



ADDRESSING THE CHALLENGE OF PROBLEMATIC DEBT: AUSTRALIA AND EUROZONE

Technical Report

Daniel W. Richards
Abdullahi D. Ahmed
Muhammad S. Tahir

**THINK
FORWARD** INITIATIVE

Addressing the challenge of problematic debt: Australia and Eurozone*

TECHNICAL REPORT

Daniel Richards, Abdullahi Ahmed, Muhammad Tahir †

September, 2019

Abstract

While household debt can be beneficial, certain types of debt incur psychological stress. This is especially true for high repayments relative to disposable income where debt can spiral out of control. In this research, we investigate problematic debt and its associated factors. This project focuses on Australia and eight European countries by employing data from ING International Survey (IIS) and the Household, Income and Labour Dynamics in Australia² (HILDA) Survey. The project identifies that households experiencing debt discomfort exhibit credit card debt, overdrafts, personal loans, and loans from vendors, friends and family. The research also investigates the following individual factors associated with a decrease in problematic 'debt-taking' (taking on debt): financial literacy, financial capability and financial wellbeing. However, financial literacy is less associated with decreasing problematic debt than are financial capability and financial wellbeing. We also find certain country-level cultural dimensions (indulgence, masculinity) relate to increasing problematic debt. Our results imply that there is a psychological aspect to problematic debt-taking that needs to be addressed by policy makers. Future initiatives in financial education should focus on these behavioural and psychological aspects to reduce the tendency to take on problematic debt.

Keywords: Problematic debt, Financial literacy, Financial capability, Financial wellbeing

* This report has been prepared by the authors for the Think Forward Initiative.

† Richards: RMIT University (corresponding author: daniel.richards@rmit.edu.au), Ahmed: RMIT University (abdullahidahir.ahmed@rmit.edu.au), Tahir: RMIT University (muhhammad.tahir@rmit.edu.au)

² This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the authors and should not be attributed to either FaHCSIA or the Melbourne Institute.' (Summerfield et al., 2017).

1. Introduction

A regular financial decision that households face is to decide whether to undertake debt (Brown, Taylor, & Wheatley Price, 2005). Use of debt can have both positive and negative impacts on a household. Positive impacts are the ability for individuals to purchase expensive assets - such as a house or a car, which would take a long time to save for - or to borrow for investment purposes. Yet, there are also negative impacts, such as exorbitant repayments and interest costs that become too burdensome for households to meet. Therefore, it is important for households to distinguish between problematic and unproblematic debt, and then make financial decisions to limit their amount of problematic debt.

One way to identify potentially problematic debt is to distinguish between *collateralised debt* and *non-collateralised debt*. Dunn and Mirzaie (2016) argued that non-collateralized debt types (including credit card debt, pay day loans and student loans) are more stressful than collateralized debt types (mortgages). Furthermore, they find credit card debt the most stressful and problematic. This implies that households should avoid non-collateralised debt (especially credit cards).

The decision on whether a household undertakes problematic debt can be triggered by urgent needs or unforeseen circumstances. At other times, the decision can be driven from a lack of knowledge, or a lack of capability to make sound financial decisions. The latter reason has been a topic of focus for many financial education programmes in many countries seeking to improve the financial decision-making skills of the population through financial literacy initiatives.

The ability to make better financial decisions is associated with certain individual factors (Remund, 2010); these include financial literacy (Grinstein-Weiss, Spader, Yeo, Key, & Freeze, 2012), financial capability (Kagotho, Ssewamala, Patak-Pietrafesa, & Byansi, 2018) and financial wellbeing (Vlaev & Elliott, 2014). An increase in some, or all, of these factors leads to households making better financial decisions. However, research has not yet empirically determined how these factors are associated with problematic debt-taking behaviour. One research question for this study is:

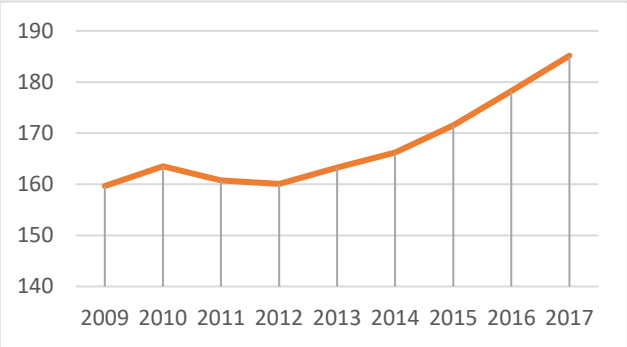
To what extent are financial literacy, financial capability, and financial wellbeing associated with a problematic debt-taking?

There are notable differences in household debt-taking behaviour between countries. Figure 1 and Figure 2 show that Australia has higher household debt with a dramatic increasing trend while Eurozone countries (countries using the Euro currency) have less household debt-taking with a decreasing trend. Often, such differences are explained by macro-economic factors such as unequal wealth distribution (Barba & Pivetti, 2009) or regulation of financial institutions (H. J. Kim, Lee, Son, & Son, 2014). Recently, however, another factor proposed is that national culture influences household financial behaviour. Households are nested within a culture which places importance on different values and ideas. These in turn influence behaviours and how financial decisions are made (Ehmke, Lusk, & Tyner, 2010).

Our research analyses the association of country-level cultural values to identify if these factors explain problematic debt-taking by households. In our study, we select countries from the Eurozone and compare them to Australia. Eurozone countries share a currency, yet have different cultural values, making them diverse in nature. This allows exploration of the influence that cultural values have on problematic debt-taking behaviour. Our research question is:

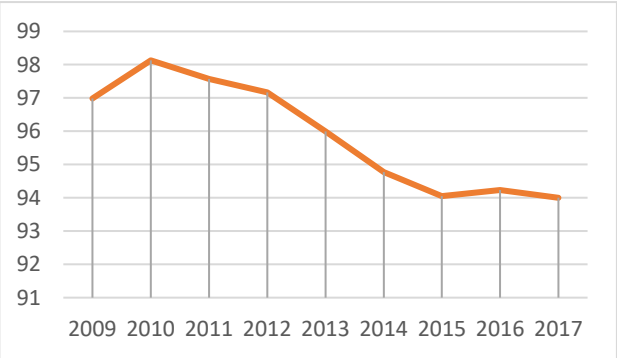
To what extent are country-level cultural values related to the problematic debt-taking?

Figure 1: Household debt-to-income ratio of Australians from 2009 to 2017.



Note: Australian Bureau of Statistics, 2017, October 30.

Figure 2: Household debt-to-income ratio of Euro countries from 2009 to 2017.



Note: Trading Economics, 2018.

2. Literature

2.1 Literature on Household Finance

2.1.1 Problematic Debt

The decision of a household to take on debt or not has many implications (Zinman, 2015). Taking on debt can enable a household to purchase assets and establish wealth, but debt - if not managed properly - can become problematic. Unmanaged problematic debt is related to health problems such as anxiety, depression (McLaughlin et al., 2011); mental-health issues (Turunen & Hiilamo, 2014); drug addiction (Richardson, 2013); and heart malfunction or migraine headaches (Jarl, Cantor-Graae, Chak, Sunbaunat, & Larsson, 2015). More alarmingly, unmanaged debt, when it becomes problematic, could lead to attempted suicide (Jacoby, 2002; Meltzer et al., 2010).

The implications of problematic debt are severe at the macro-level as well, as they contribute to a surging unemployment rate and the dwindling gross domestic product (GDP) of a country (Lombardi, Mohanty, & Shim, 2017). A negative association between household debt and economic growth was found in US households for the period 1982–2009 (Kim, 2013). There is a strong argument that problematic debt also has damaging implications on households and economies.

Since there are so many severe implications of problematic household debt, there is a need to explore the determining factors that cause it to rise. In this context, prior research focusing on identifying the reasons for rising household debt have investigated macro-economic explanations. These include unequal distribution of wealth (Barba & Pivetti, 2009); constant decline in the national income (Meniago, Mukuddem-Petersen, Petersen, & Mongale, 2013); increase in housing prices; flexible lending terms and conditions; and lax attitudes of

financial institutions (Kim et al., 2014). There is little research identifying the individual-level factors that could cause rising household debt. This study addresses this shortage by considering the individual-level reasons for taking on problematic debt: these include financial literacy (Grinstein-Weiss et al., 2012); financial capability (Kagotho et al., 2018); and financial wellbeing (Vlaev & Elliott, 2014). We now review each of these reasons.

2.1.2 Financial Literacy

An approach often adopted to improve household financial decision making is to improve their knowledge of finance; or, in other words, to make them financially literate. A financially literate person understands financial concepts and objects, coupled with the ability to apply the concepts to those objects. In addition, financial literacy familiarises a person with financial problems and helps to articulate their attitudes and behaviours accordingly (Agarwalla, Barua, Jacob, & Varma, 2015; Huston, 2010). Literature suggests that financial literacy improves financial capability and financial behaviour, because a financially literate person manages money properly and takes better financial decisions (Davutyan & Öztürkcal, 2016; Grinstein-Weiss et al., 2012). That's why a financially literate person is more likely to reduce excessive debt-taking behaviour (Atkinson & Messy, 2012). We develop the following hypothesis for empirical testing:

H1. Financial literacy is negatively associated with problematic debt-taking.

2.1.3 Financial Capability

The second factor that we are including in our study is financial capability, which is used to ascertain the behavioural aspects of management. Financial capability is a more elaborate concept than financial literacy because it involves four traits (Luukkanen &

Uusitalo, 2019). First, a financially capable person can manage money and keep track of finances. Second, they can save for future events. Third, they can make informed financial decisions. Fourth, they can engage with financial institutions. It is argued that a financially capable person also makes better financial decisions (Kagotho et al., 2018) and will avoid taking on problematic debt. We hypothesise:

H2. Financial capability is negatively associated with problematic debt-taking.

2.1.4 Financial Wellbeing

The third individual-level factor considered is financial wellbeing, where we investigate the psychological aspect of managing finances. We use financial wellbeing as a subjective measure of how an individual perceives their current and future financial situations (Sorgente & Lanz, 2017). We define it as 'the perception of being able to sustain current and anticipated desired living standards and financial freedom' (Brüggen, Hogreve, Holmlund, Kabadayi, & Löfgren, 2017, p. 229). Research has shown that improved control over finances leads to improved financial wellbeing (Vlaev & Elliott, 2014). However, the association of financial wellbeing with problematic debt management is undiscovered yet. We hypothesise:

H3. Financial wellbeing is negatively associated with problematic debt-taking.

2.1.5 Cultural Values

Cultural values are unique to each country and affect everyday life decisions (Hershey, Henkens, & Van Dalen, 2010), even if these decisions are related to household financial matters. A definition of cultural values is 'an enduring belief that a specific mode of conduct or end-state of existence is personally and socially preferable to an opposite or converse mode of conduct or end-state of existence' (Rokeach, 1973, p. 5). Cultural values are of interest because they are guiding principles of how households make decisions and these values are relatively stable over time (Gogolin, Dowling, & Cummins, 2017).

There is a growing research that cultural values influence the financial behaviour of households (Gogolin et al., 2017). Ehmke et al. (2010) analysed the cultural differences of China, Niger, France and US and their impact on experimental economic behaviour involving financial cooperation and fairness. They concluded that the cultural values of each country influence economic decision making. Dellande, Gilly, and Graham (2016) found cultural values of Anglos and Latinos influenced debt-management. Anglos were better at resolving debt problems as they negotiated better payment conditions from lenders.

In this research, we include many of the cultural dimensions established by Hofstede (1980, 1991, 2001, 2011), but we are particularly interested in two dimensions. The first is long-term time orientation because it has been identified as a deciding factor in decreasing debt maturity (Breuer, Hens, Salzmann, & Wang, 2015). Research found that residents of countries with a national culture of long-term orientation have a higher debt repayment rate in contrast to those with short-term orientation. We hypothesise:

H4. Long-term orientation is negatively associated with problematic debt-taking.

The second dimension of interest is indulgence, which relates to acting on impulses. Research has shown that impulsive buying behaviour occurs when people fail to self-regulate in order to achieve long-term financial goals (Fenton-O'Creevy, Dibb, & Furnham, 2018). Furthermore, impulsive buying has adverse financial outcomes for individuals. We predict that indulgence will be associated with an increase in problematic debt-taking as people will use debt to fund indulgent behaviour. We hypothesise:

H5: Indulgence is positively associated with problematic debt-taking.

3. Methodology

To answer the highlighted research questions and investigate our hypotheses, we employ two different datasets and use multiple quantitative methods. In this section, we briefly outline each dataset along with the rationale for using it. Then we outline how key variables are measured and lastly provide the appropriate mathematical models employed.

3.1 Data

3.1.1 *Household, Income and Labour Dynamics Australia (HILDA) Survey*

The HILDA survey is a household panel study that collects information, including financial information, on 17,694 individuals in Australia (Summerfield et al., 2017). The survey commenced in 2001 and is repeated yearly with each repetition referred to as a wave. After a detailed investigation of all the waves, we found data suited to this project in Wave 16, which was released in 2017. We filtered observations to only include people with credit cards and exclude people with missing information. The number of respondents is 8,810. The HILDA data gives an accurate depiction of the financial situation of Australian households with credit cards. The dataset is used to answer the first research question, Hypotheses 1–3 and to identify proxy variables for the second dataset.

3.1.2 *ING International Survey (IIS)*

In order to make cross-country comparisons, we utilize the ING International Survey (IIS) on Savings published in 2017, which collected self-reported financial data from a representative sample of the population from 13 European countries, USA and Australia. (ING: Think Economic and Financial Analysis, 2017). While data is collected from 15 countries, our analysis includes only countries which utilize the Euro currency (Austria, Belgium, France,

Germany, Italy, Luxemburg, the Netherlands and Spain), and compare these to Australia. After further inspection, we noted that there were fewer respondents for Luxemburg (n=608), creating a difference in the data when comparisons to other countries were made. For this reason, we omitted Luxemburg from our analysis, which is derived from the dataset. The specific survey data collected was the IIS 2017 Savings Survey, which reports all our variables of interest. We excluded all observations with missing data leaving a sample of 7,120 respondents. We use the IIS dataset to answer research questions 1 and 2 and Hypotheses 1–5.

3.2 Methodology

3.2.1 *Dependent variable - Problematic debt*

In our research, we specifically focus on debt that is problematic for a household. However, households can take on a variety of debts such as mortgages, investment loans, credit cards, student loans, and any other vehicle or personal loans including interest on all loans payable (Cassells, Duncan, Kelly, & Ong, 2015; Dana, 2017). So, the key question is what debt do households find problematic? We answer this question empirically using data from the IIS dataset.

In the IIS dataset, seven types of personal debt were included: overdrafts, personal loans from a financial institution, loans from a pawn broker, credit card debt, loans from friends/family, student loans and vendor loans. In addition, respondents were asked to rate their comfortability level on a five-point Likert scale ranging from 1) 'very uncomfortable' to 5) 'very comfortable' in response to the question 'To what degree are you comfortable or uncomfortable with the amount of household debt?'. Using an ordinary least squares regression, we identify the debts households have when they are uncomfortable with their amount of debt. The results in Table 1 identify that overdrafts, personal loans from a financial

institution, credit card debt, loans from friends/family, and loans from vendors are associated with uncomfortable attitudes towards debt. We use these five debt types to create a problematic debt variable where respondents with one or more of these debts take the value of one. All other respondents (without these debts) take the value of zero.

Regarding the HILDA data, there are fewer types of debt measured by this survey. There is, however, information regarding credit card debt and the extent to which respondents are paying off their monthly balances. As credit card debt was identified as a problematic debt in the IIS dataset, there is congruence between the two datasets on this variable. For problematic debt in the HILDA dataset, we use responses to the question, 'How often do you pay off all credit card monthly balances?'. The responses are 'Pay off entire balance hardly ever', 'Pay off entire balance not very often', 'Pay off entire balance about half the time', 'Pay off entire balance most months', 'Pay off entire balance always'. We define problematic debt as those who fail to pay off monthly. Thus, those respondents who selected the first three responses listed above take the value one. Respondents who selected either of the final two responses take the value zero. We omit respondents from the dataset if they refused to answer, declared they didn't know, or who were not asked (because they did not have a credit card).

3.2.2 Independent variables - Financial Literacy, Financial Capability and Financial Wellbeing
 Measuring financial literacy, financial capability and financial wellbeing is done more accurately in the HILDA dataset than in the IIS dataset. The questionnaire items used to measure financial literacy, financial capability, and financial wellbeing in the HILDA dataset are outlined in appendices A1, A2 and A3, respectively. For the IIS dataset, proxies needed to be used in our research; here, we outline their development.

Table 1: Level of Comfort with Types of Debt in the IIS Dataset.

	Model 1 ^a
Overdraft	-0.799*** (0.0452)
Personal loan from a financial institution	-0.186*** (0.0422)
Loan from a pawn broker	0.262* (0.111)
Credit card debt	-0.297*** (0.0436)
Loan from friends/family	-0.607*** (0.0548)
Student loan	-0.0839 (0.0802)
Loan from vendor	-0.193*** (0.0574)
Constant	3.245*** (0.0435)
N	3,246
Adjusted R ²	0.1191
F-statistics	63.66***

Note: This table reports results from a linear regression model: $Y_{it} = \beta_0 + \beta_1 x_{1it} + \beta_2 x_{2it} + \dots + \beta_n x_{nit} + \epsilon_{it}$ where Y_{it} is the dependent variable for the answer 'To what degree are you comfortable or uncomfortable with the amount of household debt?'. Answers ranged from 1- 'very uncomfortable' to 5- 'very comfortable'. x represents the list of independent variables and ϵ is the error term. Standard errors are in parentheses and * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Only respondents with debts in the IIS dataset are included. N is the number of observations.

The IIS dataset does not contain any item to measure the financial literacy of the respondents. However, both the datasets (HILDA and IIS) have demographic questions about education level, which we therefore use as a proxy for financial literacy. There is support for using this proxy in academic literature. In this regard, Lusardi and Mitchell (2014) found that the percentage of correct responses to the financial literacy questions increases with the education level of the respondents. In addition, data in the HILDA as well, as depicted in Figure 3 below, show that as the education level increases, the percentage of correct responses to the financial literacy items increases. Finally, a Spearman's rank correlation between financial literacy and education levels was conducted using the entire HILDA dataset. It produced a coefficient value of 0.3151 ($n=17,694$, $p<.01$), indicating a medium-level association between

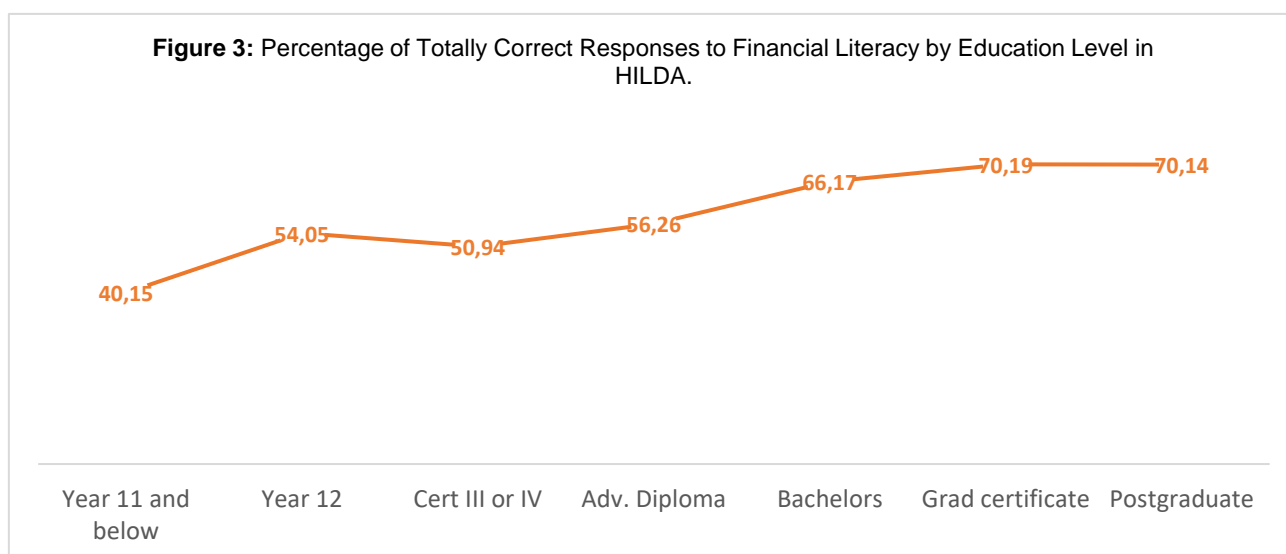
financial literacy and education levels³. These arguments support education level as a proxy for financial literacy.

In the IIS dataset, four items were identified which could be used to measure financial capability and financial wellbeing. These items are presented in Appendix A4. To ascertain that these items were measuring unique aspects, a principal component analysis was conducted. The results confirmed the alignment of two items for one factor, which we use for financial capability, and two items for another factor, which we use for financial wellbeing. The financial capability measures align with the financial capability trait of Luukkanen and Uusitalo (2019) termed the 'ability to save for the future'. The financial wellbeing measures align closely with the financial wellbeing trait of Kempson, Finney, and Poppe (2017) termed 'meeting commitments'.

3.2.3 Independent variables - Country cultural variables

In this project, we use cultural value dimensions (Hofstede, 1980; 1991; 2001; 2011) to measure the attributes of national culture. Hofstede (1980) created four cultural value dimensions using a large survey conducted on IBM subsidiaries in 70 countries with a total sample of 117,000 employees. Subsequent amendments have added two more dimensions (Hofstede, 1991; 2001; 2011); we therefore have six cultural dimensions: power distance, individualism, uncertainty avoidance, masculinity, long-term orientation, and indulgence. Hofstede Insights (2019) defines these variables as:

Power distance – The acceptance of unequal distribution of power within society, with lower scores indicating a nonacceptance of unequal power distribution.



³ In addition, we tested the relationship between education and financial literacy while controlling for age and employment status by adopting an ordinal logistic

regression model. The results are omitted for brevity, but they showed a positive relationship between education and financial literacy when control variables are also included.

Individualism – The perception of interdependence between members of society (characterised by ‘I’ or ‘we’). High scores indicate that people are independent of each other.

Uncertainty avoidance – A society’s preparedness, readiness and alertness to avert and unexpected events. A higher score for this cultural value means there are some established beliefs or institutions that guide people to avoid uncertainties (and vice versa).

Masculinity – Reflects the prevalence of competition, achievement, and success in a culture. A high score implies a culture where people are admired and rewarded for their successes, while a lower score shows that people work not for themselves but for the whole society.

Long-term orientation – Reflects whether a society maintains links to the past to deal with its present and future challenges. A lower score reflects links with tradition while a higher score represents innovation to prepare for the future.

Indulgence – Reflects the extent to which societies control their desires and impulses. A high score indicates more indulgence and a low score reflects restraint over their desires.

Each of the six dimensions has a value for each country ranging from ‘0’ to ‘100’. The country is regarded as low scoring on the cultural value dimension if the value is in the range 0–50, and high scoring in the range 51–100. Appendix B shows the cultural values for the countries of interest.

3.2.4 Control variables

In addition to the independent variables of interest, we also control for factors which could influence debt-taking. Specifically, we include age because younger people will have less access to debt than older people. However, as people build wealth over time, their need to take on debt decreases. For these reasons, we include age and age-squared as control

variables to allow for a nonlinear relationship between age and problematic debt-taking. Other control factors included in our estimations are gender, income level, and employment status, as these variables can also influence debt-taking behaviour. Finally, the concept of financial wellbeing can be related to overall wellbeing and we include a measure of overall wellbeing in our model. (Appendix A5 outlines the question used to measure overall wellbeing.)

3.3 Methodological framework

The analyses will be undertaken in different steps. First, ordinary least square (OLS) regression will be applied using the HILDA survey to identify the relationships between financial literacy, financial capability, and financial wellbeing. The OLS equations for this purpose are:

$$FW_i = \beta_0 + \beta_1 FC_i + \beta_2 FL_i + \beta_3 D_i + \varepsilon_i$$

$$FC_i = \beta_0 + \beta_1 FL_i + \beta_2 D_i + \varepsilon_i$$

Where FW_i is the financial wellbeing of individual i , FC_i is financial capability, FL_i is financial literacy, D_i are the control demographic factors (age, gender, employment status, education level, and overall wellbeing), and ε_i is the error term that sums those factors that we are unable to incorporate into the model.

The second analysis involves the main dependent variable (problematic debt), which has a binary response of one or zero. For this reason, we apply a logistic regression model to analyse the available data. A logistic regression provides output in the form of negative or positive coefficient values. The signs of these coefficients give us an indication of positive or negative association between the independent and dependent variables; however, the magnitudes of the coefficient values are difficult to interpret. Therefore, to interpret the magnitude, we calculate odds ratios, which can be defined as:

$$\sigma(x) = \frac{e^x}{e^x + 1} = \frac{1}{1 + e^{-x}}$$

Where x is the linear combination of all the explanatory variables of the study and e represents their exponential value. In our study, the explanatory variables include financial literacy, financial capability, financial wellbeing, cultural factors, and control variables. The probability p of the dependent variable equalling or approaching to a specific 'case' can be interpreted using the following equation:

$$p(x) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x)}}$$

This equation can also be transformed into the following equation after taking exponential values of both sides:

$$\left(\frac{p(x)}{1 - p(x)} \right) = e^{\beta_0 + \beta_1 x}$$

Here, the left-hand side variable is equal to the odds ratio and the right-hand side is the exponential of the regression coefficients. It can also be shown like this:

$$\mathbf{Odds} = e^{\beta_0 + \beta_1 x}$$

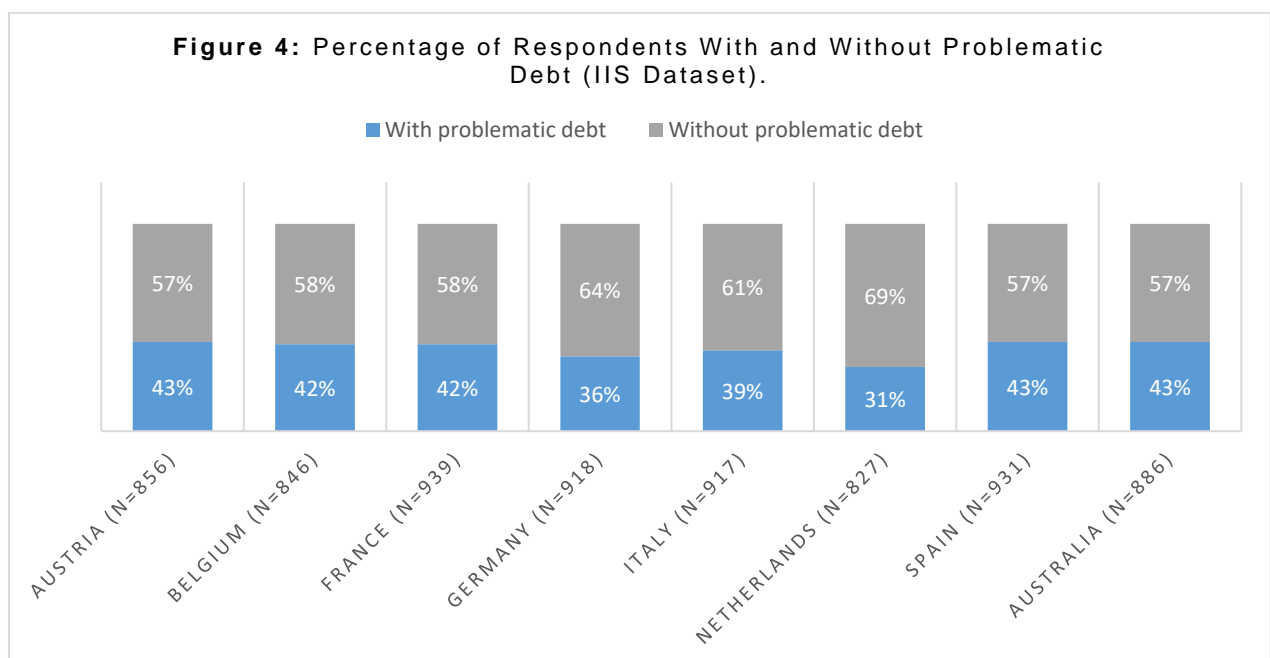
4. Results

In this section, we outline the results of the research. We cover the results in three progressive subsections. The first provides a description of the data to explore the relationship between the variables of interest. The second subsection investigates the relationship between problematic debt and financial literacy, financial wellbeing, and financial capability, using both data sets. The final subsection incorporates the use of country differences in problematic debt-taking and cultural dimensions.

4.1 Descriptive analysis: problematic debt and independent variables

The descriptive statistics from the IIS dataset (Table 2) and the HILDA Survey (Table 3) are investigated to identify any unusual observations and to compare the similarity in magnitudes between the datasets. It should be noted that the datasets are different in scope and coverage. Generally, the HILDA survey has more complex measures of financial literacy, financial capability, and financial wellbeing. The IIS

dataset has greater coverage of countries and more measurements of debt types taken by respondents. To begin, it is worth examining the extent to which problematic debt has been identified in our datasets. Table 2 outlines the IIS dataset and shows that 46% of respondents have taken debt and 40% of respondents have taken debt that we consider as problematic (refer to Section 2.3.1 for how problematic debt was identified). A comparison of problematic debt across countries is outlined in Figure 4, showing that Australia, Spain, and Austria have the highest percentage (43%), and the Netherlands has the lowest percentage (31%). In contrast, the descriptive statistics from the HILDA dataset, which are outlined in Table 2, show that problematic debt has been taken out by 25% of respondents. This occurs because the HILDA dataset focuses only on credit card debt, where the individual has not repaid their monthly debt in full. This difference in measurement can explain the reduced respondent numbers with problematic debt observed in the HILDA survey.



The descriptive statistics are also reviewed for consistency in the main independent variables. From Table 2, we observe that the mean for financial wellbeing is higher than financial capability, yet overall wellbeing is higher than both. This suggests that overall wellbeing is more prominent than financial wellbeing. A comparison of means and standard deviations for financial wellbeing and financial capability between Tables 2 and 3 shows that similar levels are being observed, despite the difference in scaling of the data in the two datasets. We can conclude that congruent amounts of financial wellbeing and financial capability occur.

Table 2: Descriptive Statistics of IIS Dataset.

Variable	Mean	Std dev.	Min.	Max.
Takes debt ^a	46.39			
Takes problematic debt ^a	40.00			
Overall wellbeing	3.63	.906	1	5
Financial wellbeing	3.32	1.036	1	5
Financial capability	3.03	.808	1	5
Income ^b	7.129	2.737	1	14
Age	46.25	15.223	18	90
Age squared	2370.8	1408.851	324	8100
Female ^a	50.03			
Employed (above 35+ hours/week) ^a	41.1			
Employed (below 35 hours/week) ^a	12.9			
Own business ^a	5.8			
Non-working student ^a	5.2			
Unemployed ^a	7.5			
Personal reasons for not working ^a	9.4			
Retired ^a	18.1			
Postgraduate ^a	12.7			
Pre-sixteen ^a	12.1			
Bachelors ^a	18.4			
Vocation education ^a	19.9			
A-level ^a	36.6			
No completed education ^a	0.3			

Note: These summary statistics are from IIS dataset for the eight countries (n=7,120).

^a Indicates binary variables which are represented as percentages.

^b Income is a categorical variable.

Financial literacy is directly measured in the HILDA Survey and has a mean of 4.309, a standard deviation of 0.988 and a range from 0 to 5. This illustrates that most respondents score highly on financial literacy, with either 4 or 5 questions answered correctly.

Additionally, the statistics in Tables 2 and 3 illustrate factors which are controlled in this study. The data shows a range of employment status (with 41% of respondents being employed), a spread of educational levels (37% having only A-levels) and 50% gender balance. This range of data is important because it allows us to accurately control for educational and employment factors which might influence our results.

Table 3: Descriptive Statistics of HILDA.

Variable	Mean	Std dev	Min.	Max.
Problematic debt-taking ^a	25.02			
Financial wellbeing ^b	5.472	1.219	.5	8
Financial literacy ^b	4.309	0.988	0	5
Financial capability ^b	5.310	1.139	1	7
Female ^a	47.80			
Age	50.43	16.09	15	98
Age squared	2802.3	1683.02	225	9604
Employed (above 35+ hours/week) ^a	49.42			
Employed (below 35 hours/week) ^a	18.81			
Non-working student ^a	0.64			
Home duties ^a	5.22			
Hunting for job ^a	1.94			
Retired ^a	21.78			
Other employment ^a	1.03			
Year 11 or below ^a	17.86			
Year 12 ^a	11.21			
Cert. III or IV ^a	22.44			
Advanced diploma ^a	12.33			
Bachelors ^a	18.96			
Graduate diploma ^a	8.80			
Postgraduate ^a	8.40			

Note: These summary statistics are for the HILDA dataset (N= 8,810). These numbers are different from an overall depiction of the whole dataset because only those respondents were included in this study who responded to all of our interested items.

^a Indicates binary variables which are represented as percentages.

^b Overall refers to the combined measures.

We also include a measure of age and age squared because we anticipated that the relationship between age and debt-taking is not linear. In other words, as age increases, debt-taking also increases, but this relationship stops when people reach certain ages. When doing the data analysis, we found that including these control variables was important because the influence of financial literacy, financial capability and financial wellbeing reduced when these factors were considered.

Next, we conduct further correlation analysis to examine any significant statistical interrelations between key explanatory and dependent variables. A pairwise correlation test is presented in Table 4. As expected, the results show that financial literacy, financial capability and financial wellbeing are positively and significantly correlated to each other. This means that high financial literacy is associated with high financial capability and financial wellbeing. Furthermore, the negative coefficients in the row of problematic debt suggests that financial literacy, financial capability and financial wellbeing are negatively associated with the problematic debt.

Further investigation of the interrelations in independent variables is outlined in Table 5. This test includes control variables (age, gender, education level and employment status, which have been omitted from Table 5 for brevity). The results in Model 1 of Table 5 show that financial literacy does not have a statistically significant relationship with financial wellbeing when control variables are considered. However, financial capability is related to both financial wellbeing (Model 1) and financial literacy (Model 2). Overall, this implies that the relationship between financial literacy and financial wellbeing is not strong and does not persist when other factors are considered. In other words, financial literacy may not be a critical skill in enhancing the general financial wellbeing of households.

Table 4: Correlation of Financial Literacy, Financial Capability, Financial Wellbeing and Problematic Debt Using HILDA.

	1	2	3
1. Financial literacy	1		
2. Financial capability	0.077 ***	1	
3. Financial wellbeing	0.066 ***	0.376 ***	1
4. Problematic debt	-0.062 ***	-0.293 ***	-0.386 ***

Note: *** p<0.001, N=8810

Table 5: Regression of Financial Literacy, Financial Capability, Financial Wellbeing and Control Variables Using HILDA.

	Model 1 ^a	Model 2 ^b
Financial capability	0.379*** (0.0106)	-
Financial literacy	0.0138 (0.0125)	0.089*** (0.0125)
Constant	3.508*** (0.128)	4.715*** (0.118)
N	8810	8810
Adjusted R ²	0.1941	0.0701
F statistics	125.77***	42.48***

Note: *** p<0.01, ** p<0.05, * p<0.1. Parentheses contain standard error. In both models the control variables are age, gender, education level, and employment status, and are omitted for brevity.

^aFinancial wellbeing is the dependent variable.

^bFinancial capability is the dependent variable.

4.2 Financial literacy, financial wellbeing and financial capability with problematic debt

To analyse the effect of financial literacy, financial capability and financial wellbeing on problematic debt, we use a logistic regression model to estimate the influence of factors on problematic debt-taking. The results for the HILDA survey and IIS dataset are reported in Tables 6 and Table 7, respectively. The results omit the control variables for brevity. Overall, the results indicate that financial literacy, financial wellbeing and financial capability reduce problematic debt-taking. In Table 6, each of these independent variables has a statistically significant relationship with problematic debt and the odds ratios are below 1, showing that they decrease problematic debt-taking. This supports Hypotheses 1, 2, and 3.

However, it is important to understand the magnitude of effect as well as the statistical significance. This can be interpreted by comparing the odds ratios reported in Table 6. Here, we see that both financial capability and financial wellbeing have odds ratios well below the value of 1, but financial literacy has an odds ratio closer to 1. This means that a 1-unit change in financial well-being or financial capability is associated with a greater reduction in problematic debt-taking than a 1-unit increase in financial literacy. In addition, this result needs to be considered along with the descriptive statistics on financial literacy, which show many people scored 5 out of 5 on this scale. Thus, they cannot improve their financial literacy score. It suggests that improving financial literacy will have a limited impact in reducing problematic debt.

Table 7 outlines the results for the IIS dataset, where Model 1 compares the results for the Eurozone countries and Australia separately. This survey did not measure financial literacy, so a proxy of education level is used to assess this score. Overall, the results indicate that higher financial literacy is associated with less problematic debt. The results

Table 6: Logistic Regression Analysis of Financial Literacy, Financial Capability, Financial Wellbeing and Problematic Debt Using HILDA.

	Model 1
Financial capability	0.723*** (0.0259)
Financial wellbeing	0.516*** (0.0261)
Financial literacy	0.934** (0.0291)
Constant	71.111*** (0.346)
N	8810
Pseudo R ²	0.197
LR Chi ²	1957.543***

Note: *** p<0.01, ** p<0.05, * p<0.1. Parentheses contain standard error. The dependent variable - problematic debt - is a binary response variable, where 0 = respondents not in problematic debt; 1 = respondents who are in problematic debt. In this model, control variables age, education, gender and employment status are included but not reported here.

show that those with a lower education level are more likely to have problematic debt in the Eurozone countries. Also, those with a postgraduate qualification are less likely to have problematic debt in Australia. This supports Hypothesis 1 (financial literacy is negatively associated with problematic debt-taking) for the Eurozone countries. There is also support for Hypotheses 2 and 3 (financial capability and financial wellbeing are negatively associated with problematic debt-taking) in Eurozone countries because these variables have odds ratios below 1, and are statistically significant. However, financial capability is not significant in the Australian data. This insignificant result in the IIS data may occur because the sample size is smaller (n=886), or a different measure of financial capability is adopted.

In sum, the analysis of the HILDA survey illustrates that financial literacy, financial capability, and financial wellbeing are associated with less problematic debt, but the latter two variables have more influence.

Table 7: Logistic Regression of Education Level, Financial Capability and Financial Wellbeing Using IIS Dataset.

	Model 1 Eurozone	Model 2 Australia
Education level	-	-
A-level	1.240** (0.122)	1.153 (0.246)
Vocation education	1.118 (0.122)	0.944 (0.220)
Bachelors	1.073 (0.121)	0.827 (0.189)
Postgraduate	0.949 (0.118)	0.539** (0.149)
No completed education	1.602 (0.807)	1.378 (1.431)
Financial capability	0.877*** (0.031)	1.030 (0.096)
Financial wellbeing	0.436*** (0.014)	0.553*** (0.046)
Constant	2.182** (0.807)	5.430** (4.515)
N	6234	886
Pseudo R ²	0.109	0.089
LR Chi ²	914.681***	107.417**

Note: *** p<0.01, ** p<0.05, * p<0.1. Parentheses contain standard error. The dependent variable - problematic debt - is a binary response variable, where 0 = respondents not in problematic debt; 1 = respondents who are in problematic debt. In both models, controlled variables are age, gender, income, employment status and overall wellbeing.

The IIS dataset illustrates that this relationship holds in Eurozone countries, most of which have a smaller percentage of households with problematic debt than Australia.

4.3 Problematic debt and cultural factors

We finally extend our analysis to examine the role of country-level cultural dimensions in influencing debt-taking behaviour. Here, we use only IIS dataset data because it contains across-country analysis, and allows us to expand our dataset by incorporating Hofstede's six cultural dimensions (refer to Appendix B for values). For cross-country comparison, it is important to take into account how each unique country household characteristic influences key financial decision-making processes. Thus, to be consistent with our previous findings, we include financial capability, financial wellbeing, overall wellbeing, and control demographic factors in our analysis.

The results reported in Table 8 contain three models: Model 1 includes the cultural dimensions and control variables; Model 2 includes country based dummy variables and control variables, and Model 3 utilizes the cultural dimensions, education levels, financial capability, and financial wellbeing. The purpose of Model 2 is to test if the results for financial literacy, financial capability, and financial wellbeing hold when country-based differences are considered. Overall, the results hold for financial literacy, but only if the degree of confidence is reduced to $p < 0.1$. The results for financial wellbeing and financial capability remain robust. Model 2 also shows country-based differences in problematic debt where the Eurozone countries are compared to Australia. The results show respondents in France, Germany, Italy, and The Netherlands report less use of problematic debt levels than Australia when control variables are considered.

The results in Model 1 show that three cultural dimensions are statistically significant and related to problematic debt-taking. The variable *long-term orientation* shows a negative relationship with

problematic debt-taking, so that countries with a long-term orientation take on less problematic debt. However, this result is not robust and disappears in Model 3 when more variables are added. Thus, we cannot support Hypothesis 4 to conclude that a long-term cultural dimension will reduce problematic debt-taking.

The second significant variable, *indulgence*, is robust across both models 1 and 3. This supports Hypothesis 5, that is, high indulgence is associated with an increase in the tendency to take on problematic debt. This result is compatible with expectations in the literature, because countries which are more likely to score highly on this dimension will have higher impulsivity. These impulses often require funding and we would expect households to use problematic debt to fund this behaviour.

A third variable, and where we observe a significant influence, is *masculinity*, where higher scores in this dimension are associated with more problematic debt. This result is unusual and harder to interpret. High scores on this dimension represent success and competition, but low scores reflect caring for others, and quality of life. It is possible that a highly masculine culture values conspicuous consumption of status, funded through debt. An alternative idea is that highly masculine countries do not foster financial support programs.

Finally, we see that *individualism* is statistically significant in Model 3 only. However, as this is not statistically significant in Model 1, we refrain from drawing conclusions regarding this dimension.

Table 8: Logistic Regression of Cultural Dimensions, Countries and Control Variables on Problematic Debt Using the IIS Dataset.

	Model 1	Model 2	Model 3
Education level			-
A-level		1.163*	1.159
		(0.104)	(0.104)
Vocation education		1.008	1.006
		(0.100)	(0.100)
Bachelors		0.991	0.992
		(0.103)	(0.103)
Postgraduate		0.807*	0.802*
		(0.092)	(0.091)
No completed education		1.561	1.568
		(0.700)	(0.704)
Financial capability		0.890***	0.894***
		(0.029)	(0.029)
Financial wellbeing		0.450***	0.451***
		(0.014)	(0.014)
Power distance	1.010		1.014
	(0.008)		(0.009)
Individualism	0.992		0.985**
	(0.007)		(0.007)
Masculinity	1.010**		1.013***
	(0.004)		(0.004)
Uncertainty avoidance	0.999		0.990
	(0.009)		(0.009)
Long-term orientation	0.996*		0.999
	(0.002)		(0.002)
Indulgence	1.012***		1.016***
	(0.004)		(0.005)
Austria		1.026	
		(0.110)	
Belgium		0.847	
		(0.090)	
France		0.691***	
		(0.072)	
Germany		0.733***	
		(0.078)	
Italy		0.643***	
		(0.069)	
Netherlands		0.587***	
		(0.065)	
Spain		0.858	
		(0.090)	
Australia ^b		-	
Constant	0.188***	3.832***	2.341
	(0.094)	(1.311)	(1.286)
N	7120	7120	7120
Pseudo R ²	0.019	0.108	0.108
LR Chi ²	185.846***	1033.288***	1031.276***

Note: *** p<0.01, ** p<0.05, * p<0.1, and parentheses contain standard error. These analyses incorporate respondents from eight countries in the IIS dataset: Austria, Belgium, France, Germany, Italy, The Netherlands, Spain and Australia. In Model 2, the results for Australia are omitted because Australia is the reference group. In all models, the control variables age, gender, income, employment status, and overall wellbeing are included but not reported for brevity.

5. Discussion

This project investigated the role of problematic debt-taking in a household. Debt-taking by households can have positive and negative outcomes. On the one hand, households use debt to purchase assets, such as property, that they cannot afford without debt and build wealth in doing so. On the other hand, taking debt can have negative influences for a household, as the repayments can cause psychological stress. Prior research indicates that non-collateralized debt types - such as credit card debt, payday loans, and student loans - are more stressful than collateralized debt types, such as mortgages (Dunn & Mirzaie, 2016).

The first contribution of our research was to assess the types of debt that households find stressful and label these as problematic debts. Specifically, we find overdrafts, personal loans from financial institutions, credit card debts, loans from friends/family, and vendor loans are associated with greater discomfort in debt repayment by households. Of these five types of loans, three are provided by financial institutions, and one is provided by retailers. Additionally, we found that 40% of households have these types of debts across Australia and the Eurozone countries. One large implication is that policymakers need to focus attention on the role that financial institutions have in the process of lending non-collateralized debt to the general public. Often, legislation and regulation focus on collateralized debt, such as mortgages. Our research suggests attention needs to be placed on overdrafts, credit cards, personal loans, and vendor loans. An examination of the lending practices at large financial institutions, combined with the development of new strategies, would help reduce the existence of problematic debt.

Other research that investigates debt-taking behaviour focuses on macro factors, which include a liberal attitude of financial institutions: unequal wealth Distribution, increasing house prices, and decreasing national income (Barba & Pivetti, 2009; Kim et al., 2014; Meniago et al., 2013). Our research chose to focus on factors under the control of individuals. Hence, we identified individual-level reasons that could cause and explain why a household has problematic debt; specifically, these are financial literacy, financial capability, and financial wellbeing.

A major contribution of our research is identifying the dynamic relationships between these concepts. Initial analysis showed a positive relationship between all three concepts but - when factors such as age, education and employment status were considered - financial literacy was no longer linked to financial wellbeing. This interesting result suggests that financial literacy could have an indirect relationship with financial wellbeing rather than a direct one. The implications of this is that by improving knowledge of financial concepts and objects, a person may not improve their financial wellbeing. Thus, the efforts to improve financial literacy skills may prove redundant.

The next analysis looked at the relationships between financial literacy, financial capability, and financial wellbeing with problematic debt-taking in Australia. Specially, we find that all three factors are related to a decreased amount of problematic debt. However, of the three, financial capability and financial wellbeing have a stronger influence on problematic debt. This has important implications for policies on financial education, because financial capability and financial wellbeing incorporate psychological aspects which are absent in financial literacy. Financial education initiatives often focus on

improving knowledge. Whilst this has some benefit, our research suggests more emphasis also needs to be placed on improving the behavioural aspects of finance. For example, financial education could: improve day-to-day financial dealings, enhance the ability to balance spending with income, or address negative psychological connotations associated with personal finance. This would be of benefit in reducing problematic debt.

Next, we compared the frequency of problematic debt-taking in Australia and the Eurozone countries. Australia, Spain, and Austria had the highest occurrence of problematic debt-taking with the Netherlands having the lowest occurrence. To extend the reasons why certain countries might have more problematic debt-taking in their populations, we incorporated Hofstede's cultural value dimensions to investigate how these influence financial decision-making processes.

Our results show that indulgence is positively associated with problematic debt-taking, meaning that countries with high scores on indulgence are more likely to have problematic debt. The indulgence cultural dimension has implications since it illustrates a possible connection between problematic debt being used to fund impulsiveness, and a tendency to give in to desires. Prior research highlighted that impulsive buying leads to worse financial outcomes for households (Fenton-O'Creedy et al., 2018). Our research extends this to suggest that impulsivity is related to problematic debt. A key suggestion is that impulsivity could be incorporated into lending requirements for financial institutions when issuing loans that could lead to problematic debt.

Two unexpected results occurred in our analysis. First, we predicted that high scores in the long-term orientation cultural dimension would be associated with decreased debt-taking. However, our results found that this was not robust. This may occur due to our limited number of countries under analysis.

Future research may be required to investigate this aspect more carefully together with in-depth data from more countries to vigorously test this dimension. Second, we found that increased masculinity was associated with a greater level of problematic debt. This finding is difficult to theorise. A high score for masculinity reflects a society which prioritises competition, achievement, and success. These traits may also lead to use of problematic debt in a society because households use this debt to fund a status symbol based lifestyle. An alternative explanation is that highly masculine societies lack the infrastructure to give financial help, leading to problematic debt-taking.

5.1 Limitations

This research has a few limitations that we were unable to avoid. First, binary logistic regression does not provide a causal relationship between the variables; it only gives a bidirectional relationship. Therefore, our results show that people with improved financial wellbeing status do not take on problematic debts, and that those who do not take on problematic debts have improved financial wellbeing. Hence, we cannot strictly provide one-directional causal association. Other limitations include measurement validity, where we used education level as a proxy for financial literacy, two items for financial capability, and two items for financial wellbeing in the IIS dataset. Finally, we used Hofstede's cultural value dimensions at the country level to explain the cultural effects of households. However, this may be a poor measure or indicator of the actual culture of the participants in the research.

6. References

- Agarwalla, S. K., Barua, S. K., Jacob, J., & Varma, J. R. (2015). Financial Literacy among Working Young in Urban India. *World Development*, 67, 101-109.
- Atkinson, A., & Messy, F. A. (2012). *Measuring Financial Literacy: Results of the OECD/International Network on Financial Education (INFE) Pilot Study*. Paris: OECD Publishing.
- Australian Bureau of Statistics. (2017, October 30). Household Income and Wealth, Australia, 2015-16. Retrieved from [http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/6523.0~2015-16~Feature%20Article~Household%20Debt%20and%20Over-indebtedness%20\(Feature%20Article\)~101](http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/6523.0~2015-16~Feature%20Article~Household%20Debt%20and%20Over-indebtedness%20(Feature%20Article)~101)
- Barba, A., & Pivetti, M. (2009). Rising Household Debt: Its Causes and Macroeconomic Implications—A Long-Period Analysis. *Cambridge Journal of Economics*, 33(1), 113-137. doi:10.1093/cje/ben030
- Breuer, W., Hens, T., Salzmann, A. J., & Wang, M. (2015). On the Determinants of Household Debt Maturity Choice. *Applied Economics*, 47(5), 449-465. doi:10.1080/00036846.2014.972547
- Brown, S., Taylor, K., & Wheatley Price, S. (2005). Debt and Distress: Evaluating the Psychological Cost of Credit. *Journal of Economic Psychology*, 26(5), 642-663. doi:10.1016/j.joep.2005.01.002
- Brüggen, E. C., Hogreve, J., Holmlund, M., Kabadayi, S., & Löfgren, M. (2017). Financial Well-Being: A Conceptualization and Research Agenda. *Journal of Business Research*, 79, 228-237. doi:10.1016/j.jbusres.2017.03.013
- Cassells, R., Duncan, A., Kelly, S., & Ong, R. (2015). Beyond Our Means? Household Savings and Debt in Australia. In (pp. 80). Australia: Bankwest Curtin Economics Centre, CBS, Curtin University.
- Dana, H. (2017). *An Analysis of Household Debt and Its Effects Following the Great Recession of 2008*. (Doctor of Philosophy), Northcentral University, San Diego, California.
- Davutyan, N., & Öztürkbal, B. (2016). Determinants of Saving-Borrowing Decisions and Financial Inclusion in a High Middle Income Country: The Turkish Case. *Emerging Markets Finance and Trade*, 52(11), 2512-2529. doi:10.1080/1540496X.2016.1187596
- Dellande, S., Gilly, M. C., & Graham, J. L. (2016). Managing Consumer Debt: Culture, Compliance, and Completion. *Journal of Business Research*, 69(7), 2594-2602. doi:10.1016/j.jbusres.2015.10.140
- Dunn, L. F., & Mirzaie, I. A. (2016). Consumer Debt Stress, Changes in Household Debt, and The Great Recession. *Economic Inquiry*, 54(1), 201-214. doi:10.1111/ecin.12218
- Ehmke, M., Lusk, J., & Tyner, W. (2010). Multidimensional Tests for Economic Behavior Differences across Cultures. *The Journal of Socio-Economics*, 39(1), 37-45. doi:10.1016/j.socec.2009.06.006
- Fenton-O'Creevy, M., Dibb, S., & Furnham, A. (2018). Antecedents and Consequences of Chronic Impulsive Buying: Can Impulsive Buying be Understood as Dysfunctional Self-Regulation? *Psychology & Marketing*, 35(3), 175-188. doi:10.1002/mar.21078
- Gogolin, F., Dowling, M., & Cummins, M. (2017). Individual Values and Household Finances. *Applied Economics*, 49(35), 3560-3578. doi:10.1080/00036846.2016.1262528
- Grinstein-Weiss, M., Spader, J. S., Yeo, Y. H., Key, C. C., & Freeze, E. B. (2012). Loan Performance among Low-Income Households: Does Prior Parental Teaching of Money Management Matter? *Social Work Research*, 36(4), 257-270. doi:10.1093/swr/svs016
- Hershey, D. A., Henkens, K., & Van Dalen, H. P. (2010). Aging and Financial Planning for Retirement: Interdisciplinary Influences Viewed through a Cross-Cultural Lens. *International Journal of Aging and Human Development*, 70(1), 1-38. doi:10.2190/AG.70.1.a
- Hofstede, G. (1980). *Culture's Consequences: International Differences in World-related Values*. Beverly Hills, CA.: Sage Publications,.
- Hofstede, G. (1991). *Cultures and Organizations: Software of the Mind*. London, UK.: McGraw-Hill Publishers,.
- Hofstede, G. (2001). *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations across Nations* (Second ed.). Beverly Hills, CA.: Sage Publications,.
- Hofstede, G. (2011). Dimensionalizing Cultures: The Hofstede Model in Context. *Online Readings in Psychology and Culture*, 2(1), 3-26. doi:10.9707/2307-0919.1014

- Hofstede Insights. (2019). Hofstede Insights: Country Comparison. Retrieved from <https://www.hofstede-insights.com/country-comparison/>
- Huston, S. J. (2010). Measuring Financial Literacy. *Journal of Consumer Affairs, 44*(2), 296-316.
- ING: Think Economic and Financial Analysis. (2017). ING International Survey Savings January 2017. Retrieved from <https://think.ing.com/reports/will-you-take-a-hit-to-your-savings/>
- Jacoby, M. B. (2002). Does Indebtedness Influence Health? A Preliminary Inquiry. *The Journal of Law, Medicine & Ethics, 30*(4), 560-571. doi:10.1111/j.1748-720X.2002.tb00426.x
- Jarl, J., Cantor-Graae, E., Chak, T., Sunbaunat, K., & Larsson, C. A. (2015). Trauma and Poor Mental Health in Relation to Economic Status: The Case of Cambodia 35 Years Later. *PLOS ONE, 10*(8), e0136410. doi:10.1371/journal.pone.0136410
- Kagotho, N., Ssewamala, F. M., Patak-Pietrafesa, M., & Byansi, W. (2018). Testing the Financial Capability Framework: Findings from YouthSave-Impact Study Kenya. *Social Work, 63*(1), 67-74. doi:10.1093/sw/swx056
- Kempson, E., Finney, A., & Poppe, C. (2017). *Financial Well-Being A Conceptual Model and Preliminary Analysis*. Oslo and Akershus University College of Applied Sciences. Norway.
- Kim, H. J., Lee, D., Son, J. C., & Son, M. K. (2014). Household Indebtedness in Korea: Its Causes and Sustainability. *Japan and the World Economy, 29*, 59-76. doi:10.1016/j.japwor.2013.12.001
- Kim, Y. K. (2013). Household Debt, Financialization, and Macroeconomic Performance in the United States, 1951-2009. *Journal of Post Keynesian Economics, 35*(4), 675-694. doi:10.2753/PKE0160-3477350408
- Lombardi, M. J., Mohanty, M. S., & Shim, I. (2017). *The Real Effects of Household Debt in the Short and Long Run*. BIS Working Paper. Bank for International Settlements. Bank for International Settlements. Switzerland.
- Lusardi, A., & Mitchell, O. S. (2014). The Economic Importance of Financial Literacy: Theory and Evidence. *Journal of Economic Literature, 52*(1), 5-44. doi:10.1257/jel.52.1.5
- Luukkanen, L., & Uusitalo, O. (2019). Toward Financial Capability—Empowering the Young. *Journal of Consumer Affairs, 53*(2), 263-295. doi:10.1111/joca.12186
- McLaughlin, K. A., Nandi, A., Keyes, K. M., Uddin, M., Aiello, A. E., Galea, S., & Koenen, K. C. (2011). Home Foreclosure and Risk of Psychiatric Morbidity during the Recent Financial Crisis. *Psychological Medicine, 42*(7), 1441-1448. doi:10.1017/S0033291711002613
- Meltzer, H., Bebbington, P., Brugha, T., Jenkins, R., McManus, S., & Dennis, M. S. (2010). Personal Debt and Suicidal Ideation. *Psychological Medicine, 41*(4), 771-778. doi:10.1017/S0033291710001261
- Meniago, C., Mukuddem-Petersen, J., Petersen, M. A., & Mongale, I. P. (2013). What Causes Household Debt to Increase in South Africa? *Economic Modelling, 33*, 482-492. doi:10.1016/j.econmod.2013.04.028
- Remund, D. L. (2010). Financial Literacy Explicated: The Case for a Clearer Definition in an Increasingly Complex Economy. *Journal of Consumer Affairs, 44*(2), 276-295.
- Richardson, S. (2013). A Reflection on the Household, Income and Labour Dynamics in Australia Survey. *Australian Economic Review, 46*(2), 216-222. doi:10.1111/j.1467-8462.2013.12017.x
- Rokeach, M. (1973). *The Nature of Human Values*. New York, NY, US: Free Press.
- Sorgente, A., & Lanz, M. (2017). Emerging Adults' Financial Well-being: A Scoping Review. *Adolescent Research Review, 2*, 255-292. doi:10.1007/s40894-016-0052-x
- Summerfield, M., Bevitt, A., Freidin, S., Hahn, M., La, N., Macalalad, N., . . . Wooden, M. (2017). *HILDA User Manual - Release 16*. Melbourne: Melbourne Institute of Applied Economic and Social Research, University of Melbourne
- Trading Economics. (2018). Euro Area Household Debt to Income. Retrieved from <https://tradingeconomics.com/euro-area/households-debt-to-income>
- Turunen, E., & Hiilamo, H. (2014). Health Effects of Indebtedness: A Systematic Review. *BMC Public Health, 14*(1), 489. doi:10.1186/1471-2458-14-489
- Vlaev, I., & Elliott, A. (2014). Financial Well-Being Components. *Social Indicators Research, 118*(3), 1103-1123. doi:10.1007/s11205-013-0462-0
- Zinman, J. (2015). Household Debt: Facts, Puzzles, Theories, and Policies. *Annual Review of Economics, 7*(1), 251-276. doi:10.1146/annurev-economics-080614-115640

7. Appendix

Appendix A1: Items of Financial Literacy in Wave 16 of HILDA.

Financial literacy concept	Items	Possible responses (correct answer in bold)
Simple interest	'Suppose you put \$100 into a no-fee savings account with a guaranteed interest rate of 2% per year. How much would be in the account at the end of the first year?'	Don't know / refused / \$102 / other value
Inflation	'If the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, would you be able to buy more/the same/less than today?'	Don't know / refused / more / same / less than today
Risk and return	'An investment with a high return is likely to be high risk.'	Don't know / refused / true / false
Portfolio choice	'Buying shares in a single company usually provides a safer return than buying shares in a number of different companies.'	Don't know / refused / true / false
Time value of money	'If by the year 2020 your income has doubled, but the prices of all of purchases have also doubled. In 2020, will you be able to buy more/the same/less than today?'	Don't know / refused / more / same / less than today

Note: Some of these items are based on Lusardi and Mitchell (2014). Each financial literacy question has a correct and incorrect answer(s). A financial literacy measure is developed by taking the sum of correct answers provided by each individual.

Appendix A2: Items of Financial Capability in Wave 16 of HILDA.

Category of financial capability by Luukkanen and Uusitalo (2019)	Relevant items in HILDA
Managing money and keeping track of finances	1. I am very organized when it comes to managing my money daily. 2. I keep a close personal watch on my financial affairs.
Ability to save for future events	1. I always make sure I have money saved up for emergency/unexpected expense. 2. I do a good job of balancing my spending and saving.
Ability to make informed financial decisions according to given financial situation	1. I am good at dealing with day-to-day financial matters. 2. I feel confident about the financial decision I make.
Ability to find information about terms and conditions of different financial contract offered by financial institutions	1. I make certain I understand the commitments I agree to in financial contracts. 2. I feel comfortable dealing with banks and other financial institutions.

Note: Each question was measured using a likert scale ranging from 1– strongly disagree to 7– strongly agree. a financial capability measure was developed taking the mean scores on these items.

Appendix A3: Items of Financial Wellbeing and Wellbeing in Wave 16 of HILDA.

Question	Response
Financial wellbeing	
In the current scenario, what's your financial situation?	Range from 1 for very poor to 6 for prosperous
I am going to read out a list of different aspects of life and, using the scale on show card 13, I want you to pick a number between 0 and 10 that indicates your level of satisfaction with each. The more satisfied you are, the higher the number you should pick. The less satisfied you are, the lower the number. c) Your financial situation?	Range from 0 for totally dissatisfied to 10 for totally satisfied.
<i>Note: A financial wellbeing measure was created by taking the mean of scores for each participant on these items.</i>	

Appendix A4: Factor Loadings of Principal Component Analysis (Varimax) for the IIS Dataset.

Items	Component I (financial capability)	Component II (financial wellbeing)
I/We always have enough money available to cover our living costs.		.7018
I/We sometimes run out of money. †		.7086
Money is there to be spent. †	.6988	
It is more satisfying to spend money than to save it for the long term. †	.7029	
<i>Note: Items are measured on a Likert scale ranging from 1 – Strongly Disagree to 5 – Strongly Agree.</i>		
† denotes reversed scale items. Both components have eigenvalues of more than one. The first component accounted for 38% of variance, while the second component explained 38% of variance. The analysis retained only those items that have factor loadings values of more than .4. The variable financial capability was formed by calculating the mean from a respondent's score on the second two items and financial wellbeing on the first two items.		

Appendix A5: Measurement of Overall Wellbeing in the IIS Dataset.

Overall wellbeing	
Do you feel happy, in general?"	Ranges from No = 1, Rarely = 2, Sometimes = 3, Most of the time = 4 and Yes =5
<i>Note: An overall wellbeing measure was created by taking the mean of scores for each participant on these items. overall wellbeing is used as a control variable only.</i>	

Appendix B: Hofstede's Cultural Dimension Values.

Country/Hofstede Cultural Dimension	Power Distance	Individualism	Masculinity	Uncertainty Avoidance	Long-term Orientation	Indulgence
Austria	11	55	79	70	60	63
Belgium	65	75	54	94	82	57
France	68	71	43	86	63	48
Germany	35	67	66	65	83	40
Italy	50	76	70	75	61	30
Netherlands	38	80	14	53	67	68
Spain	57	51	42	86	48	44
Australia	36	90	61	51	21	71

The authors



Daniel W. Richards
Lecturer at RMIT University
E-mail:
daniel.richards@rmit.edu.au



Abdullahi D. Ahmed, Associate
Professor at RMIT University
E-mail:
abdullahidahir.ahmed@rmit.edu.au



Muhammad S. Tahir
PhD Candidate at RMIT University
E-mail:
muhammad.tahir@rmit.edu.au

Disclaimer

The views and opinions expressed in this report are solely those of the author(s) and do not necessarily reflect the official policy or position of the Think Forward Initiative - TFI - or any of its partners. This report has been prepared by the author(s) for the TFI Short-term Research Track. Responsibility for the information, data and content in this report lies entirely with the author(s). The primary purpose of the TFI Short-term Research Track is to inspire practical research insights in the financial decision-making domain. It does not constitute any financial advice or service offer.