definition so that respondents' answers correspond as

[13] NL: CBS StatLine table 83934NED, *Welvaart; grenzen van 10%-groepen inkomen en vermogen*, besteedbaar huishoudinkomen, private households including students, https://opendata.cbs.nl/#/CBS/nl/dataset/83934NED/table. U.S.: U.S. Census Bureau, *Income in the United States: 2024*, Current Population Reports P60-286, Table A-4a, https://www.census.gov/library/publications/2025/demo/p60-286.html, and *Income and Poverty in the United States: 2014*, Current Population Reports P60-252, Table A-2, https://www.census.gov/content/dam/Census/library/publications/2015/demo/p60-252.pdf.

closely as possible to what the deciles represent. We also highlight in bold two elements that could otherwise lead to incorrect responses: whether the question refers to household or individual income, and whether it refers to disposable or gross income. Each question also includes a "prefer not to say" option, coded as missing, because income is a sensitive topic (Tourangeau and Yan 2007) and forcing respondents to provide an answer may increase the risk of inaccurate reporting.

Step 3: Convert the deciles into brackets. Rounding each decile in Table W16 half up to a sensible interval (e.g., 1,000 for annual income, 100 for monthly income) yields the response options shown in Table W17.

Step 4: Re-derive the amounts when the question is reused. National statistical offices update income distributions on a regular schedule, so current figures are generally available whenever the question is fielded. In the two examples used here, Statistics Netherlands (CBS) publishes updated figures each October and the U.S. Census Bureau each September.

Applying the procedure to a subgroup. The same steps can be applied to any population for which an income distribution is available. This is particularly relevant when the target population differs substantially from the national population, for example in a study of spending among older households. The final column of Table W17 illustrates the procedure for U.S. households with a householder aged 65 or older. In this case, the source[14] reports household counts in $5,000 income bands rather than percentiles. We therefore cumulate the counts and select the band boundary closest to each decile as the cut point. Because these boundaries do not coincide exactly with the deciles, the resulting categories contain between 7.9% and 12.3% of the subgroup rather than exactly 10% each.

[14] U.S. Census Bureau, *HINC-02. Age of Householder by Total Money Income in 2024, Type of Household, Race and Hispanic Origin of Householder*, households with a householder aged 65 and over, https://www.census.gov/data/tables/time-series/demo/income-poverty/cps-hinc/hinc-02.html.

Table W17: Income question derived from income distributions

Question	*What was your **household's** total **net annual (/ monthly) income** over the period from 1 January 2024 to 31 December 2024?* *Add up, for all household members:* • *wages and salary* • *income from your own business* • *benefits and pensions* • *income from assets and from renting out property* • *allowances (such as rent and healthcare allowance) and child benefit* • *alimony received* • *if monthly: holiday pay and any thirteenth month, spread over twelve months* *Then deduct:* • *alimony paid*		*What was your total **household income** over the period from 1 January 2024 to 31 December 2024, **before taxes**?* *Add up, for all household members:* • *wages and salaries* • *self-employment income* • *Social Security, retirement and pension income* • *unemployment, disability and workers' compensation* • *veterans' and survivor benefits* • *public assistance* • *interest, dividends and rent received* • *alimony and child support received* *Do not include:* • *capital gains* • *non-cash benefits such as SNAP or Medicaid*	
	Netherlands (annual)	**Netherlands (monthly)**	**U.S.**	**U.S. households 65+**
1	Less than €21,000	Less than €1,700	Less than $20,000	Less than $15,000
2	€21,000–27,999	€1,700–2,299	$20,000–34,999	$15,000–24,999
3	€28,000–33,999	€2,300–2,799	$35,000–49,999	$25,000–34,999
4	€34,000–39,999	€2,800–3,299	$50,000–64,999	$35,000–44,999
5	€40,000–47,999	€3,300–3,999	$65,000–83,999	$45,000–54,999
6	€48,000–56,999	€4,000–4,799	$84,000–105,999	$55,000–74,999
7	€57,000–68,999	€4,800–5,699	$106,000–134,999	$75,000–94,999
8	€69,000–81,999	€5,700–6,799	$135,000–175,999	$95,000–124,999
9	€82,000–101,999	€6,800–8,499	$176,000–250,999	$125,000–189,999
10	€102,000 or more	€8,500 or more	$251,000 or more	$190,000 or more
—	Prefer not to say	Prefer not to say	Prefer not to say	Prefer not to say

Scope and limitations. We use deciles as a default because they spread respondents evenly across the distribution, are generally available from national statistical sources, and make the resulting variable interpretable as an individual's position within that distribution. Ten categories should be regarded as a lower bound rather than a target. More categories may be warranted when outcomes of interest are concentrated at one end of the distribution, such as financial hardship at the lower end or wealth accumulation at the upper end. At the same time, finer brackets require respondents to locate themselves more precisely, which may increase item nonresponse or selection of the "prefer not to say" option. Likewise, matching the wording of the question to the income definition underlying the published distribution is a

sensible starting point, but we have not tested alternative wordings. For some populations, a wording that more closely reflects how respondents themselves conceptualize income may yield more accurate reports, even at some cost to alignment with the published income concept. In addition, our categorical-income analyses recode continuous income reports into brackets and therefore assume that respondents would place themselves in the bracket matching their reported income. When brackets are presented directly, it is possible that the exact placement of cut-offs and their width may shape answers. Finally, the most recently published income distributions will typically lag behind the year in which the data is collected, though the resulting drift is likely to be small compared with the drift that arises when brackets are not updated at all.

REFERENCES

Pieters, Constant, Hans Baumgartner, and Rik Pieters (2026), "Improving the Discriminant Validation of Multi-Item Scales," *Journal of Marketing Research*, 63 (3), 502–17.

Tourangeau, Roger and Ting Yan (2007), "Sensitive Questions in Surveys," *Psychological Bulletin,* 133 (5), 859–83.