

Financial Literacy and KiwiSaver Decisions

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ABSTRACT

In this paper we observe a strong relationship between the level of financial literacy and KiwiSaver decisions, a voluntary defined contribution retirement plan introduced in New Zealand in 2007. Among a sample of staff at Auckland University of Technology we observe that those respondents with higher financial literacy scores were more likely to have joined KiwiSaver, have determined their savings needs at retirement, make larger contributions, have considered the effect of risk, fees and performance and regularly follow up the performance of their KiwiSaver fund. These are all decisions that will affect the level of eventual savings. We observe that many participants with lower financial literacy scores have a set and forget mindset to KiwiSaver, failing to review the performance of their KiwiSaver fund or adjust the fund type as their needs change. [1] It appears, based on our findings, that improvements in financial literacy could improve KiwiSaver outcomes in the longer term.

KEYWORDS: Retirement Planning, KiwiSaver, New Zealand, Financial literacy
JEL CODES: C83, G28, G29

1. INTRODUCTION

Financial illiteracy has been shown to be endemic in the majority of studies on the issue, irrespective of country¹ or demographic group studied². The concern for policy makers is that financial decision makers tend to make poor financial decisions when they have low financial literacy, such as having inadequate savings for retirement (Lusardi and Mitchell, 2009), and ultimately winding up with fewer financial assets and more ability to cope with unforeseen situations (Anderson, et al. 2004). Additionally, low financial literacy among the public has also been shown to have macroeconomic consequences including less available capital for expansion, greater wealth inequality and exacerbated financial cycles (Mandell and Klein, 2009; OECD, 2005 among others).

An issue of increasing importance is the way financial literacy impacts on individuals' preparedness for retirement. Risk and responsibility for retirement planning has gradually been shifted from employers to employees through more use of defined contribution ("DC") retirement schemes (Benartzi and Thaler, 2001; Broadbent et al., 2006; Cannon and Tonks, 2011). Unlike defined benefit plans, where the eventual retirement income is set in advance, DC plans only set the level of contributions made by the employer and employee. The level of retirement income depends on the sum saved at retirement, which depends heavily on the returns earned from investments made during the contribution period. Further, the employee is often responsible for making decisions around asset allocation and the level of risk taken. As a result, the level of retirement income is uncertain and depends heavily on employees choices. Given the complexity of the financial decisions, concerns have been raised about the

¹ Countries include Australia (ANZ, 2003;2005; 2008; 2011), Germany (Bucher-Koenen and Lusardi, 2011), Italy (Fornero and Monticone, 2011), Japan (CFS, 2001; Sekita, 2011), Korea (Jumpstart, 2003), the Netherlands (Alessie et al., 2011), New Zealand (Colmar Brunton, 2006; 2009; 2013), Sweden (Almenberg and Save-Soderbergh, 2011), the UK (FSA, 2006; Banks and Oldfield, 2007), the US (Lusardi and Mitchell, 2009; Mandell 2008), Russia (Klapper and Panos, 2011), Chile (Behrman et al., 2010), Indonesia and India (Cole et al. 2010)

² Mandell (2009) looked at US high school and college students while Lusardi and Mitchell (2009) consider the general US public.

~~ability of individuals to make good quality of the decisions being made by financial decision makers individuals~~ (Mitchell and Zeldes, 1996).

New Zealand recently joined the trend towards greater use of defined contributions. Recognising the threat of the upcoming baby boomer generations' retirement and the significant pressure this will place on the affordability of the New Zealand Superannuation scheme³, the government introduced KiwiSaver in 2007. KiwiSaver represents a form of DC plan whereby employees who opt in contribute a percentage of their income and receive employer contributions and additional government financial incentives. These funds are invested on individuals' behalf by private fund providers. While the scheme was established in a way that minimises the decisions that must be made, the decisions required are however extremely important, and while appearing deceptively easy, have significant consequences for the eventual level of retirement savings. Further, the decisions require a broad understanding of a number of core financial concepts. Decisions, assuming a participant doesn't opt out, include the level of personal contribution, the fund provider and the risk level to be taken. Those who fail to opt out, but also fail to make the above decisions, are auto-assigned to one of six default conservative funds with personal contributions set at 2%, which was raised to 3% in April 2013.

A number of concerns have been raised with regards to how individuals make their KiwiSaver decisions. As at June 2012, 59% of participants were contributing 2% personally (IRD, 2012). Moreover, a large percentage of Kiwisaver participants have not moved beyond a default conservative fund (MBIE, 2012). It has been argued the combined consequence of these decisions will leave many participants short of the sum required for their retirement (XX). Additionally, a recent survey has also shown that less than 20% of participants consider performance and less than 15% consider fees when choosing a fund provider (XX).

³ New Zealand Superannuation is a defined benefit scheme funded on a pay as you go basis from government revenue.

Therefore, there is evidence to suggest that despite the importance of the KiwiSaver decisions the public is being asked to make, they are failing to make sensible-good decisions.

The purpose of this research is to examine the role that financial literacy has on KiwiSaver decisions and the information people rely on to make them. As a result we will provide evidence on whether improving financial literacy might improve the quality of KiwiSaver decisions. We develop and administer a questionnaire to 163 respondents asking them about their demographics, financial experience, KiwiSaver decisions and testing their financial literacy. We employ 11 financial literacy questions covering a range of important concepts that have been pre-tested and validated in previous studies internationally, split into three basic and eight advanced questions. We find that our sample on average answered 2.1 basic questions and just 4.1 advanced questions correctly and that the performance of our respondents was broadly comparable with previous financial literacy surveys conducted in NZ. Our results showed strong evidence that the financial decisions made by our respondents were related to their level of financial literacy. Specifically, we find strong evidence in both univariate and multiple variable regressions that show those with higher financial literacy were more likely to enrol in KiwiSaver, to contribute at a higher rate, to know the fees they are charged and to have compared them before selecting a fund provider, to have considered the appropriate level of risk and to compare performance and compare it more frequently. Further, we also find higher financial literacy improves the quality of decisions, with more financially literate participants more likely to select an appropriate risk level. Overall, we find a strong relationship between financial literacy and KiwiSaver decisions..

The rest of the paper is structured as follows section 2 provides an overview of the financial literacy literature. Section 3 discusses the situation in NZ with respect to financial literacy and KiwiSaver. Section 4 sets out the data and methodology. Section 5 presents the results and Section 6 concludes the paper.

2. LITERATURE REVIEW

Virtually all studies investigating the level of financial literacy has found consistently low levels of financial literacy. While the literature initially focused on the US (Bernheim 1995; 1998), more recently studies have considered a wide range of countries. A meta-analysis of global financial literacy surveys conducted by the Organization for Economic Co-operation and Development (OECD) in late 2005 shows huge gaps in the financial knowledge and skills of individuals across 12 OECD countries. Meanwhile, studies at the national level include Australia (ANZ, 2003;2005; 2008; 2011), Germany (Bucher-Koenen and Lusardi, 2011), Italy (Fornero and Monticone, 2011), Japan (CFS, 2001; Sekita, 2011), Korea (Jumpstart, 2003), the Netherlands (Alessie et al., 2011), New Zealand (Retirement Commission, 2005; 2009; 2013), Sweden (Almenberg and Save-Soderbergh, 2011), the UK (FSA, 2006; Banks and Oldfield, 2007), the US (Lusardi and Mitchell, 2011; Mandell 1998-2008), Russia (Klapper and Panos, 2011), Chile (Behrman et al., 2010), Indonesia and India (Cole et al. 2010) among others. The findings, while highlighting differences between the level of financial literacy between countries (Xu and Zia, 2012) document significant portions of the population do not have the financial knowledge to be financially capable.

While financial literacy has been shown to be poor on average, studies have identified significant differences in the overall level of financial literacy based on demographic and socio-economic factors. For instance, a number of studies have identified that age has an inverted u-shaped relationship with financial literacy, with younger people and those over 50 having the lowest levels of financial literacy (Worthington, 2004; Almenberg and Save-Sdoerbergh, 2011; Lusardi and Mitchell, 2011). In addition, males have been consistently shown to be more financially literate than females (Worthington, 2004; Chen and Volpe, 2002; Lusardi and Mitchell, 2006, 2008; Almenberg and SäveSöderbergh, 2011; Monticone,

2009; Volpe et. al., 1996; Dvorak and Hanley, 2010; Van Rooij et al., 2011b), as are those who are more highly educated (Worthington, 2004; Lusardi and Mitchell, 2006, 2008; Almenberg and Säve-Söderbergh 2011) and those with more wealth (Bernheim, 1998; Guiso and Jappelli, 2008; Worthington, 2004; Lusardi and Mitchell, 2008). Finally, studies have also documented differences in financial literacy among different ethnicities. In the US, Lusardi and Mitchell (2007) finds that Whites and Asians are more likely to be financial literate, while in Australia Worthington (2004) finds non-english speakers tend to have worse financial literacy.

Numerous studies have identified the serious consequences of poor financial literacy, particularly among those who are more likely to make financial mistakes (Agarwal et al., 2009). Those with poor financial literacy are more likely to rely on debt (Lusardi and Tufano, 2009), especially expensive debts such as credit cards and predatory lenders (Hilgert et al., 2003), are more likely to end up in arrears on their mortgage repayments or in the process of foreclosure (Hirad and Zorn, 2001), are more likely to experience bankruptcy proceedings (Lusardi and Mitchell, 2009). In addition to misusing debt, those with low financial literacy also tend to save less (Bell and Lerman, 2005) and underestimate the effect of compound interest and, therefore, accumulate less wealth (Stango and Zimman, 2011). Having higher levels of debt and fewer financial assets, the financially illiterate are also more susceptible to financial crises (Anderson et al., 2004). On the other hand, better financial literacy results in greater stock market participation (Van Rooij et al., 2011a; Kimball and Shumway, 2006), and a greater propensity to invest in lower cost mutual funds (Hastings and Tejada-Ashton, 2008; Hastings et al., 2010; Hastings and Mitchell, 2011).

A particularly concerning outcome, especially for policy makers, is a lack of preparedness for retirement. This may stem from a general short-sightedness when making financial decisions (Van Rooij et al. 2011b), however the consequence is that many people

nearing retirement have few savings on which they can rely in retirement (Lusardi, 1999; Lusardi and Mitchell, 2007). Lusardi and Mitchell (2009) note that less than one-third of a sample of 50+ respondents in the US had attempted to prepare a retirement plan, and that less than 20% believed they had succeeded in preparing a sound financial plan. In addition to failing to have prepared a retirement plan, few respondents in the US were even aware of the Social Security benefits that they were eligible for (Bernheim, 1998; Mitchell, 1988; Gustman and Steinmeier, 2005). However, it has consistently been shown that those with higher financial literacy are more likely to have prepared for retirement (Lusardi and Mitchell, 2007; Van Rooij et al. 2011b). Van Rooij et al. (2011b) also establish the causality of the relationship whereby higher financial literacy results in more retirement planning. Lusardi and Mitchell (2007) establish that just the process of planning for retirement results in better outcomes in retirement savings.

3. The New Zealand Setting

Financial Literacy in New Zealand

The Commission for Financial Literacy and Retirement Income has commissioned, in conjunction with the ANZ bank, a periodic survey of financial literacy that is conducted every four years. The first survey was conducted in 2005 and provided a first measure of New Zealanders' level of financial literacy and was used to benchmark efforts to improve financial literacy (Colmar Brunton, 2006). This was a nationally representative survey, with face to face interviews of 856 adult New Zealanders. The survey centred upon five areas: mathematical and standard literacy, financial understanding, financial competence, financial planning and consumer rights. The survey concluded that while overall New Zealanders have a reasonable level of financial knowledge, many lacked an understanding of everyday financial matters. There have been two follow up surveys conducted in 2009 (Colmar Brunton, 2013) and 2013 (Colmar Brunton, 2013). Based on the score of the top and bottom

third of respondents in 2005, the later surveys compared the changes in overall financial knowledge. In 2009, the percentage of high knowledge respondents increased by nearly 10% compared to the earlier survey, however, this improvement came from a reduction in moderate knowledge respondents. Those with the least knowledge were largely unchanged. The 2013 results reported a small reduction in the high knowledge group, and again little improvement in the low knowledge group. The average knowledge scores also stayed fairly similar at 39.67 in 2005, 40.67 in 2009 and 40.72 in 2013 (scores were between 0 and 58.5).

The surveys also provide support for the demographic and socio-economic factors that are shown to impact financial literacy. Those with lower levels of personal financial knowledge were more likely to be young (18 to 24) or older (75+), people with lower levels of formal education, income and net wealth, and renters rather than homeowners. Gender was also found to strongly affect financial literacy. The 2013 survey further notes that just 28% of respondents had a written financial plan, the same percentage who have put money aside for the long-term and 31% who have worked out how much they need for retirement.

Additionally a 2007 poll commissioned by the Reserve Bank of New Zealand found that many respondents had a weak understanding of credit ratings and incorrect perceptions of risk within the financial sector (XX). Only 19% of respondents stated that they used credit rating to decide where to put their money, although those with more knowledge used ratings more frequently. Respondents also had a poor understanding of financial disclosures. Both these findings suggest New Zealanders are ill-prepared for making financial decisions around mutual funds which require the ability to interpret financial disclosures and consider more complicated comparison measures.

The Retirement Situation in NZ

New Zealand currently pays a universal, flat-rate pension to people aged 65 and over irrespective of their assets, income or employment status. This state pension, known as New Zealand Superannuation, is funded on a pay-as-you-go basis out of general taxation. It provides a level of income that equates to 33% - 43% of the national average after-tax ordinary-time weekly wage, a sum designed to minimise poverty among older people (Ministry of Social Development, 2010). As such, it represents a foreseeable, basic, indexed annuity on which people are able, without penalty, to layer additional earnings, investment income and assets. However, doubts have been raised about the long-term fiscal sustainability of New Zealand Superannuation with the approaching retirement of the baby boomer generation. It is estimated that the cost of New Zealand Superannuation will double from currently 4% of GDP to close to 8% by 2060 with similar growths in health care costs (NZ Treasury, 2013). In addition, only 9% of survey respondents felt they could live adequately on NZ Superannuation with most respondents describing comfortable as twice the current NZ Super entitlement (XX). It is obvious that NZ Superannuation is not sufficient by itself, and will likely be reduced in response to cost pressures in the future, either by increasing the retirement age, reducing entitlements or means and income testing.

However, less than 30 per cent of the active labour force had purchased supplementary retirement plans either through their employers or directly from an insurer or other financial services company by the end of 2005. As a result, in 2007 the New Zealand government introduced KiwiSaver, a type of subsidised, defined contribution retirement savings plan offered by private-sector providers. It was created to encourage New Zealanders to save more for retirement, to supplement the New Zealand Superannuation benefit and to help increase an individual's retirement income. KiwiSaver is an opt-out defined contribution plans in which both the employer and employee contribute to the employee's pension fund while the employee is employed. Initially, employee contributions were set at a minimum of

2%⁴, with employers required to match the rate of the minimum contribution. Employees can however select to contribute either 2%, 4% or 8%. In addition the government provides a one-off bonus of \$1,000 on joining KiwiSaver and tax credits at the value of 50cents per \$1 contribution by the employee upto a maximum of \$520 per year. All money is collected by the Inland Revenue Department out of wages and salaries and distributed to private fund providers for management.

In addition to contribution rate, participants have the choice of fund provider. There are currently 35 providers, however, as many of them have up to five different KiwiSaver funds; generally labelled as Cash, Conservative, Balanced, Growth and Aggressive, participants have a wide range of choices. However, this requires participants to be able to make a decision about both a suitable provider and a suitable fund type which has an appropriate level of risk. On start up a default system was set in place. The government selected six providers who would act as default providers. Those participants who did not choose a fund would be randomly assigned into a conservative fund within one of the six providers. Alternatively, employers could select a preferred default provider. This was initially envisioned as a landing place before participants made a decision. However, a substantial portion of KiwiSaver members have elected to not select a fund, and have not subsequently changed from a conservative default portfolio.

A recent review of KiwiSaver highlighted a number of issues in relation to the default system. Specifically, concerns were expressed regarding the requirement that default funds be invested in a conservative fund, predominantly bonds and cash, which for particularly younger participants can result in substantially less available funds at retirement. A suggestion that default funds follow a lifestyle investing model, where funds are initially

⁴ It was originally stated the minimum would be 4%, however this was to be phased in from 2% per year to 4% over two years. Before it could be increased the government reset the minimum to 2%. This has since been increased to 3% in April 2013.

invested in a more risky fund that becomes progressively less risky over time, was rejected however (MBIE, 2013).

4. METHODOLOGY

To study the relationship between financial knowledge and retirement preparation, we administered an internet-based survey to a sample of staff at the Auckland University of Technology. Recruitment was done by invitation to all university employees through advertisements placed in internal communications emailed to staff and via leaflets distributed in the internal mail system. A sample of university staff has a greater level of education in general, and therefore should represent a sample that should generally have higher financial literacy compared to the general public. ~~However, this will tend to present a best case scenario when compared with the general public~~^[32]. Data was collected on the demographics of respondents (age, sex, marital status, ethnicity, income, etc), their financial literacy, retirement planning, KiwiSaver decisions, information selections and risk attitude.

~~The survey consists of 71 questions (See Appendix A)~~^[33] covering demographics, financial literacy, retirement planning, KiwiSaver decisions, information selections and risk attitude. Specifically, two sets of questions are used to assess financial literacy. In 2004, Lusardi and Mitchell developed three questions to measure financial literacy for the US Health and Retirement Survey (HRS). The questions related to knowledge of compound interest, inflation, and time discounting. An extended module on financial literacy consisting of five questions on basic financial literacy and eleven questions on advanced financial literacy was included in the household survey of the Dutch National Bank (Van Rooij, et al., 2011b) and in the American Life Panel (Lusardi and Mitchell, 2007, 2009). The questions employed to measure financial literacy in this study are previously used in the US HRS and the Dutch National Bank Survey.

We explore respondents' financial literacy levels at two levels, first with 3 questions on basic financial literacy, and second with 8 questions on more sophisticated financial literacy concepts. These questions are pre-tested and validated in prior financial literacy studies (Lusardi and Mitchell, 2007, 2009; Van Rooij, et al., 2011b). The basic financial literacy measures are designed to cover fundamental concepts, expressed in everyday settings, such as simple calculation of interest rates, compound interest, time discounting and the effect of inflation. The second set of questions seeks to measure more advanced financial knowledge. The advanced financial questions assess respondents on topics including familiarity with financial assets, risk and return, diversification, the function of stock markets and the relationship between bond prices and interest rates. Moreover, we use the set of all twelve financial literacy questions to evaluate the overall financial knowledge of individuals by constructing a total financial literacy index. Based on the results of the financial literacy questions, we construct indices of financial literacy by counting the number of questions correctly answered ("don't know" and "prefer not to say" are categorized as wrong answers). Respondents with higher scores represent those with relatively more financial knowledge..

Respondents are also asked demographic questions including age, gender, income and education level. Demographic factors are important indicators of the level of financial literacy. Financial illiteracy is not only widespread, but it is also concentrated among particular demographic groups, such as women, the elderly, and those with low education (Lusardi and Mitchell, 2007). As a result, the research will look at how financial literacy is distributed across these demographic groups in the New Zealand context. Furthermore, we collect data on a range of KiwiSaver choices to understand the preparedness and preference of respondents for retirement savings. It also allows us to study the impact of financial literacy on KiwiSaver decisions. Besides financial literacy and demographics factors, information acquisition is central to understanding investment behaviour and portfolio

allocation (van Rooij et al., 2011b). Therefore, we examine the information sources used to help make KiwiSaver decisions by various financial literacy groups.

5. RESULTS

Table 1 presents a summary of the demographics of our respondents. We observe that our sample is predominantly (approximately 75%) made up of individuals aged 30-59 with nearly equal numbers in their 30's, 40's and 50's. As a result, we have nearly half the number of respondents in the under 29 and over 60 categories as we did in the other age groups⁵. The sample is also strongly represented by women, with over 70% of respondents. This may impact our results as women have consistently tested as having lower financial literacy than men⁶. Based on ethnicity, we observe that our sample is broadly consistent with the ethnic composition of NZ as a whole. Our sample slightly over-represents European, 70% of our sample versus 67.6% in the 2006 census, and Asian, 13.5% in sample versus 9.2% nationally. The exception is those identifying as Maori and Pacific Islander, who make up only 10.2% versus 21.5% nationally in 2006. The majority of our sample is either married, in a civil union or a de facto relationship (62.9%) with 21.8% single and 11.2% either separated, divorced or widowed.

We observe our sample is heavily over-represented when it comes to education qualifications, particularly at the post-graduate level. This is not surprising given the sample was drawn from university staff where both administrative and academic staff frequently have Masters or higher level qualification. This again may bias our basic results as education levels have been shown to correlate with financial literacy. Close to 76% of our sample is in full-time employment, with most of the other respondents in part-time employment. The

⁵ As may be noted, the percentages do not sum to 100%, the remaining observations were respondents who did not answer particular questions.

⁶ We control for this bias by including a gender variable in later regressions analysis.

other category is dominated by those currently studying. Those respondents studying are also likely to be earning less than \$20,000 per year. Roughly 35% of the sample is earning less than \$60,000 per year, which is approximately the current average wage/salary in NZ for a full-time employee (Statistics NZ, 2013). The slightly higher average annual income maybe due to either the use of university staff who may earn better than average salaries or the fact the sample is based in Auckland which has a higher than average median salary in nation surveys. Close to 60% of the sample identify themselves as the main income earner, while the sample is split nearly equally between those identifying as the primary financial decision maker and those who stated that the responsibility was shared. Only 7.1% of the sample abdicated responsibility to someone else.

Table 2 presents the summary of the respondent's financial experiences. Greater financial experience has been identified as improving financial literacy (Dvorak and Hanley, 2010; Frijns et al. 2014), and more experienced individuals may be in a position to make better KiwiSaver decisions. Panel A considers respondents experience with financial assets, which we separate into four categories; Savings, Investments, Insurances and Property. We observe that nearly 85% of the sample has a savings account, and a slightly higher percentage have KiwiSaver. The high enrolment in KiwiSaver is not surprising given the soft compulsion approach used by the NZ government. A much smaller percentage however has experienced term deposits, just 40%. Even fewer respondents have experience with investments, just 20% have invested in stocks, and just over 5% have invested in bonds or other mutual funds. In contrast, property is extremely popular with more than 60% of the sample having bought at least one property. The majority of respondents have their own home, most with a mortgage, however, about 16% of the sample has more than one property and roughly 8% have an investment property.

Panel B presents the results for the experience with liabilities. While nearly 90% of the sample has a credit card, roughly two-thirds either always or usually repay it completely each month, indicating smart use of a credit card. Likewise, we observe low rates of experience with what would be considered bad debts. Roughly 30% of the sample has experienced hire purchases or personal/bank loans, which tend to be high interest debts for depreciating assets. By contrast, 60% of the respondents have or have had a mortgage and nearly 30% have experience with student loans, what might be considered smart debt.

We form a financial experience index by summing the total of the respondents' experiences. Figure 1 presents the distribution of the financial experience index. We observe the lowest score is 2 representing an individual with extremely limited financial experiences, a savings account and a credit card, while the highest is 14 representing very broad experiences. On average respondents have a score of 7.5 experiences, while the median is slightly higher at 8. The latter figure suggests a slight skew to the right with more respondents having fewer experiences.

Table 3 presents the results of the financial literacy questions. We asked respondents to answer 11 questions, 3 basic and 8 advanced, covering a variety of topics that are considered important and separated the questions in to two categories; basic and advanced questions. We asked three basic questions, covering questions used in numerous financial literacy studies. Specifically we tested knowledge of compounding, inflation and time value of money (TVM). Our respondents, perhaps driven by the predominance of women in the sample, scored worse than the general NZ public for the two questions that have been tested widely in NZ. Specifically, Lusardi and Mitchell (2011) compared the responses to three questions, two of our basic questions (compounding and inflation) and one of our advanced questions (diversification), among 14 countries. For the compounding and inflation questions, 86% and 81% respectively answered correctly whereas our sample were right only 68% and

73%. In addition, only two thirds of the sample was able to correctly answer the time value of money question. Panel B presents the results for the advanced questions. Again we asked pre-tested questions covering a broad range of topics that a financial literate individual should be able to answer correctly. The percentages for the advanced questions remain below an ideal level. Nearly three-quarters of respondents were able to identify that spreading investments over assets reduced risk correctly, while just below two-thirds of respondents understood purchasing power, the function of stock markets, and that stocks are riskier than bonds. Less than half of respondents correctly identified that stocks give higher long-run returns. Most concerning however, is the poor performance for the mutual funds question and the question about whether a fund of stocks is riskier than one stock. These both test understanding of mutual funds, which KiwiSaver funds are a type of. The fact only one-third of respondents could correctly answer these questions is a cause for concern. The 32.4% who correctly answered the diversification question is similar to the 27% found in Lusardi et al. (2011).

We created three indices of financial literacy based on the number of questions respondents answered correctly. First, a basic financial literacy index was created by adding the scores on the three basic questions which ranges between 0 and 3. 11% of our sample was unable to correctly answer a single question while half the sample got all three correct. Second, we created an advanced financial literacy score which ranges between 0 and 8. Surprisingly, fewer respondents got 0 than for the basic index, just 5.5%, but only 3.1% got all 8 questions correct. The average score is 4.09 while the median is 4. The final financial literacy index is a total index created by summing the basic and advanced indices per respondent. Respondents could score between 0 and 11. Figure 2 presents the distribution of the responses. Just over 4% of the sample got 0, while less than 2% answered all the questions correctly. We do however see a substantial proportion of the sample scoring 10, around 15%. The average is 6.2 correct questions, while the median is 6.

Table 4 breaks down the financial literacy scores by the demographics of our respondents. We see some evidence of a difference in financial literacy between the age groups⁷. In particular, we observe some weak evidence that those in the 30's group had worse financial literacy across all three indices, while the under 29's were worse on the advanced questions. The 40's age group however, did better both on the advanced questions and had a mean total index. Consistent with previous financial literacy literature, women were statistically worse than men, nearly 2 questions less overall, and Europeans had higher financial literacy, while Maori and Pacific Islanders had worse scores. Asians, who have been shown to outperform in previous literature did worse in the basic questions by half a question on average. We also observe that single people had statistically lower index values for the advanced and total indices.

When we consider education and employment demographics, we observe that the level of education plays a significant role. Those with postgraduate qualifications performed on average much better than the rest of the sample. The insignificance for the Secondary School sample is likely a result of the low number of observations, just 8. We also see some evidence of a relationship between income level and financial literacy. Those in income brackets below \$80,000 per year have lower indices for both the advanced, and as a result, the total index, while those above \$80,000 do better. There is little evidence that employment status is related to financial literacy, although those in the other category do have lower basic and total scores, while the differences main earners, and somewhat surprisingly, primary financial decision-makers are insignificant.

KiwiSaver Decisions

⁷ All significance is calculated based on t-tests of the difference in means between one group and all other groups.

Table 5 presents details on the retirement planning and KiwiSaver decisions made by our respondents, and looks at differences in the average financial literacy scores based on the decisions made. The first question asked respondents to rate how much consideration they had given to their financial planning. Only 5.5% of respondents had not given at least some thought to their retirement plans, while 31% had given a lot of thought to the issue. There appears to be little relationship with financial literacy however. The group who had given retirement no thought had statistically lower literacy scores, but there was no evidence that more thinking about retirement was related to the level of financial literacy of the respondent. Nor do we see a relationship with having a written plan. We do however see a significant difference when we asked how much was needed for retirement. Those who were able to provide a number for their retirement needs, either a lump sum or a per annum figure, had statistically higher scores. Given a determined goal for retirement is considered an important part of retirement planning, it may be that those with higher financial knowledge, especially around issues like inflation, returns and compounding are better able to determine their retirement needs.

With regards KiwiSaver and the decisions made by our respondents, nearly 90% of our sample has enrolled in KiwiSaver. We also observe that there is a statistical difference in the financial literacy of those who have joined and those who haven't. Only 35% of our sample were enrolled in a default fund, and only 17 respondents had at some point changed from a default fund. Neither of these questions resulted in significant differences in financial literacy scores. Of the KiwiSaver respondents, 8 didn't know their contribution, 56 were contributing 2%, 62 were contributing 4% and 15 were contributing 8%. Further, we see that the contribution rate is positively related to the financial literacy of respondents. Those who didn't know their contribution rate had significantly lower scores for the total and the basic questions, while those in the higher than default categories had higher than average scores.

Likewise, those respondents who knew the fees their fund charged when they joined, had compared the fees with other funds, considered the appropriate level of risk and compared the performance of funds all had higher financial literacy scores. Likewise, the respondents who considered the performance of their fund at least monthly scored higher across all three indices, while those who never looked at their funds performance had the lowest scores.

Table 6 presents the results of the importance respondents placed on three sets of variables; criteria used to decide on a fund, benefits from KiwiSaver and information sources used by the respondents to make their decisions. We group respondents based on total financial literacy score in three groups, low literacy (0-3), moderate literacy (4-7) and high literacy (8-11). We then calculate the average importance placed on each variable and calculate the difference of the average between the three literacy groups.

The first set of variables we consider examine the criteria used to determine the fund the respondent invested or would invest in. When we consider the average over the total sample, we observe a greater importance is placed on reputation and risk, followed by fees, past returns, professional advice and finally friends and family. When we consider the differences in the importance placed on the criteria by the different financial literacy groups we observe some interesting results. First, for those with the lowest financial literacy the advice of friends and family is has considerably more weight, it becomes the fourth most important factor rather than last and the average importance is statistically higher than for the other groups. By contrast, those with the greatest financial literacy place considerably less importance on friends and family and also professional advice, scoring both significantly lower. These findings support previous literature which finds that those with low financial literacy place greater weight on friends and family for financial decisions. In contrast to the literature however, we find those with the most literacy place less importance on any advice,

whereas previous literature has found these individuals tend to rely more on professional advice.

The second set of variables considers the incentives placed within the KiwiSaver scheme to attract enrolments. Specifically, the initial government incentive of \$1,000 placed into each account, the on-going yearly tax credit, the employers' contribution and the ability to use funds for a deposit on a family home. Respondents rated the employer contribution and the initial government contribution the most important, followed by the on-going tax credit as the most important, while the home deposit was viewed as being of little interest, as evidenced by the median value of 1. Of interest, the financial incentives which make the scheme so popular are rated as less important by the less financially literate respondents. This is potentially evidence of the effect of a lack of financial numeracy or a lack of understanding around the effects of compounding whereby small additional sums can greatly increase retirement savings. By contrast, the most financially literate placed greater importance on the initial government contribution and the on-going tax credits, while placing very little importance on the home deposit, possibly as a result of these respondents already owning homes which makes the home deposit redundant.

The final set of variables considers the various potential information sources respondents could use to make financial decisions. We observe some interesting results. First, when compared with the average importance in the criteria and the benefits questions, the importance of information sources is considerably lower, a high of just 2.48. Second, on average, we see that generally more objective sources are rated higher, as evidenced by the importance placed on financial publications, employers, friends and family and advertisements/prospectus. Third, we find some differences in the importance placed on different information sources. Less financially literate people put more importance on family and friends, which is consistent with previous literature, personal bankers, meeting and

presentations and insurance companies. In short, less financial literate people appear to place more emphasis on advice given to them from people whom they may perceive as acting in their best interest. This is also supported by the fact that they place family and friends and employers as the most important sources of information. Those with moderate financial literacy place less importance on financial publications, preferring employers and friends and family, although these are not statistically significant from the other financial literacy groups. The most financially literate place considerably less importance on personal advice, rating family and friends, personal bankers and meetings as less important than the other groups, and more on financial publications. This may indicate that the most capable financial decision makers are interested in evaluating objective information and making a personal decision on that basis.

As we noted earlier, our sample is over-represented in several categories which may influence our results. To control for their potentially confounding impact, we undertake regression analysis where the answers to the KiwiSaver decisions are treated as the dependent variable and we regress them against the total financial literacy scores⁸, the financial experience index, age (actual age rather than age group), gender, ethnicity dummy variables, education and annual income. As many of the decisions are binary yes/no type answers we conduct probit regressions to determine the effect a variable has on the probability of the respondent answering yes or no. For the questions on financial planning, contribution and performance comparison frequency where we have ordered answers, such as financial planning which goes from a lot of thinking to not at all, we employ ordered logit regressions.

The regressions results are presented in Table 7 and show that financial literacy has a strong relationship with many of the decisions our respondents made. In particular, we find our respondents are more likely to have determined the amount needed for retirement,

⁸ We also conducted the same testing against both the advanced and basic indices. The results are broadly consistent with the total literacy score results and so are excluded. The results are available upon request.

enrolled in KiwiSaver, known the funds fees when they joined, compared fees, considered the appropriate risk level and compared performance. These all support the earlier findings in Table 5 and show that more financially literate respondents were more likely to undertake what we consider to be good decisions in relation to KiwiSaver. Once we add the control variables, and in particular age, we also see that more financially literate respondents are more likely to have selected their own fund rather than simply be in the default. Our ordered logit results also confirm the earlier findings of Table 5. We see no relationship between financial literacy and the amount of financial planning people have done, but we do see a positive relationship with contribution, suggesting more financial literate individuals make higher contributions to their KiwiSaver. We also see a negative relationship with the performance comparison frequency. In this case, as we have ordered it from most frequently to least, this denotes that more financially literate individuals pay closer attention to their KiwiSaver balances.

Of our control variables, we note some significance for age, particularly in relation to financial planning, having a written plan, having determined a retirement sum needed and having selected a fund. The relationship with the first three variables is likely to be the result of the well-known fact that as people get closer to retirement age they pay more attention to their retirement savings. We also observe a positive relationship between financial experience and KiwiSaver enrolment. As KiwiSaver is one of the instruments included in the financial experience index, we would expect this relationship. We also see some significance for education. Interestingly, we see that higher education is negatively associated with contribution rate and risk, but positively with having compared fees and more frequent performance comparison. The negative relationship with contributions may be the result of higher qualifications resulting in higher annual incomes and therefore needing to contribute less to reach financial goals. The final analysis we conduct considers the choice of fund type.

We start by looking at the average financial literacy of the respondents who are invested in each KiwiSaver fund type in Table 8. We see clear evidence of differences in financial literacy between the different fund types. Specifically, those invested into cash funds have considerably lower financial literacy, across all three indices, while those in conservative funds have a lower total score. Meanwhile those invested into balanced funds have a slightly higher total and basic literacy scores, while Growth is higher again and significantly different for all three indices. The results suggest that those investing into more risky portfolios are generally more financial literate.

We also consider how good the decisions are that our respondents are making. Specifically we consider whether our respondents select an appropriate type of fund. To do this, we follow the lifestyle investing model and assume that investors in the under 29 group should invest in the most aggressive funds, those in their 30's in growth funds, those in their 40's balanced funds, those in their 50's in conservative funds while those in the 60+ group should invest in cash funds, which are the least risky.

Table 9 presents a breakdown of the type of funds selected by each age group and the percentages taking more or less risk than suggested. The bolded numbers on the diagonal represent the percentage taking the appropriate level of risk. For both the 60+ and under 29 categories we observe no one invested in the ideal portfolio. Even more concerning for the under 29 category is the fact that over 80% of the respondents were invested in the cash and conservative funds. These represent the least risk and offer the lowest long term return, despite the fact that under 29's can sustain the most risk. The 40's group appear to have the best choices, however, this maybe simply an artefact of the fact that the balanced fund is the most popular choice for three age groups, the 30's, 40's and 50's. Overall, we observe that the 50's and 60+ groups are considerably more likely to be in a higher risk portfolio than is recommended while the under 29 and 30's are more likely to take too little risk. For both

groups this is a significant risk, for the older groups that a financial downturn could significantly reduce their wealth with insufficient time for it to recover, and for the younger group that they will be left with insufficient assets at retirement.

We test the relationship between the fund choice and financial literacy using a multinomial logistic regression. We test this by defining a variable as 1 if a respondent has too little risk, 2 if they have the ideal risk and 3 if they have too much risk, and running the regression with 2 as the base case. We then report the odds ratios. We report our results in Table 10. We note that there is a negative but significant odd ratio for financial literacy in the less risk case. This means that for a 1 question reduction in the financial literacy score, we see a nearly 35% reduction in the probability of a respondent having the ideal risk. Interestingly, we do not see a similar effect on the more risk category. We also observe that men are about 2.5 times more likely to take more risk than they should, and that older respondents are less likely to take less risk and more likely to take more risk. Finally, higher annual income makes a respondent less likely to take more risk.

6. Conclusion

Overall, our results, using a sample of staff at Auckland University of Technology, suggest that there is a strong relationship between financial literacy and the KiwiSaver decisions people make. We observe that those respondents with higher financial literacy scores were more likely to be members of KiwiSaver, have determined an amount needed for retirement, make larger contributions, have considered the effect of risk, fees and performance and keep a closer eye on the performance of their KiwiSaver fund. These are all decisions likely to affect the level of eventual savings. It has been widely discussed that the 2% (now 3%) base contribution is too low to allow people to meet their retirement needs. Also, many participants have a set and forget mindset to KiwiSaver, meaning they fail to review the performance of their KiwiSaver fund or adjust the fund type as their needs change.

It appears, based on our findings, that improvements in both basic and advanced financial literacy may improve KiwiSaver outcomes in the longer term.

References

- Agarwal, S., Driscoll, J., Gabaix, X., & Laibson, D. (2009). Financial Decisions over the Lifecycle with Implications for Regulation. *Brookings Papers on Economic Activity* Fall 2009, 51-101.
- Alessie, R., van Rooij, M. & Lusardi, A. (2011). Financial Literacy, Retirement Preparation and Pension Expectations in the Netherlands. *Centre for Research on Pensions and Welfare Policies Working Paper*
- Almenberg, J. & Soderbergh, J. (2011). Financial Literacy and Retirement Planning in Sweden. *Centre for Research on Pensions and Welfare Policies Working Paper*
- Anderson, S., Zhan, M., & Scott, J. (2004). Targeting Financial Management Training at Low-Income Audiences: Bits, Briefs, and Applications. *Journal of Consumer Affairs* 38 167–177.
- ANZ (2003): “ANZ Survey of adult financial literacy in Australia: final report”.
- ANZ (2005): “ANZ Survey of adult financial literacy in Australia: final report”.
- ANZ (2008): “ANZ Survey of adult financial literacy in Australia: final report”.
- ANZ (2011): “ANZ Survey of adult financial literacy in Australia: final report”.
- Banks, James and Zoe Oldfield. (2007), “Understanding Pensions: Cognitive Functions, Numerical Ability and Retirement Saving,” *Fiscal Studies*, 28(2).
- Behrman, J., Mitchell, O., Soo, C. & Bravo, D. (2010). Financial Literacy, Schooling and Wealth Accumulation. *National Bureau of Economic Research Working Paper Series No 16452*.
- Bell, E. & Lerman, R. (2005). Can Financial Literacy Enhance Asset Building? *Opportunity and Ownership Project*, 6, 1-8.
- Bernatzi, S. & Thaler, R. (2001). Naïve Diversification Strategies in Defined Contribution Savings Plans. *American Economic Review* 91, 79-98.
- Bernheim, D. (1995), Do Households Appreciate Their Financial Vulnerabilities? An Analysis of Actions, Perceptions, and Public Policy, *Tax Policy and Economic Growth*, pp. 1-30.
- Bernheim, D. (1998). “Financial Illiteracy, Education and Retirement Saving,” in Mitchell, O. & Schieber, S. (eds.) *Living with Defined Contribution Pensions*, Philadelphia: University of Pennsylvania Press, pp. 38-68.
- Broadbent, J., Palumbo, M. & Woodman, E. (2006). The Shift from Defined Benefit to Defined Contribution Pension Plans – Implications for Asset Allocation and Risk

- Management. *Working Paper for Working Group on Institutional Investors, Global Savings and Asset Allocation*.
- Bucher-Koenen, T. & Lusardi, A. (2011). Financial Literacy and Retirement Planning in Germany. *Centre for Research on Pensions and Welfare Policies Working Paper*
- Cannon, E. & Tonks, I. (2011). The Value and Risk of Defined Contribution Pension Schemes: International Evidence. *Forthcoming Journal of Risk and Insurance*.
- CFS (2001): “Consumer Survey on Finance”, The central council for financial services information, Japan.
- Chen, H. & Volpe, R. (2002). Gender Differences in Personal Financial Literacy among College Students. *Financial Services Review* 11, 289-307.
- Cole, S., Shapiro, J. & Shastry, G. (2010). Financial Literacy and Mineworkers: Using randomized control trial to determine the impact of financial education on mineworkers: Findings from the baseline study. *Financial Education Fund*.
- Colmar Brunton (2006). *ANZ-Retirement Commission Financial Knowledge Survey*. Available at <http://www.financialliteracy.org.nz/national-strategy>
- Colmar Brunton (2009). *ANZ-Retirement Commission Financial Knowledge Survey*. Available at <http://www.financialliteracy.org.nz/national-strategy>
- Colmar Brunton (2013). *ANZ-Retirement Commission Financial Knowledge Survey*. Available at <http://www.financialliteracy.org.nz/national-strategy>
- Dvorak, T. & Hanley, H. (2010). Financial Literacy and the Design of Retirement Plans. *Journal of Socio-Economics* 39, 645-652.
- FSA (2006): “Levels of financial capability in the UK: Results of a baseline survey”, consumer research 47, *Financial Services Authority*.
- Fornero, E. & Monticone, C. (2011). Financial Literacy and Pension Plan Participation in Italy. *Centre for Research on Pensions and Welfare Policies Working Paper*
- Frijns, B., Gilbert, A. & Tourani-Rad, A. (2014). Learning by Doing: The Role of Financial Experience in Financial Literacy, *Forthcoming Journal of Public Policy*
- Guiso, L. & Jappelli, T. (2008). Financial Literacy and Portfolio Diversification. *EUI Working Paper 2008/31*.
- Gustman, A. & Steinmeier, T. (2004). What People Don't Know about their Pensions and Social Security. In Gale, W. Shoven, J. & Warshawsky M. *Private Pensions and Public Policies*, Washington, DC: Brookings Institution: 57-125.
- Hastings, J., & Mitchell, O. (2011). How Financial Literacy and Impatience Shape Retirement Wealth and Investment Behaviours. *NBER Working Paper No. 16740*

- Hastings, J., Mitchell, O., & Chyn, E.. (2010). Fees, Framing, and Financial Literacy in the Choice of Pension Managers. *Pension Research Council Working Paper, Wharton School. Summer.*
- Hastings, J., & Tejada-Ashton, L. (2008), Financial Literacy, Information, and Demand Elasticity: Survey and Experimental Evidence from Mexico. *NBER Working Paper No. 14538.*
- Hilgert, M., Hogarth, J. & Beverly, S. (2003). Household Financial Management: The Connection Between Knowledge and Behavior. *Federal Reserve Bulletin* 89, 309-322.
- Hirad, A., & Zorn, P. (2001). A Little Knowledge is a Good Thing: Empirical Evidence of the Effectiveness of Pre-Purchase Homeownership Counselling. *Working Paper, Freddie Mac.*
- Inland Revenue Department (IRD). (2012). *KiwiSaver Annual Evaluation Report.*
- Kimball, M., & Shumway, T. (2006). Investor Sophistication, and the Participation, Home Bias, Diversification, and Employer Stock Puzzles, *Mimeo, University of Michigan.*
- Klapper, M. & Panos, G. (2011). Financial Literacy and Retirement Planning in View of a Growing Youth Demographic: The Russian Case. *Centre for Research on Pensions and Welfare Policies Working Paper*
- Mandell, L. (2008). *The Financial Literacy of Young American Adults: Results of the 2008 National Jump\$tart Coalition Survey of High School Seniors and College Students.* Seattle, WA: University of Washington and the Aspen Institute.
- Mandell, L. (2009). The Impact of Financial Education in High School and College on Financial Literacy and Subsequent Financial Decision Making. *Paper presented at the American Economic Association meetings, San Francisco, CA.*
- Mandell, L. and Klein, L. (2009). The Impact of Financial Literacy Education on Subsequent Financial Behaviour. *Journal of Financial Counseling and Planning* 20, 15-24.
- Ministry of Business Innovation and Employment (MBIE). (2012). *Review of KiwiSaver Default Provider Arrangements: Discussion Document.*
- Mitchell, O. (1988). Worker Knowledge of Pensions Provisions. *Journal of Labor Economics* 6, 28-29.
- Mitchell, O. & Zeldes, S. (1996). Social Security Privatisation: A Structure for Analysis. *NBER Working Paper No 5512*
- New Zealand Treasury, (2013). *Affording our Future: Statement on the Long Term Fiscal Position.*

- Lusardi, A. & Mitchell, O. (2007). Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth. *Journal of Monetary Economics* 54, 205-224.
- Lusardi, A. & Mitchell, O. (2009). How Ordinary Consumers Make Complex Economic Decisions: Financial literacy and retirement readiness. *Mimeo Wharton School*
- Lusardi, A. & Mitchell, O. (2011). Financial Literacy around the World: An Overview. *Journal of Pension Economics and Finance* 10, 497-508.
- Lusardi, A. & Tufano, P. (2009). Debt Literacy, Financial Experience and Overindebtedness. *Working Paper, Harvard Business School*
- OECD (2005): “Improving financial literacy: analysis of issues and policies”.
- Sekita, S. (2011) Financial Literacy and Retirement Planning in Japan. *Centre for Research on Pensions and Welfare Policies Working Paper*
- Stango, V., & Zinman, J. (2011). Fuzzy Math, Disclosure Regulation and Credit Market Outcomes: Evidence from Truth in Lending Reform. *Review of Financial Studies* 24, 506-534.
- Van Rooij, M., Lusardi, A. & Alessie, R. (2011a). Financial Literacy and Stock Market Participation. *Journal of Financial Economics* 101, 449-472.
- Van Rooij, M., Lusardi, A. & Alessie, R. (2011b). Financial Literacy and Retirement Planning in the Netherlands. *Journal of Economic Psychology* 32, 593-608.
- Worthington, A. (2004). The Distribution of Financial Literacy in Australia. *Discussion Papers in Economics, Finance, and International Competitiveness, Queensland University of Technology.*
- Xu, L. & Zia, B. (2012). Financial Literacy Around the World: An overview for the evidence with practical suggestions for a way forward. *World Bank Policy Research Working Paper 6107.*

Table 1: Summary of Respondent Demographics

		Number	Percentage
<i>Age</i>	<i>Under 29</i>	17	10%
	<i>30-39</i>	41	24.1%
	<i>40-49</i>	43	25.3%
	<i>50-59</i>	41	24.1%
	<i>60+</i>	19	11.2%
<i>Gender</i>	<i>Female</i>	123	72.4%
	<i>Male</i>	39	22.9%
<i>Ethnicity</i>	<i>European</i>	119	70.0%
	<i>Maori and Pasifika</i>	19	10.2%
	<i>Asian</i>	23	13.5%
	<i>Other</i>	2	1.2%
<i>Education</i>	<i>Secondary School</i>	8	4.7%
	<i>Certificate/Diploma/Bachelors</i>	59	34.7%
	<i>Post Graduate</i>	95	55.9%
<i>Marital Status</i>	<i>Single – Never Married</i>	37	21.8%
	<i>Married/Civil Union</i>	107	62.9%
	<i>Separated/Divorced/Widowed</i>	19	11.2%
<i>Income Level</i>	<i>1-20,000</i>	9	5.3%
	<i>20,001-40,000</i>	9	5.3%
	<i>40,001-60,000</i>	42	24.7%
	<i>60,001-80,000</i>	40	23.5%
	<i>80,001-100,000</i>	30	17.6%
	<i>100,001-120,000</i>	22	12.9%
	<i>120,001-150,000</i>	8	4.7%
	<i>150,000+</i>	2	1.2%
<i>Employment Status</i>	<i>Full Time</i>	129	75.9%
	<i>Part Time</i>	23	13.5%
	<i>Other</i>	10	5.9%
<i>Main Income Earner</i>	<i>Yes</i>	100	58.8%
	<i>No</i>	62	36.5%
<i>Primary Decision Maker</i>	<i>Yes</i>	71	41.8%
	<i>No</i>	12	7.1%
	<i>Shared Responsibility</i>	78	45.9%

Table 2: Summary of Respondents Financial Experience

	Number	Percentage
Panel A: Assets		
Savings		
Savings Account	144	84.7%
Term Deposit	67	39.4%
KiwiSaver/Pension Fund	146	85.9%
Investments		
Stocks	34	20.0%
Bonds	11	6.5%
Mutual Fund	9	5.3%
Property		
Own Home – Mtg	75	44.1%
Own Home - Freehold	33	19.4%
Investment Property	40	23.5%
Insurances		
Car/House/Contents	140	82.4%
Life/Health	111	65.3%
Income Protection	37	21.8%
Panel B: Liabilities		
Credit Card	151	88.8%
Repay Monthly	106	62.4%
Hire Purchase	50	29.4%
Mortgage	102	60.0%
Personal/Bank Loan	48	28.2%
Student Loan	48	28.2%
Payday Advance Loan	1	.6%

Figure 1: Total Financial Experience Index

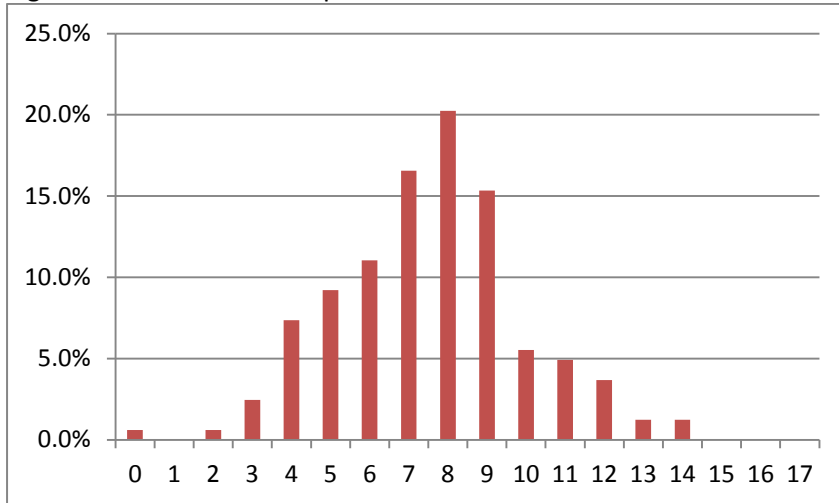


Figure 2: Total Financial Literacy Index

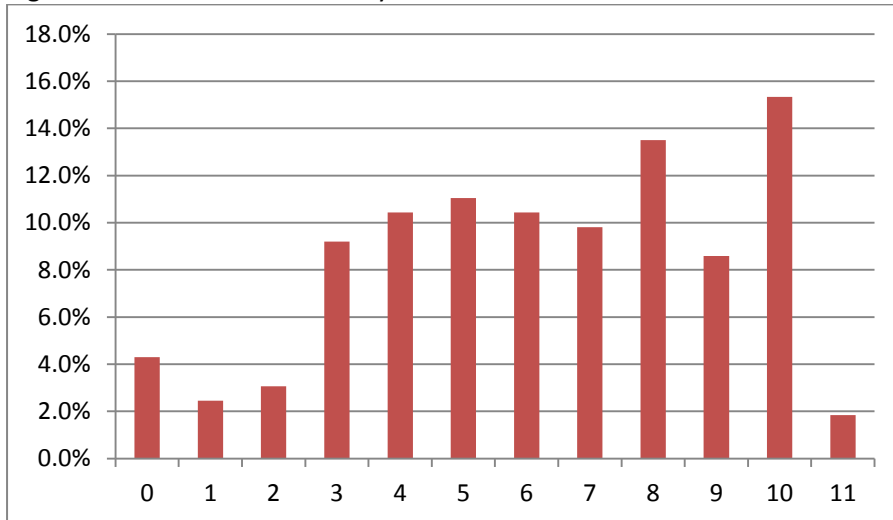


Table 3: Summary of Financial Literacy Questions and Indices

	Number	Percentage	
Panel A: Basic Question			
Q1 – Compounding	116	68.2%	
Q2 – Inflation	125	73.5%	
Q3 – TVM	108	66.3%	
Basic Index			
	0	18	11.0%
	1	23	14.1%
	2	40	24.5%
	3	82	50.3%
Panel B: Advanced Questions			
Q1 – Purchasing Power	111	65.3%	
Q2 – Market Function	110	64.7%	
Q3 – Mutual Funds	55	32.4%	
Q4 – OCR	21	12.9%	
Q5 – Diversification	55	32.4%	
Q6 – Risk	109	64.1%	
Q7 – Returns	80	47.1%	
Q8 - Diversification	126	74.1%	
Advanced Index			
	0	9	5.5%
	1	15	9.2%
	2	19	11.7%
	3	27	16.6%
	4	18	11.0%
	5	26	16.0%
	6	17	10.4%
	7	27	16.6%
	8	5	3.1%

Table 4: Financial Literacy and Demographic Factors

			FL_Basic	Diff	FL_Adv	Diff	FL_Total	Diff
<i>Age</i>								
	<i>Under 29</i>	17	2.1	-0.1	3.4	-0.8*	5.4	-0.9
	<i>30-39</i>	41	1.8	-0.4**	3.5	-0.8**	5.3	-1.3**
	<i>40-49</i>	43	2.3	0.2	4.6	0.7*	6.9	0.9*
	<i>50-59</i>	41	2.3	0.2	4.4	0.4	6.7	0.6
	<i>60+</i>	19	2.3	0.2	4.4	0.4	6.7	0.6
<i>Gender</i>								
	<i>Female</i>	123	2.0		3.7		5.8	
	<i>Male</i>	39	2.4	0.4**	5.2	1.5***	7.7	1.9***
<i>Ethnicity</i>								
	<i>European</i>	119	2.3	0.7***	4.3	0.8*	6.6	1.5***
	<i>Maori and Pasifika</i>	19	1.3	-0.9***	2.9	-1.3**	4.3	-2.2***
	<i>Asian</i>	23	1.7	-0.5**	3.9	-0.3	5.6	-0.7
	<i>Other</i>	2	3.0	0.9	5.5	1.4	8.5	2.3
<i>Marital Status</i>								
	<i>Single – Never Married</i>	37	2.1	0	3.3	-1.0**	5.4	-1.0*
	<i>Married/Civil Union</i>	107	2.1	-0.6	4.3	0.6	6.4	0.5
	<i>Separated/Divorced/Widowed</i>	19	2.3	0.1	4.5	0.5	6.8	0.6
<i>Education</i>								
	<i>Secondary School</i>	8	2.4	0.2	3.1	-1.0	5.5	-0.8
	<i>Certificate/Diploma/Bachelors</i>	59	1.9	-0.4**	3.4	-1.0***	5.4	-1.4***
	<i>Post Graduate</i>	95	2.3	0.3*	4.6	1.2***	6.9	1.5***
<i>Income Level</i>								
	<i>1-20,000</i>	9	1.3	-0.9**	2.9	-1.3*	4.2	-2.1**
	<i>20,001-40,000</i>	9	2.3	0.2	4.7	0.6	7.0	0.8
	<i>40,001-60,000</i>	42	1.9	-0.3	3.4	-0.9**	5.3	-1.2**
	<i>60,001-80,000</i>	40	2.0	-0.2	3.6	-0.7*	5.6	-0.9*
	<i>80,001-100,000</i>	30	2.5	0.4*	4.8	0.9**	7.3	1.3**
	<i>100,001-120,000</i>	22	2.5	0.4	5.3	1.4***	7.8	1.8***
	<i>120,001-150,000</i>	8	2.4	0.2	5.0	1.0	7.4	1.2
	<i>150,000+</i>	2	3.0	0.9	5.0	0.9	8.0	1.8
<i>Employment Status</i>								
	<i>Full Time</i>	129	2.2	0.4*	4.1	0.3	6.4	0.6
	<i>Part Time</i>	23	2.0	-0.1	4.2	0.1	6.2	-0.2
	<i>Other</i>	10	1.5	-0.7**	3.2	-1.0	4.7	-1.6*
<i>Main Income Earner</i>								
	<i>Yes</i>	100	2.2		4.2		6.4	
	<i>No</i>	62	2.0	-0.2	3.9	-0.3	5.9	-0.5
<i>Primary Decision Maker</i>								
	<i>Yes</i>	71	2.2	0	4.0	-0.2	6.2	-0.1
	<i>No</i>	12	1.9	-0.2	4.7	0.6	6.6	0.4
	<i>Shared Responsibility</i>	78	2.1	0	4.1	0	6.2	0

Table 5: Financial Literacy and KiwiSaver Decisions

		Obs	%	FL_Total	Diff	FL_Basic	Diff	FL_Adv	Diff
<i>Considered Financial Planning</i>									
	<i>A Lot</i>	31	19%	6.03	-0.40	1.84	-0.43**	4.19	0.03
	<i>Fair Amount</i>	61	37.4%	6.48	0.21	2.31	0.22	4.16	-0.01
	<i>A Little</i>	62	38.0%	6.44	0.15	2.24	0.10	4.19	0.04
	<i>Not At All</i>	9	5.5%	3.89	-2.48**	1.33	-0.86**	2.56	-1.63**
<i>Written Plan</i>									
	<i>Yes</i>	19	11.7%	6.53		2.11		4.42	
	<i>No</i>	144	88.3%	6.19	-0.34	2.15	0.01	4.05	-0.37
<i>Determined Amount Required</i>									
	<i>Yes</i>	52	31.9%	7.21		2.42		4.79	
	<i>No</i>	101	62.0%	5.58	-1.63***	1.95	-0.47***	3.63	-1.16***
<i>Enrolled in KS</i>									
	<i>Yes</i>	145	89.0%	6.43		2.22		4.21	
	<i>No</i>	18	11.0%	4.67	-1.76**	1.50	-0.72***	3.17	-1.04*
<i>Selected Fund</i>									
	<i>Yes</i>	88	60.7%	6.90		2.35		4.55	
	<i>Default</i>	51	35.2%	6.08	-0.82*	2.14	-0.22	3.94	-0.60
<i>Changed from Default</i>									
	<i>Yes</i>	17	11.7%	6.00		1.88		4.12	
	<i>No</i>	34	23.4%	6.29	0.29	2.27	0.39	4.02	-0.10
<i>Contribution</i>									
	<i>Do Not Know</i>	8	5.5%	4.63	-1.69*	1.38	-0.81**	3.25	-0.89
	<i>2%</i>	56	38.6%	5.98	-0.38	2.05	-0.13	3.93	-0.25
	<i>4%</i>	62	42.8%	7.02	1.26***	2.42	0.45***	4.60	0.82**
	<i>8%</i>	15	10.3%	7.27	1.14*	2.60	0.51**	4.67	0.63
<i>Knew Fees Charged</i>									
	<i>Yes</i>	66	45.5%	7.12		2.39		4.73	
	<i>No</i>	73	50.3%	6.00	-1.12**	2.14	-0.26	3.86	-0.86**
<i>Compared Fees Charged</i>									
	<i>Yes</i>	45	31.0%	7.38		2.27		5.11	
	<i>No</i>	96	66.2%	6.18	-1.20**	2.27	0.00	3.91	-1.21***
<i>Considered Risk Level</i>									
	<i>Yes</i>	101	69.7%	7.36		2.46		4.90	
	<i>No</i>	53	36.6%	4.38	-2.98***	1.68	-0.78***	2.70	-2.20***
<i>Performance Compared</i>									
	<i>Yes</i>	45	31.0%	7.69		2.51		5.18	
	<i>No</i>	97	66.9%	6.01	-1.68***	2.13	-0.38**	3.88	-1.30***
<i>Performance Comparison Freq</i>									
	<i>Monthly</i>	14	9.7%	7.64	1.54*	2.50	0.39*	5.14	1.15*
	<i>Semi-Annually</i>	57	39.3%	6.60	0.56	2.35	0.32*	4.25	0.24
	<i>Annually</i>	43	29.7%	6.79	0.76	2.28	0.19	4.51	0.57
	<i>Never</i>	32	22.1%	5.22	-1.26**	1.81	-0.41**	3.41	-0.85*

Table 6: Financial Literacy and the Importance of Criteria, Benefits and Information Sources

	Average	Median	FL_Low	Diff	FL_Mod	Diff	FL_High	Diff
<i>Importance of Criteria</i>								
<i>Past Returns</i>	3.75	4	3.55	-0.24	3.70	-0.08	3.88	0.22
<i>Fees</i>	3.90	4	3.82	-0.12	3.90	-0.04	3.98	0.10
<i>Risk</i>	4.16	4	4.09	-0.11	4.25	0.11	4.15	-0.06
<i>Reputation</i>	4.34	5	4.14	-0.25	4.39	0.08	4.38	0.06
<i>Friend/Family Advice</i>	2.82	3	3.77	1.12***	2.72	-0.20	2.59	-0.41**
<i>Professional Advice</i>	3.35	4	3.64	0.35	3.49	0.26	3.08	-0.45**
<i>Importance of Benefits</i>								
<i>Government Kickstart</i>	4.33	5	3.82	-0.63***	4.39	0.05	4.52	0.28*
<i>Government Tax Credit</i>	3.78	4	3.00	-0.95***	3.82	0.02	4.08	0.48**
<i>Employer Contribution</i>	4.42	5	4.00	-0.51**	4.48	0.08	4.54	0.19
<i>Home Deposit</i>	2.13	1	3.45	1.55***	2.02	-0.23	1.80	-0.61**
<i>Importance of Information Sources</i>								
<i>Financial Publications</i>	2.48	3	2.27	-0.23	2.17	-0.51**	2.83	0.63***
<i>Employer</i>	2.37	2	2.64	0.30	2.46	0.12	2.22	-0.29
<i>Family/Friend</i>	2.35	2	2.91	0.70**	2.40	0.13	2.03	-0.50**
<i>Advertisement/Prospectus</i>	2.25	2	2.41	0.21	2.14	-0.18	2.27	0.06
<i>Fund Company</i>	2.02	1	2.14	0.18	1.85	-0.24	2.07	0.14
<i>Personal Banker</i>	1.87	1	2.45	0.72**	1.83	-0.33	1.63	-0.37*
<i>Meeting/Presentation</i>	1.78	1	2.41	0.74***	1.74	-0.08	1.60	-0.33*
<i>Investment Broker</i>	1.64	1	1.77	0.17	1.64	0.03	1.55	-0.13
<i>Insurance Co</i>	1.56	1	1.95	0.48**	1.41	-0.23	1.53	-0.03

Table 7: Regression Analysis of Total Financial Literacy and KiwiSaver Decisions

	Plan Thinking	Written Plan	Amount	Enrolled	Selected Fund	Default Changed	Contribution	Knew Fees	Compared Fees	Risk	Perf Compared	Freq Comparison
Constant		-3.6303*** (-2.9092)	-3.49*** (-3.481)	1.8417 (1.5534)	-1.6364 (-1.2323)	-1.0868 (-0.874)		-1.3245 (-1.5356)	-2.6765*** (-2.7384)	-1.3722 (-0.9987)	-2.6932** (-2.0636)	
Fin Lit	-0.0097 (-0.1624)	-0.0018 (-0.0318)	0.0889* (1.9043)	0.1406** (2.3081)	0.0882* (1.8472)	0.0153 (0.2138)	0.1685*** (2.5846)	0.0946** (2.0207)	0.1076** (2.2200)	0.2697*** (5.0532)	0.1292** (2.5672)	-0.1736*** (-2.6354)
Fin Exp	-0.082 (-1.0544)	-0.0276 (-0.3895)	0.0864 (1.5431)	0.1978** (2.3306)	-0.0602 (-1.0616)	-0.0847 (-0.982)	0.0459 (0.5404)	0.0229 (0.4056)	-0.0388 (-0.6488)	-0.0034 (-0.0566)	0.0002 (0.0039)	0.0692 (0.8583)
Age	-0.0692*** (-4.2793)	0.0394*** (-2.6302)	0.0192* (1.6968)	0.0016 (0.1027)	0.0190* (1.6884)	0.0066 (0.3879)	0.0136 (0.8360)	0.0020 (0.1843)	0.0169 (1.4255)	-0.0011 (-0.0925)	0.0126 (1.1034)	-0.0091 (-0.5835)
Gender	0.522 (-1.3181)	-0.2885 (-0.7600)	0.3216 (1.0556)	-0.4816 (-1.3525)	-0.0643 (-0.2050)	0.4371 (0.9277)	0.3008 (0.7006)	-0.3256 (-1.0717)	-0.3651 (-1.2085)	0.0032 (0.0093)	0.0636 (0.2087)	-0.0542 (-0.1304)
Euro	-0.7214 (-0.5407)	0.3998 (-0.7566)	1.0840** (2.2649)	-0.6110 (-1.1893)	0.3021 (0.2971)	-0.3301 (-0.639)	0.1284 (0.1008)	0.2897 (0.8084)	-0.1067 (-0.2935)	1.1234 (1.0766)	-0.3174 (-0.3238)	16.0867 (0.0270)
Maori	-1.644 (-1.1685)	0.6053 (-0.9201)	0.7356 (1.2676)	-0.4454 (-0.7198)	1.3249 (1.2114)	0.5343 (0.7775)	1.0995 (0.8035)	-0.0870 (-0.1772)	0.0221 (0.0445)	0.7810 (0.7105)	-0.1043 (-0.1005)	16.4015 (0.0275)
Asian	-1.1051 (-0.7979)				0.3504 (0.3333)		0.1737 (0.1329)			0.6013 (0.5629)	-0.2228 (-0.2193)	16.5357 (0.0277)
Education	-0.2018 (-0.7049)	0.1911 (-0.6875)	0.0484 (0.2207)	-0.2348 (-0.7947)	-0.1023 (-0.4669)	0.3267 (0.9298)	-0.5425* (-1.6870)	-0.0483 (-0.2314)	0.5712** (2.3835)	-0.3745* (-1.6797)	0.3028 (1.3459)	0.6990** (2.3623)
Annual Income	-0.0906 (-0.7171)	0.0066 (-0.0584)	-0.1027 (-1.0997)	-0.1816 (-1.3557)	0.2012** (2.1076)	-0.1841 (-1.175)	0.1734 (1.2810)	0.1319 (1.4290)	-0.0964 (-1.0079)	0.1148 (1.1154)	-0.0259 (-0.2768)	-0.0631 (-0.5122)
C1 Constant	-6.9467*** (-3.8487)						-1.2231 (-0.6790)					14.5291 (0.0244)
C2 Constant	-4.9656*** (-2.8098)						1.4354 (0.7981)					17.1056 (0.0287)
C3 Constant	-1.9342 (-1.1226)						3.9328** (2.1621)					18.5719 (0.0312)
Pseudo R2	0.0974	0.1081	0.1496	0.1515	0.0979	0.1179	0.0519	0.0795	0.0914	0.2592	0.0922	0.0717
Obs	160	158	148	158	136	71	139	135	136	151	139	143

Table 8: Financial Literacy and Fund Type

<i>Fund Type</i>	Obs	FL_Total	Diff	FL_Basic	Diff	FL_Adv	Diff
<i>Cash</i>	25	4.36	-2.21***	1.60	-0.64***	2.76	-1.57***
<i>Conservative</i>	36	5.53	-0.91*	1.92	-0.29	3.61	-0.62
<i>Balanced</i>	60	6.77	0.84*	2.38	0.38**	4.38	0.46
<i>Growth</i>	28	8.11	2.26***	2.57	0.52**	5.54	1.74***
<i>Aggressive</i>	5	8.20	2.03	3.00	0.89*	5.20	1.14

Table 9: Summary of Age and Fund Type

	<i>Cash</i>	<i>Conservative</i>	<i>Balanced</i>	<i>Growth</i>	<i>Aggressive</i>	<i>Less Risk</i>	<i>Ideal</i>	<i>More Risk</i>
<i>Under 29</i>	43.8%	37.5%	18.8%	0.0%	0.0%	100.0%	0.0%	
<i>30-39</i>	21.6%	24.3%	32.4%	18.9%	2.7%	78.4%	18.9%	2.7%
<i>40-49</i>	14.0%	14.0%	48.8%	18.6%	4.7%	27.9%	48.8%	23.3%
<i>50-59</i>	8.1%	16.2%	51.4%	18.9%	5.4%	8.1%	16.2%	75.7%
<i>60+</i>	0.0%	44.4%	27.8%	27.8%	0.0%		0.0%	100.0%

Table 10: Regression Analysis of the Fund Type Decision

	Less Risky	More Risky
Constant	9.6672** (2.5046)	-28.9999 (-0.0172)
Fin Lit	-0.3487** (-2.5461)	0.1150 (0.8213)
Fin Exp	-0.0643 (-0.4613)	0.1742 (1.1705)
Age	-0.1376*** (-3.0985)	0.2255*** (4.5192)
Gender	1.1327 (1.3994)	2.5845*** (2.9348)
Euro	0.7764 (0.3463)	15.8186 (0.0094)
Maori	16.0186 (0.0132)	30.4269 (0.0146)
Asian	-0.0970 (-0.0421)	14.2332 (0.0085)
Education	-0.4846 (-0.8429)	-0.0049 (-0.0089)
Annual Income	-0.2544 (-1.0646)	-0.5095* (-1.9440)
Pseudo R2	0.5098	
Obs	151	