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Using Survey and Banking Data to Measure Financial Wellbeing

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Commonwealth Bank of Australia and Melbourne Institute Financial Wellbeing Scales Technical Report No. 1
March 2018

In partnership with

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THE UNIVERSITY OF MELBOURNE

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Abstract

An enormous research literature has considered and measured various aspects of financial wellbeing. Although several self-reported metrics have been developed, none has been universally adopted, and none harnesses the advantages of linking data from customer financial records with self-reported information from personal responses. This study conceptualizes, develops, tests, and validates multi-item scales of the financial wellbeing of the customers of a major Australian bank using self-reported survey data from the customers that are matched with their financial records. The study develops its scales using Item Response Theory models which produce two distinct, yet related, scales of financial wellbeing:

- a Reported Financial Wellbeing Scale that is formed from responses to 10 questions about whether people meet their financial obligations and have financial freedom, control, and security, and
- an Observed Financial Wellbeing Scale that is formed from five financial-record measures of customers' financial net positions, spending, and payments.

The Reported and Observed Financial Wellbeing Scales are distinct, both in the sense that they are constructed from different measures and in the sense that they represent different underlying constructs. However, they have a positive (Spearman) correlation of 40 per cent. The Item Response Theory models show that each scale reliably differentiates between a wide range of outcomes and that the components within each scale have similar power to discriminate. We validate the scales by examining how they correlate with characteristics that are conceptually linked to financial wellbeing. Both scales are positively associated with income, home ownership, metropolitan residence, financial windfalls, financial knowledge, thrifty attitudes, and good financial habits and negatively related to poor health and financial setbacks.

JEL classification: D1, I3

Keywords: Financial wellbeing, scale, bank record data, Item Response Theory, Australia

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Executive Summary

The corporate vision of Commonwealth Bank of Australia (CBA) is ‘to excel at securing and enhancing the financial wellbeing of people, businesses and communities’ (CBA 2017, p. 2). To achieve that vision and to design policies and products to improve Australians’ financial wellbeing, an operational measure of financial wellbeing is required.

This document reports the results of collaborative research between CBA and the Melbourne Institute: Applied Economic and Social Research and the Department of Finance at the University of Melbourne to conceptualise, develop, and test operational measures of the financial wellbeing of CBA’s customers and Australians generally. The goal was to design and construct one or more financial wellbeing scales with data that could be *observed* from customers’ financial records and data that customers could *report* about the financial outcomes they perceive and experience.

An enormous literature has considered various aspects of financial wellbeing, especially from the fields of financial services and financial planning. Despite this, no definition or metric has been universally adopted. In addition, no financial wellbeing scale combines objective data from customer records with self-reported information from personal responses. Customer-record data have the potential to enrich current models of financial wellbeing and improve our ability to monitor and improve people’s financial outcomes.

We developed a preliminary conceptualisation of financial wellbeing and how it is determined that guided our scale development. Based on this conceptualisation, we produced generalisable scales of financial wellbeing. Two separate scales capture two main dimensions of financial wellbeing: *reported financial wellbeing*—formed from people’s responses to several survey questions—and *observed financial wellbeing*—formed from customers’ financial records. After showing how these scales relate to one another, we used them to describe the distribution of financial wellbeing in a representative sample of CBA customers across several dimensions.

Definition and Determinants of Financial Wellbeing

Financial wellbeing has many dimensions. Our definition of financial wellbeing is grounded in CBA’s conceptualisation which considers the situational and temporal dimensions of ‘every day, rainy day, and one day’ financial outcomes. It also adopts elements of other functional dimensions that have been emphasised by previous researchers and financial professionals. In addition, it is informed by our empirical analyses, which revealed that wellbeing has components that relate to financial outcomes that people experience and *report* through a personal, subjective lens and to financial outcomes that can be *observed* from their financial positions, spending, savings, borrowing, and payments.

We define financial wellbeing as

the extent to which people both perceive and have:

1. *financial outcomes in which they meet their financial obligations,*
2. *financial freedom to make choices that allow them to enjoy life,*
3. *control of their finances, and*
4. *financial security—*

now, in the future, and under possible adverse circumstances.

We develop a conceptualisation of the determinants of financial wellbeing based on an abstract, theoretical description of people’s financial behaviour. We conceptualise financial wellbeing as having three general sets of determinants: financial behaviour, household characteristics, and external conditions. The influence of these determinants on financial wellbeing mainly operates through financial behaviour. This conceptualisation helps us sharpen the separation between measures of financial wellbeing and measures of its determinants, which is crucial for the construction of financial wellbeing scales.

The Financial Wellbeing Scales

Our empirical analyses reveal that the measures of people's financial wellbeing can be grouped into two broad categories that relate to financial outcomes that they report based on their experiences and perceptions and to outcomes that can be observed from their financial positions, spending, savings, borrowing, and payments. Because of this, CBA and the Melbourne Institute (CBA-MI) create two scales of financial wellbeing.

The *CBA-MI Reported Financial Wellbeing Scale (version 1)* is formed from people's responses to 10 questions that ask about their perceptions and experiences of how they are meeting their financial obligations, whether they have financial freedom to make choices, whether they are in control of their finances, and whether they are financially secure.

The *CBA-MI Observed Financial Wellbeing Scale (version 1)* is formed from five measures that come from customers' financial records and that describe their financial circumstances constructed from records of their financial net positions, spending, savings, borrowing, and payments.

The CBA-MI Reported and Observed Wellbeing Scales are distinct measures both in the sense that they are constructed from different measures and in the sense that they represent different things. However, they are positively related to each other—people with good wellbeing in one dimension often (but not always) have good wellbeing in the other. The observed outputs from the two scales have a positive (Spearman) correlation of 40 per cent.

The Distribution of Financial Wellbeing

The Reported Financial Wellbeing Scale shows that people are somewhat more likely to report experiencing or perceiving good outcomes for a given condition rather than neutral or bad outcomes. The Observed Financial Wellbeing Scale shows a similar pattern.

We analyse the distribution of reported and observed financial wellbeing across the socio-demographic spectrum. We report several findings:

- Women are uniformly more likely than men to have low levels of reported and, to a lesser degree, observed financial wellbeing.
- Home owners are uniformly more likely to have higher reported and observed financial wellbeing.
- Both types of financial wellbeing are uniformly lower among people with limiting health conditions.
- Metropolitan area residents have slightly better reported and observed financial wellbeing than rural residents.
- Respondents who report having a major worsening in financial circumstances have markedly worse reported and observed financial wellbeing.
- People with stronger preferences for living within their means, better understanding of financial matters, better and longer-term planning behaviour, and more regular savings habits tend to have better reported and observed financial wellbeing.

- Reported financial wellbeing does not change much from young adulthood to middle age, yet it rises between the ages of 50 and 70. In contrast, people's observed financial wellbeing declines from people's late 20s to early 40s but increases afterwards.
- There are also marked differences in both wellbeing measures depending on people's living arrangements and work situations.

Discussion

The project's most important substantive finding is the distinction between reported and observed financial wellbeing. Our quantitative analyses showed that these are separate components of financial wellbeing. Having identified these divergences, future research by the CBA-MI team will work to increase our understanding the reasons for them.

Another key innovation in this project is the use of linked self-reported and customer-record data to measure financial wellbeing. Despite some challenges, the CBA-MI team observed financial wellbeing scale has strong statistical properties. Future research by the CBA-MI team will investigate ways to improve upon this measure and may result in different versions of the scales.

> **Our vision is to excel at securing and enhancing the financial wellbeing of people, businesses and communities.**
>
> **Commonwealth Bank of Australia (2017, p. 2)**

1. Introduction

The corporate vision of Commonwealth Bank of Australia (CBA) is 'to excel at securing and enhancing the financial wellbeing of people, businesses and communities' (CBA 2017, p. 2). Tracking progress towards that vision requires an operational measure of Australians' financial wellbeing. A measure is necessary to help CBA understand its customers' wellbeing and develop more thoughtful and beneficial products. A measure is also needed for researchers, policymakers, businesses, and community groups to document the distribution of financial wellbeing across different segments of society, monitor trends in financial wellbeing, and evaluate the effectiveness of policy, product, capability, and behavioural interventions.

Recognising these needs, CBA has collaborated with researchers from the Melbourne Institute: Applied Economic and Social Research and the Department of Finance at the University of Melbourne to conceptualise, develop, and test operational measures of the financial wellbeing of CBA's customers and Australians generally. A uniquely innovative element of this project is the inclusion of both data that could be observed from customers' financial records and data that customers could report about the financial outcomes they perceive and experience. This report describes the resulting CBA-MI scales of customers' *reported financial wellbeing* and *observed financial wellbeing.*

1.1 Goals and Criteria

The collaboration addressed several goals. The central and overarching goal was to produce scales of financial wellbeing that were both operational and durable as a proof of concept. By operational, we mean that the scales could be implemented using actual data, and not just specified as a thought exercise. By durable, we mean that the scales needed to be conceptually sound, statistically reliable, externally valid, and generalisable. In terms of its conceptualisation, the scales needed to measure financial wellbeing as an outcome that is related to but separate from the many other underlying characteristics and behaviours that contribute to financial wellbeing. A distinct and separate outcome measure is necessary to study how underlying characteristics affect financial wellbeing and to test the effectiveness of interventions. Another conceptual goal was to create scales around CBA's existing three-part conceptualisation of every day, rainy day, and one day financial wellbeing. The collaboration also sought to develop scales that were applicable to Australians generally.

The collaboration operated under several other criteria. It constructed the scales using consumer financial data from CBA's customer records and self-reported data from its customers. This required the collaboration to specify measures from both sources, to develop methods for gathering the data, and to collect the data. The project also operated under a strict four-month proof-of-concept timeline. Additionally, the project team mutually agreed at its first formal meeting that the self-reported data would be collected through a large-scale, on-line survey.

1.2 Approach

To achieve these goals and meet the other criteria, the collaboration adopted a two-phase approach. Phase 1 was a specification phase, and these specifications were implemented and tested in phase 2.

The specification phase occurred in June and July 2017. The research team developed a preliminary conceptualisation of financial wellbeing that guided the development of its scale. The team specified and refined measures of financial wellbeing from CBA's customer records that could serve as candidates for inclusion in a scale. It considered and developed a set of self-reported measures of financial wellbeing and specified how an on-line survey would be conducted, whom it would sample, and what it would ask.

The implementation phase was conducted in August and September 2017. During the first week in August, CBA and its survey partner, FiftyFive5, fielded the on-line survey with a sample of digitally-engaged customers. Self-reported data from the survey were linked to the customers' financial records. The linked data were used to create the scales, and the scales were tested and analysed using additional data from the survey and bank records. The team also developed final definitions and a conceptual model of financial wellbeing. This report describes the outcomes from the implementation phase.

The remainder of this report is organised as follows. Section 2 reviews previous research that has specified or implemented scales of financial wellbeing and that inform both our conceptualisation of financial wellbeing and our empirical analysis. Section 3 offers our definition and conceptualisation of financial wellbeing and provides a theoretical model of how financial wellbeing is determined. Section 4 introduces and describes the CBA-MI Reported and Observed Financial Wellbeing Scales. Section 5 reports how financial wellbeing varies among CBA's customers. Section 6 concludes and offers directions for future research.

2. Background

An enormous literature has considered various aspects of financial health, especially from the fields of financial services and financial planning (see, e.g., Greninger et al. 1996; Joo 2008). Several definitions and conceptualisations of financial wellbeing have been offered, including comprehensive considerations of Australians' financial wellbeing by Bray et al. (2011) and Muir et al. (2017). However, no definition or measure has been universally adopted. We review the existing conceptualisations and measurement approaches below.

2.1 Conceptualisations

Joo (2008) has offered one of the broadest conceptualisations of financial wellbeing. Based on a comprehensive review of previous studies of wellbeing, Joo theorises that financial wellbeing is a multidimensional concept defined in terms of a broad set of characteristics and outcomes, including people's satisfaction with their financial situation, the objective status of their financial situation, financial attitudes, and financial behaviours. Joo's conceptualisation provides a wide-ranging picture of someone's financial health, and measures based on this type of conceptualisation can be used in descriptive analyses of the levels and distribution of financial wellbeing in a population. However, this breadth is also a weakness. Because Joo includes attitudes, behaviours, and objective circumstances as components of wellbeing, Joo's conceptualisation cannot be used to investigate how these characteristics separately contribute to wellbeing. That is, it cannot distinguish causes from consequences.

Other conceptualisations of financial wellbeing have been motivated by a desire to study how changes in characteristics such as financial literacy, attitudes, and financial inclusion affect financial wellbeing. Accordingly, they have been framed more narrowly in terms of *end outcomes*. Several conceptualisations have been based primarily in terms of objective outcomes. For example, Parker et al. (2016) characterise people's financial wellbeing in terms of their spending, saving, borrowing and planning outcomes. Bray (2001) focuses on financial deprivation and distinguishes among people's experiences with financial hardships, financial management problems, and financial exclusion. In a subsequent analysis, Bray et al. (2011) consider a wider range of financial outcomes by adding a domain of material affluence to the previous set of outcomes. A Norwegian study by Kempson et al. (2017) frames financial wellbeing in terms of meeting commitments, financial comfort, and financial resilience. Kempson et al. also hypothesise that financial wellbeing includes people's future security, but they omit this from their final conceptualisation because Norway's strong retirement protections already address this issue. Their study shows the importance of considering context in conceptualising financial wellbeing and why country-specific approaches may be needed.

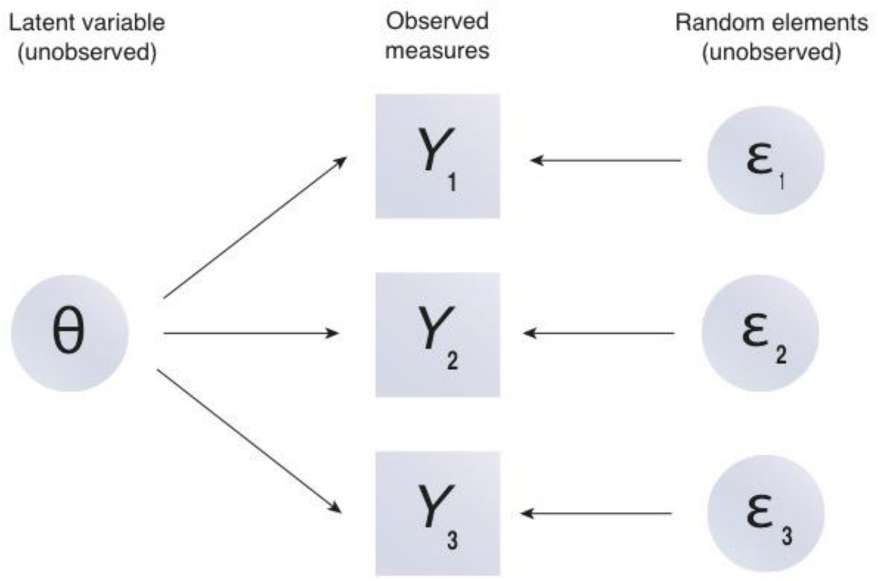
Some conceptualisations have also blended subjective and objective elements. The U.S. Consumer Financial Protection Bureau (CFPB, 2015) differentiates between people's present and future circumstances but also between their desires for financial freedom and for security and control. Based on these considerations, the CFPB (2015, p.5) defines financial wellbeing as a condition with four components: having control over day-to-day, month-to-month finances; having the capacity to absorb a financial shock; being on track to meet financial goals; and having the financial freedom to make the choices that allow people to enjoy their lives. Muir et al. (2017) consider domains of people meeting expenses with some money left over, being in control of their finances, and feeling secure with their financial situation. Vlaev and Elliot (2014) similarly include conditions of meeting expenses with funds left over and financial satisfaction in their conceptualisation but see people's objective financial outcomes and sense of financial control as conditions that contribute to these outcomes. Bruggen et al. (2017) argue that financial wellbeing is linked to people's perceptions of their current and anticipated desired living standards and financial freedom.

These existing conceptualisations helped to inform our conceptual approach which is described in detail in section 3.

2.2 Measurement

All the conceptualisations described in section 2.1 are developed to guide the construction of measures of financial wellbeing. An initial practical consideration is the general measurement approach. Financial wellbeing is not captured by a single indicator and cannot be measured directly. Instead, it is measured indirectly as one or more latent, or unobserved, variables. To do this, we and most existing research adopt a 'scale' approach. The scale approach assumes that a set of observed measures, say Y_1, Y_2, and Y_3, follows from or are results of an underlying latent outcome, say θ. Each of the observed measures also depends on some random elements, or noise, say ε_1, ε_2, and ε_3. Because of the noise elements, none of the observed measures is a perfect measure of the latent outcome. Figure 2.1 shows these relationships, with boxes indicating measures that we can observe, circles indicating variables that we cannot observe, and arrows indicating the directions of relationships.

Figure 2.1. Scale relationship between a latent variable and observed measures



The next consideration are the measures that might be included in a scale. Joo (2008) and Parker et al. (2016) offer recommendations for items to include in possible scales but do not implement or test empirical scales. For example, Parker et al. recommend two categories of indicators for each of their four domains of outcomes. In their framework, spending outcomes include indicators for spending less than income and paying bills on time and in full; saving outcomes include having sufficient living expenses in liquid savings and having sufficient long-term savings or assets; borrowing outcomes have indicators of having a sustainable debt load and having a prime credit score; and planning outcomes include indicators of having appropriate insurance and planning for expenses. Each set of indicators could, in turn, include self-reported measures or objectively determined measures.

Most of the other studies move beyond general specifications to actually construct empirical scales based on their conceptualisations. However, these scales are all formed using self-reported measures, rather than a combination of self-reported and financial-record measures, as used within our analysis. The CFPB (2017) and Prawitz et al. (2006) have conducted the most careful and thorough analyses. The CFPB begins with qualitative interviews of consumers and financial experts. From the narrative interview responses, the CFPB identifies themes and uses these to develop candidate sets of subjective questions. The CFPB uses cognitive interviewing to refine the questions. The CFPB then fields and analyses three successive quantitative surveys in which it uses Item Response Theory (IRT) models to identify 10 measures that cover its four conceptual domains but also align into a single scale of financial wellbeing.

Prawitz et al. (2006) develop the InCharge Financial Distress/Financial Wellbeing (IFDFW) scale, which measures ‘perceptions about financial wellbeing and stress about one’s financial condition’. Their development process includes an extensive review of the conceptualizations of financial wellbeing that identified a total of 58 relevant concepts, attributes, and objects; a summary of the opinions of 52 experts (i.e., a ‘Delphi’ study) to reduce these to 10 key measurement items; and two surveys to assess the validity of these items that reduce them to the final eight-item IFDFW scale. The IFDFW scale has been used in several other studies (e.g. Gutter and Copor, 2011; Taft et al., 2013), illustrating its validity in various institutional backgrounds.

Bray (2001) and Bray et al. (2011) also develop scales from sets of highly reliable measures. Rather than develop new questions, Bray (2001) and Bray et al. (2011) use questions whose reliability has been demonstrated through their extensive use in large-scale Australian household surveys. Bray (2001) and Bray et al. (2011) use factor analyses to identify measures that belong in their scales and find that each scale can be represented by a single underlying factor.

Kempson et al. (2017) and Muir et al. (2017) undertake qualitative analyses to refine their conceptual approaches and to develop initial measures. Kempson et al. form several new questions based on their qualitative analyses, while Muir et al. rely more on existing banks of questions that were selected based on interviews with everyday Australians and financial experts. Each research team uses factor analyses to construct scales and finds that their scales can be represented by single factors.

Delafrooz and Paim (2013), Vlaev and Elliott (2014), and FiftyFive5 (2016) also develop multi-item measures of financial wellbeing but with less initial conceptual guidance. Vlaev and Elliott construct a single-factor scale from three items involving financial satisfaction, life satisfaction, and meeting expenses. Delafrooz and Paim construct a scale of financial wellness using a set of nine self-reported subjective and objective measures. They also construct a separate scale of financial stress that mixes items of stress related to people's financial situation with general questions about stress. FiftyFive5 constructs a single index with sub-indices for domains of fulfilment, resilience, and sustainability. However, the FiftyFive5 index includes many behavioural, attitudinal, and capability-related characteristics, so it is not formally a scale.

To our knowledge, there has been no attempt to build an overarching financial wellbeing scale from objective measures. However, studies have considered individual objective measures. Greninger et al. (1996) is an especially useful objective study. Greninger et al. conduct a Delphi study with 156 financial experts to identify key financial thresholds and benchmarks that are associated with financial wellbeing. Their analysis uncovers approximately a dozen indicators in the areas of liquidity, savings, asset allocation, inflation protection, tax mitigation, housing expenses, and credit. As with the specifications from Parker et al. (2016), these provide initial guidance for forming objective indicators.

2.3 Lessons

Although researchers have developed several definitions and measures of financial wellbeing, including several focused on the Australian context, no definition or metric has been universally adopted. In addition, we are not aware of existing scales that combine data from customer records with self-reported information from personal responses. Nevertheless, previous studies provide much helpful information to guide us towards such a scale. The existing conceptualisations have substantial overlaps. Several, including those by Bray (2001), Bray et al. (2011), Kempson et al. (2017), and Parker et al. (2016), emphasise objective conditions, and the conceptualisations by the CFPB (2015) and Muir et al. (2017) combine subjective and objective conditions.

Many studies also construct empirical scales, though always with self-reported measures from surveys. The empirical scales provide a rich set of candidate measures, including some measures from Bray (2001), Bray et al. (2011), and the CFPB (2015) that have been either extensively used or rigorously tested. Researchers have generally reported that they can find measures that align with their proposed conceptual domains. More than this, they find that measures can be represented by a single factor and combined into a single scale. Studies also identify many potential objective measures that would be good candidates for a scale.

3. Conceptual Analysis of Financial Wellbeing

We conduct a *conceptual analysis*, or thought analysis, which considers what financial wellbeing is, what it consists of, and how it is determined. This includes developing a formal definition of financial wellbeing, describing its components, and developing a model that considers financial wellbeing as an outcome. The definition of financial wellbeing and description of components tell us what our scales are measuring. The conceptual model of how financial wellbeing is determined helps us understand the properties of financial wellbeing—for instance, how we would expect financial wellbeing to differ between people at different life stages or with different economic opportunities. The model also clarifies the definition of financial wellbeing and provides a logical basis for testing and validating our scales.

3.1 The Definition of Financial Wellbeing

Our approach to defining people's financial wellbeing considers wellbeing in terms of *outcomes* that people achieve or experience, rather than all the conditions, characteristics and behaviours that might contribute to those outcomes. We consider outcomes so that we and other researchers can study how underlying characteristics affect financial wellbeing and test the effectiveness of interventions.

Our approach also draws on the conceptual framework that Commonwealth Bank of Australia has developed. CBA's framework emphasises how outcomes fit into three types of *situations* that are relevant to people's personal finances. These are people's:

- 'every day' finances that encompass people's immediate, day-to-day and month-to-month financial outcomes,
- 'rainy day' finances that encompass outcomes that prepare people to maintain their wellbeing if there are unexpected, adverse events, and
- 'one day' finances that encompass outcomes that allow people to sustain their wellbeing over time and achieve long-term goals.

In developing our definition, we reviewed and considered other definitions that were put forward generally by the CFPB (2015) and more specifically for Australia by Bray (2001) and Muir et al. (2017).

Our definition is further informed by our empirical analyses, which revealed that wellbeing had two primary components. The first component involves financial outcomes that people experience and interpret through a personal, subjective lens and that they can report. The second component involves financial outcomes that can be objectively observed in people's financial records, accounts, and transactions.

We define people's financial wellbeing as

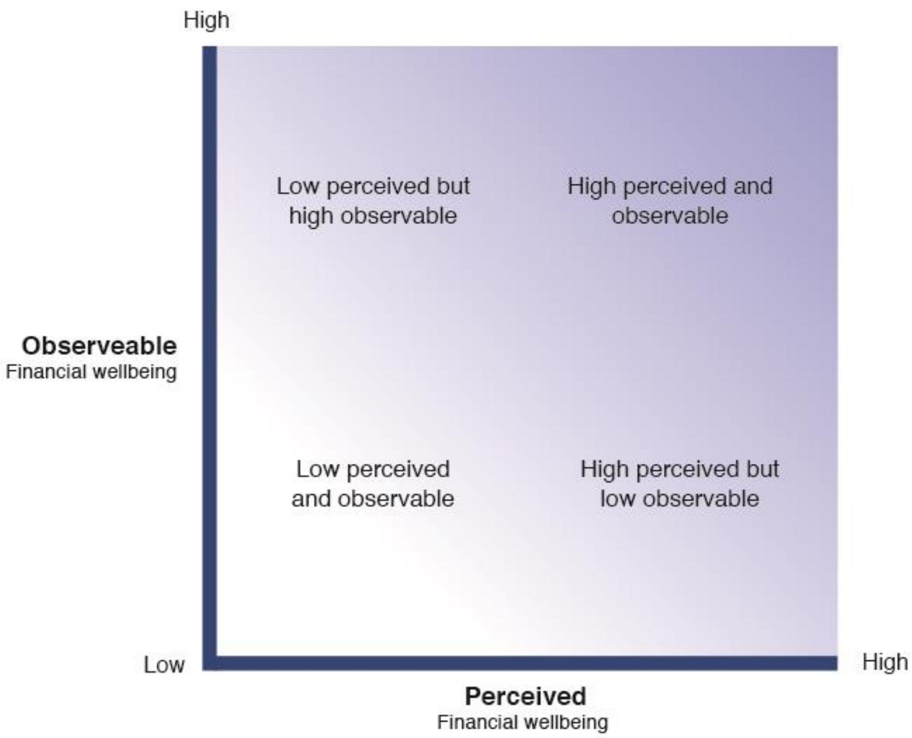
> *the extent to which people both perceive and have:*
> 1. *financial outcomes in which they meet their financial obligations,*
> 2. *financial freedom to make choices that allow them to enjoy life,*
> 3. *control of their finances, and*
> 4. *financial security—*
>
> *now, in the future, and under possible adverse circumstances.*

The definition has several dimensions, including situational/temporal, functional, and subjective/objective dimensions. The situational/temporal dimensions correspond to CBA's conceptualisation and indicate that financial wellbeing involves outcomes now (every day), in the future (one day), and under possible adverse circumstances (rainy day). The functional dimensions are the goals and objectives that people and financial planners have identified for people to meet their financial obligations, to have the financial freedom to enjoy additional consumption and other fulfilling choices, to control rather than be controlled by their finances, and to have security and be free from financial anxiety. Lastly, the definition includes financial outcomes as people perceive and experience them and outcomes that are manifest in people's financial positions and transactions. The definition also describes degrees of wellbeing—it is not an either/or condition.

3.2 Relating the Perceived and Observable Components of Financial Wellbeing

As mentioned above, people's overall financial wellbeing consists of outcomes as they perceive and experience them and outcomes as they can be objectively and independently observed. Both sets of components are interrelated, yet they capture different facets of financial wellbeing. People's overall financial wellbeing is characterised by whether they have better or worse perceived financial wellbeing and better or worse objectively observable financial wellbeing. For many people, their perceived and observable financial wellbeing align, but for some people, they do not. The two-component categorisation of financial wellbeing is depicted in Figure 3.1.

Figure 3.1. Two-component categorisation of overall financial wellbeing



Below we discuss the combined categorisations in more detail.

High perceived and observable financial wellbeing

People in this category have unambiguously good financial wellbeing. They experience and perceive good financial outcomes, and they also have good objective financial outcomes. Their positive subjective assessments of their financial condition align with their positive objective outcomes. People in this category are meeting many of their every day, rainy day, and one day objectives, though it is possible that they are missing some objectives.

Low perceived and observable financial wellbeing

People in this category have unambiguously poor financial wellbeing. They experience and perceive bad financial outcomes, and they also have bad objective financial outcomes. Their negative subjective assessments of their financial condition align with their negative objective outcomes. People in this category are not meeting many of their every day, rainy day, and one day objectives, though they might be meeting some objectives. They frequently report financial problems and seldom report financial successes. They also either have low savings or low access to funds, run low account balances, or run into payment problems.

Low perceived but high observable financial wellbeing

People in this category have ambiguous financial wellbeing. They have good objective financial outcomes, but they do not derive a sense of wellbeing from their finances. Their negative subjective assessments of their financial condition are not aligned with their positive objective outcomes. People in this category tend to report financial problems but not financial successes. Yet they have savings, access to funds, adequate account balances, and/or few payment problems.

High perceived but low observable financial wellbeing

People in this category also have ambiguous financial wellbeing. They experience and perceive good financial outcomes, but they have bad objective financial outcomes. Their subjective assessments of their financial condition are not aligned with their objective outcomes. People in this category report being successful in many of their every day, rainy day, and/or one day objectives, yet their financial statements indicate that they have low savings or access to funds, low account balances, or problems making payments.

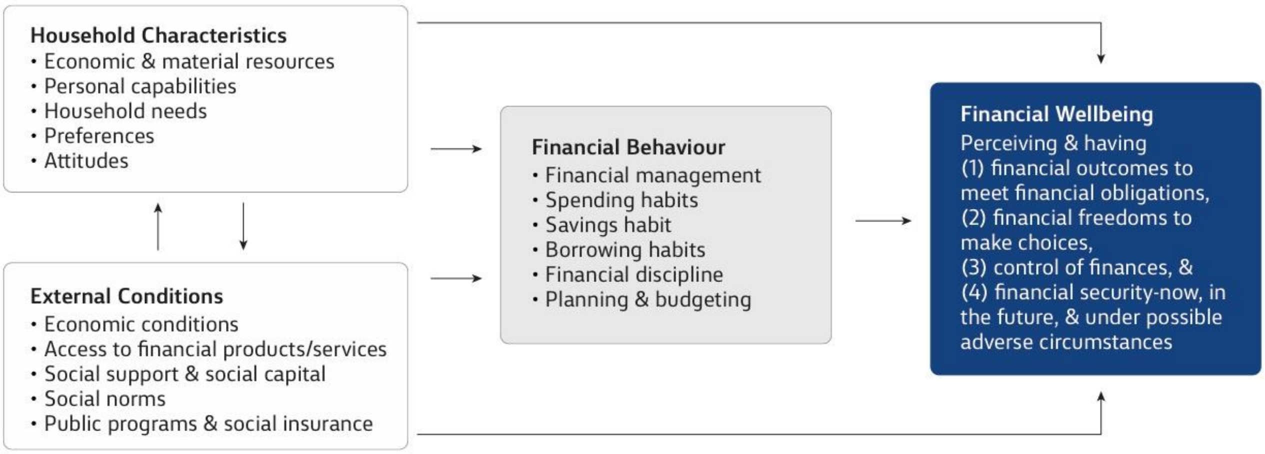
3.3 Conceptual Model of How Financial Wellbeing is Determined

We conceptualise financial wellbeing as having three general sets of determinants: *financial behaviour*, *household characteristics*, and *external conditions*. Our focus regarding the determinants of financial wellbeing is financial behaviour, which we see as directly determined by household characteristics and external conditions. The relationships among these general sets of determinants is shown in Figure 3.2.

Our conceptualisation is based on a simplified and abstract description of people's financial behaviour. In this model, we divide people's (remaining) lifetimes into discrete periods (for example, working life and in retirement). In each of these periods, people care principally about the amounts of goods and services that they can consume. The consumption of these goods and services generates what we observe as financial behaviour. For now, we assume that all the goods and services are interchangeable so that we only consider the total expenditures on them (it is possible to distinguish between capital goods and simpler perishable goods, necessary and luxury goods, etc.).

To effectuate this expenditure, people use their available household economic and material resources. Within each period, people receive a net income which equals their earnings from work plus the interest and dividends from their savings and investments but less the interest they pay on any debts. In addition to this net income, people can add to their current available resources through a process of dis-saving by drawing down any accumulated wealth or by borrowing against future income and wealth. They can also add to their future available resources by saving—either by adding to their savings and investments or by paying down their debts. People's economic and material resources are not solely determined by their own actions. They are also affected by the economic conditions around them, including the aggregate economic growth, unemployment rate, interest rates, and so on. Finally, people can also draw on publicly-provided resources such as public programs and social insurance, and on community-based resources such as social support and social capital to make their expenditure decisions.

Figure 3.2 Conceptual Model of the Determinants of Financial Wellbeing



People derive satisfaction and pleasure from their current expenditures and their beliefs over how much they will be able to spend in the future in several ways. First, people derive more marginal satisfaction from each additional dollar of expenditure at low levels of expenditures and less from each additional dollar at higher levels. People care about their expenditures in the current period, but they also care about expenditures in future periods. However, people discount their future expenditures; the further away the future is, the less they care about it in the current period. People also discount expenditures that are uncertain; receiving $100 for sure is more satisfying than a 50-50 chance of receiving either $200 or nothing. This correspondence between people's derived satisfaction and their expenditures is characterised by their preferences and attitudes.

People's derived satisfaction from expenditures also depends on what they consider as an acceptable level of expenditure given their situation. Therefore, people's satisfaction from expenditures is affected by their household needs (e.g., their household's size and their life stage) and by the social norms they are subjected to (e.g., the typical level of expenditure in their community). Finally, people will make expenditure decisions in the best way their personal capabilities—their financial knowledge, information, training, and ability to make sound decisions—allow them to. These decisions will be bounded by their access to financial products and services, which will determine their options.

To make financial decisions, people attempt to set their expenditures to maximise their satisfaction while bounded by the constraints their economic resources, household needs, and their own attitudes and capabilities impose on them. The way people solve this problem results in financial behaviours, which are the main determinants of their financial wellbeing.

Financial behaviours directly contribute to people's financial wellbeing, since they influence people's expenditures. These behaviours can be categorised based on whether they respond to people's desire to secure current or future expenditure, or to insure against rainy days. People spending in a responsible manner will improve their financial security in the future, and will be able to make mistakes without catastrophic consequences. Because people care about future expenditure and discount risky expenditure, responsible spending should lead to greater financial wellbeing.

Financial behaviours can also be categorised based on the way they add to people's wellbeing: whether behaviours are meant to ensure people can meet their needs and cover their necessary expenses, or whether features of people's expenditure enhance their sense of satisfaction. For example, purposefully spending below what a person could afford might seem suboptimal, but it could still improve their financial wellbeing if it improves their financial position in the future or improves their experience of other current expenditures because they do not worry as much about the future.

Finally, the contribution of financial behaviours to financial wellbeing needs to be seen within the frame of the general wellbeing achievable by that household at any given moment, and this wellbeing will be directly determined by their household characteristics and their external conditions. For example, all else equal, a household with less resources will also have lower financial wellbeing. Similarly, a household in a favourable economic environment will have higher financial wellbeing than a household in a poorly-performing economy, even if both households have the exact same characteristics. Because of this, the receipt of $100 contributes more to the wellbeing of a small disadvantaged household than to the wellbeing of a larger and more advantaged household, yet advantaged households will generally have higher financial wellbeing than disadvantaged ones. Moreover, people's attitudes will influence the wellbeing they perceive from objectively equal expenditures. For example, a person who is unwilling to take risk will benefit more from a given expenditure on insurance than someone who is willing to take risk.

Our conceptual model of financial wellbeing shares many elements with the frameworks of financial capabilities and stress of Bray et al. (2011), the CFPB (2015), and Muir et al. (2017). Both Bray et al. and the CFPB see financial wellbeing as chiefly driven by financial behaviours, which are in turn determined by people's resources. Bray et al. also consider household resources as a key determinant of financial behaviour and focus more on the role of ecological conditions by explicitly distinguishing between formal institutions (e.g., access to banking, the quality of financial services) and informal ones (e.g., social links such as parents and friends). However, in their model, attitudes and household needs play a less prominent role. In the CFPB's categorisation, like in ours, attitudes and capabilities are direct determinants of financial behaviour, and they further develop an explicit categorisation of financial behaviours. However, they do not explicitly distinguish between household resources and ecological conditions, and they give little consideration to people's 'rainy day' exposure. Muir et al. structure their framework in a nested approach, which suggests that societal influences can affect communities, which in turn affect households, individuals' behaviour, and finally their financial wellbeing. The 'outer levels' can also influence a person's financial behaviour and wellbeing directly.

3.4 Implications for Measurement

Our conceptual analysis above is helpful for developing a scale of financial wellbeing in two ways. First, it motivates and delineates the differences between the determinants of financial behaviours, the financial behaviours themselves, and the financial wellbeing they produce. Second, the framework provides us with a set of candidate measures for the determinants of financial behaviours and wellbeing outcomes.

Our conceptualisation places financial wellbeing as the key outcome. To measure financial wellbeing, we will focus on measuring relevant outcomes from people's decision-making process. Objectively observable markers are the easiest to identify based on our model. Relevant financial wellbeing outcomes include markers such as people's net financial position and whether they are late for payments or owe money to financial institutions. This outcomes approach aligns with the approaches of Bray et al. (2011), Parker et al. (2016), and Kempson et al. (2017).

Our scale of financial wellbeing also includes reportable markers in each of our conceptual domains such as people's self-reported ability to meet regular expenses, instances of having money left over at the end of the month, their perceived capacity to handle unexpected expenses, and their sense of control over their own finances. These markers are each related to people's observable financial circumstances, though they may have additional subjective elements. Because of this, it is crucial to account for these along with the observable components of financial wellbeing.

Our conceptualisation places financial behaviours as key determinants of financial wellbeing but not as wellbeing outcomes themselves. Relevant financial behaviours include observable markers in the financial records such as opening a direct deposit savings account, setting up an automatic payment system for bills, or seeking financial advice from a professional. Other elements of our model—namely household resources, ecological conditions, household needs, and attitudes and capabilities—are also important determinants but are not considered as outcomes. It is important to measure the determinants so we can correlate them with our measures of financial wellbeing to better establish their properties and to test the premise of our model. For many of these elements we have observable markers in the financial records, such as household income and household size. For others, such as preferences and attitudes, we rely on survey items.

4. The CBA-MI Financial Wellbeing Scales

4.1 The CBA-MI Reported Financial Wellbeing Scale (version 1)

The CBA-MI Reported Financial Wellbeing Scale (version 1) is formed from people's responses to 10 questions that ask about their perceptions and experiences of how they are meeting their financial obligations, whether they have financial freedom to make choices, whether they are in control of their finances, and whether they are financially secure. These perceptions and experiences are considered under every day, rainy day, and one day circumstances. Each question has five possible responses, with the worst financial wellbeing outcomes assigned values of zero and the best financial wellbeing outcomes assigned values of four. The questions were drawn from several sources, including six from the CFPB (2015), one from Muir et al. (2017), two from FiftyFive5 (2017), and one that we developed. Table 4.1 lists the questions, sources, and possible responses.

The items cover all the functional and situational/temporal elements of the definition of financial wellbeing. Item 1 addresses meeting financial obligations; items 2 and 6 address financial freedom; items 5, 8 and 9 address control over finances; and items 3, 4, 7 and 10 address financial security. Similarly, items 1, 2, 8 and 9 address everyday situations; 3 and 7 address rainy day situations; and 4 and 10 address one day situations. Quantitative testing, which is described in Appendix D, indicated that all five responses to all 10 items contributed to the measurement of reported financial wellbeing.

Table 4.1 CBA-MI Reported Financial Wellbeing Scale (version 1)

Item (Source)	Responses
1. In the last 12 months, how difficult was it for you to meet your necessary cost of living expenses like housing, electricity, water, health care, food, clothing or transport? (Muir et al. 2017)	0 - Very difficult 1 - Difficult 2 - Neither difficult nor easy 3 - Easy 4 - Very easy
How well do the following statements describe you or your situation? (CFPB 2015) **2.** I can enjoy life because of the way I'm managing my money **3.** I could handle a major unexpected expense **4.** I am securing my financial future	0 - Not at all 1 - Very little 2 - Somewhat 3 - Very well 4 - Completely
How often do the following statements apply to you? (CFPB 2015) **5.** My finances control my life * **6.** I have money left over at the end of the month **7.** Giving a gift for a wedding, birthday or other occasion would put a strain on my finances for the month *	0 - Never 1 - Rarely 2 - Sometimes 3 - Often 4 - Always
When it comes to how you think and feel about your finances, please indicate the extent to which you agree or disagree with the following statements (FiftyFive5 2017 and Comerton-Forde et al. 2018): **8.** I feel on top of my day to day finances **9.** I am comfortable with my current levels of spending relative to the funds I have coming in **10.** I am on track to have enough money to provide for my financial needs in the future	0 - Disagree strongly 1 - Disagree 2 - Neither agree nor disagree 3 - Agree 4 - Agree strongly

* Negative statement that is reverse-coded in scale.

A person's reported financial wellbeing scale value is formed by adding the responses to all 10 questions and multiplying the sum by 2.5. This results in a 0-100 scale in which larger values indicate higher amounts of reported financial wellbeing.

Reported Financial Wellbeing Scale =
Sum of responses to items 1 to 10 multiplied by 2.5

4.2 The CBA-MI Observed Financial Wellbeing Scale (version 1)

The CBA-MI Observed Financial Wellbeing Scale is formed from five additional measures numbered 11-15 below that come from customers' financial records and that describe their every day, rainy day, and one day circumstances. Except for item 12, each measure has three possible outcomes, with the worst financial wellbeing outcomes assigned values of zero and the best outcomes assigned values of two. Table 4.2 lists the measures and possible outcomes.

Table 4.2. CBA-MI Observed Financial Wellbeing Scale (version 1)

Item	Outcomes
11. Number of months in last year with payment dishonours	0 - 7 or more months 1 - 1 to 6 months 2 - None
12. Any payday loans in last year?	0 - Yes 1 - No
13. Days in last year with liquid balances below one week's average expenses	0 - 75% or more 1 - 1% to 75% 2 - Never
14. Days in last year during which customer had the ability to raise one month's expenses from savings or available credit	0 - 25% or less 1 - 25% to 99% 2 - Always
15. Age-normed percentile of customer's median savings balance over last year	0 - Below 35th percentile 1 - 35th to 90th percentile 2 - Above 90th percentile

A person's observed financial wellbeing scale value is formed by adding the outcomes from all five items and multiplying the sum by $^{100}/_{9}$. This results in a 0-100 scale in which larger values indicate higher amounts of observed financial wellbeing.

Observed Financial Wellbeing Scale =
Sum of outcomes from items 11 to 15 multiplied by $^{100}/_{9}$

The items in the scale address the functional and situational/temporal elements of our definition of financial wellbeing. All the items are measures that are constructed from records of people's financial positions or of their spending, savings, borrowing, or payment outcomes. Items 11 and 12 encompass elements of meeting financial obligations; item 13 addresses conditions that give rise to financial freedom; and items 14 and 15 describe outcomes that provide control and security. The items also span our situational space with items 11 and 13 addressing every day finances; items 12 and 14 addressing rainy day finances; and item 15 addressing one day finances.

Unlike the items from the reported financial wellbeing scale, which could distinguish between five levels of outcomes, our quantitative testing indicated that the items from the observed financial wellbeing scale could only distinguish between three—or in the case of payday loans, two—levels of outcomes. Quantitative testing further indicated that observed financial wellbeing was distinct from reported financial wellbeing and that none of the items in the scales overlapped.

Both of our scales are formed from simple summations of categorical responses. This method imposes restrictions on the underlying data. It treats each item as being equally informative about people's underlying reported or observed financial wellbeing. The method also treats each unit increase in a given response outcome as having the same relationship with underlying financial wellbeing as a unit increase in any other response outcome. For example, the difference between someone just agreeing (value 3) or agreeing strongly (value 4) that she or he is on track to have enough money to provide for her or his financial needs in the future adds exactly the same to our measure of wellbeing as the difference between someone finding it difficult (value 2) or neither difficult or easy (value 3) to meet her or his necessary cost of living expenses. We compared our simple scales to more complex scales based on Item Response Theory model estimates that allowed for differences among items in terms of their reliability and response differences. Our simple scale of reported financial wellbeing was correlated 99.2 per cent with a more flexible IRT scale, and our simple scale of observed financial wellbeing was correlated 98.0 per cent with a more flexible IRT scale. Therefore, our simple scales are appropriate and capture almost all the information of more flexible but complex scales.

5. Financial Wellbeing in Our Sample

5.1 On-line Survey

To obtain the data to develop and analyse our financial wellbeing scales, we conducted an on-line questionnaire survey of 5,682 CBA customers in the first week of August 2017 and linked the responses from the survey to financial-record data for the same customers. A detailed description of the survey is given in Appendix A, the questionnaire is listed in Appendix B, and recruiting and informed consent materials are listed in Appendix C.

Before recruiting customers for the survey, we carefully considered what we would be able to observe from their financial records. Although the records are a rich source of data, the bank's view of its customers is incomplete or limited in number of ways. Most importantly, the bank only observes financial activities that customers conduct through CBA. The extent to which customers use other financial institutions will influence the completeness of the bank's observation of the customers' financial wellbeing. Customers who use CBA as their main financial institution (MFI) and use more products with CBA will provide more complete pictures. To balance the need to have a sample that could describe all of CBA's customers with the need to have adequate numbers of respondents with high-quality financial-record data, the survey used a stratified sampling approach with three strata:

> **Stratum A:** A nationally representative sample of CBA customers. Invitations were e-mailed to approximately 60,000 customers from this sample, and 1,611 customers provided responses.
>
> **Stratum B:** A sample of sole-MFI customers for whom CBA has a relatively complete view of

their financial position and transaction behaviours. These are customers believed to undertake their banking solely through CBA and who are identified by reference to information collected through transactional data. This sample was selected to ensure that we had enough customers for whom we have a complete view of their financial-record data. Approximately 180,000 e-mail invitations were sent to this sample, and 2,899 customers responded.

Stratum C: A sample of 'high-visibility' split-MFI customers for whom CBA appears to be the main – but not sole – banking provider but for whom CBA also has either recent product application or Financial Health Check data. This sample is selected to allow us to construct a view of the financial wellbeing of non-exclusive CBA customers. CBA e-mailed invitations to approximately 60,000 customers from this sample, and 1,172 customers responded.

Subjects for the on-line survey were CBA adult customers with e-mail addresses who had not opted out of on-line research and marketing communications from the bank. Subjects were sent an e-mail invitation from CBA that contained a unique survey link; CBA retained a master list of the survey links so that responding subjects could be matched to their financial-record data. The invitation e-mail contained a Plain Language Statement describing the risks and benefits of participation, and the first page of the on-line survey linked to and administered a consent document. If consent was given, the first few questions of the survey asked additional screeners to confirm the respondent's location and age, and to ensure that no one under 18 completed the survey. A single reminder e-mail was sent to customers who did not respond to the initial survey invitation.

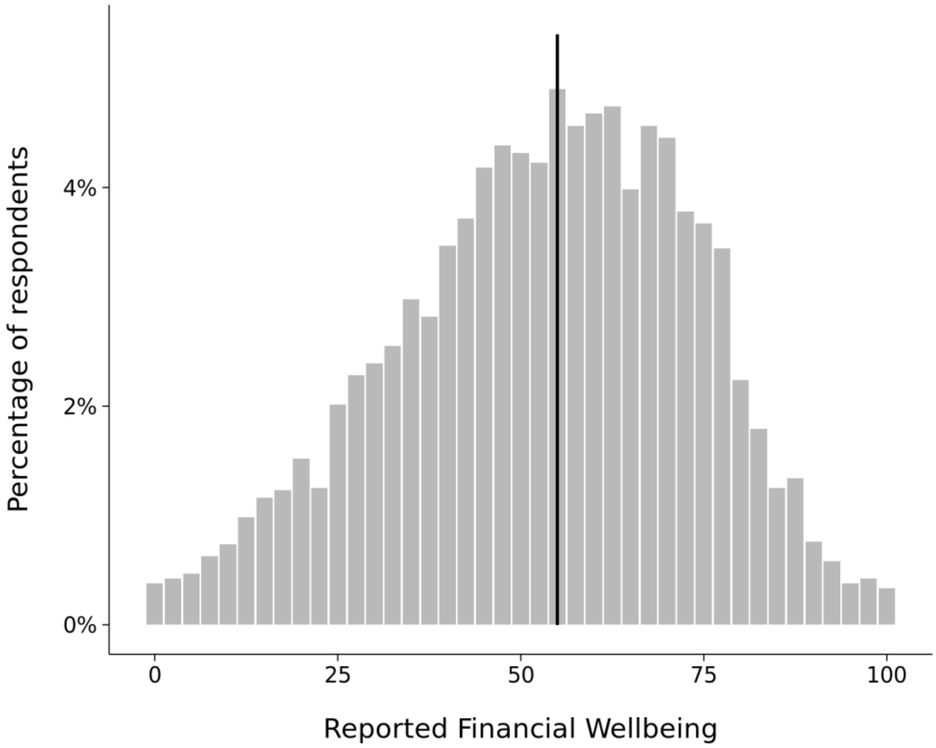
After asking the screening questions, the survey asked about the subject's perceptions and experiences with financial outcomes, including 33 questions about financial wellbeing. The survey also asked people about major life events, intermediate financial behaviours, banking relationships, household financial holdings, loans, financial circumstances, financial literacy, financial habits, attitudes, and many demographic and economic characteristics. The survey instrument is reproduced in Appendix B.

We dropped observations for 50 customers who did not answer all the financial wellbeing questions. We initially conducted analyses using a subset of survey respondents who reported conducting all their financial transactions and holding all their financial products through CBA. Further analyses, however, revealed that the scale measurement relationships for these customers were indistinguishable from customers who reported conducting most of their financial transactions and holding most of their financial products through CBA. Because the two groups were so similar, we combined the samples in our analyses, resulting in a sample of 4,470 customers who were mostly sampled through Strata B and C but also partly through Stratum A.

5.2 Distribution of Financial Wellbeing

Figure 5.1 shows the percentages of MFI customers in our on-line survey with each level of reported financial wellbeing. Customers' scale values ranged over the entire set of possible outcomes from 0 to 100. The black vertical line in the figure indicates the median value of reported financial wellbeing—that is, the value at which half of the sample reports better values and half reports lower values. The median value and modal value (value with the most responses) of the reported financial wellbeing scale among the MFI customers were each 55.

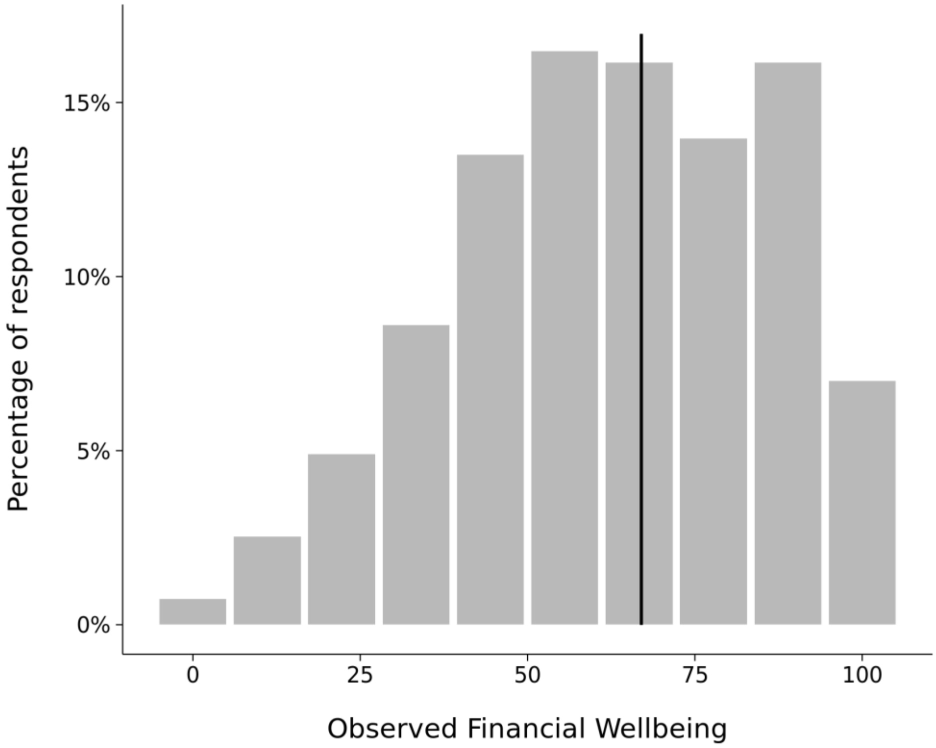
Figure 5.1 Distribution of Reported Financial Wellbeing



As the figure indicates, the distribution is skewed towards higher scale values, meaning that people were somewhat more likely to report experiencing or perceiving good outcomes for a given condition than neutral or bad outcomes. Only a small percentage of people had values at or near the top and bottom ends of the scale (about one per cent had scores of 5 or lower and about one per cent had scores of 95 or higher).

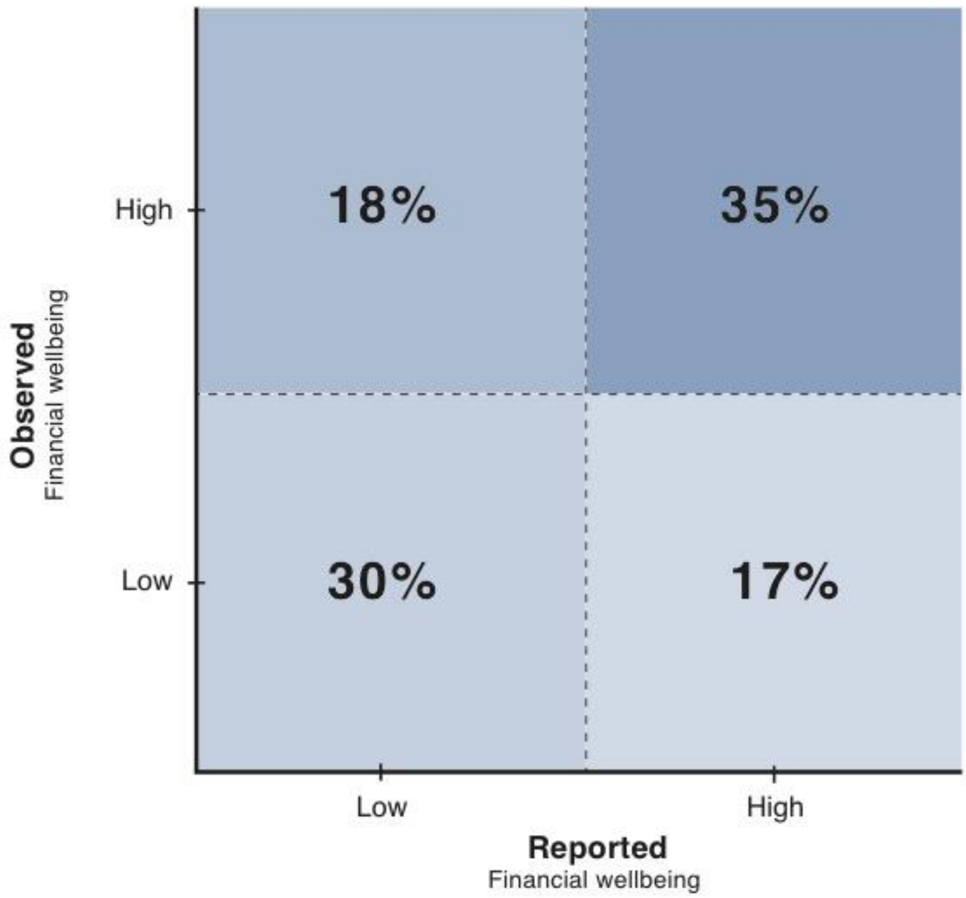
Figure 5.2 shows the percentages of MFI customers in our on-line survey with each level of observed financial wellbeing. As with reported financial wellbeing, customers' values of observed financial wellbeing spanned all the possible values of the score. The median value of observed financial wellbeing was 67, and the modal value was 56. The distribution was skewed towards higher values, and relatively few customers had scale values at the top or bottom of the distribution.

Figure 5.2 Distribution of Observed Financial Wellbeing



Although reported and observed financial wellbeing are distinct scales, they are positively related—people with high reported financial wellbeing also tend to have high observed financial wellbeing. Formally, the sample responses from the scales had a positive (Spearman) correlation of 40 per cent. Another way to convey the relationship is to plot the percentages of customers with both scores at or above the median values, both scores below the median values, and scores that are at or above the median value on one scale and below the median value on another. We do this in Figure 5.3 and organise the results in the same way as Figure 3.1. Consistent with the positive relationship between the two scales, most people—about two-thirds—have values on the two scales that are both at or above the median (35 per cent) or below the median (30 per cent). About a sixth of customers (17 per cent) have values of reported financial wellbeing that are at or above the median but values of observed financial wellbeing that are below the median, while a sixth of customers (18 per cent) have values of observed financial wellbeing that are at or above the median but values of reported financial wellbeing that are below the median.

Figure 5.3 Distribution of combined financial wellbeing



5.3 Financial Wellbeing for Different Types of CBA Customers

In this section we report how reported and observed financial wellbeing vary for CBA customers with different sets of characteristics.

Figure 5.4 shows the percentages of women and men with different values of the reported and observed financial wellbeing scales. In general, financial wellbeing tends to be lower for women. Women are uniformly more likely than men to have low levels of reported financial wellbeing and less likely to have high levels. The relationship with gender is also apparent for observed financial wellbeing, but it is weaker and less uniform. Women are more likely than men to have moderately low values of observed financial wellbeing; men are more likely than women to have moderately high values; but women and men are equally likely to have extremely high or low values.

Figure 5.4 Financial wellbeing for women and men

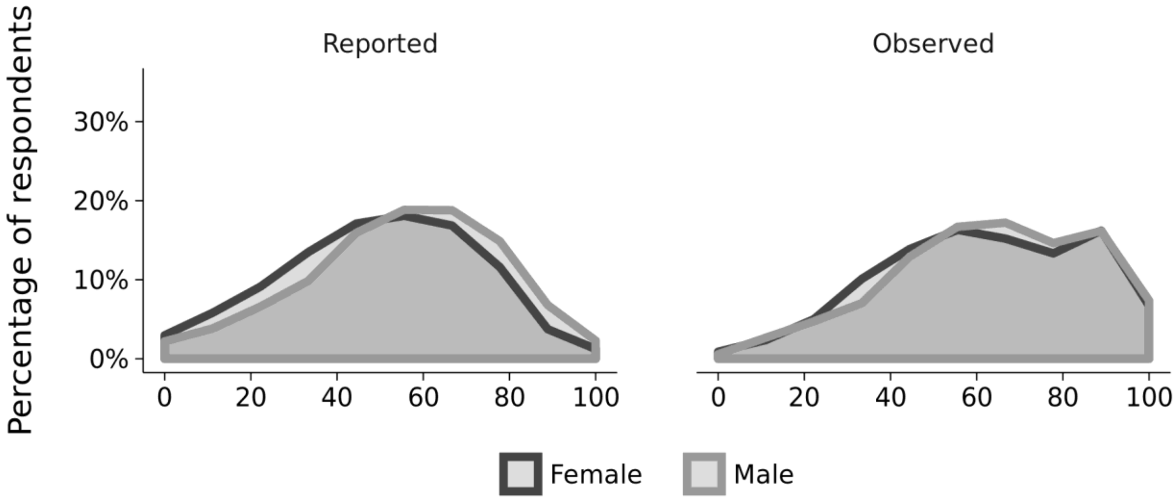


Figure 5.5 shows how the reported and observed financial wellbeing scale values differ for people who own their homes outright (without a mortgage), people who own homes but hold a mortgage, and people who do not own their homes. People who own their homes outright are uniformly more likely to have higher reported and observed financial wellbeing, while people who do not own their homes are uniformly more like to have lower reported and observed wellbeing.

Figure 5.5 Financial wellbeing by housing tenure

Figure 5.6 shows the distributions of reported and observed financial wellbeing among people who do and do not report having a long-term health condition, impairment, or disability that restricts their everyday activities. Both types of financial wellbeing are uniformly lower among people with limiting health conditions. The association is especially pronounced for reported financial wellbeing but also apparent for observed financial wellbeing.

Figure 5.6 Financial wellbeing by limiting health conditions

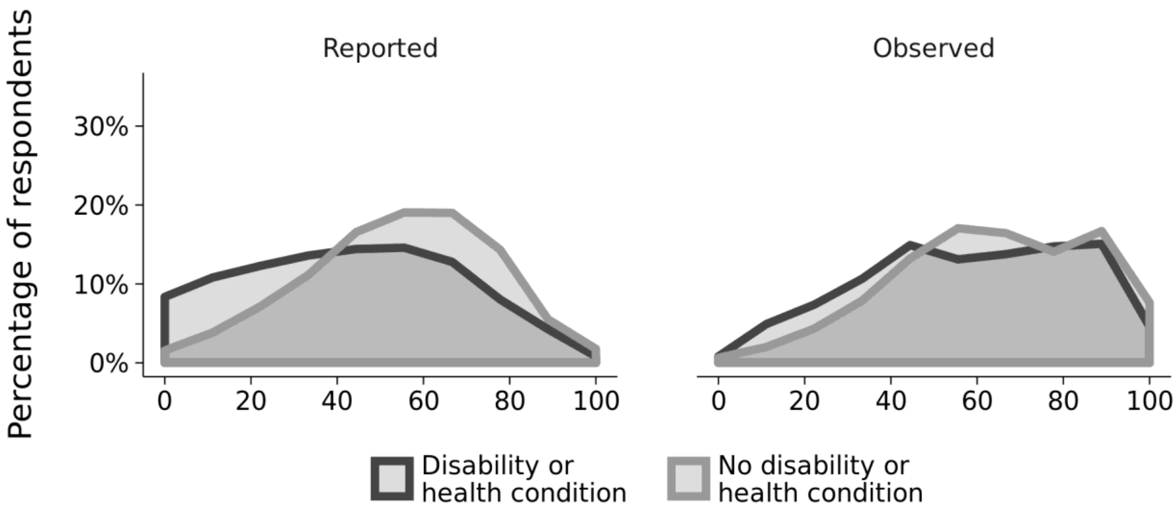
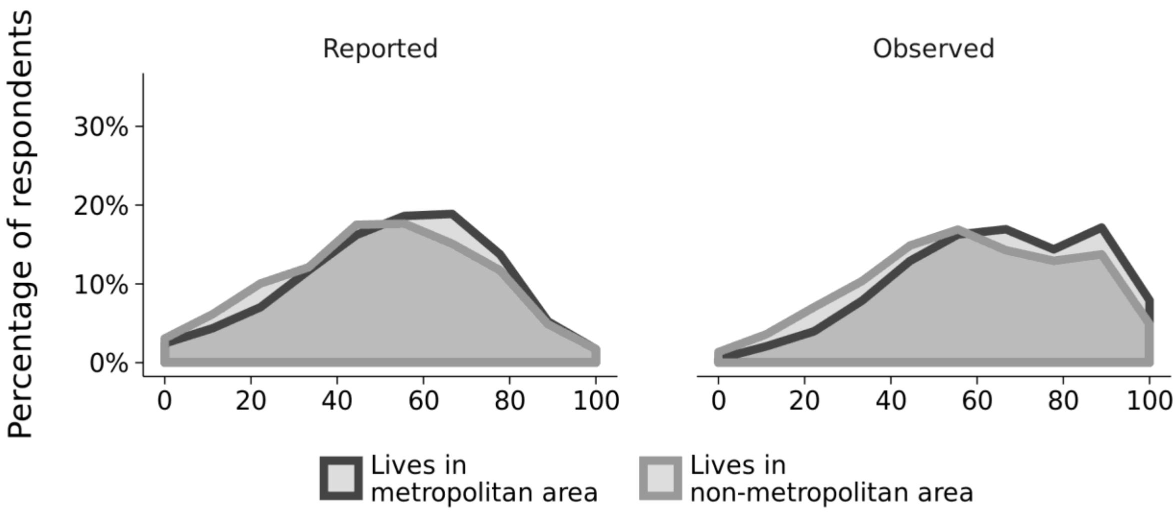


Figure 5.7 shows the distributions of reported and observed financial wellbeing for customers who live inside and outside metropolitan areas. There is a modest but uniform tendency for metropolitan residents to have better reported and observed financial wellbeing.

Figure 5.7 Financial wellbeing by metropolitan residence



The top panels of Figure 5.8 show the distributions of reported and observed financial wellbeing for customers who did and did not report experiencing a major worsening in their financial situation over the preceding year, while the bottom panels show the distributions for customers who did and did not report a major improvement in their situation. A major worsening in financial circumstances is strongly and uniformly associated with worse reported and observed financial wellbeing. Major improvements are strongly and uniformly associated with better reported financial wellbeing but not consistently associated with observed financial wellbeing.

Figure 5.8 Financial wellbeing by major changes in financial situation

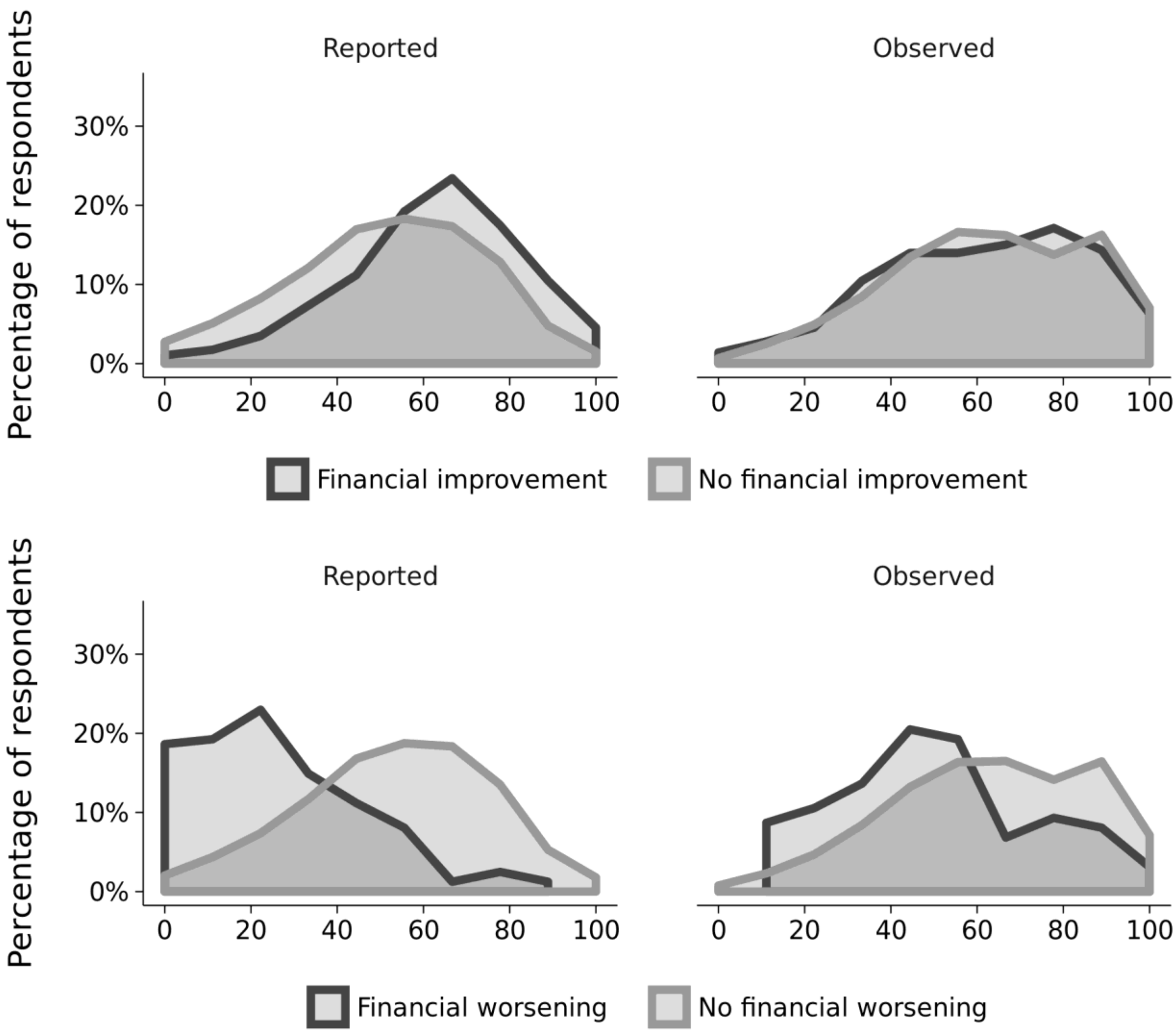
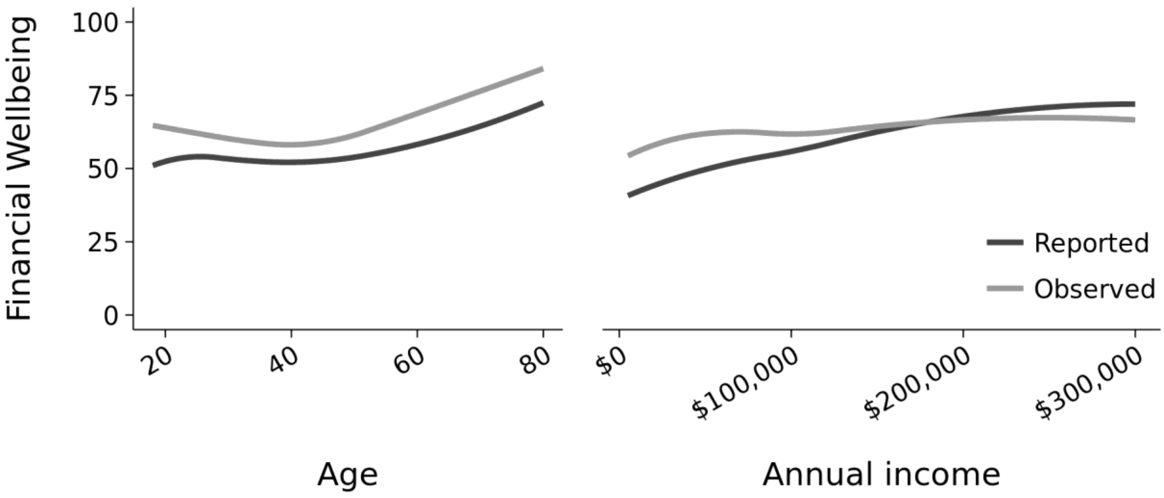


Figure 5.9 is organised in a different way than our previous figures. Figure 5.9 shows how the median values of the reported and observed financial wellbeing scales differ with people's ages (left panel) and with their annual household incomes (right panel). The graph on the left reveals that people's median reported financial wellbeing (the dark gray line) does not differ much between young adults and middle-age adults; however, after age 50, median reported financial wellbeing increases with age until people reach their 70s. In contrast, people's observed financial wellbeing (the light gray line) is negatively associated with age from people's late 20s to early 40s but increases afterwards. The age pattern in observed financial wellbeing is consistent with people acquiring more financial responsibilities and obligations early in adulthood but having fewer responsibilities and greater financial resources later in adulthood. The graph on the right reveals that people's median reported and observed financial wellbeing generally increase with income. The relationship between income and reported financial wellbeing is uniformly positive. The relationship between income and observed financial wellbeing is positive across most of the range of incomes, but weaker than for reported wellbeing.

Figure 5.9 Median financial wellbeing by age and income



The next figures also show the relationship between customers' characteristics and the median values of their reported and observed financial wellbeing. However, because the characteristics that we consider take on just a few values, we display the results using bar charts. Figure 5.10 shows how median reported (left) and observed (right) financial wellbeing differ for customers who live with a partner, live without a partner but with others, and live alone. Living with other adults usually provides access to additional resources and lowers per-person living costs; however, it can also lead to a loss of financial control. The figures indicate that people who live alone tend to have worse reported and observed financial wellbeing than people living with other adults.

Figure 5.10 Median financial wellbeing by household living arrangements

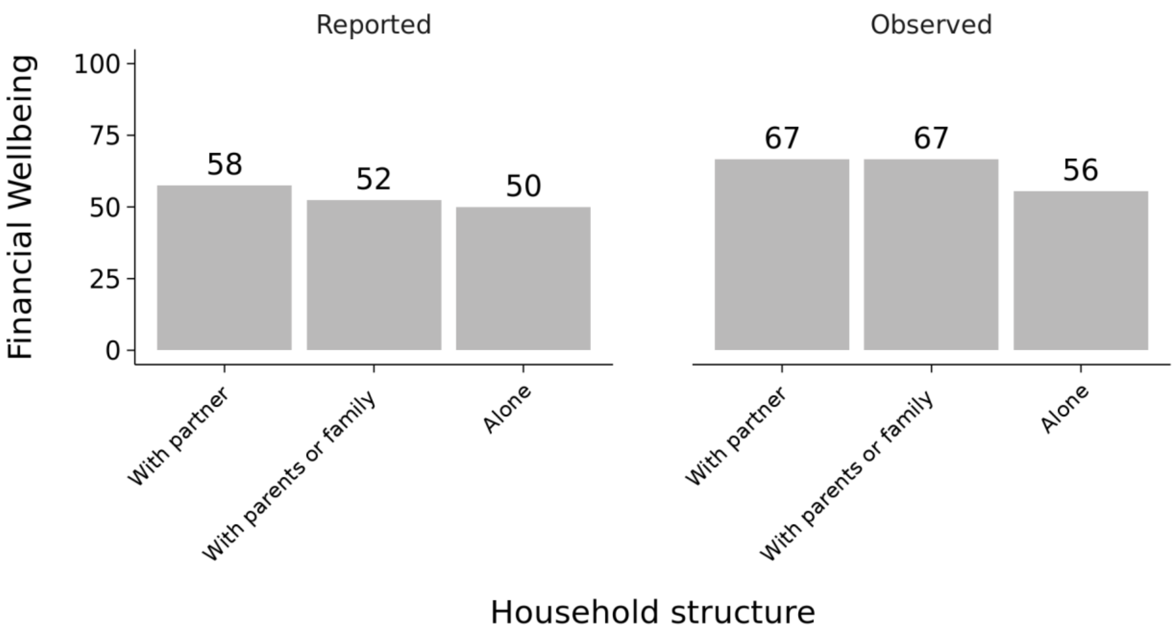


Figure 5.11 shows how median reported and observed financial wellbeing differ among people in different work situations. Customers who are retired have the highest reported and observed financial wellbeing, while customers who are out of a job but not students or carers have the worst reported wellbeing, and those with home duties have the worst observed wellbeing. The high levels of financial wellbeing among retirees is consistent with the age distributions that we considered earlier. Customers who are working have the next highest levels of observed and reported financial wellbeing. Students have lower values of reported financial wellbeing but the same levels of observed financial wellbeing as workers. Although students have low incomes, their relatively high levels of observed financial wellbeing might reflect their low levels of financial responsibilities. People who are not working because of home duties generally have low reported and observed financial wellbeing, which is consistent with their reduced incomes but greater expenses from additional dependents.

Figure 5.11 Median financial wellbeing by work status

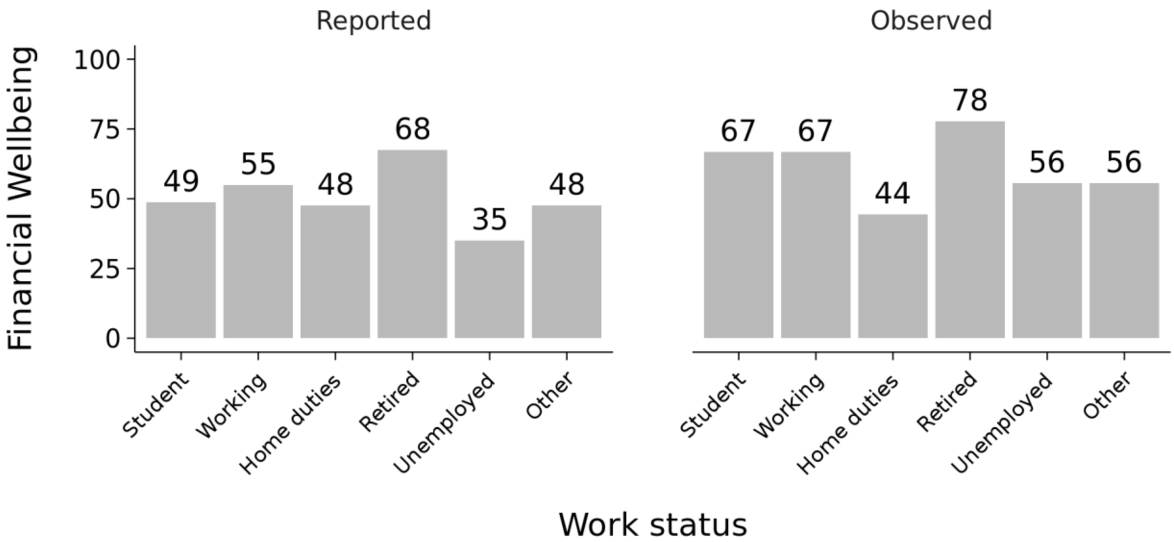


Figure 5.12 shows how median reported and observed financial wellbeing differ among people with different levels of completed schooling. People who completed nine or fewer years of school and people with Certificate I or II credentials have low levels of financial wellbeing while people who completed a bachelor's degree or more schooling have high levels of financial wellbeing. Financial wellbeing generally increases with the amount of secondary schooling and with the attainment of Certificate III or IV credentials, instead of I or II credentials.

Figure 5.12 Median financial wellbeing by completed schooling

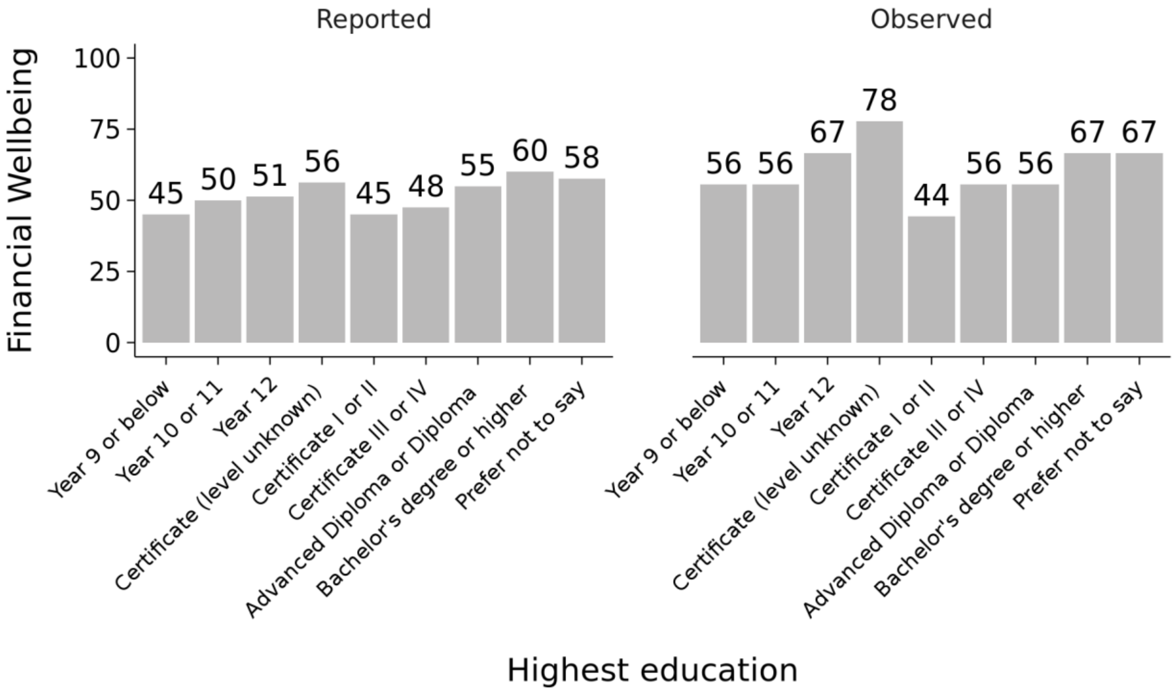


Figure 5.13 shows how median reported and observed financial wellbeing vary with customers' self-assessed overall health status. As with the results for limiting health conditions, reported financial wellbeing is worst for people who report poor overall health and best for people who report excellent health. There is a weaker positive association between observed financial wellbeing and self-assessed health status.

Figure 5.13 Median financial wellbeing by self-assessed health status

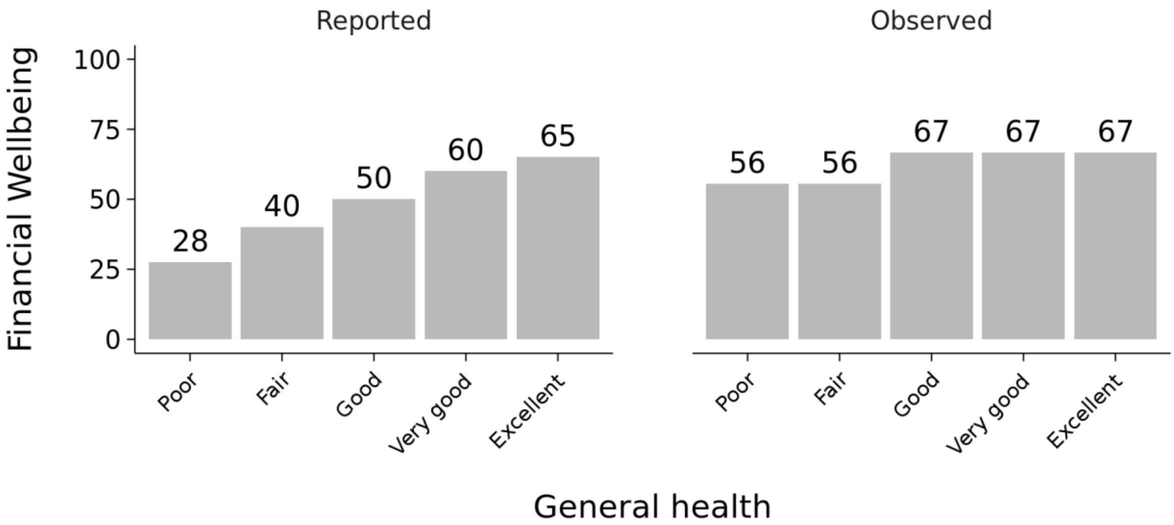
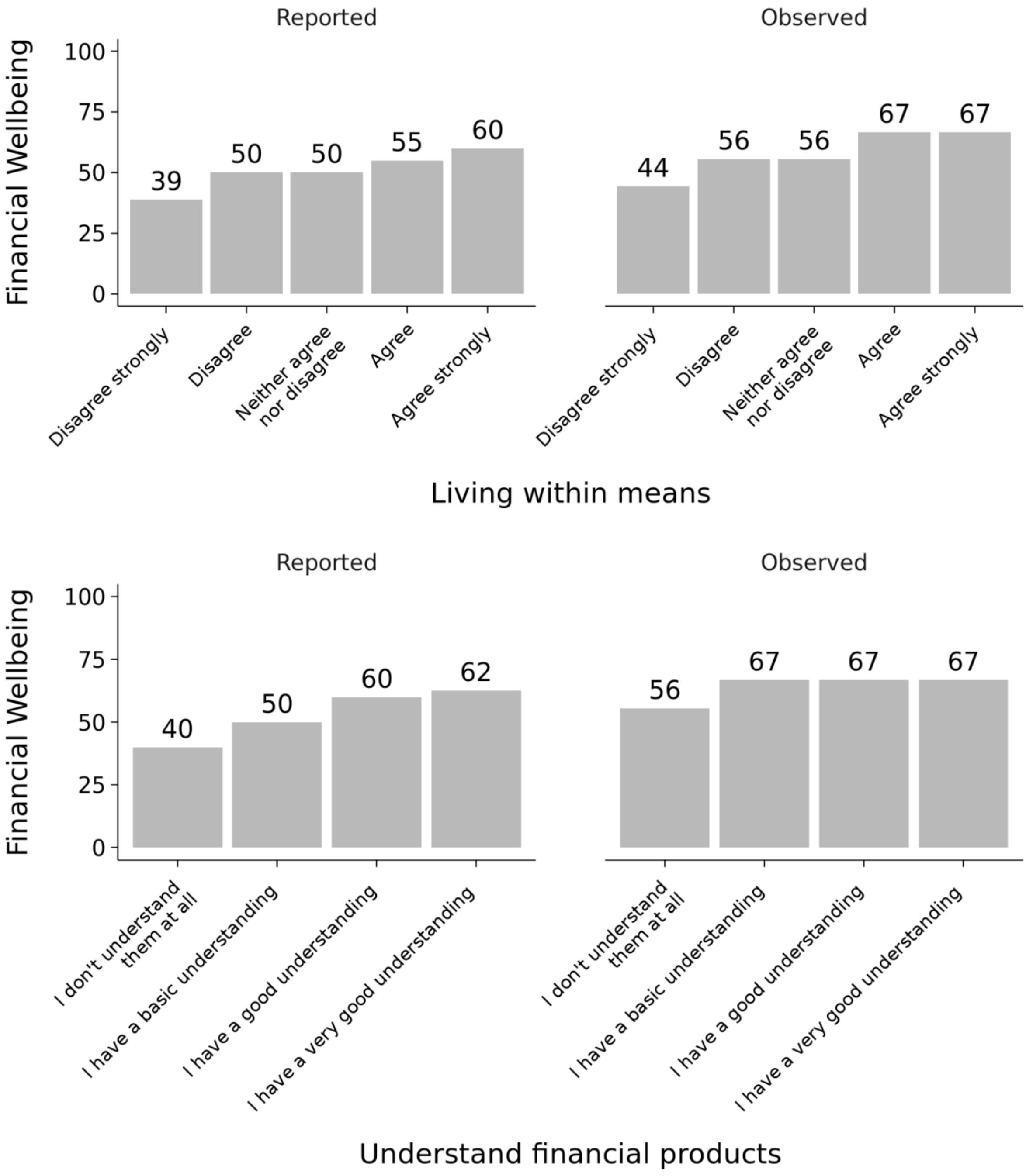
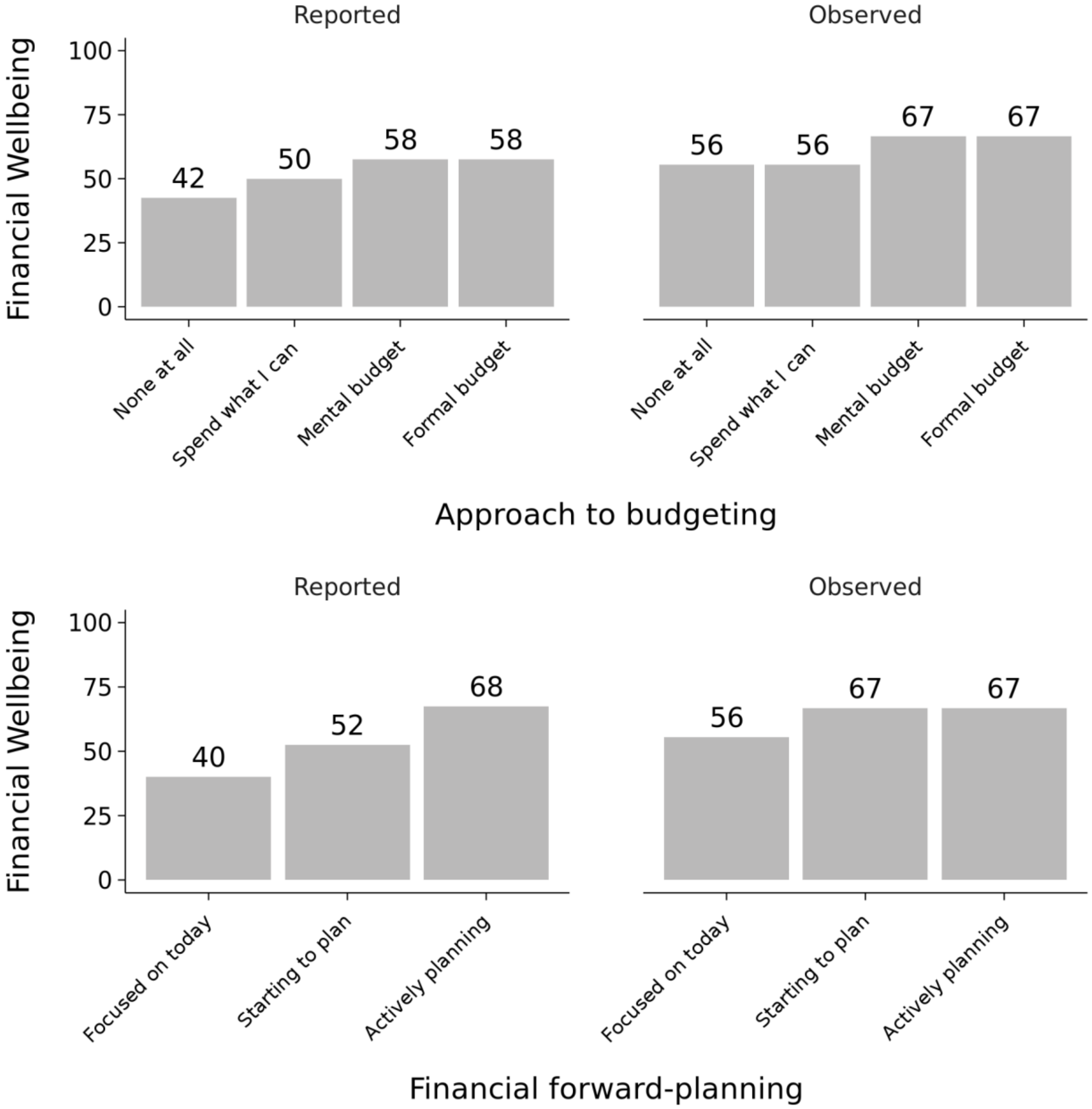


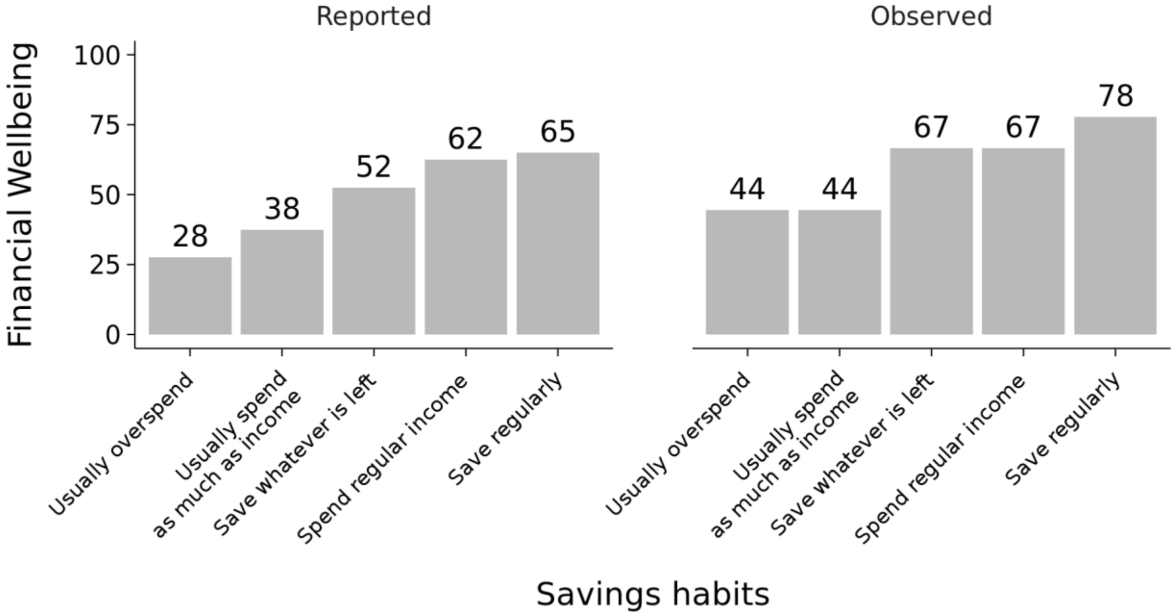
Figure 5.14 shows how median reported and observed financial wellbeing differ with several financial attitudes, capabilities, and behaviours. These include whether people prefer to live within their means and not on credit (first panel), how much they understand financial services and products (second panel), their budgeting behaviour (third panel), their planning horizons and behaviour (fourth panel), and their savings and spending habits (fifth panel). The patterns in the graphs mostly fit with expectations. People with stronger preferences for living within their means, better understanding of financial matters, better budgeting, better and longer-term planning behaviour, and more regular savings habits tend to have better reported and observed financial wellbeing, though the associations with observed financial wellbeing tend to be weaker.

Figure 5.14 Financial wellbeing by financial attitudes, capabilities and behaviours





Reported
Observed
Financial Wellbeing
100
75
50
25
0
42
50
58
58
56
56
67
67
None at all
Spend what I can
Mental budget
Formal budget
Approach to budgeting
Reported
Observed
Financial Wellbeing
40
52
68
56
67
67
Focused on today
Starting to plan
Actively planning
Financial forward-planning



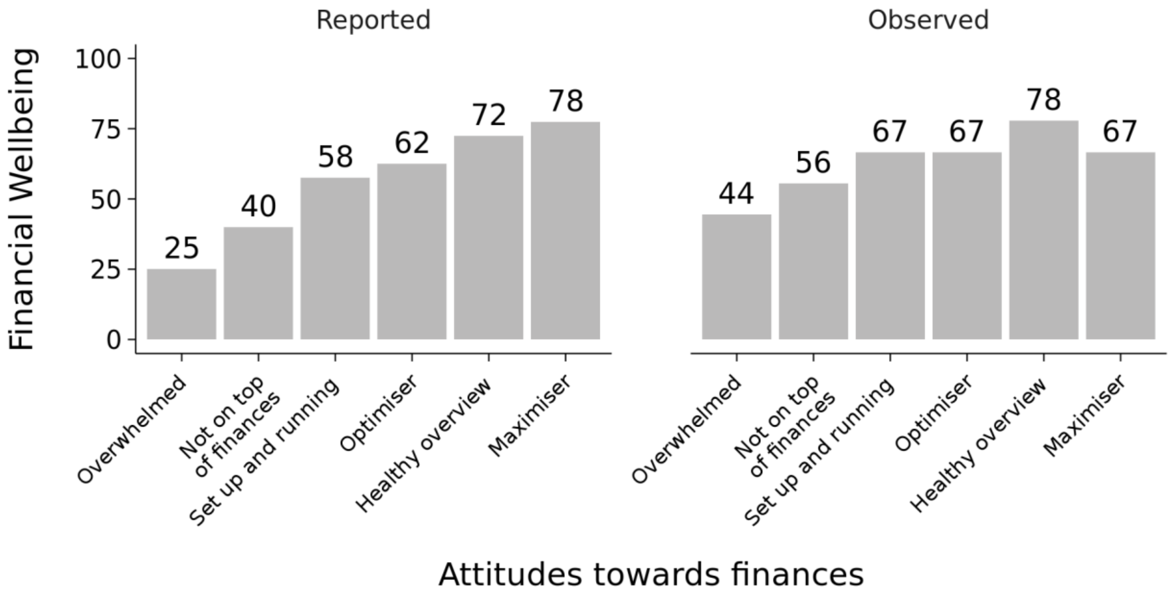
Lastly, survey respondents were presented with six short statements that described financial feelings and behaviours and were asked to pick the statement that best described them. CBA has used these statements in other research as profilers of customers' financial types. The statements and short labels for the types (the labels were not shown to the respondents) are listed below. Although the statements encompass multiple conditions, they are ordered from a bad set of descriptions to a good set of descriptions.

Statement of behavioural type	**Short label**
I find my finances overwhelming. There's not much left for me to spend after my everyday expenses are paid. I tend to avoid thinking too much about my finances as it worries me.	Overwhelmed
I'm not really on top of my finances. I tend to spend money when I have it, don't really save or stick to a budget. I don't do much research into financial matters.	Not on top of finances
My finances are all set up and running, there is probably room to optimise them but I feel that there are more important things in life to worry about. I keep a bit of a budget (usually in my head) and do a little research here and there.	Set up and running
I'm on top of my finances and enjoy managing them. I'm constantly looking at ways to optimise them and willing to put in the time and effort. I'm quite disciplined and will cut back on spending to achieve a savings goal. I keep a detailed budget and do a lot of research.	Optimiser
I have a healthy overview of my finances and am happy to get into the detail when I need to. I'm comfortable with my financial position and I have investments working for my future. I always try to have a healthy buffer in place so I can still enjoy the good things in life.	Healthy overview

I'm on top of my finances and actively maximising my wealth for the future. I manage my own portfolio and investments and it's important for my money to work hard for me. I keep a detailed budget and enjoy engaging with the details of my finances.	Maximiser

Figure 5.15 shows how median reported and observed financial wellbeing differed with the typologies. The ordering of people's reported financial wellbeing exactly follows the typologies, and the ordering of people's observed financial wellbeing mostly follows the typologies.

Figure 5.15 Median financial wellbeing by financial behaviour type



6. Conclusion

This report documents how Commonwealth Bank of Australia and the Melbourne Institute: Applied Economic and Social Research jointly developed two scales of financial wellbeing: the CBA-MI Reported Financial Wellbeing Scale and the CBA-MI Observed Financial Wellbeing Scale.

CBA-MI define people's financial wellbeing as the extent to which people both perceive and have: (1) financial outcomes in which they meet their financial obligations, (2) financial freedom to make choices that allow them to enjoy life, (3) control of their finances, and (4) financial security—now, in the future, and under possible adverse circumstances. The definition has situational/temporal dimensions, functional dimensions, and perceived and objectively observable dimensions.

The CBA-MI Reported Financial Wellbeing Scale is the empirical counterpart to the perceived situational/temporal and functional components. The scale is constructed as the sum of the responses to 10 questions, each with five possible outcomes, that ask about the elements of the definition.

The CBA-MI Observed Financial Wellbeing Scale is the empirical counterpart to the objectively observable situational/temporal and functional components. It is constructed as the sum of five financial-record measures, each with two or three possible outcomes, that are constructed from bank record data.

To develop its scales, the CBA-MI research team reviewed previous conceptualisations and measures of financial wellbeing. The team, with their research partner, FiftyFive5, fielded a large on-line survey of CBA customers' that asked many questions about customers' financial wellbeing and about their financial and personal circumstances. The team linked the survey responses to CBA customer records of people's financial positions and financial transactions and used these data to develop many novel measures of customers' observed financial wellbeing. With the combined survey and customer-record data, the team undertook preliminary data analyses and exploratory factor analyses to refine the set of candidate measures for its scales. It then estimated formal Item Response Theory models to arrive at its final scales. It also undertook confirmatory analyses of its scale procedures in independent samples and validated its scales against other measures.

A key innovation in this project is the use of linked self-reported and customer-record data to measure financial wellbeing. Although previous studies, including the CFPB (2015), Kempson et al. (2017), FiftyFive5 (2017), and Muir et al. (2017), had developed scales based on self-reported measures, no one had constructed an operational scale using bank-record data, and no one had investigated financial wellbeing using self-reported data in combination with customer records. Our analyses show that each of these data sources captures distinct, yet related, aspects of people's financial wellbeing.

Consistent with the research by the CFPB (2015), Kempson et al. (2017), Muir et al. (2017), and others, the CBA-MI Reported Financial Wellbeing Scale incorporates elements of meeting financial obligations and responsibilities, having discretional spending, being in control, and establishing financial security. Our scale has strong overlaps with the CFPB, from which it draws six items, but it is strengthened by the addition of an item from Muir et al. on necessary expenses, items from FiftyFive5 about being on top of day-to-day finances and being comfortable with net spending and savings, and a new item that we constructed about being on track to meet future financial needs. The availability of many validated and well-performing self-reported items from previous research gave us a deep pool of initial measures to test. The finding that six of the 10 items from the CFPB scale worked well among CBA's Australian bank customers should not come as much of a surprise given the extensive and rigorous testing that went into the CFPB scale items. Two of the four alternative items in the CBA-MI Reported Financial Wellbeing Scale ask about more concrete circumstances than the related CFPB items. For example, where the CFPB scale asks about 'just getting by' financially, the CBA-MI scale asks the Muir et al. question about meeting necessary expenses, complete with a list of those expenses. The CBA-MI scale also asks directly about spending relative to savings. Another difference between the CFPB and CBA-MI scales is that many more CBA-MI items are framed positively—all the CFPB items that are excluded from the CBA-MI scale are either framed negatively or ambiguously. The results from our analysis suggest that Australians respond more consistently to a scale with more concrete and objective content and more positively framed items.

Quantitative analyses show that the CBA-MI Reported Financial Wellbeing Scale discriminates between differences in wellbeing across a wide range of levels and is strongly correlated with many financial and personal characteristics of CBA customers. The correlations are in directions that we would expect based on our conceptual model. For example, reported financial wellbeing is higher for homeowners, is lower for people with health conditions, and increases with income—these associations suggest that the scale is valid.

The CBA-MI Observed Financial Wellbeing Scale is constructed from fewer measures, and the measures have less variation. The observed financial wellbeing scale discriminates more strongly between differences in wellbeing at low levels of financial wellbeing (two of its five items measure financial problems) than at high levels. It is also less strongly correlated than the reported financial wellbeing scale with CBA customers' financial and personal characteristics. Because there were almost no examples from existing research of measures of financial wellbeing from bank-record data, nearly all the measures in our scale were newly developed. We had fewer candidate measures to consider for inclusion in the scale and had less existing evidence about the likely performance of the measures. Despite these challenges, the CBA-MI Observed Financial Wellbeing Scale has strong statistical properties. The five items have high inter-item reliability. All five items performed well and were shown to discriminate between different levels of financial wellbeing in formal IRT analyses. The resulting scale correlates with characteristics identified in our conceptual model in ways that suggest that the scale is valid. Future research by the CBA-MI team will investigate ways to improve this measure. We have assigned version numbers to the scales because future improvements in the scales may lead to different versions.

The project's most important substantive finding is the distinction between reported and observed financial wellbeing. Our quantitative analyses showed that these are separate components of financial wellbeing. The two components are positively related—people with good reported financial wellbeing tend to have good observed financial wellbeing and vice versa. However, the relationship is far from perfect. As we describe in this report, about one third of the customers from our study had wellbeing that was above the median in one dimension but below the median in the other. This indicates that the way that people perceive and experience financial outcomes can be different from an outsider's objective observation of those outcomes. Having identified these divergences, future research by the CBA-MI team will work to increase our understanding the reasons for them.

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Appendix A. Description of the On-line Survey

The project's on-line survey collected self-reported measures of financial wellbeing corresponding to each of the elements in our definition of financial wellbeing. It additionally asked other financial wellbeing questions that had been included in other research and gathered demographic, socioeconomic, behavioural, attitudinal, and ecological data. This appendix describes the on-line survey instrument, including the rationale for adoption of an on-line survey, the survey sampling framework, the procedure for recruitment of respondents, and the linkage between the survey and the CBA customer financial record information.

A.1 Considerations

The survey data were collected in the form of an on-line questionnaire that could be completed by customers at any location on any device providing they had an internet connection. Telephone and direct interview survey methods were also considered. The costs associated with these alternatives were, however, significantly higher than those for an on-line survey. Furthermore, both would have required a substantially more time to achieve the desired sample size.

There were, however, potential disadvantages associated with the adoption of an on-line survey. These included: (i) biases in the respondent profile (for example, a skewing towards younger respondents); (ii) low response rates; (iii) the potential for non-compliance (deliberate or inadvertent); (iv) technology constraints; and (v) privacy.

To address the first two risks, a large number of invitations (Invitations = 300,000) were sent to targeted customers with the aim of obtaining a reasonable sample size (N=6,000). To address the third risk, extensive care was taken to ensure that the wording of the survey was clear and that respondents could complete the survey in their own time. In this respect, each customer received his or her own unique survey link to begin the survey, and the customers were allowed to close (and re-commence) the survey at any time. Finally, the University of Melbourne Human Ethics Advisory Group approved the survey and survey procedures, including its protections of privacy.

A.2 Sampling Strata

The on-line survey was limited to digitally-engaged CBA customers and drew data from three target groups (strata), resulting in a partially-overlapping stratified sampling framework. The strata were:

Stratum A: A nationally representative sample of CBA customers. Invitations were e-mailed to approximately 60,000 customers from this sample.

Stratum B: A sample of sole-MFI customers for which the bank has a relatively complete view of their financial position and behaviours. These were customers believed to undertake their banking solely through CBA and who were identified by reference to information collected through transactional data. This sample was selected to ensure that we had enough customers for whom we had a complete view of their financial data and could link their financial-record data to their survey responses to construct the financial wellbeing scales. Approximately 180,000 e-mail invitations were sent to this sample.

Stratum C: A sample of 'high-visibility' split-MFI customers for whom the CBA appeared to be the main—but not sole—banking provider but for whom CBA also had either recent product application or Financial Health Check data. This sample was selected to allow us to construct a view of the financial wellbeing of non-exclusive CBA customers, and to analyse the properties of our financial wellbeing scale and its determinants among customers for whom we have incomplete financial record information. CBA e-mailed invitations to approximately 60,000 customers from this sample.

A.3 Recruitment

The recruitment of participants and the execution of the survey were overseen by market research company FiftyFive5. Parallel Data—an on-line survey provider and sub-contractor to Fiftyfive5—was responsible for scripting and hosting the survey. To provide a social incentive and assist in the recruitment process, CBA agreed to donate $5,000 to three charity partners who support Australians in vulnerable financial circumstances. Participants' votes decided which charities received proportions of the donations.

The recruitment process was follows:

(i) The final sample pool of potential survey respondents constructed by CBA was sent an electronic survey invitation e-mail by CBA in html format (to ensure that no external organisations required access to customer names and e-mail addresses). The e-mail referenced and included a Plain Language Statement information sheet as an attachment. The recruitment e-mail and Plain Language Statement are shown in Appendix C.

(ii) Each survey invitation included a unique survey link that allowed each individual survey respondent to begin the survey, allowed them to close the survey and re-start where they left, and allowed them to be identified later by CBA for the purposes of linking the survey answers to the customers' financial records.

(iii) An initial page of the survey linked to and administered the consent document, which is shown in Appendix C; if consent was given, the first few questions of the survey included additional screeners to confirm location and final respondent age, and to ensure that no one under 18 completed the survey.

(iv) The e-mail invitations were sent in tranches over the course of several days.

(v) An e-mail reminder was sent to customers who did not respond to the initial request. For this, FiftyFive5 sent CBA the list of links for completed surveys. CBA used these links to form a list of e-mail addresses that had not responded for the purpose of sending e-mail reminders. The reminder statement is shown in Appendix C.

A.4 Description

The full survey instrument is given in Appendix B. The instrument was divided into the six sections.

The survey's first section asked demographic profiling questions about the respondent's age, gender, and geographic location.

The second asked questions about the person's perceptions and experiences with financial outcomes, including 33 questions about financial wellbeing. The wellbeing questions were selected from existing scales and analyses, including the CFPB (2015), FiftyFive5 (2017), Muir et al. (2017), and other studies. Section C also asked questions about major life events and intermediate financial behaviours.

This was followed by a third section with additional demographic and economic questions about the person's work status, household composition, household tenure, and housing payments.

The survey's fourth section focused on objective financial circumstances, including the person's banking relationships, the value of household deposits, loans, and investments. The information from this section helped to validate the identification of sole- and split-MFI customers and to help us determine the visibility of the financial records.

The fifth section focused on financial literacy, habits, attitudes, and intermediate behaviours.

The sixth section asked a final set of profiling questions about household income, other economic circumstances, household responsibilities, health, and personal background.

A.5 Linking to CBA Financial-Record Data

In addition to the self-reported data from the survey, the wellbeing scales were developed using data sourced from CBA's own financial databases. In order to derive a robust wellbeing scale, survey data were be used to validate CBA's financial data by exploring whether the self-reported measures were consistent with the evidence produced by CBA's internal datasets.

Appendix B: CommBank Financial Wellbeing Survey Instrument

August 2017

Programmer instructions:

- All responses single response unless otherwise indicated as multiple ***(MR)***
- Randomise indicated statements between respondents, _not_ within respondent
- All respondents are eligible – no termination points
- Include flat-line checks – if same code across all pop up “For this question, you cannot have the same answer for every statement, please can you re-check and revise your answers”
- Each screen needs an ‘escape hatch’ to comply with university ethics – a link that someone can click before exiting the survey that requests that the data collected be deleted

Sample and quotas:

- **Core sample frame:** All CommBank customers with email addresses available for contact. We will include both a nationally representative customer sample, along with boosts of pre-identified MFI customers for which we are confident we have a reasonably complete view of their financial and transactional objective data

Sample stream	N
Nat rep customer sample	60,000
MFI customer boost	180,000
Complete view through product application data	60,000
Total invited sample	***300,000***

Questionnaire outline:

SECTION ORDER		*KEY QUESTIONS*	*ROLE*
A1	***Profilers***	*Basic demographics*	*Profiling*
C	***Subjective financial wellbeing measures***	*Financial situation, goals, attitudes and behaviours across every day, rainy day and one day elements of financial wellbeing*	*Creation of Subjective Financial Wellbeing Index*
A2	***Further profilers***	*Snapshot of household set-up*	*Profiling*
B	***My banking and financial set-up***	*My currently financial set-up – relationships, products, snapshot of footings and CommBank share of wallet/footings. Individual vs household level and financial systems*	*Context & alignment to internal classification data*
D	***Additional subjective and stated behavioural measures***	*Known influencers, needs, attitudes, engagement and behaviour used to bring to life and understand key drivers of financial wellbeing*	*Further understanding, profiling and commercialising the index*
F	***Classification***	*Further demographic, household and socioeconomic classifiers*	*Further profiling*

Survey introduction screen

SCREEN 1:

Great, thanks for taking part!

To make life easier, if you need to complete the survey over multiple sessions you can simply close your browser and re-click on your original survey link to start back where you left off.

At the end of the survey, we'll ask you to choose which of one of the three charities that support Australians in vulnerable financial circumstances you'd like CommBank to donate to on your behalf.

Before we get started, please take a moment to read the following research consent form.

[^INSERT CONSENT STATEMENT]

I agree **[NEXT BUTTON LABEL CHANGE FOR THIS SCREEN]**

PROGRAMMER NOTE: STORE BUTTON CLICKS AS A 'SURVEY CONSENT' VARIABLE
IF NOT CLICKED, THEN SURVEY TERMINATED
.

SECTION A1: Initial profilers

SHOW INTRO AND A2A-A4 ON SAME SCREEN

Before you start the survey, we would like to ask you a few questions to make sure that we are surveying a good cross section of the community.

A2a Please type in your age? _____ *(please enter below)* ***TERMINATE IF <18***

A2b ***HIDDEN QUESTION: PLEASE CODE AGE INTO THE FOLLOWING:***

1. 18-21
2. 22-24
3. 25-29
4. 30-34
5. 35-39
6. 40-44
7. 45-49
8. 50-54
9. 55-59
10. 60-64
11. 65-69
12. 70-74
13. 75-79
14. 80+

A3 And are you…

1. Male
2. Female
3. Other <Please specify>

A4a Please type in your postcode: _______

A4b **HIDDEN QUESTION: STATE:**

1. NSW
2. VIC
3. QLD
4. WA
5. SA
6. TAS
7. ACT
8. NT

A4c **HIDDEN QUESTION: PLEASE CODE INTO METRO AND RURAL:**

1. Metro
2. Rural

SECTION C: Subjective financial wellbeing measures (and related ecological questions)

We'd now like to ask you some questions about your **financial situation** as well as about some of your **financial experiences, goals, attitudes and behaviours**. Firstly…

C3a Which, if any, of these major events that have happened in your life over the past 12 months?
Please select all that apply

PROGRAMMER: ROTATE ORDER OF CODES 1-16, ALLOW MULTIPLE RESPONSE

1. Got married
2. Separated from spouse or long-term partner
3. Got back together with spouse or long-term partner after a separation
4. Pregnancy / pregnancy of partner
5. Partner or I gave birth to, or adopted a new child
6. Serious personal injury or illness to self
7. Serious illness or death of an immediate or close family member
8. Serious illness or death of a close friend
9. Retired from the workforce
10. Fired or made redundant by an employer
11. Changed jobs (i.e., employers)
12. Promoted at work
13. Major improvement in financial situation (e.g., received an inheritance, significant bonus, etc)
14. Major worsening in financial situation (e.g., went bankrupt)
15. Changed residence

16. A weather-related disaster (e.g., flood,bushfire, cyclone)
17. None of these

C2a How **satisfied** are you with your **financial situation**?
Please pick a number between 0 and 10, where 0 means totally dissatisfied' and '10 means totally satisfied'.

Totally dissatisfied					Neutral					Totally satisfied
0	1	2	3	4	5	6	7	8	9	10

C2b Given your current needs and financial responsibilities**, would you say that you (and your family) are...**
Please select one response only

1. Prosperous
2. Very comfortable
3. Reasonably comfortable
4. Just getting along
5. Poor
6. Very poor

C4a What is your **current level of savings** (including cash, bank deposits and other formal savings like bonds and term deposits)?
Please select one response only. Please consider monthly income as the sum total of the post-tax income that you (or the main income earner in your household) generate from all sources.

1. I have no savings
2. I have savings equal to less than 1 month's income
3. I have savings equal to 1-3 month's income
4. I have savings equal to 4-6 month's income
5. I have savings equal to more than 6 month's income

C4b **What is your current level of debt?**
Please select one response only

1. More debts than I can pay back
2. Debts that I am just managing to pay back
3. Debts that I am paying back comfortably
4. Debts that I am paying back very comfortably
5. No debts

C5a **How well** do the following statements describe you or your situation?

	RANDOMISE ORDER	Not at all	Very little	Somewhat	Very well	Completely
A	I could handle a major unexpected expense	1	2	3	4	5
B	I am securing my financial future	1	2	3	4	5
C	Because of my money situation, I feel like I will never have the things I want in life	1	2	3	4	5
D	I can enjoy life because of the way I'm managing	1	2	3	4	5

	my money					
E	I am just getting by financially	1	2	3	4	5
F	I am concerned that the money I have or will save won't last	1	2	3	4	5
G	I am very organised when it comes to managing my money day to day	1	2	3	4	5
H	I do a good job of balancing my spending and savings	1	2	3	4	5
I**	I run short of money because I overspend	1	2	3	4	5
J**	I am impulsive and tend to buy things even when I can't really afford them	1	2	3	4	5
K**	I try to save money to have something to fall back on in the future	1	2	3	4	5
L**	I try to save some money regularly even if it is only a small amount	1	2	3	4	5
M**	I always make sure I have money saved for bad times	1	2	3	4	5

**Note: Statements A-F represent Statements 1-6 from CFPB Financial Well-Being Scale*
***Note: Represent key behaviours from Kempson*

C5b **How often** do the following statements apply to you?

	RANDOMISE ORDER	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**
A	Giving a gift for a wedding, birthday or other occasion would put a strain on my finances for the month	1	2	3	4	5
B	I have money left over at the end of the month	1	2	3	4	5
C	I am behind with my finances	1	2	3	4	5
D	My finances control my life	1	2	3	4	5
E	I feel optimistic and upbeat about my financial future	1	2	3	4	5
F	I am confident about meeting my expenses later in retirement	1	2	3	4	5

**Note: Statements A-D represent Statements 7-10 from CFPB Financial Well-Being Scale*

C6a In the last 12 months, **how difficult was it for you to meet your necessary cost of living expenses** like housing, electricity, water, health care, food, clothing or transport?
Please select one response only

1. Very difficult
2. Difficult
3. Neither difficult nor easy
4. Easy
5. Very easy

C6b When was the last time you bought **something special for yourself** – something that you wouldn't normally buy?
Please select one response only

1. Within the last week
2. Within the last month
3. Within the last 3 months
4. Within the last 12 months
5. More than a year ago
6. I've never bought something special for myself

C7a And when it comes to how you **think and feel about your finances**, please indicate the extent to which you agree or disagree with the following statements.

	RANDOMISE ORDER SPLIT OVER 3 SCREENS	**Disagree strongly**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Agree strongly**
A*	I am making progress towards my financial goals	1	2	3	4	5
D	I prefer to live within my means and am not comfortable living on credit	1	2	3	4	5
E**	I am willing to make sacrifices today for a secure financial future tomorrow	1	2	3	4	5
F	I find managing my finances difficult and confusing	1	2	3	4	5
G*	I feel like I will never pay off all my debt	1	2	3	4	5
H	I often put off making financial decisions	1	2	3	4	5
J*	I feel on top of my day to day finances	1	2	3	4	5
L*	I am comfortable with my current levels of spending relative to the funds I have coming in	1	2	3	4	5
M*	I am comfortable with my current levels of debt and my ability to repay it	1	2	3	4	5
N**	I am confident in my ability to manage my day to day finances	1	2	3	4	5
O*	I feel that I have enough set aside that I could manage financially if I was to lose my source of income for a period of time	1	2	3	4	5
Q**	I have some clear savings goals that I am working towards	1	2	3	4	5
S**	I regularly sit down and review my finances to ensure everything is on track	1	2	3	4	5
W*	My financial situation is largely outside of my control	1	2	3	4	5
X	My financial situation will look after itself and I don't think or worry about it	1	2	3	4	5
Z*	I am on track to have enough money for my financial needs in the future	1	2	3	4	5

** Statements flagged for use in index construction by MI*
*** Statements not flagged for use in index construction but suggested by MI to include for analysis purposes*

C7b And **how often** do you (or your household) do each of the following?

	RANDOMISE ORDER	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**
A	Save money so that you could cover major unexpected expenses or a fall in income	1	2	3	4	5
B	Use a credit card/ overdraft or borrow money to buy food or to pay expenses because you have run short of money	1	2	3	4	5
C	Borrow money to pay off debts	1	2	3	4	5
D	Overdraw on your bank account/s	1	2	3	4	5

**Note: Represent key behaviours from Kempson*

C8a In the last 12 months, did any of the following happen to you **because of a shortage of money?**

	RANDOMISE ORDER	**Yes**	**No**

A	Could not pay electricity, gas or telephone bills on time	1	2
B	Could not pay the mortgage or rent on time	1	2
C	Pawned or sold something	1	2
D	Went without meals	1	2
E	Asked for financial help from friends or family	1	2
F	Asked for help from welfare/community organisations	1	2

C9a Suppose you faced an **emergency expense** tomorrow that is **equal to one month of your income**. What statement best describes **your ability to meet this expense**?
Please select one response only

1. I could easily raise the money
2. I could raise the money, but it would involve sacrifices (such as, reduced spending, using more credit than I would like)
3. I would have to do something drastic to raise the money (such as taking out personal lending, payday lending, pawning or selling a possession, applying for additional credit, borrowing from family or friends)
4. I don't think I could raise the money

SECTION A2: Further household questions

We'd now like to ask you a few more questions about you and your household.

A5a Which of the following best describes your work status?

1. Working full time (35 hours or more per week)
2. Working part time (less than 35 hours per week)
3. Home duties
4. Semi-retired (still doing some work, but less than 35 hours per week)
5. Fully retired (not working at all)
6. Unemployed
7. Student attending school / university
8. Other (please specify)

A5b **(ASK IF WORKING FULL TIME, PART TIME OR SEMI-RETIRED, A5A=1/2/4)**
Are you happy with the amount of hours you're currently working?

1. I'd like to be working more hours
2. I'm happy with the amount of hours I'm working
3. I'd like to be working less hours

A6a Which of the following best describes your household?

1. Live alone
2. Live with a partner (married or de facto)
3. Living with parents
4. Living with partner (married or de facto) and parents
5. Living with other family members

6. Living with flatmates or friends

A6b And do you have any **dependent children** of any age?
That is, that you support financially.

1. Yes, living in my household (please type in how many ______)
2. Yes, living in another household (please type in how many ______)
3. No

A6c **(ASK IF A6B=1/2)** Which of the following age groups do your dependent children fall?
Please select all that apply. ***MR***

1. 0-2 years
2. 3-5 years
3. 6-11 years
4. 12-14 years
5. 15-18 years
6. Over 18 years

A6d At present, how many people in total live in your household?
Please type a number into the box below.
[INSERT TEXT BOX]

A7a Where you live, do you…?

1. Live at home or elsewhere without paying rent or board
2. Rent
3. Own your home with a mortgage
4. Own your home outright (no mortgage)
5. Other (please specify)

A7b **(ASK IF RENTING OF PAYING MORTGAGE, A7A=2/3, OTHERWISE SKIP AND AUTOFILL CODE 5)**
Which of the below statements best describes you/ your family's [**^INSERT IF A7A=2** "rent", **IF A7A=3** "mortgage"] payments?
Please select one response only

1. I am behind on my payments
2. I am just managing to make my payments
3. I am managing to make my payments but with some strain on my budget
4. I make my payments comfortably
5. I don't have any payments

SECTION B: My banking and financial set-up

We'd now like to ask you some questions about **your current banking and how you go about managing your personal and household finances.** To start with…

B1a Which of these banks or financial institutions do you hold personal **banking** products or accounts with? ***(MR)***
Please select all that apply.

B1b **In total, how many different** banks in total do you hold personal banking products or accounts with?

1. One bank only
2. Two banks
3. Three banks
4. Four banks
5. Five or more banks

B1c And which do you consider to be your **main** financial institution?
By main financial institution we are referring to the bank where you hold the account/s that you mainly use for your day to banking and transactions.
SHOW SELECTED AT B1a

	ROTATE ORDER OF BRANDS	***B1a HOLD PRODUCTS***	***B1c. MFI***
A	AMP	1	1
B	ANZ	2	2
C	Bank of Melbourne	3	3
D	Bank of Queensland	4	4
E	Bank SA	5	5
F	Bankwest	6	6
G	Bendigo Bank	7	7
H	Citibank	8	8
I	Commonwealth Bank	9	9
J	HSBC	10	10
K	ING	11	11
L	Macquarie Bank	12	12
M	NAB	13	13
N	RAMs	14	14
O	St.George	15	15
P	Suncorp	16	16
Q	Westpac	17	17
R	A Building Society (please specify)	18	18
S	A Credit Union (please specify)	19	19
T	An industry superfund	20	20
U	Other (please specify)	21	21
V	Unsure	99	NA

B1d Thinking about the **transactional banking in your household** (eg. paying bills and day to day spending), how much is **done through your main financial institution**, from accounts held in your name?

1. All of it
2. Most of it
3. Some of it
4. Very little of it
5. None of it

B2a Which of the following banking, investment or insurance products or services do you **currently** have or use? ***(MR)***
Please select all that apply.

1. Everyday transaction account (with EFTPOS or Debit Card)
2. Savings account
3. Term deposit
4. Credit card
5. Personal loan/car loan
6. Home loan/ mortgage for a home you live in
7. Home loan/ mortgage for an investment property
8. A mortgage offset account (that offsets mortgage interest with your deposits/savings)
9. Investment or margin loan (for investing in shares)
10. Managed funds or share portfolio (outside of superannuation)
11. Home & contents insurance
12. Car insurance
13. Life insurance (life, trauma/TPD, income)
14. Annuities/ allocated pensions (outside of superannuation)

B2b And which of the following financial institutions do you hold the following products and services with?
Please select all that apply

	<DOWN THE SIDE> ***INSERT SPECIFIC 'BANKING' PRODUCTS SELECTED AT B2A.***	***<ACROSS THE TOP>*** ***INSERT BRANDS SELECTED AT B1A*** ***PROGRAMMER TO INCLUDE 'OTHER'***									

B3 Using the table below, please provide your **best estimate of the total value you hold** in each of the following…

	B3a. YOUR CURRENT BANK DEPOSITS (transaction account, savings, term deposits) [SHOW ALL]	***B3b. YOUR CREDIT CARDS OR PERSONAL LOANS [SHOW IF B2A=4/5]***	***B3c. YOUR MORTGAGES OR INVESTMENT LOANS (values still owing on all loans) [SHOW IF B2A=6/8]***	***B3d. YOUR MORTGAGE OFFSET OR REDRAW [SHOW IF B2A=6/7]***	***B3e. YOUR LIFE INSURANCE COVERAGE [SHOW IF B2A=12]***	***B3f. YOUR INVESTMENT PORTFOLIO [ONLY SHOW IF B2A=7/10]***	***B4g. YOUR SUPER-ANNUATION [SHOW ALL]***
Less than $1,000	1	1	1	1	1	1	1
$1,000 - $1,999	2	2	2	2	2	2	2
$2,000 – $4,999	3	3	3	3	3	3	3
$5,000 - $9,999	4	4	4	4	4	4	4
$10,000 - $14,999	5	5	5	5	5	5	5
$15,000 - $19,999	6	6	6	6	6	6	6
$20,000 - $49,999	7	7	7	7	7	7	7
$50,000 - $99,999	8	8	8	8	8	8	8
$100,000 - $199,999	9	9	9	9	9	9	9
$200,000 - $299,999	10	10	10	10	10	10	10
$300,000 - $399,999	11	11	11	11	11	11	11
$400,000 - $499,999	12	12	12	12	12	12	12
$500,000 - $599,999	13	13	13	13	13	13	13

$600,000 - $699,999	14	14	14	14	14	14	14
$700,000 - $799,999	15	15	15	15	15	15	15
$800,000 - $999,999	16	16	16	16	16	16	16
$1,000,000 - $1,499,999	17	17	17	17	17	17	17
$1,500,000 - $1,999,999	18	18	18	18	18	18	18
$2,000,000 - $2,499,999	19	19	19	19	19	19	19
$2,500,000 - $2,999,999	20	20	20	20	20	20	20
$3,000,000 or more	*21*	*21*	*21*	*21*	*21*	*21*	*21*
Unsure (please attempt to provide best guess before selecting this)	*22*	*22*	*22*	*22*	*22*	*22*	*22*
I do not wish to answer this question	*23*	*23*	*23*	*23*	*23*	*23*	*23*
I don't have this	*24*	*24*	*24*	*24*	*24*	*24*	*24*

B4a **(ASK IF RENT OR PAY A MORTGAGE, A7A=2/3)** You mentioned you [**^INSERT IF A7A=2** "rent", **IF A7A=3** "have a mortgage". How much are your [**^INSERT IF A7A=2** "**rental payments**", **IF A7A=3** "**mortgage payments**"] each month?
SHOW IF RENT (A7A=2) AND HOUSE SHARE (A6A=5/6) If you share housing/boarding please only select the amount that you are contributing to the total.

1. Less than $500
2. $500-999
3. $1,000-1,499
4. $1,500-1,999
5. $2,000-2,499
6. $2,500-2,999
7. $3,000-3,499
8. $3,500-3,999
9. $4,000-4,499
10. $4,500-4,999
11. $5,000-5,499
12. $5,500-5,999
13. $6,000-6,499
14. $6,500-$6,999
15. $7,000 or more

B5b Which of the following best describes who in your household does the following?

	RANDOMISE ORDER	**Always me**	**Usually me**	**Shared equally between myself and another in household**	**Usually another in household**	**Always another in household**	**Always/ usually someone not living in my household (eg. relative)**
A	Paying bills and managing day to day spending	1	2	3	4	5	6
B	Managing large household purchases (eg. major appliances, cars, etc)	1	2	3	4	5	6
C	Savings, investments and borrowings	1	2	3	4	5	6

B5c **(ASK IF LIVE WITH PARTNER, A6A=2/4)** Which of the following best describes how your banking and finances are structured in your household?

1. All joint accounts
2. A mix of joint accounts and personal/individual accounts
3. All accounts held individually

SECTION D: Additional subjective and stated behavioural measures (incl. CSI ecological questions)

D1a How much understanding do you have about financial services and products?

1. I have a very good understanding
2. I have a good understanding
3. I have a basic understanding
4. I don't understand them at all

D1b Which of the following statements best describes you in relation to your finances?

1. I'm primarily focussed on my finances today and haven't put much thought into planning for my financial future
2. I'm starting to think about planning for my financial future but have not yet taken active steps towards this
3. I am actively planning for my financial future

D2a Which of the following best describes your **current approach to budgeting**?
Please select one response only.

1. I have a formal budget that's documented (e.g. spreadsheet, book or online tool) that calculates my outgoing expenses and the amount of money I need to allocate each week or month
2. I have a 'mental' budget – no documentation or spreadsheets, but I still keep track of my finances and spending
3. I don't really work to a budget – I just spend what I think I can afford at the time
4. I don't work to a budget at all

D2b Which of the following statements comes closest to describing your (and your family's) **savings habits**?
Please select one response only

1. Don't save: usually spend more than income
2. Don't save: usually spend about as much as income
3. Save whatever is left over at the end of the month – no regular plan
4. Spend regular income, save other income
5. Save regularly by putting money aside each month

D2c **(SHOW IF HAVE A CREDIT CARD, B2A=4)** Which of the following best describes how you manage your **credit card payments**?

1. I **always pay** my credit card/s off at the end of each month
2. I **try to pay** my credit card/s off at the end of each month
3. I **sometimes** pay my credit card/s off at the end of each month
4. I **tend to carry** credit card debt over each month

5. I **always carry** credit card debt over each month

D3a Below are six different statements describing how people feel and behave with their finances. Which **one** of these statements do you feel best describes you when it comes to your finances?

PROGRAMMER: SHOW SLIDE RULE ACROSS TOP. DON'T SHOW CODES OR LABELS – ONLY STATEMENT DESCRIPTIONS

1 Struggling Survivor	2 Impulsive Survivor	3 Coaster	4 Optimiser	5 Overseer	6 Maximiser
I find my finances overwhelming. There's not much left for me to spend after my everyday expenses are paid. I tend to avoid thinking too much about my finances as it worries me.	I'm not really on top of my finances. I tend to spend money when I have it, don't really save or stick to a budget. I don't do much research into financial matters.	My finances are all set up and running, there is probably room to optimise them but I feel that there are more important things in life to worry about. I keep a bit of a budget (usually in my head) and do a little research here and there.	I'm on top of my finances and enjoy managing them. I'm constantly looking at ways to optimise them and willing to put in the time and effort. I'm quite disciplined and will cut back on spending to achieve a savings goal. I keep a detailed budget and do a lot of research.	I have a healthy overview of my finances and am happy to get into the detail when I need to. I'm comfortable with my financial position and I have investments working for my future. I always try to have a healthy buffer in place so I can still enjoy the good things in life.	I'm on top of my finances and actively maximising my wealth for the future. I manage my own portfolio and investments and it's important for my money to work hard for me. I keep a detailed budget and enjoy engaging with the details of my finances.

SECTION F: Classification

Last, a few final questions about you and your household.

F1a In which of the following broad groups does your total (pre-tax) **household annual** income fall?
(IF RETIREE (A5A=4/5): *Please include the value of any allocated pensions or annuities here.*
SHOW CODEFRAME

1. Under $10,000 per year (under $385 per fortnight)
2. $10,000 to $19,999 per year ($385 to $769 per fortnight)
3. $20,000 to $29,999 per year ($770 to $1,154 per fortnight)
4. $30,000 to $39,999 per year ($1,155 to $1,538 per fortnight)
5. $40,000 to $49,999 per year ($1,539 to $1,923 per fortnight)
6. $50,000 to $59,999 per year ($1,924 to $2,308 per fortnight)
7. $60,000 to $69,999 per year ($2,309 to $2,692 per fortnight)
8. $70,000 to $79,999 per year ($2,693 to $3,077 per fortnight)
9. $80,000 to $89,999 per year ($3,078 to $3,462 per fortnight)
10. $90,000 to $99,999 per year ($3,463 to $3,846 per fortnight)
11. $100,000 to $109,999 per year ($3,847 to $4,231 per fortnight)
12. $110,000 to $119,999 per year ($4,232 to $4,615 per fortnight)
13. $120,000 to $129,999 per year ($4,616 to $5,000 per fortnight)
14. $130,000 to $139,999 per year ($5,001 to $5,385 per fortnight)
15. $140,000 to $149,999 per year ($5,386 to $5,769 per fortnight)
16. $150,000 to $199,999 per year ($5,770 to $7,692 per fortnight)
17. $200,000 to $249,999 per year ($7,693 to $9,615 per fortnight)
18. $250,000 or more per year ($9,616 or more per fortnight)
19. Prefer not to say

F1b Do you own a business, either solely or in partnership with others?

1. Yes
2. No

F1c **(ASK IF F1B=1, OTHERWISE SKIP AND AUTOFILL AS CODE 1 "PERSONAL ONLY")**
Are the accounts you hold with CommBank used for…

1. Personal banking only
2. A mix of personal and business banking
3. Business banking only

F1d Which of the below best describes your income?

1. I earn a **fixed salary** (ie. a regular amount each week, fortnight, month, etc)
2. I earn a **wage** (ie. paid by the hour or day) but it is **largely consistent** from month to month
3. I earn a **wage** (ie. paid by the hour or day) and it **varies considerably** from month to month
4. I earn **varied amounts** from month-to-month based on sale of goods or services, project-based work, casual work contracts, etc
5. I am on a **fixed pension**
6. I own/run a business **(SHOW IF F1B=1)**
7. I do not earn an income

F1e And do you have any other sources of income?
Please select all that apply. ***MR***

1. Income generated by others (partner, parent, child, etc) that contributes to the running of the household
2. Property investment returns (eg. rental yields)
3. Non-property investment returns (eg. interest, dividends, etc)
4. Work bonuses
5. I own/run a business **(SHOW IF F1B=1)**
6. Other (please specify)

F3a Which of the following best describes your current situation?

1. Single
2. Married
3. De facto / living with a partner
4. Widowed
5. Divorced
6. Separated
99. Prefer not to say

F3b What is the highest level of education that you have **already** completed?
If you were educated in a country other than Australia, please choose the closest option from the list

1. Year 9 or below
2. Year 10 or 11
3. Year 12
4. Certificate (level unknown)
5. Certificate I or II
6. Certificate III or IV
7. Advanced Diploma or Diploma
8. Bachelor's degree or higher

99. Prefer not to say

F4a Over the past 30 days, about how often did you feel…

	RANDOMISE ORDER	All of the time	Most of the time	Some of the time	A little of the time	None of the time	Don't know
A	Nervous	1	2	3	4	5	99
B	Hopeless	1	2	3	4	5	99
C	Restless or fidgety	1	2	3	4	5	99
D	So depressed that nothing could cheer you up	1	2	3	4	5	99
E	That everything was an effort	1	2	3	4	5	99
F	Worthless	1	2	3	4	5	99

F4b Over the past 12 months, how would you describe your level of contact with social connections? Social connections refer to **connections with family, friends, work colleagues, neighbours or clubs**.

1. I am isolated or alone most of the time
2. I have occasional contact
3. I have regular contact with more distant social connections
4. I have regular contact with close connections

98. Don't know

F4c How likely are you to get financial support from your social connections (family, friends, work colleagues, neighbours, clubs etc.) in times of crisis?

1. Always/Very Likely
2. Fairly likely
3. Unsure
4. Fairly unlikely
5. Never/Very unlikely

F4d How much support have you had from community or government organisations to help with your financial situation over the past 12 months?

1. I did not need any community or Government support
2. I've needed support, but I had no access to it
3. I receive emergency support services (e.g. food-banks or vouchers)
4. I receive specialised support services (e.g. meals on wheels, financial counselling, no interest loan, homecare services)
5. I used their support occasionally, but I was not reliant on them

F5a In the last two weeks did you spend time providing unpaid care, help or assistance to family members or others because of a disability, a long term illness or problems related to old age?

1. Yes
2. No

IF NO TA F5a SKIP F5b

F5b To what extent do you feel that the unpaid work you provided in the last week has impacted your ability to work and earn an income?

1. Impacted a lot
2. Impacted a little
3. Did not impact much
4. Not impacted at all

F5c Do you have any long-term health condition, impairment or disability that restricts you in your everyday activities, and has lasted or is likely to last, for 6 months or more?

1. Yes
2. No

IF YES SELECTED AT F5C ASK F5D

F5d To what extent does your disability affect your ability to work?

1. Impacts a lot
2. Impacts a little
3. Does not impact much
4. No impact at all

F6a In general, would you say your health is:

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

F6b Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them.

Please use this scale where 1 means "no choice at all" and 10 means "a great deal of choice" to indicate how much freedom of choice and control you feel you have over the way your life turns out.

No choice at all					Neutral					A great deal of choice
0	1	2	3	4	5	6	7	8	9	10

F7a What country were you born in?
Please select the one that best applies

1. Australia
2. New Zealand
3. Pacific Islands
4. UK
5. Europe
6. North America or Canada
7. South America
8. China
9. Japan
10. Another Asian country (eg. Vietnam, Thailand, Korea)
11. India, Pakistan, Bangladesh or Sri Lanka
12. A Middle Eastern country (e.g. Lebanon, Turkey, Iraq)
13. Africa
14. Other (please specify)

F7b And around how many years have you lived in Australia?
ASK IF NOT BORN IN AUSTRALIA - CODE 2-98 F7A [INSERT TYPE IN BOX]
PROGRAMMER NOTE: YEARS MUST BE LESS THAN AGE PROVIDED AT A2A

F8a Finally, which of the below three charities would you like us to donate to on your behalf?
CommBank will donate $1,000 for every 500 completed surveys up to a total of $5,000. We will distribute the final donation across the three charities based on the final responses to this question. All of these charities are currently supported by CommBank.

RANDOMISE ORDER CHARITIES ARE SHOWN

1. **Domestic Violence NSW** – Commbank have worked with them to develop the Addressing Financial Abuse Guide
2. **AIME (Australian Indigenous Mentoring Experience)** – Commbank have developed a financial capability workbook for indigenous youth and their mentors
3. **St Vincent de Paul NSW** – CommBank are working with this charity on a financial capability module to support community workers with financially vulnerable clients

That's the end of our survey. Thanks for your time.
If you have any specific feedback about this survey, please type it into the box below.

Appendix C: Recruiting E-mails and Participant Information Statements

Invitation e-mail

Help us understand.

CommonwealthBank

Dear <Name>,

We believe that we have an important role to play in helping Australians improve their financial wellbeing. That's why we've partnered with researchers at the University of Melbourne to understand and measure the financial wellbeing of Australians.

We'd value your input and would like to invite you to answer a few survey questions, which should take around **15-20 minutes** to complete. To thank you for your time, we'll make a donation to 3 charity partners who support Australians in vulnerable financial circumstances, up to a total of $5,000. You'll be able to choose the charity by voting at the end of the survey.

Participation in this research is voluntary and responses will remain completely confidential.

Attached to this email is an information statement, describing the research and how we will use and protect your data. We encourage you to read and keep the statement in case you have questions or concerns about the research.

If you'd like to take part in shaping the future of financial wellbeing for Australians, click on the link to start.

Start now

Yours sincerely,
The CommBank Team.

Your privacy is important to us - please be assured we have not provided your personal details to any third parties. We will never send an email that asks you to provide your log in or password details.

This survey will expire on **Friday 11th August.**

About the Survey
Participation in this study is voluntary and your responses will remain confidential. We'll link your survey responses to information we have about how you use our products and services. This will help the University of Melbourne gain a more complete understanding of how different financial behaviours contribute to financial wellbeing.

Your confidentiality and privacy will be protected and the information will be used for research purposes only. At no point will our research partners have access to any of your personal information, and how you respond to the survey will have no impact on your current or future relationship with us or on any products or services that you use now or in the future. This research is only about gaining a better understanding financial wellbeing.

The survey will be conducted by independent survey company FiftyFive5 for market research purposes only. No personal information will be shared with FiftyFive5. Should you wish to check the bona fides of this research company, the Australian Market & Social Research Society can be contacted on 1300 364830.

View the CBA Privacy Policy

View FiftyFive5's Privacy Policy

If you wish to be removed from this survey please click here.

If you have any technical problems with the survey you can email our survey partners at surveysupport@fiftyfive5.com.

If you have any questions or comments about this research, or no longer wish to receive email invitations to take part in Commonwealth Bank surveys, please contact Commonwealth Bank directly at cba_research@cba.com.au

Reminder e-mail

Help us understand.

CommonwealthBank

Dear <Name>,

There's still time to share your input before the survey closes on **Friday 11th August.**

Your responses to the survey will help us and researchers at the University of Melbourne understand and measure the financial wellbeing of Australians.

The survey should take around **15-20 minutes** to complete.

To thank you for your time, we'll make a donation to 3 charity partners who support Australians in vulnerable financial circumstances, up to a total of $5,000. You'll be able to choose the charity by voting at the end of the survey.

Participation in this research is voluntary and responses will remain completely confidential.

Attached to this email is an information statement, describing the research and how we will use and protect your data. We encourage you to read and keep the statement in case you have questions or concerns about the research.

To begin the survey click the link below or copy and paste the link below into your browser.

Start now

Yours sincerely,
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Your confidentiality and privacy will be protected and the information will be used for research purposes only. At no point will our research partners have access to any of your personal information, and how you respond to the survey will have no impact on your current or future relationship with us or on any products or services that you use now or in the future. This research is only about gaining a better understanding financial wellbeing.

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Plain Language Statement and Consent Form

THE UNIVERSITY OF MELBOURNE

Plain Language Statement
Measuring Financial Well-Being

Introduction

You are invited to complete a survey on financial well-being as part of a research project. The survey should take no longer than 15-20 minutes in total. The research is carried out by the Melbourne Institute of Applied Economic and Social Research at the University of Melbourne (UoM) and the Commonwealth Bank of Australia (CBA). Your participation is voluntary and you are free to withdraw from the survey at any time and ask for unprocessed data to be deleted.

How will my confidentiality be protected?

With your agreement, the researchers involved in this project will link the answers you provide in the survey with information about the products and services that you use from CBA. This allows us to gain a more complete understanding of how different factors contribute to financial well-being. The information will be used by researchers at the University of Melbourne and at CBA; it will be used only for research purposes and will have no impact on your current or future relationship with the CBA or on any products or services that you are currently using or may choose to use in the future. The processed data will remain confidential, non-identifiable and securely stored by researchers. Anonymous results from the research may be published in academic journals and presented at conferences. The non-identifiable data will be retained for five years from the last publication so that other researchers may review the accuracy and consistency of the analysis in the future upon request.

Who can I contact if I have any concerns about the project?

This research project has been approved by the Human Research Ethics Committee of The University of Melbourne. If you have any concerns or complaints about the conduct of this research project, which you do not wish to discuss with the research team, you should contact the Manager, Human Research Ethics, Research Ethics and Integrity, University of Melbourne, VIC 3010. Tel: +61 3 8344 2073 or Email: humanethics-complaints@unimelb.edu.au. All complaints will be treated confidentially. In any correspondence please provide the name of the research team or the name or ethics ID number of the research project.

Investigators

Principal Investigator:
Prof. David Ribar (Melbourne Institute) email: Financial-Wellbeing@unimelb.edu.au, tel: +61 3 8344 8309
UoM Co-Investigators: Carole Comerton-Forde (Department of Finance), Edwin Ip (Department of Economics), Carsten Murawski (Department of Finance), Nicolas Salamanca (Melbourne Institute), Sam Tsiaplias (Melbourne Institute), Roger Wilkins (Melbourne Institute)
CBA Co-Investigators: Ben Grauer (Financial Well-being)

FHEAC No: 1749750
Date: 26 July 2017

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THE UNIVERSITY OF MELBOURNE

Consent Form
Project Title: Measuring Financial Well-Being

This is a project designed to help understand the financial well-being of Australians. My participation is completely voluntary. If, prior to processing the data, I do not wish for my data to be included in the project, I may request to have my responses withdrawn from the data set.

With my permission, the researchers in this project would like to link my survey answers to information on the products and services that I use from Commonwealth Bank. I understand that this is entirely for research purposes and will not affect my current or future relationships or standing with the Commonwealth Bank. I also understand that confidentiality of data will be preserved subject to any legal requirements and my data will become non-identifiable upon processing.

If I have any questions about this research project, I can contact its principal researcher Prof. David Ribar (email: Financial-Wellbeing@unimelb.edu.au, tel: 03 8344 8309) from the Melbourne Institute. If I have any concerns about the treatment of research participants, I can contact the Human Research Ethics Committee at The University of Melbourne (Phone: 03 8344 2073 or Fax: 03 9347 6739).

By clicking "I agree", I declare myself fully informed and I agree to participate on a purely voluntary basis.

Appendix D. Quantitative Analysis

D.1 Data Preparation and Linkage

To develop the scales, we first prepared an analysis data set that linked customers' self-reported financial wellbeing measures from the on-line survey with observable measures constructed from financial records. We initially prepared an analysis file that linked survey and financial-record data for the sole-MFI customers from the survey. Sole-MFI customers were an initial focus because CBA has the best visibility of their objective financial circumstances. We also prepared an analysis file that linked all MFI customers in the survey, including split-MFI customers; this second analysis data set was used to examine whether the split-MFI customer-record data are of sufficient quality and coverage to permit pooling.

D.2 Preliminary Analyses with Self-Reported Measures

The survey asked 33 questions about financial outcomes that we considered for inclusion in the financial wellbeing scales. The questions, sources, and situational domains are listed in Table D.1.

Table D.1. Candidate Self-Reported Financial Wellbeing Questions

Question	Source	Everyday finances	Rainy day finances	One day finances
How satisfied are you with your financial situation?	HILDA, FF5, Muir et al.	x	x	x
Given your current needs and financial responsibilities, would you say that you (and your family) are … {*from 'prosperous' to 'very poor'*}	HILDA	x	x	x
What is your current level of debt?	Muir et al.*	x		
I am just getting by financially	CFPB	x		
I am behind with my finances	CFPB	x		
My finances control my life	CFPB	x		
In the last 12 months, how difficult was it for you to meet your necessary cost of living expenses like housing, electricity, water, health care, food, clothing or transport?	Muir et al.	x		
I feel on top of my day to day finances	FF5	x		
My financial situation is largely outside of my control	Muir et al.	x		
<u>In the last 12 months, did any of the following happen to you because of a shortage of money?</u>				
-- Could not pay electricity, gas or telephone bills on time	Bray	x		
-- Could not pay mortgage or rent on time	Bray	x		
-- Pawned or sold something	Bray	x		
-- Went without meals	Bray	x		
-- Asked for financial help from friends or family	Bray	x		
-- Asked for help from welfare/community organisations	Bray	x		

Question	Source	Everyday finances	Rainy day finances	One day finances
I can enjoy life because of the way I’m managing my money	CFPB	x		
I have money left over at the end of the month	CFPB	x		
I am comfortable with my current levels of spending relative to the funds I have coming in	FF5	x		
I am comfortable with my current levels of debt and my ability to repay it	FF5	x		
Which of the below statements best describes you/ your family’s rent/mortgage payments? {*from 'I am behind on my payments' to 'I don't have any payments'*}	Original	x		
I feel like I will never pay off all my debt	FF5	x		x
When was the last time you bought something special for yourself - something that you wouldn't normally buy?	Muir et al.	x		
Giving a gift for a wedding, birthday or other occasion would put a strain on my finances for the month	CFPB	x	x	
I could handle a major unexpected expense	CFPB		x	
I feel that I have enough set aside that I could manage financially if I was to lose my source of income for a period of time	FF5		x	
Suppose you faced an emergency expense tomorrow that is equal to one month of your income. What statement best describes your ability to meet this expense? {*from 'I could easily raise the money' to 'I don't think I could raise the money'*}	Kempson et al.*		x	
What is your current level of savings (including cash, bank deposits and other formal savings like bonds and term deposits)?	Muir et al.		x	x
I am concerned that the money I have or will save won’t last	CFPB		x	x
I am securing my financial future	CFPB			x
Because of my money situation, I feel like I will never have the things I want in life	CFPB			x
I feel optimistic and upbeat about financial future	FF5*			x
I am confident about meeting my expenses later in retirement	Original			x
I am making progress towards my financial goals	FF5			x

Question	Source	Everyday finances	Rainy day finances	One day finances
I am on track to have enough money to provide for my financial needs in the future.	Original			x

* Indicates question or responses were reworded from original.

The first empirical task was to calculate histogram distributions of the responses to each question and examine whether any response patterns appeared to come from multiple answering processes or had problematic features. Based on this analysis we dropped the question about general financial satisfaction because it was multimodal with large modes at the central response (5) and at response (7) and smaller modes at the endpoints (0 and 10).

We also conducted exploratory factor analyses on the three yes/no financial management and the three yes/no financial hardship indicators from Bray (2001) and Bray et al. (2011). These factor analyses and all our subsequent analyses accounted for the outcome measures being categorical variables. We determined that the three financial management indicators could be combined into a single measure of the count of financial management problems and that the three financial hardship indicators could be combined into a single measure of the count of financial hardship problems.

We next conducted an exploratory factor analysis with the remaining/resulting 29 self-reported items. We dropped the CFPB (2015) question on whether someone was just getting by financially and the Muir et al. (2017) question about whether someone had recently bought something special for herself or himself because they had very poor fits.

There were several other sets of questions that addressed very similar outcomes but that had minor variations in conditions or wording. From these sets of questions, we used the question that had the strongest associations with the other self-reported items and low complexity. We dropped the other related questions. Specifically,

- Two questions explicitly addressed financial control; we kept the question from the CFPB (2017), 'My finances control my life', and dropped the question from Muir et al. (2017), 'My financial situation is largely outside of my control'.
- Four measures/questions asked about necessary expenses; we kept the question from Muir et al. (2017) about difficulty meeting necessary expenses and dropped a question we had constructed about meeting rent/mortgage payments and the two count measures based on Bray (2001) and Bray et al. (2011).
- Three questions asked about the ability to meet unexpected expenses. We kept the question from Kempson et al. (2017) about facing an emergency expense and dropped the question from the CFPB (2017) about the ability to handle a major unexpected expense and a question from FiftyFive5 (2016) about having enough set aside to manage a loss of income.
- Two questions asked about ability to repay debt. We kept the FiftyFive5 (2016) question about never paying off debt and dropped the FiftyFive5 question about being comfortable with current levels of debt.
- Two questions asked about retirement and future needs. We kept a question that we developed about being on track to have enough money to provide for financial needs in the future and dropped a question about being confident about meeting expenses later in retirement.
- Two questions asked about people's financial futures. We kept the CFPB question about people securing their financial future and dropped the FiftyFive5 question about people being optimistic and upbeat about their financial future.

- Additionally, we dropped a question from HILDA about whether people felt poor or prosperous because it appeared to be a general profiler.

This left us with 17 self-reported measures that were considered in subsequent analyses.

D.3 Financial-Record Measures

The project developed 18 candidate measures of financial wellbeing from the customer-record data. Table 4.1 lists and describes these measures. All 18 measures were considered in subsequent analyses.

Table D.2. Candidate customer financial record measures

Measure	Description
<u>Every day measures</u>:	
Net spend	Monthly measure (12 months) of all inflows into CBA accounts divided by all outflows; specified as categorical age-normed average[A]
Total interest payments relative to inflows	Ratio of total annual interest payments to total annual inflows into CBA accounts; specified as categorical, age-normed ratios[A]
Total loan payments relative to inflows	Ratio of total annual loan payments (interest plus principal) to total annual inflows into CBA accounts; specified as categorical, age-normed ratios[A]
Income volatility HL	Difference between highest monthly inflows over last 12 months and lowest monthly inflows divided by mean over the last 12 months
Income volatility IQ	The inter-quartile range of monthly inflows over the last 12 months, divided by the mean monthly inflows over the last 12 months
Dishonour fees	Count of months in which customer incurred fee for a rejected payment over last 12 months; specified categorically as no such fees, fees in one month, fees in 2-3 months, fees in 4-6 months, and fees in 7 or more months
Late payments	Count of months in which customer incurred late payment fees and overlimit fees for all credit card customers over last 12 months; specified categorically as no such fees, fees in one month, and fees in multiple months
Unpaid credit card balances carried forward	Measure based on credit card statements, repayments, and balances; tentatively categorise as 1) never carried a balance forward or did not have a credit card; 2) sometimes (less than half a year) carried an aggregate balance forward for less than half a year; 3) persistently (more than half a year) carried forward an aggregate balance below 50% of average monthly inflows; 4) persistently carried forward a balance of 50% to 100% of average monthly inflows and 5) persistently carried a larger balance forward.

Measure	Description
Payday loans	Binary indicator for debits that go to a payday loan company based on direct debit Australian Payments and Clearing Association (APCA) number[1] and the biller name.
Frequency of near-zero balances	Proportion of days on which liquid balances are less than one week's average (total outflow) expenditures; categorised as never, 1-25%, 25-50%, 50-75%, 75% or more
<u>Rainy day measures</u>:	
Ability to cover one month expenses	Proportion of days in last year customer's net position, including available credit and redraws, was more than monthly (outflows) expenditures.
Ability to raise $2000	Proportion of days in last year customer's net position, including available credit and redraws, was more than $2000; specified as a categorical age-normed measure[A]
Insurance products	Binary indicator of whether customer has CBA insurance products or made any payments to insurance organisations in the last 12 months
Standard insurance products	Binary indicator of whether customer has CBA insurance products, except credit card and loan insurance, or makes payments to insurance organisations in the last 12 months
<u>One day measures</u>:	
Savings rate and growth categorical measure	Categorical measure of savings growth and regularity; negative growth more than 50% of time, negative growth less than 50% of time; other growth; positive growth less than 50% of time; positive growth more than 50% of time (including interest-only growth)
Median daily savings balance	Median of the daily balances over the past 12 months calculated using the ending balance for each day; form categorical age-normed measure of median[A]
Proportion of savings balance increases	Proportion of savings balance changes over a year that are positive; form categorical age-normed measure of proportions[A]
Symmetrically-based savings growth rate	Median savings balance for the preceding 30 days, S_t, minus the median savings balance for the corresponding 30 days a year earlier, S_{t-1}, divided by their average ($= \frac{S_t - S_{t-1}}{0.5*(S_t + S_{t-1})}$).

[A] For age-normed, categorical variables, we first calculate the percentile position of the value of the customer's measure in the rank ordering from lowest to highest of all the values for the same measure from people of the same age and customer type (e.g. compare sole-MFIs to sole-MFIs) in a million-customer sample of CBA financial records. We next construct an ordered categorical measure for age percentile measures that are in the bottom 10th percentiles, the next 25 percentiles (10 to 35), the next 30 percentiles (>35 to <65), the next 25 percentiles, and the top 10th percentile.

[1] An APCA number is a unique six-digit identification number which identifies individuals and companies approved by financial institutions to use in the Direct Entry system

D.4 Exploratory Factor Analyses of Linked Self-Reported and Financial-Record Data

We next conducted exploratory factor analyses with the combined set of 17 self-reported and 18 financial-record financial outcome measures. Ten financial-record measures (the net spending measure, the loan and interest repayment measures, the two income volatility measures, the two insurance measures, the categorical savings measure, the proportion of savings balance increases, and the savings growth rate measure) were immediately dropped because they were not associated with the other self-reported and financial-record measures. The measure of the ability to raise $2000 was dropped because it was highly correlated with proportion of time that a customer could raise a month's expenses but had a slightly weaker fit with the other measures.

We conducted another exploratory factor analysis with the 17 self-reported outcome measures and the remaining seven financial-record measures. Parallel analyses indicated that the 24 measures were explained by two factors. Factor loadings, unexplained variance results, and communality measures from the two-factor solution are shown in Table D.3. Factor loadings can be interpreted as the contribution of each question to each of the factors. Unexplained variances are a measure of how much of the variation in each question is *not* captured by the two factors considered. Communality measures the amount of information each question shares with all other questions in the analysis.

Table D.3. Exploratory factor analysis results—two-factor solution

Question/measure	Loading 1st factor	Loading 2nd factor	Unexplained variance	Comm.
Self-reported outcomes:				
What is your current level of debt?	0.44	0.24	0.65	1.5
I am behind with my finances	0.61		0.51	1.1
My finances control my life	0.65		0.61	1.0
How difficult was it for you to meet your necessary cost of living expenses?	0.75		0.35	1.0
I feel on top of my day to day finances	0.81		0.34	1.0
I can enjoy life because of the way I'm managing my money	0.75		0.39	1.0
I have money left over at the end of the month	0.68		0.40	1.1
I am comfortable with my current levels of spending …	0.72		0.50	1.0
I feel like I will never pay off all my debt	0.64		0.59	1.0
Giving a gift for a wedding, birthday or other occasion would put a strain on my finances for the month	0.75		0.43	1.0
Suppose you faced an emergency expense … equal to one month of your income. What statement best describes your ability to meet this expense?	0.62	0.31	0.34	1.5
What is your current level of savings?	0.39	0.55	0.34	1.8
I am concerned that the money I have or will save won't last	0.64		0.66	1.1
I am securing my financial future	0.75		0.43	1.0

Question/measure	Loading 1st factor	Loading 2nd factor	Unexplained variance	Comm.
Because of my money situation, I feel like I will never have the things I want in life	0.68		0.59	1.0
I am making progress towards my financial goals	0.78		0.45	1.0
I am on track to have enough money to provide for my financial needs in the future	0.86		0.33	1.0
Financial-record measures:				
Dishonour fees		0.52	0.66	1.1
Late payments		0.44	0.75	1.2
Unpaid credit card balances carried forward	0.21	0.57	0.52	1.3
Payday loans		0.48	0.70	1.1
Frequency of near-zero balances		0.90	0.26	1.0
Ability to cover one month expenses		0.83	0.30	1.0
Median daily savings balance		0.71	0.54	1.0
Proportion of variance explained	0.35	0.16		

Note: Factor loadings with absolute values below 0.2 are suppressed.

The results reveal a striking pattern. All but one of the self-reported measures align strongly on the first factor, and all the financial-record measures align on the second factor. The self-reported measure that aligns on the second factor is the self-report of an observable condition involving savings levels.

From this set, we

- dropped the questions about debt levels, savings levels, and ability to meet one month's expenses because they covered observable conditions or were similar to financial-record measures and had high communality;
- reintroduced the question about handling an unexpected expense to add a rainy day measure;
- dropped the question about being behind in finances because of its modest factor loadings and overlap with meeting necessary expenses;
- dropped the question about never paying off debt because of its overlap with meeting necessary expenses and high unexplained variance, and
- dropped the questions about money not lasting, never having the things wanted in life, and making progress towards financial goals because they overlapped with several other one day questions and had high unexplained variances.

D.5 Item Response Theory Analyses

IRT models fit the response patterns of a series of indicators to an underlying latent measure. In our case, they relate the responses to the candidate financial-record and self-reported measures to an underlying score of financial wellbeing. An IRT modelling approach has several advantages over more traditional scale construction approaches. IRT models allow measures to:

- Differ in the level of financial wellbeing that they indicate (for example, an indicator for frequently paying bills late likely indicates a very low level of financial wellbeing, while an indicator for having sufficient savings to cover a major unexpected expense likely indicates a higher level of financial wellbeing);
- Differ in the strength of their association with financial wellbeing—some measures might be noisier and less discriminating than others;
- Be missing or incomplete

Using the revised candidate measure set of 10 self-reported measures and seven financial-record measures, we fit two-parameter IRT graded response models separately for latent variables corresponding to the first and second factors. Let θ be a latent variable that represents someone's financial wellbeing. Let Y_i be the ordered categorical measure of a person's response to item *i*, where Y_i can take on the values 1, …, *J*. Let δ_{ij} the 'severity level', or differentiation parameter, of response category *j* from item *i*, and let α_i be the discrimination parameter for item *i*. The two-parameter graded response model assumes that the probability that someone gives a categorical response of *j* or higher to item *i* is

$$\mathrm{Prob}(Y_i \geq j) = \frac{\exp\left[\alpha_i\left(\theta - \delta_{ij}\right)\right]}{1 + \exp\left[\alpha_i\left(\theta - \delta_{ij}\right)\right]}$$

where exp[] is an exponential operator.

Table D.4 reports the estimated severity and discrimination parameters for the model for the first latent variable, using the 10 self-reported measures.

Table D.4. IRT severity and discrimination parameter estimates—first latent variable

Item	δ_{i1}	δ_{i2}	δ_{i3}	δ_{i4}	α_i
1. How difficult was it for you to meet your necessary cost of living expenses?	-1.907	-0.914	0.458	1.404	2.473
2. I can enjoy life because of the way I'm managing my money	-1.821	-0.873	0.630	2.117	2.365
3. I could handle a major unexpected expense	-1.093	-0.386	0.885	1.997	2.364
4. I am securing my financial future	-1.479	-0.559	0.900	2.197	2.112
5. My finances control my life *	-2.016	-0.845	0.558	2.025	1.438
6. I have money left over at the end of the month	-1.639	-0.694	0.313	1.212	2.237
7. Giving a gift for a wedding, birthday or other occasion would put a strain on my finances for the month *	-1.973	-1.157	-0.141	0.979	2.101
8. I feel on top of my day to day finances	-2.226	-1.117	-0.171	1.588	2.464
9. I am comfortable with my current levels of spending relative to the funds I have coming in	-2.569	-0.979	-0.030	2.126	1.759
10. I am on track to have enough money to provide for my financial needs in the future	-1.666	-0.576	0.365	2.045	2.275

* Responses reverse coded.

The estimates for the severity parameters, which all increase with response levels for every item, indicate that higher responses are associated with higher values of the underlying latent variable for every item and possible response category. The differences across items in the estimated discrimination parameters are relatively modest. The question about meeting necessary cost of living expenses has the strongest discrimination (least noise) regarding the underlying latent variable, while the question about finances controlling the respondent's life has the weakest discrimination. Analyses of Item Characteristic Curves (ICCs) from the model revealed that every response from every included item contributed information to identifying the underlying latent variable. Based on the estimation and ICC results, we created a 0-100 scale, called the CBA-MI Reported Financial Wellbeing Scale, that consisted of the sum of the response values from the 10 questions, multiplied by 2.5. The scale has a correlation of 99.2 per cent with the predicted latent variable from the IRT model. It has a reliability coefficient (Cronbach's alpha) of 0.92.

We initially fit a similar IRT specification of the second latent variable, using the seven financial-record measures with two categorical outcomes for the payday loans measure, three categorical outcomes for the dishonours and late payments measures, and five outcomes for the other measures. Analyses of ICCs revealed that late payment and unpaid credit card balance measures did not contribute in a consistent way to the underlying latent variable. The ICCs further revealed that the middle response categories for the five-category low-balance, ability to raise money, and savings measures did not consistently contribute to the underlying latent variable. Based on these results, we dropped the late payment and unpaid credit card balance measures from our analyses and respecified the low-balance, ability to raise money, and savings measures as three-category measures as indicated in Table 4.2.

Table D.5 reports the estimated severity and discrimination parameters for the revised model for the second latent variable, using the final five financial-record measures and a restricted set of categorical outcomes.

Table D.5. IRT severity and discrimination parameter estimates—second latent variable

Item	δ_{i1}	δ_{i2}	α_i
11. Number of months in last year with payment dishonours	-2.718	-0.564	1.153
12. Any payday loans in last year	-2.455		1.444
13. Days in last year with liquid balances below one month's average expenses	-1.291	0.373	3.352
14. Days in last year during which customer had the ability to raise one month's expenses from savings or available credit	-0.599	0.321	3.182
15. Age-normed percentile of customer's median savings balance over last year	-0.802	2.060	1.345

The estimates for the severity parameters increase with response levels for the four three-category items and indicate that higher responses are associated with higher values of the underlying latent variable. The differences across items in the estimated discrimination parameters are larger than for the first latent variable. The low-balance measure has the strongest discrimination (least noise) regarding the underlying factor, while dishonours measure has the weakest discrimination. Analyses of ICCs from the model revealed that every response from every included item contributed information to identifying the underlying latent factor. Based on the estimation and ICC results, we created a 0-100 scale, called the CBA-MI Observed Financial Wellbeing Scale, that consisted of the sum of the response values from the five measures, multiplied by $^{100}/_{9}$. The scale has a correlation of 98.0 per cent with the predicted factor from the IRT model. It has a reliability coefficient of 0.71.

D.6 Specification and Sensitivity Tests

Customers for the analysis sample

We initially conducted our quantitative analyses using the customers in our survey who indicated that they held all their financial products and conducted all their financial transactions with CBA. We compared the results from these analyses to results from analyses that used customers who indicated that CBA was their main financial institution but not their only financial institution. There were no substantial differences in the results between the two sets of customers. Accordingly, we pooled the data for both sets of customers; the detailed results contained in this report come from the pooled set of customers.

Other potential measures for our scales

Prior to conducting our formal IRT analyses, we used informal methods including inspection, exploratory factor analyses, and logic rules to reduce the set of items. We also estimated separate IRT models for the reported and observed wellbeing scales. To examine the sensitivity of our results to these specification choices, we iteratively re-estimated both of our IRT models adding each of the excluded measures one at a time. For the reported financial wellbeing model, we added the 23 excluded self-reported measures from the original set in Table D.1 and the 17 financial-record measures from Table D.2 one at a time. For the observed financial wellbeing model, we added the 33 self-reported measures from Table D.1 and the 12 excluded financial-record measures from Table D.2. None of the added measures changed our results regarding our principal specifications, indicating that the measurement relationships for the 10 self-reported measures in the reported financial wellbeing scale and the five financial-record measures in the observed financial wellbeing scale do not change when additional measures are included. Moreover, ICC analyses of the resulting models confirm that most of the added measures fail to contribute consistently to the underlying scales, which formally indicates that these measures should not be included.

Confirmatory analyses

The construction of our two scales are based on results from formal statistical models and tests that indicate that the included items can differentiate between different levels of underlying latent factors, have good discrimination properties, and have high reliability. However, prior to conducting our final formal analyses, we conducted many informal, exploratory, and preliminary formal analyses using the same analysis sample. These earlier analyses with the same sample undoubtedly led to stronger formal results, and some of our formal results might be artefacts of the sample. To test whether this was an issue, we undertook confirmation analyses in which we re-estimated each of our IRT models and examined the results using alternative samples that had not been used in our primary analyses.

Our model of reported financial wellbeing was estimated using the MFI customers from the on-line survey. However, the survey also included many CBA customers who held most of their financial products or conducted most of their financial transactions with other institutions (non-MFI customers). We re-estimated our IRT model for reported financial wellbeing using these other customers who had not been included in our initial analyses and confirmed that the scale measurement relationships for these customers were similar to those who were included in our analysis sample.

Our model of observed financial wellbeing was estimated using MFI customers who participated in the on-line survey. We constructed a sample of CBA MFI customers who were not survey participants, using a random sample of identical size to the initial analysis, and re-estimated the IRT model of observed financial wellbeing for this alternative sample. These analyses also confirmed that the scale measurement relationships for our survey and non-survey samples were similar.

Differential item functioning

To be universal, the measurement relationships for our two scales—that is, the ways in which our items/measures function in the scales—should be the same for anyone with the same underlying values of reported or observed wellbeing, regardless of the person's other circumstances. Following the method of Kim and Cohen (1998), we conducted differential item functioning tests for customers in our analysis sample who differed in their:

- Housing tenure (owned home outright, owned home but paid a mortgage, did not own home),
- Household composition (lived alone, lived with a partner, lived in someone else's home, lived with roommates), and
- Work status (working or looking for work, student, retired, carer).

There were no substantial differences in item functioning across the different subgroups.

External validity

We examined how each of our scales was associated with measures that are related to but distinct from financial wellbeing. We were especially interested in measures of characteristics from our conceptual model of how financial wellbeing is determined. These analyses revealed that both financial wellbeing scales were positively correlated with customers' financial satisfaction, income, education, home ownership, and financial improvements and negatively associated with health problems and financial setbacks. Many of these relationships are shown and discussed in Section 5.3 of the report.

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