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Household finances and well-being in Australia: An empirical analysis of comparison effects ☆

Sarah Brown, Daniel Gray *

Department of Economics, University of Sheffield, 9 Mappin Street, Sheffield S1 4DT, United Kingdom

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ABSTRACT

This paper explores the importance of the household's financial position for an individual's level of well-being. Initially, the empirical analysis, based on the Household, Income and Labour Dynamics in Australia (HILDA) Survey, a large nationally representative panel survey, aims to ascertain the impact of the household's monetary financial position on overall life satisfaction and financial well-being, with the latter being measured by financial satisfaction and subjective prosperity. The empirical analysis confirms that the household's level of net wealth, assets and debt are important determinants of overall life satisfaction and financial well-being. The paper goes on to explore whether the financial situation of households in a comparison group influences an individual's overall life satisfaction and financial well-being. The results suggest that the financial position of households in the comparison group is an important determinant of an individual's level of overall life satisfaction and financial well-being, with information effects generally dominating comparison effects. In addition, the effects of the comparison group are asymmetric depending on whether a household's financial position is above or below the average of the reference group.

1. Introduction and background

Overall life satisfaction is frequently argued to be made up of a variety of domains, such as financial satisfaction, job satisfaction and leisure satisfaction, amongst many others, see for example, Easterlin (2006), Layard (2006) and Van Praag and Ferrer-i-Carbonell (2007). In this setting, it is assumed that specific behaviours influence certain domains, and in turn these domain satisfactions determine an individual's level of overall life satisfaction. In the existing literature, however, there remain a limited number of studies which explore the determinants of financial well-being and within this literature, relatively few studies focus on the role of household assets and debt. In addition, income comparisons between individuals have

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* Corresponding author. Tel.: +44 (0)114 222 9653.
E-mail addresses: sarah.brown@sheffield.ac.uk (S. Brown), d.j.gray@sheffield.ac.uk (D. Gray).

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been extensively shown to influence individual well-being, see for example, Clark and Oswald (1996), Ferrer-i-Carbonell (2005), Luttmer (2005), Clark, Frijters, and Shields (2008) and Senik (2008). Income comparisons have been found to have comparison (negative) and information (positive) effects on individual well-being, see for example, Ferrer-i-Carbonell (2005) and Senik (2008), respectively. However, potential comparison effects of financial measures beyond income have not previously been explored. Initially, the empirical analysis presented in this paper aims to ascertain the impact of a variety of household financial measures, such as the level of household assets and debt, in addition to household income, on well-being in Australia whilst accounting for individual heterogeneity. This will provide a grounding for the subsequent analysis relating to comparison effects. The main contribution of the paper is to explore whether the financial position in a specified comparison group influences an individual's level of well-being. In this context, based on potential interdependence of preferences and the importance of relative position, the financial position of households in a comparison group may influence an individual's level of well-being. Such comparison effects related to the more general concept of household finances have not attracted attention in the existing literature. Such a lack of attention is surprising given that, for example, assets such as housing and cars are somewhat conspicuous and may thus influence well-being.

In the existing literature, there are a limited number of studies which explore the impact of monetary factors, beyond income, on individual well-being. For example, Brown, Taylor, and Wheatley Price (2005) analysing the British Household Panel Survey find that it is unsecured, opposed to secured debt which has a detrimental impact on psychological well-being, whilst Headey and Wooden (2004), analysing the HILDA survey, report that overall life satisfaction is positively related to household net wealth. Similarly, Drentea (2000) showed that anxiety is positively related to debt levels and the debt to income ratio. Furthermore, Keese and Schmitz (2014) explored the relationship between household indebtedness and a variety of different health measures. Analysing data from the German Socio-Economic Panel (GSOEP) survey they found that, once individual fixed effects were accounted for, household debt displayed a strong negative relationship with self-assessed health status and mental well-being. Furthermore, Bridges and Disney (2010) explored the link between the likelihood of reporting depression and a variety of objective and subjective debt measures in Britain. The study found that the subjective, rather than the objective, debt measures had a direct impact on the likelihood of reporting depression.

There currently exist relatively few studies which explore the influence of assets and debt on financial well-being. Headey and Wooden (2004), using cross-section data from the 2002 wave of the HILDA survey, explore the impact household net wealth, defined as the household's total assets minus total debt, has on both subjective well-being and ill-being. The results reveal that both income and net wealth are positively associated with financial satisfaction. Similarly, Hansen, Slagsvold, and Moum (2008) explore financial satisfaction in old age in Norway. Analysing the first wave of the Norwegian Life Course, Aging, and Generation Study (NorLAG), the authors aim to assess whether assets and liabilities can explain increasing financial satisfaction in old age. The findings suggest that financial satisfaction is influenced by a wide range of financial measures beyond simply income. Furthermore, the study reports that a large proportion of the increase in the level of financial satisfaction in old age can be explained by increased levels of assets and decreased levels of debt held in later life. However, it is still found that, at low levels of income and wealth, older individuals tend to be more financially satisfied than their equally poor younger counterparts. Similarly, Plagnol (2011) explores the impact of assets and debt on financial satisfaction across the life course in the U.S., using data from the second and third waves of the National Survey of Families and Households (NSFH). The findings indicate that income follows a concave pattern over the life course, suggesting that financial satisfaction is influenced by other factors besides income. In accordance with prior expectations, the regression analysis reveals that financial satisfaction is increasing in income whilst increases in financial satisfaction in later life can be explained by an increase in the level of assets and a decrease in the debt level of the household. We build on these studies by initially exploring the effect of household net wealth, the level of total assets and debt on measures of overall life satisfaction and financial well-being in Australia.

Our main contribution, however, lies in contributing to the growing area of social comparisons by exploring the effect the relative financial position of the household, as captured by measures in addition to income, has on both overall life satisfaction and financial well-being. Social comparisons have received a large amount of attention across a variety of disciplines including economics and psychology, where a particular focus has been on the effects of income, see for example Ferrer-i-Carbonell (2005), Clark et al. (2008), Layard, Mayraz, and Nickell (2010), Luttmer (2005) and McBride (2001) amongst many others. A seminal paper in the area of relative income was by Duesenberry (1949), who used relative income to explain saving behaviours of households in the US. In addition to income, social comparisons are found to affect a wide variety of behaviours, both financial and non-financial. For example, Blanchflower, Landeghem, and Oswald (2009) show that an individual's perceptions of weight are influenced by their relative body mass index, whilst Mujcic and Frijters (2015) report a comparison health effect using Australian data. In addition, Clark (2003) and Powdthavee (2007) show that there is a reduced stigma to being unemployed in areas of high unemployment. This paper aims to contribute to this body of research by exploring the effect of the relative financial position, as measured by net wealth, the level of assets and debt of the household in addition to household income.

In the existing literature there has been a large number of studies exploring the effects of both relative and absolute income, see Clark et al. (2008) for a comprehensive review. In these studies, the analysis frequently includes both measures of absolute and relative income, see for example, Ferrer-i-Carbonell (2005), Clark et al. (2008), Layard et al. (2010), Luttmer (2005) and McBride (2001). In addition, there are studies which explore the influence an individual's income rank has on well-being, see for example, Boyce, Brown, and Moore (2010) and Clark, Westergård-Nielsen, and Kristensen (2009). Generally, in these studies the measure of absolute income has a positive impact on a variety of individual well-being outcomes.

However, relative income has been found to have mixed results including negative and positive impacts on well-being. As a consequence, relative income continues to receive considerable attention in the existing literature and has wider importance as a potential explanation of the Easterlin Paradox (Easterlin (1974)). The findings of these papers suggest that increases in income do not necessarily lead to increases in well-being if it is in conjunction with an increase in the income of an individual's peers.

This paper extends the existing literature by adopting a more holistic view to household finances. In a similar vein to relative income, an individual's level of well-being is potentially influenced by the financial position of others. Based on the theory of the interdependence of preferences, it is anticipated that an individual's level of utility is not only related to personal circumstances but also the circumstances of a comparison group. For example, an extensive literature on overall life satisfaction aims to ascertain the relationship between income and well-being. In the related literature, several studies assert not only the importance of one's own income, but also an individual's income compared to the average in a comparison group. In these studies, it is anticipated that there will be a positive own income effect and a negative comparison income effect, see for example, Ferrer-i-Carbonell (2005), Luttmer (2005) and Clark et al. (2008).

Alternatively, an increase in the average income of the comparison group could potentially be associated with an increase in utility, as individuals could observe other individuals' progression and improvement and interpret this as a signal that their position will improve soon. This phenomenon is potentially capturing positive ambition effects and is called the 'information effect' by Senik (2004) but was also called the 'tunnel effect' by Hirschman and Rothschild (1973). This argument suggests that there may be positive effects on well-being if individuals interpret rising incomes of a comparison group as a signal of future prospects. Consequently, a higher reference income could potentially be perceived as relative deprivation, or an indicator of better future prospects. Senik (2008) argues that comparison and information effects are both present and the individual's personal economic circumstances will determine which effect dominates. In a recent study, FitzRoy, Nolan, Steinhardt, and Ulph (2014) explore potential tunnel and comparison effects in Britain and both West and East Germany and how these effects vary with age. The authors argue that comparison and tunnel effects potentially dominate at different stages of life, specifically, that tunnel effects should dominate in early life, while comparison effects should be more apparent in later life. Splitting the sample by age, FitzRoy et al. (2014) find that the average income of the comparison group has positive and negative impacts on overall life satisfaction for younger and older individuals, respectively. These results are found to be robust to a wide range of specifications.

In addition, it is interesting to explore whether there exists an asymmetric effect of being above or below the reference group, that is, whether there are upward or downward social comparisons. We may expect differential results for if an individual falls below, or above, the average of the reference group. For example, the increase in utility from being above the average financial position of the reference group may be lower than the decrease in utility from falling below the average financial position of the reference group. It is frequently cited that individuals compare themselves to those above, opposed to below them, see for example, Boyce et al. (2010), Duesenberry (1949) and Ferrer-i-Carbonell (2005). Duesenberry (1949) suggested that comparisons should be asymmetric; specifically it should be poorer individuals which are influenced by the income of their richer peers, opposed to richer individuals being influenced by their poorer peers. Similarly, Boyce et al. (2010), analysing the BHPS, find that individuals weight upward comparisons over downward comparisons, that is comparisons are made to those above rather than below the individual. In contrast however, McBride (2001) analysing the US General Social Survey, find that the comparison income effect was more apparent for the rich compared to the poor. Consequently, this paper allows the relative household financial position to have a differential impact on well-being if the household is above, or below, the average of the comparison group.

In summary, this paper builds on the existing literature by conducting longitudinal analysis of individual well-being in Australia, as measured by overall life satisfaction, financial satisfaction and subjective prosperity, whilst controlling for the household's level of assets, debts and net wealth and, in addition, accounting for unobserved individual heterogeneity. More importantly, the empirical analysis explores the impact of comparison and information effects on overall life satisfaction, financial satisfaction and subjective prosperity. Specifically, it explores the relationship between the level of net wealth, total assets and debt (both unsecured and secured) of households in a specified comparison group and overall life satisfaction, financial satisfaction and subjective prosperity. Consistent with Ferrer-i-Carbonell (2005), this paper explores the influence of both the average financial position of a comparison group and the potential asymmetry of the comparison effects, that is, whether an individual's household financial position is above or below that of the comparison group. In the existing literature, such comparison effects have been related to income only. In contrast, in this paper we adopt a more holistic view of household finances. We anticipate that, consistent with existing literature relating to comparison incomes, the financial position of the household's reference group will influence an individual's own level of well-being. We however do not possess any strong priors relating to whether the effect of the financial position of the comparison group on individual well-being will be negative (comparison effects) or positive (information effects). Moreover, we anticipate that these effects will be asymmetric based on whether the household is above or below the average of the comparison group.

2. Method

The empirical analysis is based on data drawn from the Household, Income and Labour Dynamics in Australia (HILDA) survey. The HILDA survey commenced in 2001 and is financed by the Australian Government with the Melbourne Institute

of Applied Economic and Social Research being responsible for its design and management. The HILDA survey is a nationwide panel survey that contains a wide range of social, demographic and socio-economic information. Further details of the HILDA survey are described in Wooden, Freidin, and Watson (2002). This paper focuses on the 2002, 2006 and 2010 waves as these waves contain a supplementary wealth module. This wealth module includes detailed information on the household's wealth, including the monetary values of a variety of assets and debts held by the household. The analysis draws on an unbalanced panel of 27,530 observations of individuals aged between 16 and 93.[1]

2.1. Dependent variables

In accordance with the existing literature, see for example, McBride (2001), Ferrer-i-Carbonell (2005) and Luttmer (2005), we initially explore the effects of income, assets and debts on overall life satisfaction. Overall life satisfaction is based on the question *"All things considered, how satisfied are you with your life?"* This is measured on an eleven point scale, where higher values are associated with being more satisfied. The mean level of overall life satisfaction is 7.90 whilst the median is 8. In line with Dolan, Peasgood, and White (2008), the distribution of overall life satisfaction is skewed, with individuals tending to report higher values of overall life satisfaction.

Joo and Grable (2004) assert that financial well-being comprises of both objective and subjective aspects of one's financial position, and captures how content an individual is with their material and non-material financial position. We explore two measures of financial well-being, namely, financial satisfaction and subjective prosperity, as they potentially capture different aspects of financial well-being. Following Headey and Wooden (2004), and similar to Hansen et al. (2008) and Plagnol (2011), financial satisfaction is based on the question, *"I am now going to ask you some questions about how satisfied or dissatisfied you are with some of the things happening in your life…Your financial situation."* Similar to overall life satisfaction, this is measured on an eleven point scale, with higher values indicating being more satisfied. The mean level of financial satisfaction is 6.40 with the median being 7. Like overall life satisfaction, financial satisfaction is skewed with individuals tending to report higher rather than lower levels of financial satisfaction.

The level of subjective prosperity is based on the question, *"Given your current needs and financial responsibilities, would you say that you and your family are…"* This is originally measured on a six point scale ranging from *"very poor"* to *"prosperous"*. However, due to a lack of observations in the lowest two categories, the lowest two categories are combined and, as a result, subjective prosperity is measured on a five point scale with the mean level of subjective prosperity being 1.81. 52.7% of the sample report being *"reasonably comfortable"*, that is, reporting a score of 2, whilst only 1.4% of individuals report being *"prosperous"*, that is, reporting the highest value of subjective prosperity. This measure has been used extensively in the previous literature, and has been argued to capture a variety of different aspects of an individual's financial position. For example, Siahpush, Spittal, and Singh (2007) use this variable to capture an individual's level of material well-being, whereas Cole, Daly, and Mak (2009) argue that it captures financial deprivation. Similarly, Qu, Weston, and De Vaus (2009) interpret the responses to this question as capturing an individual's level of perceived prosperity.

It should be acknowledged that both financial satisfaction and subjective prosperity are closely related to overall life satisfaction. For example, Easterlin (2006), Layard (2006) and Van Praag and Ferrer-i-Carbonell (2007) find that financial satisfaction, amongst other domains, is an important determinant of overall life satisfaction. However, the determinants of financial satisfaction and subjective prosperity have received limited attention from the recent literature with the exception of, for example, Plagnol (2011) and Headey and Wooden (2004). The analysis presented in this paper aims to contribute to this literature relating to the determinants of financial satisfaction and subjective prosperity, in addition to, for the purposes of comparison to the existing literature on comparison effects, overall life satisfaction. The correlations between the three variables are presented in Table 1. Although, it is clear that they are correlated, they potentially capture different aspects of individual well-being, and consequently it is important to consider all three variables independently.[2]

2.2. Independent variables

A variety of measures are used to capture the household's financial position. These measures include the household's disposable income, the household's level of net wealth, the total level of assets, the total level of debt and the levels of unsecured debt and secured debt. It is widely acknowledged that financial variables, such as income and net wealth, are hard to measure in surveys and are potentially under-reported and reported with error. As a consequence, in order to reduce the potential bias relating to these financial measures, we use the imputed derived variables contained in the HILDA survey. Full details of this imputation method are presented in Hayes and Watson (2009). These imputed measures have been previously

[1] We drop all individuals who report missing values for any of the dependent variables, making the sample of individuals analysed through out the paper consistent, in order to make the results comparable across all three dependent variables.

[2] We have also explored the inclusion of financial satisfaction and subjective prosperity as independent variables in the overall life satisfaction equation. In the case of subjective prosperity, the effects of unsecured debt and net wealth maintain their sign and significance levels at the 5% level. However, once financial satisfaction is included, in line with prior expectations, the statistical significance of the financial variables falls. It should be noted that, the inclusion of financial well-being measures as well as the monetary financial variables in the subjective well-being equation is potentially problematic due to collinearity of the financial well-being and monetary financial measures. Greene (2003) states that the problems of highly correlated variables include the following: small changes in data produce wide variability in parameter estimates; high standard errors and low significance; and parameters having theoretically wrong or implausible magnitudes. Consequently, we do not include subjective and monetary financial measures in the overall life satisfaction equation.

Table 1
Dependent variable – correlations.

	Life satisfaction	Financial satisfaction	Subjective prosperity
Life satisfaction	1		
Financial satisfaction	0.4506***	1	
Subjective prosperity	0.2838***	0.5590***	1

*** Pairwise correlation coefficient, significant at the 1% level.

used to measure household financial variables by Headey and Wooden (2004). Generally, to gather information relating to the financial variables, one individual answered on behalf of the household. Where the financial variables, such as superannuation, credit card debt, individual bank accounts and other personal debts could not be accurately answered by one individual on behalf of the household, all individuals in the household were asked.[3] The responses were then aggregated to the household level. The level of household income is defined as the household's gross income from all sources minus estimated taxes. In some instances, this calculation returns a non-positive income and consequently, these 235 observations, (0.85% of observations), are omitted from the analysis. The household's level of net wealth is defined as the level of household assets minus total debt, where the level of total assets is defined as the summation of the household's financial and tangible assets and total debt is the summation of secured and unsecured debt. The level of secured debt refers to any debt secured against a property, whilst unsecured debt includes all other debt held by the household. It should be noted that all of the financial variables are measured at the household level; consequently, each household member is given the same value of the financial measures. In line with Gropp, Scholz, and White (1997), in order to take account of the skewed nature of the monetary financial variables, the empirical analysis includes the natural logarithm of each of the monetary measures. Following Brown and Taylor (2008), where net wealth, assets and debt take a positive value, the natural logarithm is simply taken. Where these variables are zero, as there are no values between 0 and 1, the natural logarithm is defined to be zero. When the value of net wealth (nw) is negative, the natural logarithm of net wealth is defined to be $-ln(|nw|)$. All monetary financial measures are inflated to 2010 prices.

In accordance with the existing literature, a wide variety of demographic and socio-economic variables are included in the econometric analysis including: age categories, namely, if the individual is aged 25–34, 35–44, 45–54, 55–64, 65–74 and 75 or above, with less than 25 years old being the omitted category; the highest level of educational attainment distinguishing between high school, vocational degree and degree or above, the omitted category is below high school level; the number of individuals in the household; marital status, i.e., whether the respondent is divorced or separated, widowed or never married, with being married as the omitted category; labour market status, i.e., whether the individual is unemployed, retired or not in the labour force, with employed or self-employed being the omitted category; and finally, health status is captured by an index of self-assessed health which ranges from 0–4, where higher values indicate being in better health.[4] In addition, 2 year and 12 region dummies are also included in order to account for business cycle and regional effects. Table 2 presents summary statistics relating to all the variables used in the empirical analysis. Due to a fixed effects specification being implemented in this paper, as discussed in detail below, time invariant characteristics, such as gender and ethnicity are not included in the empirical analysis.

2.2.1. Reference group

In order to capture potential comparison effects, a reference group for each individual needs to be defined. In the existing literature, a variety of approaches have been taken to define an individual's reference group in the context of income. For example, McBride (2001) defines an individual's reference group to be all individuals five years older or younger than the individual. In contrast, Ferrer-i-Carbonell (2005) defines an individual's reference group based on a variety of individual characteristics. These are namely, years of education (less than 10, 10, 11, 12 and 12 or more), 5 age brackets (less than 25, 25–34, 35–44, 45–65, 66 and above), and 2 regions (West and East Germany). In addition, Ferrer-i-Carbonell (2005) also explores the inclusion of gender in the definition of the comparison group and finds similar results. Layard et al. (2010) define an individual's comparison group based on age (plus and minus five years), 3 education levels and gender. Finally, in some existing studies, see for example, Luttmer (2005) and Clark et al. (2009), an individual's reference group is defined according to precise geographic location.

In this paper, we draw on the existing literature and define an individual's comparison group to be based on a variety of characteristics including the respondent's age, education level, gender and geographical region. Specifically, gender is separated into males and females and education is divided into four categories according to the highest level of education

[3] Despite the majority of the wealth questions being contained in the household questionnaire, as stated by Summerfield et al. (2014), they "...endeavoured to ask these of the person knowing the most about the household finances". In addition, all individuals were then asked questions relating to their personal wealth.

[4] We have also explored using a set of dummy variables to capture self-assessed health, the results indicate a strong linear relationship, so an index is used in the final models.

Table 2
Summary statistics.

Variable	Mean	Std. dev.	Min.	Max.
Dependent variables				
Life satisfaction	7.900	1.452	0	10
Financial satisfaction	6.404	2.255	0	10
Subjective prosperity	1.809	0.764	0	4
Independent variables				
Age (*cts.*)	46.206	17.039	16	93
Age less than 25 years[a] (*Omitted Cat.*)	11.3			
Age 25–34 years[a]	16.3			
Age 35–44 years[a]	21.3			
Age 45–54 years[a]	19.8			
Age 55–64 years[a]	14.8			
Age 65–74 years[a]	10.2			
Age 75 and above years[a]	6.3			
Female[a]	53.7			
Ln(household income)	10.985	0.739	3.219	13.234
Below high school[a] (*Omitted Cat.*)	32.0			
Degree[a]	22.9			
Vocational degree[a]	30.8			
High school[a]	14.3			
Ln(household size)	0.901	0.529	0	2.565
Married[a] (*Omitted Cat.*)	67.3			
Never married[a]	18.1			
Divorced[a]	9.6			
Widowed[a]	5.1			
Employed[a] (*Omitted Cat.*)	65.3			
Not in labour force[a]	10.8			
Unemployed[a]	2.8			
Retired[a]	21.1			
Self-assessed health (*Index*)	2.37	0.96	0	4
Financial variables				
Ln(net wealth)	11.894	4.279	−14.908	16.47
Ln(total debt)	7.806	5.249	0	14.979
Ln(total assets)	12.765	1.861	0	16.51
Ln(secured debt)	5.389	5.954	0	15.05
Ln(unsecured debt)	5.312	4.86	0	15.187
Comparison group – financial position				
Ln(avg. household income)	11.165	0.351	9.149	12.158
Ln(avg. net wealth)	13.228	0.58	9.364	15.253
Ln(avg. total assets)	13.537	0.502	9.451	15.368
Ln(avg. total debt)	11.294	1.69	0	13.655
Ln(avg. secured debt)	10.859	2.276	0	13.176
Ln(avg. unsecured debt)	9.724	1.693	0	13.019
Positive income	0.146	0.261	0	2.335
Negative income	0.326	0.499	0	7.926
Positive net wealth	0.235	0.441	0	3.502
Negative net wealth	1.569	4.054	0	29.111
Positive total assets	0.194	0.388	0	3.21
Negative total assets	0.966	1.586	0	14.048
Positive total debt	0.227	0.486	0	4.318
Negative total debt	3.715	4.471	0	13.626
Positive secured debt	0.236	0.495	0	4.762
Negative secured debt	5.706	5.358	0	13.172
Positive unsecured debt	0.191	0.539	0	4.657
Negative unsecured debt	4.604	4.351	0	13.019
Number of observations	27,530			

Note: "Average" refers to the average (mean) of the financial measure in the comparison group. "Positive" refers to $Ln(FM) - Ln(FM_r) > 0$ and "Negative" refers to $Ln(FM_r) - Ln(FM) > 0$, where FM_r is the average of the financial measure in the reference group and FM is the households own financial measure.
[a] Indicates binary variables which are represented as percentages.

obtained: below high school; high school; vocational degree; and degree or above. Consistent with McBride (2001) and Layard et al. (2010), the comparison group is defined as individuals 5 years younger and 5 years older. In addition, the geographical region is based on 12 major statistical regions.

In the empirical analysis we implement two specifications. The first specification is simply the average (mean) of the financial measures of households in the comparison group. Building on Ferrer-i-Carbonell (2005), who focuses on income only, the natural logarithm of the average financial position of the comparison group is included in the analysis. If the comparison effect dominates the information effect, it is anticipated that the higher the average level of income, net wealth and

total assets of the comparison group, the less satisfied and less prosperous an individual will feel. Similarly, the higher the average level of total, secured and unsecured debt in the comparison group, the more satisfied and more prosperous an individual will feel. However, if the average financial position of the comparison group serves to provide information to an individual, the opposite relationships are expected.

The next specification aims to capture whether the comparison effects are symmetric depending on whether a household's financial position is below or above the average financial position of the comparison group. Following Duesenberry (1949) and Ferrer-i-Carbonell (2005), it is anticipated that an individual's level of well-being will be negatively affected if their financial position is "worse" than that of the comparison group, whilst, if their financial position is "better" than the reference group, then it is not expected to influence an individual's level of well-being. Let FM and FM_r be the household's own financial measure and the average of the financial measure in the reference group, respectively. Analogous to Ferrer-i-Carbonell (2005), these measures are constructed as follows: if $FM > FM_r$ then $PositiveFM = Ln(FM) - Ln(FM_r)$, $NegativeFM = 0$. If $FM < FM_r$ then $PositiveFM = 0, NegativeFM = Ln(FM_r) - Ln(FM)$, and if $FM_r = FM$, then $PositiveFM = NegativeFM = 0$. In this paper, having income, net wealth, and total assets below that of the comparison group will potentially adversely affect well-being, whilst having debt above the comparison group will be associated with lower levels of well-being. Alternatively, the opposite relationship could be found if the comparison group provides information about the potential future position of an individual.

2.3. Model estimation

The analysis of the determinants of overall life satisfaction, financial satisfaction and subjective prosperity employs the methodology proposed by Baetschmann, Staub, and Winkelmann (2015), namely the fixed effects ordered logit model estimated via the "Blow-up and Cluster" estimator. This approach has been used to analyse overall life satisfaction in a variety of studies, see for example, Dickerson, Hole, and Munford (2014), Frijters and Beatton (2012) and Mujcic and Frijters (2015).

It is also appropriate for the analysis of financial satisfaction and subjective prosperity as they are both ordinal measures, where individual heterogeneity, as a consequence of omitted variables or from individual differences regarding the interpretation of the ordered response variable, is likely to influence the results. Following Ferrer-i-Carbonell and Frijters (2004), it is important to account for individual heterogeneity when analysing subjective well-being measures.

However, in the existing literature, there has been no accepted method regarding how to implement a fixed effects ordered logit model. For example, Winkelmann and Winkelmann (1998) explored the relationship between unemployment and overall life satisfaction using a conditional logit estimator applied to a dichotomisation at a single value across all individuals. This approach is, however, inefficient as it fails to use all the information available. Moreover, Das and Van Soest (1999) implemented an approach based on a two-step minimum distance method, which results in an efficient estimator, whilst Ferrer-i-Carbonell and Frijters (2004) advocated the use of a method based on individual specific dichotomisation. In order to estimate the fixed effects ordered logit model, we employ the "Blow-up and cluster" method developed by Baetschmann et al. (2015), where a more detailed description of the procedure can be found.

The underlying model is based upon the latent variable model,

$$y_{it}^{*} = x_{it}'\beta + \alpha_i + \epsilon_{it}, \quad i = 1, \ldots, N, \;\; t = 1, \ldots, T \tag{1}$$

where y_{it}^{*} is a latent measure of the i^{th} individual's overall life satisfaction, financial satisfaction or subjective prosperity in period t, x_{it} is a vector of observable characteristics, and β is a vector of coefficients to be estimated. α_i is a time invariant unobserved component and ϵ_{it} is a white noise error term. What is, however, observed is y_{it},

$$y_{it} = k \text{ if } \mu_k < y_{it}^{*} \leqslant \mu_{k+1}, \quad k = 1, \ldots, K \tag{2}$$

where the threshold parameters μ_k are assumed to be strictly increasing for all values of k, and $\mu_1 = -\infty$ and $\mu_{K+1} = +\infty$. It is assumed that the white noise error term, ϵ_{it}, is independently and identically distributed (IID) by the logistic distribution. It follows that the probability of observing outcome k for individual i in time period t is given as:

$$Pr(y_{it} = k | x_{it}, \alpha_i) = \Lambda(\mu_{k+1} - x_{it}'\beta - \alpha_i) - \Lambda(\mu_k - x_{it}'\beta - \alpha_i) \tag{3}$$

where $\Lambda(.)$ represents the cumulative logistic distribution.

To consistently estimate the coefficients of β, it is required that the K levels of y_{it} are dichotomised, that is collapsed into binary outcomes. This estimation method is called the "Blow-Up and Cluster" (BUC) estimator. The estimator initially "blows-up" the sample size by replacing every observation in the sample by $K - 1$ copies of itself, and then dichotomises every $K - 1$ copy of the individual at a different cut off point.[5] The conditional maximum likelihood logit estimate is then estimated using the entire sample, giving the "BUC" estimates. The fixed effects ordered logit model is implemented in Stata using the "bucologit" command proposed by Dickerson et al. (2014).[6] Due to the methodology being employed, it is not possible

[5] As a consequence of employing this methodology, the number of observations used in the estimation "blows-up" to 37,245, 62,020 and 16,852 observations for overall life satisfaction, financial satisfaction and subjective prosperity, respectively. In addition, the number of individuals is different across the dependent variables considered due to individuals not displaying any variation in their outcome variables not being used in the estimation samples.

[6] The results presented in this paper are robust to using a linear model with individual fixed effects.

to calculate the marginal effects relating to individual coefficients. However, it is possible to comment on the sign, statistical significance and the relative size of the coefficients, that is, the ratio of coefficients.

3. Results

3.1. Overall life satisfaction, financial satisfaction and subjective prosperity

Table 3 presents the determinants of overall life satisfaction, financial satisfaction and subjective prosperity. The table presents two models which capture different aspects of the household's financial position. Model 1 includes the household's level of net wealth, whilst model 2 separates net wealth into total assets, secured debt and unsecured debt in order to explore whether the components of net wealth have distinct influences on overall life satisfaction, financial satisfaction and subjective prosperity. In addition to the level of the financial variables being analysed, Table 4 presents the results of the impact of changes in the household's financial position, that is, the difference between the household's financial position at time t and at time $t-1$.[7]

Prior to considering the effects of the household's financial variables, we briefly discuss some of the other determinants of overall life satisfaction, financial satisfaction and subjective prosperity presented in Table 3. In accordance with the existing literature, compared to being married, never being married, being divorced or being widowed are all inversely related to overall life satisfaction, financial satisfaction and subjective prosperity. Similarly, compared to being employed, unemployment is inversely related to all the dependent variables considered. In addition, self-assessed health status displays a positive association with the dependent variables, with higher levels of self-assessed health associated with higher levels of overall life satisfaction, financial satisfaction and subjective prosperity, in accordance with the existing literature. For both financial satisfaction and subjective prosperity, the number of people present in the household is inversely related to financial satisfaction and subjective prosperity.

Focusing on the impact of the financial variables, it is apparent that household income is positively associated with overall life satisfaction. In line with Headey and Wooden (2004), household net wealth is positively associated with overall life satisfaction and in accordance with Brown et al. (2005), as presented in model 2, it is unsecured debt, rather than secured debt, which is inversely related to individual overall life satisfaction.[8]

The results indicate that household income is positively related to the level of financial satisfaction. These results generally accord with the findings of both Hansen et al. (2008) and Plagnol (2011). The financial variables have the expected impacts on financial satisfaction. That is, net wealth and total assets are positively related to financial satisfaction; whilst, both types of debt (secured and unsecured) are inversely related to financial satisfaction. These findings indicate that the results presented in Headey and Wooden (2004) are robust to accounting for individual heterogeneity.

Turning to the determinants of subjective prosperity presented in the final two columns of Table 3, consistent with prior expectations and financial satisfaction, both household net wealth and total assets are positively related to subjective prosperity, whereas all types of debt are inversely related to financial prosperity. Once again, these findings support the argument that monetary financial variables beyond income are important determinants of individual well-being.

As a robustness check, Table 4 presents the coefficients relating to the change in the financial variables, that is the difference between time t and $t-1$. The results are generally in accordance with those presented in Table 3, that is, increased levels of net wealth and total assets are positively related to financial well-being, whereas increases in debt levels have a detrimental impact on the dependent variables. However, the changes in debt levels fail to have a statistically significant impact on overall life satisfaction, whereas the level of net wealth and total assets are both found to have a positive and statistically significant impact.

To summarise, the analysis indicates that it is important to account for monetary factors beyond income when considering the determinants of overall life satisfaction, financial satisfaction and subjective prosperity. In addition, the analysis shows that assets and debt have distinct impacts on well-being, illustrating the importance of separating net wealth into its constituent parts. The next section goes on to explore whether the financial position of a comparison group influences overall life satisfaction, financial satisfaction and subjective prosperity.

3.2. Financial position of the reference group

This section explores whether the financial position of households in a comparison group influences an individual's level of overall life satisfaction, financial satisfaction and subjective prosperity. In Tables 5–10, we consider four different models which gradually introduce the household financial variables. Specifically, model 1 includes household income, but no other financial measures. This model provides a basis of comparison with existing studies, many of which have adopted this model, see for example, Ferrer-i-Carbonell (2005). Model 2 broadens the definition of household finances to include the household's

[7] For brevity, only the financial variables are considered and the results relating to the other variables are consistent with those presented in Table 3.

[8] We have also explored including two variables to capture whether the household has positive or negative net wealth, and obtain similar results. That is, higher levels of positive net wealth are positively related to overall life satisfaction, financial satisfaction and subjective prosperity. Similarly, higher values of negative net wealth are inversely related to both financial satisfaction and subjective prosperity. However, the level of negative net wealth does not have a significant impact on overall life satisfaction.

Table 3
Fixed effect ordered logit estimates of overall life satisfaction, financial satisfaction and subjective prosperity – basic models.

	Overall life satisfaction		Financial satisfaction		Subjective prosperity	
	1	2	1	2	1	2
Ln(household income)	0.108***	0.111***	0.343***	0.321***	0.664***	0.601***
	(0.0411)	(0.0417)	(0.0432)	(0.0439)	(0.0613)	(0.0617)
Ln(net wealth)	0.0203***		0.0382***		0.0481***	
	(0.00528)		(0.00494)		(0.00602)	
Ln(total assets)		0.0508**		0.211***		0.293***
		(0.0204)		(0.0224)		(0.0277)
Ln(unsecured debt)		−0.0168***		−0.0394***		−0.0319***
		(0.00486)		(0.00453)		(0.00524)
Ln(secured debt)		−0.000506		−0.0207***		−0.0204***
		(0.00454)		(0.00439)		(0.00501)
Age 25–34 Years	−0.126	−0.128	−0.155*	−0.136	−0.272***	−0.265**
	(0.0978)	(0.0981)	(0.0928)	(0.0932)	(0.105)	(0.108)
Age 35–44 Years	−0.161	−0.168	−0.245*	−0.247*	−0.395***	−0.417***
	(0.137)	(0.138)	(0.129)	(0.130)	(0.149)	(0.152)
Age 45–54 Years	0.00681	0.00836	−0.215	−0.223	−0.310	−0.347*
	(0.173)	(0.174)	(0.162)	(0.163)	(0.189)	(0.192)
Age 55–64 Years	0.184	0.178	−0.117	−0.166	−0.186	−0.265
	(0.214)	(0.215)	(0.200)	(0.200)	(0.235)	(0.237)
Age 65–74 Years	0.235	0.226	0.0330	−0.0221	−0.109	−0.194
	(0.260)	(0.260)	(0.242)	(0.243)	(0.289)	(0.292)
Age 75 and above	0.0652	0.0587	−0.0517	−0.0868	−0.0713	−0.0976
	(0.312)	(0.313)	(0.286)	(0.287)	(0.348)	(0.351)
Degree	−0.588***	−0.564***	−0.122	−0.0548	−0.431**	−0.344*
	(0.175)	(0.175)	(0.165)	(0.166)	(0.191)	(0.193)
Vocational degree	−0.211	−0.188	−0.123	−0.0812	−0.371***	−0.332**
	(0.130)	(0.131)	(0.119)	(0.120)	(0.141)	(0.140)
High school	−0.484***	−0.451***	−0.404***	−0.327***	−0.677***	−0.603***
	(0.130)	(0.132)	(0.118)	(0.120)	(0.133)	(0.142)
Ln(household size)	−0.104	−0.0937	−0.447***	−0.515***	−0.353***	−0.489***
	(0.0660)	(0.0690)	(0.0620)	(0.0654)	(0.0734)	(0.0762)
Never married	−0.334***	−0.335***	−0.195**	−0.230***	0.122	0.0726
	(0.0934)	(0.0936)	(0.0864)	(0.0867)	(0.0962)	(0.0978)
Divorced/separated	−0.970***	−0.962***	−0.872***	−0.878***	−0.871***	−0.861***
	(0.112)	(0.114)	(0.105)	(0.109)	(0.126)	(0.127)
Widow	−0.687***	−0.676***	−0.369**	−0.369**	−0.332	−0.372*
	(0.177)	(0.178)	(0.169)	(0.169)	(0.204)	(0.206)
Not in labour force	−0.111	−0.117*	−0.468***	−0.493***	−0.300***	−0.311***
	(0.0702)	(0.0706)	(0.0670)	(0.0672)	(0.0753)	(0.0756)
Unemployed	−0.404***	−0.401***	−1.314***	−1.311***	−0.724***	−0.717***
	(0.109)	(0.110)	(0.108)	(0.109)	(0.128)	(0.130)
Retired	0.275***	0.265***	−0.00328	−0.0383	0.0241	0.00305
	(0.101)	(0.101)	(0.0930)	(0.0925)	(0.108)	(0.108)
Self-assessed health (index)	0.685***	0.684***	0.242***	0.244***	0.312***	0.314***
	(0.0295)	(0.0295)	(0.0265)	(0.0263)	(0.0311)	(0.0315)
Number of individuals	10,495	10,495	10,495	10,495	10,495	10,495
Individual-year observations	27,530	27,530	27,530	27,530	27,530	27,530
BuC observations	37,245	37,245	62,020	62,020	16,852	16,852

The analysis also includes region and years dummies. "Number of individuals" denotes the number of individuals in the estimation sample; "Individual-year observations" denotes the number of observations; and "BuC observations" indicates the number of blow-up and cluster observations as described in Section 2.3. Robust standard errors in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

level of net wealth, whilst model 3 separates net wealth into total debt and total assets in order to explore whether the components of net wealth have distinct influences on overall life satisfaction, financial satisfaction and subjective prosperity. Finally, model 4 separates total debt into the household's levels of secured and unsecured debt in order to allow different effects from distinct debt types.Tables 5–7 include the standard measure of the average financial position of the reference group, that is, the natural logarithm of the mean of the specified comparison group for each monetary financial measure, for overall life satisfaction, financial satisfaction and subjective prosperity respectively. Tables 8–10 present the results for when a differential impact is allowed for based on whether the household's financial position is above or below the average of the comparison group for overall life satisfaction, financial satisfaction and subjective prosperity, respectively. In addition, following FitzRoy et al. (2014), in order to explore whether comparison or information effects dominate at different stages of the life course, we present the results for two age ranges, specifically, if individuals are younger, or older, than

Table 4
OLS estimates of changes in financial position on overall life satisfaction, financial satisfaction and subjective prosperity.

	Overall life satisfaction		Financial satisfaction		Subjective prosperity	
	1	2	1	2	1	2
△ Ln(net worth)	0.0128***		0.0370***		0.0132***	
	(0.00341)		(0.00510)		(0.00149)	
△ Ln(total assets)		0.0397***		0.197***		0.0747***
		(0.0129)		(0.0193)		(0.0057)
△ Ln(unsecured debt)		−0.00345		−0.0248***		−0.00465***
		(0.0.00227)		(0.00363)		(0.00122)
△ Ln(secured debt)		0.00227		−0.0148***		−0.00418***
		(0.0.00241)		(0.00369)		(0.00121)
Observations	17,035	17,035	17,035	17,035	17,035	17,035

The analysis also controls for the variables outlined in Table 2, namely: age; education; marital status; household size; labour force status; self-assessed health; region; and years dummies. Robust standard errors in parentheses.
*** $p < 0.01$.

50 years of age.[9] The results generally indicate differences between younger and older individuals when considering the effects of the reference group. For brevity, Tables 5–10 present the findings related to the financial variables only. The results relating to the standard control variables are available on request, and are generally consistent with those discussed in Section 3.1.

Table 5 presents the results relating to overall life satisfaction once the variables which capture the average financial situation of the comparison group are included. The results relating to the household's own financial variables are in accordance with those presented in Table 3, that is, household income, total assets and net wealth are all positively related to overall life satisfaction, whilst total debt and unsecured debt have inverse associations. In accordance with the existing literature, see, for example, Ferrer-i-Carbonell (2005) and Luttmer (2005), the average level of income of the comparison group generally displays an inverse relationship with overall life satisfaction. Model 2 of Table 5 indicates that the average level of net wealth in the reference group is positively related to overall life satisfaction, and the coefficient is over 2.5 times the size of the coefficient associated with household income. Generally, the average level of debt in the reference group fails to have a significant impact on overall life satisfaction. One potential explanation for these results is that assets, such as housing and cars, are arguably more conspicuous and so individuals are more likely compare themselves in these aspects, as opposed household debt which is potentially harder to directly observe.[10]

Splitting the sample by age reveals that the effects of the comparison group are distinct across the two samples. For example, considering the effects of the average level of household income shows a negative and statistically significant effect for individuals over the age of 50, however it fails to have a statistically significant effect in the younger sample. In contrast, considering the average level of net wealth suggests that there is a positive effect of the level of total assets in the comparison group for the older sample, whereas there is a statistically insignificant effect for the younger sample. This statistically insignificant result does not imply that there is no comparison effect, it however, potentially suggests that the information effects and comparison effects cancel each other out in this age group.

The results presented in Table 6 relating to financial satisfaction reveal that the inclusion of controls for the financial position of the comparison group does not change the associations between the household's own financial position and financial satisfaction, that is, total assets and net wealth have positive effects, whilst all types of debt (total, unsecured and secured debt) have inverse associations. The results indicate that the average income of households in the comparison group appears to have a limited impact on an individual's level of financial satisfaction as it is only statistically significant in one of the models considered and is statistically insignificant once the sample is split by age. The results, however, suggest that financial satisfaction is increasing in the average level of net wealth in the reference group and this effect is driven by the younger sample, as demonstrated by the positive and statistically significant impact. In accordance with FitzRoy et al. (2014), this result potentially supports information or tunnel effects being present in younger as opposed to older individuals. This again shows that the financial position of households in a comparison group is an important determinant of financial satisfaction.

Separating net wealth into total assets and total debt shows that the relationship between average net wealth in the reference group and financial satisfaction is driven by the average level of assets in the comparison group as opposed to average debt levels. The average level of total debt held by households in the comparison group fails to be a statistically significant determinant of financial satisfaction. In contrast, the average level of total assets of the comparison group is found to increase financial satisfaction; the coefficient relating to the average level of total assets in the comparison group is 56.79% ((0.184/0.324) × 100) the size of the coefficient associated with household income.

The results relating to subjective prosperity presented in Table 7, similar to the results for financial satisfaction, show that the household's own monetary financial measures maintain the same relationship with subjective prosperity as presented in

[9] It is potentially important to distinguish between retired and non-retired individuals as retired individuals are arguably less flexible and less able to change their financial position, and as a result, the impact of the average financial position of the comparison group could be different compared to their non-retired counterparts.
[10] To further explore this potential explanation, we separate total assets into financial and non-financial assets in Section 3.3.

Table 5
Fixed effects ordered logit estimates of overall life satisfaction – comparison effects.

Variables	Full sample				Younger (aged < 50)				Older (aged ⩾ 50)			
	1	2	3	4	1	2	3	4	1	2	3	4
Ln(household income)	0.123***	0.117***	0.116***	0.119***	0.119**	0.102*	0.0860	0.0930	0.152**	0.153**	0.156**	0.153**
	(0.0410)	(0.0413)	(0.0418)	(0.0418)	(0.0593)	(0.0599)	(0.0615)	(0.0617)	(0.0635)	(0.0645)	(0.0649)	(0.0645)
Ln(avg. household income comparison group)	−0.0371	−0.421**	−0.483**	−0.496**	0.291	0.174	0.142	0.130	−0.283	−0.835***	−0.805***	−0.781**
	(0.183)	(0.213)	(0.220)	(0.220)	(0.328)	(0.403)	(0.421)	(0.425)	(0.276)	(0.308)	(0.308)	(0.308)
Ln(net wealth)		0.0197***				0.0168***				0.0214		
		(0.00528)				(0.00587)				(0.0152)		
Ln(avg. net wealth comparison group)		0.313***				0.0587				0.686***		
		(0.0914)				(0.116)				(0.174)		
Ln(total assets)			0.0541***	0.0470**			0.0689***	0.0688***			0.0433	0.0347
			(0.0197)	(0.0203)			(0.0248)	(0.0258)			(0.0412)	(0.0411)
Ln(avg. total assets comparison group)			0.356***	0.339***			0.144	0.120			0.656***	0.621***
			(0.109)	(0.109)			(0.158)	(0.158)			(0.189)	(0.189)
Ln(total debt)			−0.0130**				−0.0119				−0.0112	
			(0.00554)				(0.00790)				(0.00892)	
Ln(avg. total debt comparison group)			0.0263				−0.104				0.0415	
			(0.0263)				(0.121)				(0.0280)	
Ln(secured debt)				−0.000508				−0.00470				0.00234
				(0.00455)				(0.00576)				(0.00890)
Ln(avg. secured debt comparison group)				0.0284***				−0.0109				0.0322***
				(0.0167)				(0.0621)				(0.0179)
Ln(unsecured debt)				−0.0162***				−0.0147**				−0.0193**
				(0.00487)				(0.00630)				(0.00927)
Ln(avg. unsecured debt comparison group)				0.00704				−0.0359				0.0266
				(0.0230)				(0.0716)				(0.0253)
Number of individuals	10,495	10,495	10,495	10,495	7084	7084	7084	7084	4861	4861	4861	4861
Individual-year observations	27,530	27,530	27,530	27,530	16,374	16,374	16,374	16,374	11,156	11,156	11,156	11,156
BuC observations	37,245	37,245	37,245	37,245	20,307	20,307	20,307	20,307	13,440	13,440	13,440	13,440

Analysis also controls for respondent's age, education, household size, health status, employment status, relationship status, year and region dummies. "Number of individuals" denotes the number of individuals in the estimation sample; "Individual-year observations" denotes the number of observations; and "BuC observations" indicates the number of blow-up and cluster observations as described in Section 2.3. Robust standard errors in parentheses.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table 6
Fixed effects ordered logit estimates of financial satisfaction – comparison effects.

	Full sample				Younger sample (age < 50)				Older sample (age ⩾ 50)			
	1	2	3	4	1	2	3	4	1	2	3	4
Ln(household income)	0.385***	0.351***	0.326***	0.326***	0.456***	0.410***	0.358***	0.367***	0.271***	0.258***	0.258***	0.262***
	(0.0436)	(0.0436)	(0.0443)	(0.0443)	(0.0629)	(0.0630)	(0.0643)	(0.0643)	(0.0613)	(0.0610)	(0.0622)	(0.0621)
Ln(avg. household income comparison group)	−0.143	−0.443**	−0.301	−0.298	0.326	−0.211	−0.190	−0.199	−0.383	−0.243	−0.114	−0.107
	(0.174)	(0.203)	(0.210)	(0.212)	(0.298)	(0.357)	(0.370)	(0.373)	(0.260)	(0.297)	(0.299)	(0.300)
Ln(net wealth)		0.0377***				0.0322***				0.0586***		
		(0.00494)				(0.00543)				(0.0153)		
Ln(avg. net wealth comparison group)		0.219***				0.251**				−0.117		
		(0.0833)				(0.107)				(0.157)		
Ln(total assets)			0.210***	0.209***			0.210***	0.196***			0.221***	0.224***
			(0.0212)	(0.0225)			(0.0264)	(0.0283)			(0.0462)	(0.0464)
Ln(avg. total assets comparison group)			0.181*	0.194**			0.251*	0.206			−0.173	−0.170
			(0.0979)	(0.0983)			(0.144)	(0.144)			(0.169)	(0.168)
Ln(total debt)			−0.0498***				−0.0572***				−0.0421***	
			(0.00521)				(0.00723)				(0.00850)	
Ln(avg. total debt comparison group)			−0.0186				−0.0557				0.000604	
			(0.0245)				(0.120)				(0.0262)	
Ln(unsecured debt)				−0.0389***				−0.0416***				−0.0324***
				(0.00454)				(0.00577)				(0.00877)
Ln(avg. unsecured debt comparison group)				−0.000979				0.0575				0.000634
				(0.0160)				(0.0592)				(0.0170)
Ln(secured debt)				−0.0205***				−0.0164***				−0.0328***
				(0.00440)				(0.00565)				(0.00804)
Ln(avg. secured debt comparison group)				−0.0295				−0.0280				−0.0128
				(0.0227)				(0.0660)				(0.0254)
Number of individuals	10,495	10,495	10,495	10,495	7084	7084	7084	7084	4861	4861	4861	4861
Individual-year observations	27,530	27,530	27,530	27,530	16,374	16,374	16,374	16,374	11,156	11,156	11,156	11,156
BuC observations	62,020	62,020	62,020	62,020	35,628	35,628	35,628	35,628	20,510	20,510	20,510	20,510

Analysis also controls for respondent's age, education, household size, health status, employment status, relationship status, year and region dummies. "Number of individuals" denotes the number of individuals in the estimation sample; "Individual-year observations" denotes the number of observations; and "BuC observations" indicates the number of blow-up and cluster observations as described in Section 2.3. Robust standard errors in parentheses.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table 7
Fixed effects ordered logit estimates of financial prosperity – comparison effects.

	Full sample				Younger sample (aged < 50)				Older sample (aged ⩾ 50)			
	1	2	3	4	1	2	3	4	1	2	3	4
Ln(household income)	0.703***	0.668***	0.601***	0.605***	0.811***	0.772***	0.666***	0.672***	0.516***	0.496***	0.486***	0.492***
	(0.0614)	(0.0616)	(0.0622)	(0.0620)	(0.0908)	(0.0921)	(0.0952)	(0.0956)	(0.0841)	(0.0826)	(0.0830)	(0.0830)
Ln(avg. household income comparison group)	0.178	−0.182	−0.0231	−0.0883	1.165***	0.588	0.584	0.610	−0.179	0.0980	0.180	0.0243
	(0.207)	(0.242)	(0.255)	(0.254)	(0.348)	(0.417)	(0.447)	(0.444)	(0.320)	(0.361)	(0.363)	(0.366)
Ln(net wealth)		0.0476***				0.0411***				0.0635***		
		(0.00603)				(0.00637)				(0.0192)		
Ln(avg. net wealth comparison group)		0.255**				0.286**				−0.279		
		(0.0998)				(0.127)				(0.190)		
Ln(total assets)			0.289***	0.291***			0.313***	0.306***			0.188***	0.195***
			(0.0261)	(0.0277)			(0.0319)	(0.0340)			(0.0529)	(0.0529)
Ln(avg. total assets comparison group)			0.245**	0.262**			0.374**	0.322*			−0.327	−0.291
			(0.120)	(0.120)			(0.176)	(0.171)			(0.204)	(0.208)
Ln(total debt)			−0.0426***				−0.0538***				−0.0236**	
			(0.00621)				(0.00875)				(0.0102)	
Ln(avg. total debt comparison group)			−0.0732**				−0.155				−0.0259	
			(0.0311)				(0.133)				(0.0303)	
Ln(unsecured debt)				−0.0317***				−0.0387***				−0.0125
				(0.00524)				(0.00669)				(0.0103)
Ln(avg. unsecured debt comparison group)				0.0206				0.0443				0.0513
				(0.0296)				(0.0793)				(0.0339)
Ln(secured debt)				−0.0194***				−0.0190***				−0.0204**
				(0.00502)				(0.00636)				(0.0100)
Ln(avg. secured debt comparison group)				−0.0715***				−0.0841				−0.0488**
				(0.0207)				(0.0589)				(0.0220)
Number of individuals	10,495	10,495	10,495	10,495	7084	7084	7084	7084	4861	4861	4861	4861
Individual-year observations	27,530	27,530	27,530	27,530	16,374	16,374	16,374	16,374	11,156	11,156	11,156	11,156
BuC observations	16,852	16,852	16,852	16,852	10,263	10,263	10,263	10,263	5028	5028	5028	5028

Analysis also controls for respondent's age, education, household size, health status, employment status, relationship status, year and region dummies. "Number of individuals" denotes the number of individuals in the estimation sample; "Individual-year observations" denotes the number of observations; and "BuC observations" indicates the number of blow-up and cluster observations as described in Section 2.3. Robust standard errors in parentheses.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table 8
Fixed effects ordered logit estimates of determinants of overall life satisfaction – asymmetric relative financial position.

	Full sample				Younger sample (aged < 50)				Older sample (aged ⩾ 50)			
	1	2	3	4	1	2	3	4	1	2	3	4
Ln(household income)	0.0876	−0.301	−0.365*	−0.372*	0.395	0.261	0.212	0.203	−0.113	−0.661**	−0.637**	−0.618**
	(0.185)	(0.214)	(0.222)	(0.221)	(0.330)	(0.402)	(0.420)	(0.424)	(0.279)	(0.310)	(0.312)	(0.312)
Positive income	0.0199	0.399*	0.480**	0.489**	−0.278	−0.180	−0.118	−0.102	0.150	0.700**	0.704**	0.681**
	(0.201)	(0.229)	(0.236)	(0.235)	(0.348)	(0.418)	(0.436)	(0.440)	(0.304)	(0.332)	(0.334)	(0.335)
Negative income	−0.0409	−0.420*	−0.483**	−0.492**	0.270	0.157	0.124	0.108	−0.293	−0.840***	−0.818***	−0.797**
	(0.185)	(0.216)	(0.223)	(0.223)	(0.329)	(0.403)	(0.422)	(0.425)	(0.282)	(0.314)	(0.315)	(0.315)
Ln(net wealth)		0.340***				0.0887				0.703***		
		(0.0926)				(0.118)				(0.178)		
Positive net wealth		−0.262**				0.00888				−0.667***		
		(0.103)				(0.129)				(0.203)		
Negative net wealth		0.321***				0.0726				0.683***		
		(0.0927)				(0.118)				(0.177)		
Ln(total assets)			0.410***	0.385***			0.219	0.185			0.692***	0.649***
			(0.111)	(0.111)			(0.160)	(0.160)			(0.193)	(0.193)
Positive total assets			−0.345***	−0.327***			−0.119	−0.0972			−0.688***	−0.657***
			(0.123)	(0.123)			(0.173)	(0.173)			(0.226)	(0.227)
Negative total assets			0.353***	0.335***			0.146	0.114			0.643***	0.608***
			(0.111)	(0.111)			(0.160)	(0.160)			(0.192)	(0.192)
Ln(total debt)			0.0143				−0.121				0.0330	
			(0.0267)				(0.120)				(0.0290)	
Positive total debt			−0.0581				0.0337				−0.0930	
			(0.0554)				(0.136)				(0.0809)	
Negative total debt			0.0257				−0.111				0.0404	
			(0.0264)				(0.120)				(0.0280)	
Ln(unsecured debt)				−0.00955				−0.0438				0.0123
				(0.0235)				(0.0717)				(0.0273)
Positive unsecured debt				−0.0533				0.0352				−0.136*
				(0.0471)				(0.0876)				(0.0784)
Negative unsecured debt				0.00392				−0.0289				0.0227
				(0.0231)				(0.0719)				(0.0254)
Ln(secured debt)				0.0285				−0.0162				0.0343
				(0.0174)				(0.0620)				(0.0210)
Positive secured debt				−0.0366				−0.0525				−0.0282
				(0.0553)				(0.0918)				(0.0911)
Negative secured debt				0.0285*				−0.0144				0.0315*
				(0.0168)				(0.0622)				(0.0179)
Number of individuals	10,495	10,495	10,495	10,495	7084	7084	7084	7084	4861	4861	4861	4861
Individual-year observations	27,530	27,530	27,530	27,530	16,374	16,374	16,374	16,374	11,156	11,156	11,156	11,156
BuC observations	37,245	37,245	37,245	37,245	20,307	20,307	20,307	20,307	13,440	13,440	13,440	13,440

Analysis also controls for respondent's age, education, household size, health status, employment status, relationship status, year dummies and region dummies. "Positive" refers to if the own financial measure is above the average of the comparison group, that is, $Ln(FM) - Ln(FM_r) > 0$ and "Negative" refers to if the own financial position is below the average of the comparison group, that is, $Ln(FM_r) - Ln(FM) > 0$, where FM_r is the average of the financial measure in the reference group and FM is the households own financial measure. "Number of individuals" denotes the number of individuals in the estimation sample; "Individual-year observations" denotes the number of observations; and "BuC observations" indicates the number of blow-up and cluster observations as described in Section 2.3. Robust standard errors in parentheses.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table 9
Fixed effects ordered logit estimates of determinants of financial satisfaction – asymmetric relative financial position.

	Full sample				Younger sample (aged < 50)				Older sample (aged ⩾ 50)			
	1	2	3	4	1	2	3	4	1	2	3	4
Ln(household income)	0.240	−0.101	0.0110	0.0103	0.826***	0.283	0.218	0.216	−0.101	0.0635	0.182	0.188
	(0.175)	(0.203)	(0.209)	(0.211)	(0.302)	(0.359)	(0.368)	(0.371)	(0.261)	(0.298)	(0.299)	(0.300)
Positive income	0.532***	0.751***	0.674***	0.697***	0.0268	0.413	0.484	0.518	0.680**	0.444	0.338	0.343
	(0.190)	(0.217)	(0.223)	(0.224)	(0.312)	(0.369)	(0.379)	(0.381)	(0.287)	(0.319)	(0.321)	(0.323)
Negative income	−0.0280	−0.335	−0.204	−0.202	0.502*	0.00408	−0.0212	−0.0276	−0.291	−0.112	0.00277	0.00727
	(0.177)	(0.205)	(0.212)	(0.214)	(0.303)	(0.361)	(0.373)	(0.376)	(0.264)	(0.300)	(0.301)	(0.301)
Ln(net wealth)		0.347***				0.363***				0.0369		
		(0.0849)				(0.108)				(0.159)		
Positive net wealth		0.125				0.0466				0.648***		
		(0.0999)				(0.124)				(0.186)		
Negative net wealth		0.314***				0.334***				−0.0108		
		(0.0850)				(0.108)				(0.159)		
Ln(total assets)			0.442***	0.451***			0.502***	0.447***			0.0798	0.0865
			(0.0989)	(0.0996)			(0.145)	(0.144)			(0.173)	(0.172)
Positive total assets			0.0442	0.0441			−0.0699	−0.00369			0.607***	0.595***
			(0.116)	(0.116)			(0.162)	(0.162)			(0.207)	(0.206)
Negative total assets			0.255**	0.268***			0.310**	0.271*			−0.0977	−0.0948
			(0.0997)	(0.100)			(0.146)	(0.146)			(0.172)	(0.171)
Ln(total debt)			−0.0717***				−0.104				−0.0454*	
			(0.0248)				(0.120)				(0.0270)	
Positive total debt			−0.0316				0.0110				−0.0150	
			(0.0519)				(0.134)				(0.0748)	
Negative total debt			−0.0236				−0.0476				−0.00331	
			(0.0245)				(0.121)				(0.0260)	
Ln(unsecured debt)				−0.0737***				−0.0676				−0.0505*
				(0.0229)				(0.0654)				(0.0268)
Positive unsecured debt				0.0759*				0.0804				0.0610
				(0.0438)				(0.0800)				(0.0716)
Negative unsecured debt				−0.0317				−0.0227				−0.0142
				(0.0226)				(0.0655)				(0.0252)
Ln(secured debt)				−0.0144				0.0389				−0.0291
				(0.0167)				(0.0612)				(0.0196)
Positive secured debt				−0.154***				−0.201**				−0.0584
				(0.0508)				(0.0883)				(0.0806)
Negative secured debt				−0.00156				0.0487				−0.000359
				(0.0160)				(0.0616)				(0.0170)
Number of individuals	10,495	10,495	10,495	10,495	7084	7084	7084	7084	4861	4861	4861	4861
Individual-year observations	27,530	27,530	27,530	27,530	16,374	16,374	16,374	16,374	11,156	11,156	11,156	11,156
BuC observations	62,020	62,020	62,020	62,020	35,628	35,628	35,628	35,628	20,510	20,510	20,510	20,510

Analysis also controls for respondent's age, education, household size, health status, employment status, relationship status, year dummies and region dummies. "Positive" refers to if the own financial measure is above the average of the comparison group, that is, $Ln(FM) - Ln(FM_r) > 0$ and "Negative" refers to if the own financial position is below the average of the comparison group, that is, $Ln(FM_r) - Ln(FM) > 0$, where FM_r is the average of the financial measure in the reference group and FM is the households own financial measure. "Number of individuals" denotes the number of individuals in the estimation sample; "Individual-year observations" denotes the number of observations; and "BuC observations" indicates the number of blow-up and cluster observations as described in Section 2.3. Robust standard errors in parentheses.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table 10
Fixed effects ordered logit estimates of determinants of subjective prosperity – asymmetric relative financial position.

Variables	Full sample				Younger sample (aged < 50)				Older sample (aged ⩾ 50)			
	1	2	3	4	1	2	3	4	1	2	3	4
Ln(household income)	0.878***	0.497	0.584**	0.522**	2.019***	1.451***	1.288***	1.332***	0.385	0.695*	0.716*	0.547
	(0.210)	(0.247)	(0.256)	(0.257)	(0.351)	(0.421)	(0.444)	(0.443)	(0.326)	(0.371)	(0.371)	(0.376)
Positive income	0.119	0.334	0.250	0.319	−0.604	−0.237	−0.104	−0.129	−0.0379	−0.402	−0.384	−0.208
	(0.231)	(0.266)	(0.275)	(0.275)	(0.376)	(0.444)	(0.466)	(0.464)	(0.359)	(0.396)	(0.399)	(0.405)
Negative income	0.295	−0.0661	0.0787	0.0142	1.450***	0.896**	0.827*	0.867*	−0.188	0.144	0.172	−0.00110
	(0.212)	(0.248)	(0.259)	(0.259)	(0.356)	(0.426)	(0.453)	(0.451)	(0.327)	(0.374)	(0.374)	(0.378)
Ln(net wealth)		0.419***				0.436***				−0.158		
		(0.103)				(0.130)				(0.197)		
Positive net wealth		0.263**				0.211				0.704***		
		(0.120)				(0.148)				(0.233)		
Negative net wealth		0.381***				0.404***				−0.213		
		(0.103)				(0.130)				(0.197)		
Ln(total assets)			0.608***	0.625***			0.744***	0.699***			−0.114	−0.0602
			(0.123)	(0.123)			(0.179)	(0.173)			(0.211)	(0.215)
Positive total assets			0.113	0.0966			−0.0823	−0.0472			0.688***	0.649**
			(0.142)	(0.142)			(0.198)	(0.194)			(0.254)	(0.257)
Negative total assets			0.369***	0.385***			0.473***	0.436**			−0.269	−0.221
			(0.124)	(0.124)			(0.180)	(0.175)			(0.211)	(0.215)
Ln(total debt)			−0.125***				−0.184				−0.0476	
			(0.0314)				(0.132)				(0.0317)	
Positive total debt			0.0726				0.143				−0.110	
			(0.0628)				(0.149)				(0.0936)	
Negative total debt			−0.0819***				−0.130				−0.0326	
			(0.0311)				(0.133)				(0.0303)	
Ln(unsecured debt)				−0.0173				0.00533				0.0459
				(0.0302)				(0.0785)				(0.0356)
Positive unsecured debt				0.0336				0.0559				−0.163*
				(0.0530)				(0.0951)				(0.0884)
Negative unsecured debt				0.0178				0.0496				0.0491
				(0.0300)				(0.0788)				(0.0341)
Ln(secured debt)				−0.0926***				−0.107*				−0.0608**
				(0.0213)				(0.0585)				(0.0248)
Positive secured debt				0.0201				0.0321				−0.0959
				(0.0618)				(0.0971)				(0.0992)
Negative secured debt				−0.0755***				−0.0902				−0.0519**
				(0.0208)				(0.0587)				(0.0223)
Number of individuals	10,495	10,495	10,495	10,495	7084	7,084	7084	7084	4861	4861	4861	4861
Individual-year observations	27,530	27,530	27,530	27,530	16,374	16,374	16,374	16,374	11,156	11,156	11,156	11,156
BuC observations	16,852	16,852	16,852	16,852	10,263	10,263	10,263	10,263	5028	5028	5028	5028

Analysis also controls for respondent's age, education, household size, health status, employment status, relationship status, year dummies and region dummies. "Positive" refers to if the own financial measure is above the average of the comparison group, that is, $Ln(FM) - Ln(FM_r) > 0$ and "Negative" refers to if the own financial position is below the average of the comparison group, that is, $Ln(FM_r) - Ln(FM) > 0$, where FM_r is the average of the financial measure in the reference group and FM is the households own financial measure. "Number of individuals" denotes the number of individuals in the estimation sample; "Individual-year observations" denotes the number of observations; and "BuC observations" indicates the number of blow-up and cluster observations as described in Section 2.3. Robust standard errors in parentheses.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Section 3.1. In addition, similar to the analysis of financial satisfaction, the average net wealth of households in the comparison group has a positive impact on one's own subjective prosperity, and once again this is present in the younger as opposed to the older sample. The average level of total debt of the comparison group is inversely related to subjective prosperity. This result may reflect the possibility that higher levels of debt of the comparison group may signal that a household will potentially also incur higher levels of debt in the future, and as a result will have a negative impact on subjective prosperity. Once again, the average level of total assets of the comparison group has a positive impact on subjective prosperity, lending support to information effects dominating comparison effects. Interestingly, the inverse relationship between the average level of debt in the comparison group is driven by the average level of secured debt, as opposed to the level of unsecured debt.

Table 8 presents the results relating to the potential asymmetric effects of the comparison group, that is if the household's financial position is above or below the average in the comparison group, for overall life satisfaction, whilst Tables 9 and 10 present the coefficients relating to financial satisfaction and subjective prosperity, respectively. The results indicate that, for overall life satisfaction, having a level of household income above (below) that of the comparison group has positive (negative) effects on an individual's level of overall life satisfaction. This is in line with the argument behind comparison effects, that is, individuals derive increased levels of utility from being above the average, and lower levels of utility from being below the average level of income. In contrast, having a level of net wealth above the average of the reference group has a negative impact on overall life satisfaction, whereas having net wealth below the average of the reference group has a positive association with the level of overall life satisfaction, and as presented in Table 8, this is apparent in the older, as opposed to the younger sub-sample. This negative effect of having net wealth above the average of the comparison group potentially indicates an individual's dislike of inequality in net wealth and total assets. The results suggest a positive effect of net wealth and total assets in absolute terms. However, there are disutilities the further an individual moves above the mean of their peer group. Separation of net wealth into total assets and debt reveals that this relationship is driven by the average level of total assets of the comparison group, rather than the debt levels. These results are present in the older as opposed to the younger sample. These results highlight that, in the context of social comparisons, income and household net wealth and total assets have distinct impacts on overall life satisfaction.

The results relating to financial satisfaction presented in Table 9 indicate that having a household income above that of the average of the comparison group has a positive impact on financial satisfaction, whereas, having income below the average of the comparison group does not have a statistically significant impact on financial satisfaction. It appears that increasing an individual's position within a reference group only matters if the individual rises above the average of the reference group. This result is at odds with Ferrer-i-Carbonell (2005) who finds that the average level of income of the reference group has a detrimental impact on overall life satisfaction if the individual is below the average of the reference group. This difference is potentially due to the analysis being implemented on a different country or due to the comparison group being defined in a different way. Interestingly, having a level of net wealth below that of the average of the comparison group is positively related to financial satisfaction. These effects are present in the younger, as opposed to the older, sample. This could suggest that individuals with a level of net wealth below the average of the reference group gain utility from potential information effects. In addition, Table 9 shows that having total assets below the average of the comparison group has a positive impact on financial satisfaction, and once again, this is present in the younger sample. Focusing on individuals aged 50 and above indicates that having a level of net wealth and total assets above that of the comparison group both have positive impacts on financial satisfaction. The average level of total debt in the comparison group fails to have a statistically significant impact on financial satisfaction. It is apparent, however, that having a level of secured debt above the average of the comparison group has a detrimental impact on financial satisfaction.

The findings relating to subjective prosperity presented in Table 10 suggest that having a household income above the average income of the comparison group fails to have a statistically significant impact on subjective prosperity. However, for the younger sample, having income below the average of the comparison group has a positive and statistically significant impact on subjective prosperity. The results reveal that having net wealth above or below the average of the comparison group has positive effects on subjective prosperity and separation by age reveals that the positive impact of being below the average is present in the younger sample, suggesting potential information effects, whereas the positive effect of being above the average of the reference group is present in the older sample. In accordance with net wealth, possessing total assets below that of the average of the comparison group has a positive impact on subjective prosperity, whilst having total debt below the average of the comparison group has a detrimental impact on subjective prosperity. As a consequence, an individual's level of subjective prosperity could be reduced if they anticipate that they are likely to incur higher debt levels in the future. Having a level of secured debt below the average of the comparison group has a negative impact on subjective prosperity and this is particularly prevalent in the older sample. This result could also be attributed to individuals who have a lower level of secured debt, not being able to obtain mortgages of sufficient value, and consequently this will have a detrimental impact on their level of subjective prosperity. Splitting the sample by age suggests that having total assets below that of the comparison group has a positive (insignificant) effect on the level of subjective prosperity for younger (older) individuals. Having a level of total assets above the average in the comparison group increases the subjective prosperity of older individuals.

The analysis presented in this section suggests that the financial position of households, with similar characteristics, influences an individual's own level of financial well-being. Furthermore, the empirical analysis lends support to the ideas presented by Hirschman and Rothschild (1973) and Senik (2008) with the average financial position of the comparison group potentially providing future information about their own household's financial position. The results suggest that these

effects are also present in wider measures of household finances in addition to income. More specifically, the results show that household assets and debt have distinct impacts on well-being, demonstrating the importance of separating measures of the household's financial position, such as net wealth, into its constituent parts.

3.3. Financial and non-financial assets

In order to ascertain whether comparison effects are more prevalent in observable domains, we split the level of total assets into financial and non-financial assets to explore the differential impacts across the three dependent variables considered. Financial assets include savings accounts, investments and pension funds, whilst, non-financial assets include property, business assets, vehicles and collectibles. Consequently, it would be expected that the average of the non-financial assets of the comparison group would have a greater impact, as they are more conspicuous, than financial assets. The results presented in Table 11 indicate that, for both financial satisfaction and subjective prosperity, it appears that it is the average level of non-financial, rather than financial, assets which has a statistically significant impact, supporting the idea that comparisons are drawn from more visible assets. For overall life satisfaction, however, it is the average level of financial assets in the comparison group, which is found to be statistically significant. These observed differences across the different dependent variables analysed, further serve to highlight the importance of considering a range of well-being domains when exploring the relationship between a household's financial position and individual well-being.

4. Discussion and conclusion

This paper has explored the determinants of overall life satisfaction, financial satisfaction and subjective prosperity, with a particular focus placed on the role of the household's financial position including the financial position of households in a

Table 11
Fixed effects ordered logit estimates of overall life satisfaction, financial satisfaction and subjective prosperity – financial and non-financial assets.

	Overall life satisfaction		Financial satisfaction		Subjective prosperity	
	1	2	1	2	1	2
Ln(tangible assets)	0.0221**	0.0391	0.0533***	0.216***	0.0859***	0.290**
	(0.0110)	(0.0998)	(0.0105)	(0.0836)	(0.0132)	(0.118)
Ln(avg. tangible assets comparison group)	0.0160		0.127		0.118	
	(0.0984)		(0.0806)		(0.113)	
Positive tangible assets		−0.00306		0.0492		0.258*
		(0.115)		(0.102)		(0.136)
Negative tangible assets		0.0169		0.171**		0.226*
		(0.0998)		(0.0837)		(0.119)
Ln(financial assets)	0.0527***	0.199***	0.161***	0.156**	0.175***	0.314***
	(0.0151)	(0.0738)	(0.0158)	(0.0653)	(0.0190)	(0.0839)
Ln(avg. financial assets comparison group)	0.146**		−0.0149		0.118	
	(0.0722)		(0.0638)		(0.0815)	
Positive financial assets		−0.133		0.0817		−0.0406
		(0.0873)		(0.0799)		(0.101)
Negative financial assets		0.148**		0.00415		0.154***
		(0.0727)		(0.0643)		(0.0830)
Ln(total debt)	−0.0126**	0.0144	−0.0446***	−0.0710***	−0.0341***	−0.120***
	(0.00555)	(0.0263)	(0.00521)	(0.0252)	(0.00618)	(0.0317)
Ln(avg. total debt comparison group)	0.0264		−0.0223		−0.0777**	
	(0.0260)		(0.0250)		(0.0311)	
Positive total debt		−0.0522		0.0353		0.0975
		(0.0559)		(0.0526)		(0.0639)
Negative total debt		0.0259		−0.0252		−0.0830***
		(0.0260)		(0.0249)		(0.0313)
Number of individuals	10,495	10,495	10,495	10,495	10,495	10,495
Individual-year observations	27,530	27,530	27,530	27,530	27,530	27,530
BuC observations	37,245	37,245	62,020	62,020	16,852	16,852

Analysis also controls for respondent's age, education, household size, health status, employment status, relationship status, year dummies and region dummies. "Positive" refers to if the own financial measure is above the average of the comparison group, that is, $Ln(FM) - Ln(FM_r) > 0$ and "Negative" refers to if the own financial position is below the average of the comparison group, that is, $Ln(FM_r) - Ln(FM) > 0$, where FM_r is the average of the financial measure in the reference group and FM is the households own financial measure. "Number of individuals" denotes the number of individuals in the estimation sample; "Individual-year observations" denotes the number of observations; and "BuC observations" indicates the number of blow-up and cluster observations as described in Section 2.3. Robust standard errors in parentheses.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

comparison group. The empirical analysis has explored panel data drawn from the 2002, 2006 and 2010 waves of the HILDA survey.

Using a fixed effects framework, in order to account for unobserved individual heterogeneity, the findings suggest that the levels of net wealth and assets are positively associated with overall life satisfaction, financial satisfaction and subjective prosperity, whilst the levels of total debt and unsecured debt are negatively associated with overall life satisfaction, and all types of debt (total, secured and unsecured) are inversely related to financial satisfaction and subjective prosperity. These results highlight the importance of accounting for financial factors beyond income when analysing overall life satisfaction, financial satisfaction and subjective prosperity.

Such findings are important from a wider perspective given that over the past three decades there has been a significant increase in the level of household debt across the developed world. Furthermore, many households hold high levels of debt whilst simultaneously holding a limited amount of savings and, given the current economic climate, this could make households particularly vulnerable to adverse financial shocks such as experiences of unemployment or reductions in real income. Households which experience such shocks are potentially at increased risk from financial hardship and repayment arrears which could have adverse effects across a range of well-being domains. Consequently, the high debt levels observed in Australia and many developed countries such as the UK and U.S. could be having a detrimental impact on individual well-being.

In the existing literature, the relationship between comparison incomes and overall life satisfaction has been extensively explored. This paper contributes to the existing literature by exploring the impact of the financial position of households in a specified comparison group on an individual's level of overall life satisfaction and financial well-being. That is, we have adopted a more holistic definition of household finances. Consequently, a variety of monetary variables, namely the level of income, net wealth, total assets, total debt and both secured and unsecured debt of the comparison group were considered. The findings indicate that comparison effects are present in financial measures other than income, and these results differ across the range of well-being measures analysed. Within these models, a range of positive and negative comparison effects are found highlighting the presence of both comparison and tunnel or information effects. More specifically, the results relating to the financial measures other than income, generally accord with the idea of information effects, that is the financial position of the comparison group provides information on a household's potential future financial position, and these effects have different impacts across different age groups. The results also indicate that the social comparison effects are different for different measures of the household's financial position and for different dependent variables. We have also explored whether these results are as a consequence of total assets being more visible than household income levels. For financial well-being, the results are supportive of this argument, however, there is limited evidence for overall life satisfaction.

Our findings demonstrate the importance of taking a more holistic view of household finances and also considering a range of well-being measures as well as allowing for comparison effects. Our findings thus serve to highlight the importance of exploring financial factors in addition to income when analysing well-being and will hopefully serve to stimulate more research in this area.

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