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# How prepared are New Zealanders to achieve adequate consumption in retirement?

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## **Abstract**

The majority of New Zealand retirees are happy with their current level of retirement income; however, the critical issue is “Will their financial resources last?” This question provides the catalyst for this thesis, requiring a definition for, and a way of measuring retirement adequacy that is appropriate for New Zealanders.

Government-funded NZ Superannuation forms the foundation of New Zealanders’ retirement income, sufficient to cover basic needs and prevent retirees falling below the poverty line. Some (passive) retirees find that NZ Superannuation is sufficient to meet their needs, achieving retirement adequacy regardless of their financial behaviour and actions. However, others (active) retirees, desiring a higher retirement income, are required to make financial decisions and take action to augment their NZ Superannuation in order to achieve the lifestyle and level of consumption desired in retirement. While retiree retirement adequacy can be calculated with a degree of certainty, that is not the case for pre-retirees as future employment, income, and health are susceptible to change.

This study found the Consumption Replacement approach was to be a more appropriate methodology than Income Replacement for measuring retirement adequacy. Financial calculations using data collected from an on-line survey of 1,044 respondents found that 60.4% of all ‘current’ retirees and 48.6% of ‘active’ retirees were likely to be adequately prepared for retirement, by being able to maintain pre-retirement lifestyle and consumption in retirement.

Significant retirement adequacy factors drawn from the data were used to develop the Financial Preparedness for Retirement (FPfR) Index to compare the preparedness of retirees to pre-retirees. This study found that fewer pre-retirees (32.1%) were likely to achieve retirement adequacy than retirees. Significantly, nine out of ten inadequately prepared pre-retirees would need to save more than 25% of their current household income pre-retirement in order to achieve their required retirement saving accumulation targets. The conclusion reached is that New Zealand pre-retirees are less prepared financially for retirement than current retirees.

Findings from this thesis will help provide a greater understanding of retirement preparedness amongst policymakers, government agencies, educationalists, financial institutions, professional financial advisers, and others, both internationally and in New Zealand.

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## Table of Abbreviations

CCR	Capital Consumption Ratio
CPreRInc	Current annual household Pre-retiree Income
CRetInc	Current annual household Retirement Income
ERI	Expected Retirement Income
FS	Financial Support (received or given)
HhldInc	Current Household Retirement Income
HhldRetCons	Current Retiree Household Retirement Consumption
HhldRetInc	Current Retiree Household Retirement Income
IRR	Income Replacement Rate
LYE	Last Year's Earnings (before retirement)
LYE <sup>P</sup>	Last Year's Earnings – Projected (forward or backwards to 2015)
NPV	Net Present Value
ProjHhldIncc	Projected Household Income, capital Consumption approach excluding home equity.
ProjHhldIncp	Projected Household Income, capital Preservation approach excluding Home Equity
ProjHhldIncc <sup>HEq</sup>	Projected Household Income, capital Consumption approach including partial home equity.
PHRI	Projected Household Retirement Income (excludes Home equity)
PHRI <sup>HEq</sup>	Projected Household Retirement Income includes Home equity
PRRI	Prerequisite Replacement Retirement Income
PV	Present Value
RHS	Right Hand Side
RHY	Remaining Home Loan Years - The number of year remaining for a home loan
RR	Replacement Rate
RRI	Required Retirement Income
RRR	Required Replacement Rate
RRoR	Real Rate of Return
RRRI	Required Replacement Retirement Income
RetCons	Total household Retirement Consumption
RetConsc	Total household Retirement Consumption – capital Consumption
RetConsP	Total household Retirement Consumption – capital Preservation
PVTotHhldFinRes	NPV of Total Household Financial Resources, excluding partial home equity.
PVTotHhldFinRes <sup>HEq</sup>	NPV of Total Household Financial Resources, including partial Home Equity.
RYIR	Remaining Years In Retirement
Y	Annual Income
YIR	Years In Retirement
YSR	Years Spent in Retirement
YTR	Years To Retirement

# 1.0 Introduction

## 1.1 Background to the thesis

There is a lack of research in New Zealand as to how financially prepared New Zealanders are for their retirement, or whether the financial preparations undertaken will provide sufficient consumption throughout the entire period of retirement. Those with sufficient financial resources to meet their total retirement consumption needs are considered to have achieved retirement adequacy. A key part of being prepared is calculating the total amount of consumption likely to be required in retirement. Horizon Research's (2011) survey found that the majority of New Zealanders were unaware whether they were adequately prepared financially for retirement.

Lusardi and Mitchell (2011b) found that over two-thirds of people surveyed in the US had carried out little or no retirement planning. This is an indication that many are unaware of their desired retirement consumption or saving targets. Lusardi and Mitchell (2010) found that a lack of planning correlated to a lack of savings. Stawski, Hershey and Jacobs-Lawson (2007) found that “only a small fraction of US households reaching retirement age have accumulated assets worth more than twice their pre-retirement annual income” (p.127), and many of the reasons why so many households save so little for retirement still remain unknown.

While several overseas studies have attempted to measure retirement preparedness<sup>1</sup>, often the focus is on income replacement, and not the contributing factors influencing retirement adequacy. A few commercially-produced multi-variable retirement preparedness or readiness indices exist, but few, if any, have been academically peer-reviewed. Having a valid measure for retirement preparedness would provide a benchmark against which the effectiveness of education and other efforts to lift financial literacy, saving rates, and retirement income could be judged.

Hershey and Mowen (2000) found that the lack of retirement preparedness was a major reason for people retiring with insufficient resources to maintain their financial independence throughout retirement. While a ‘lack of money’ is sometimes given as an excuse for not saving, there is US evidence that the poor could save despite low incomes

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<sup>1</sup> The major studies are detailed within Section 2.3.3.

and having resource constraints (Hogarth, Hazembuller & Wilson, 2006; Martin & Finke, 2008). This indicates that a deeper level of understanding of the factors influencing retirement preparedness is still required.

Gorman, Scobie and Paek (2013) found that household saving rates in New Zealand, after adjusting for housing revaluation effects, have been falling over the past three decades. This drop in household savings rates has occurred since the 1992 Todd Report that signalled the need for New Zealanders to take a greater role in the funding of their retirement (Task Force on Private Provision for Retirement, 1992). Perry (2015) found that New Zealanders have accepted the shift away from the Government having the responsibility to fully fund retirement towards personal responsibility, despite this Gorman et al. (2013) points out that there was no noticeable improvement in household savings until the introduction of the KiwiSaver retirement saving scheme in July 2007. Reduced household savings and inadequate financial preparation for retirement could lead to a drop in income and living standards upon retirement (Horizon Research, 2011; Crossan, Feslier & Humard, 2011).

In New Zealand, NZ Superannuation<sup>2</sup> provides a basic level of retirement income for most people, offering the elderly a degree of living standard protection, especially if they own their own home and are debt free. There are indications that a large proportion of New Zealanders have done little more than join KiwiSaver and pay off their home loan (Lissington, 2015). This raises the concern that some people, after taking a few basic steps towards saving for retirement, may develop an untested belief that they have provided sufficiently to have adequate funds in retirement. Without doing the calculations, it is unknown whether current retirement saving contributions, even allowing for the use of home equity, will be sufficient to achieve the retirement consumption outcomes they expect given individual specific circumstances. This raises the issue for pre-retirees as to the amount of wealth accumulation required before retirement. While determining retirement adequacy for households is vital, no generally accepted definition for retirement adequacy exists to help answer the question (e.g. Yuh, Hanna, & Montalto 1998; Martin & Finke, 2008), and general surveys of savings levels are therefore methodologically weak.

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<sup>2</sup> NZ Superannuation is a non-contributory, taxable, non-income tested universal state funded pension (Dale & St John, (2016)

The most common theoretical approach taken in determining the adequacy of retirement savings is to start with a predetermined point of adequacy, such as a prescribed income replacement rate of say 65% against which adequacy is then measured. This approach is unrelated to the actual retirement consumption requirement of the various households with differing needs. There is an alternative, more practical approach, which involves firstly determining the total retirement consumption required for each individual household, then comparing this against the financial resources available to that household for the duration of retirement. This is a more accurate approach, but has rarely been researched in the past, probably due to the challenges of doing so. This study takes the latter, practical approach, thereby addressing this gap in the literature.

Before an index was constructed it was first necessary to define retirement adequacy, and to identify which retirement adequacy measure was most appropriate for New Zealand households. Using data collected from an on-line retirement preparedness survey, financial adequacy calculations were performed. These calculations make it possible to identify that 46.8% of active retirees and 31.2% of pre-retirees were deemed most likely to achieve consumption adequacy in their retirement. There is a need to identify the size of the household retirement savings gap at the household level, which is addressed by this study.

An index of financial preparedness for retirement using only non-financial data was developed as an alternative way to predict retirement adequacy. Indices are often used to measure a range of economic activities. They provide easy-to-interpret state-of-play activity indicators, which over a period of time reflect any changes that occur, and provide a useful comparative benchmark to measure the effectiveness of any intervention measures introduced. The construction of economic indices can range from the simple, involving summation of financial data, to the more complex, involving a number of contributing factors. In the case of complex index construction, predictive models identify which contributing factors are more significant than others. A predictive equation generated from the model's process produces a factor weighting for each of the significant factors identified. Summation of each factor's weighted scores produce an indexation measure. Several predictive models were considered before determining that the backwards stepwise logistic regression model was the most effective at explaining the retiree retirement adequacy results.

By using the survey data collected it was found that 50.2% of active retirees and 1.2% of pre-retirees were deemed most likely to achieve consumption adequacy in their retirement. This pre-retiree variation indicates that some shift in demographic, financial attitudinal and behavioural factors has occurred in recent years to have caused the financial preparedness for retirement index to become ineffective for pre-retirees. Finally, a comparison between pre-retiree and retiree adequacy results indicated that New Zealand pre-retirees aged 50 and over, are less prepared financially for retirement than current New Zealand retirees.

## 1.2 Objectives of the thesis

This thesis explores whether New Zealanders in general are well-prepared financially for retirement, and whether their expectations for consumption throughout their retirement are likely to be met. While New Zealand's economic environment and retirement system is unique, given the KiwiSaver retirement savings scheme and NZ Superannuation is universal, it is expected that elements of this thesis will have worldwide application.

**Research Question:** How prepared are New Zealanders to achieve adequate consumption in retirement?

This study has five research objectives that will provide the basis upon which to answer the research question. Objective One assesses which method of determining adequacy of retirement income is most appropriate for New Zealand households. Objective Two uses this measure of adequacy to determine the financial preparedness of retirees for their retirement. Objective Three identifies the attributes and characteristics of retirees who are deemed to be adequately prepared for retirement. Objective Four uses the retiree attributes and characteristics identified to develop a Financial Preparedness for Retirement Index for use in New Zealand. Finally, Objective Five uses the index to assess how prepared pre-retirees aged 50 and over are for retirement.

Each research objective contributes further to the existing pool of knowledge. These contributions include: defining and measuring retirement adequacy for New Zealanders; identifying retirement consumption expectations, of retirees and pre-retirees; identifying the characteristics of retirees who were well-prepared financially for retirement; and is an example of applied adequacy research which can be used as a template for research in other countries.

The development of the Financial Preparedness for Retirement (FPfR) Index is New Zealand's first retirement preparedness construct, and establishes a benchmark for preparedness for both retirees and pre-retirees. These indexation scores will provide a benchmark against which the effectiveness of future financial awareness and retirement savings initiatives can be measured. Findings from this thesis will help provide a greater understanding of retirement preparedness amongst policymakers, government agencies, educationalists, financial institutions, professional financial advisers, and others, both internationally and in New Zealand.

### 1.3 Thesis Outline

This thesis consists of five sections. Section 1 is a brief introduction to the study. Section 2 reviews current literature to provide some background to the research question and to identify factors influencing retirement adequacy. Section 2 consists of six sub-sections. The first sub-section is a brief introduction, followed by a sub-section that reviews the theory behind consumption smoothing. The third sub-section reviews the definitions of retirement adequacy. The fourth sub-section investigates the relevant factors influencing financial preparedness for retirement, including factors specific to New Zealand's situation. The final sub-section reviews a range of existing indices and models used to measure retirement preparedness and the methodologies employed in their development.

Section 3 details the research methods used in this study. Section 4 presents findings specific to Objectives 1 to 5 and discussions relating to those findings. The final section concludes the thesis by providing a brief overview of the findings, conclusions and implications; commentary on associated research limitations as well as suggestions for future research; recommendations; and lastly commentary on the academic contribution this thesis makes.

## **2.0 Prior Research**

### **2.1 Introduction**

Since the introduction of the KiwiSaver retirement savings scheme in 2007 a greater number of New Zealanders are saving for their retirement (IRD, 2014). Despite a greater number of New Zealanders saving for their retirement, it is unclear whether New Zealanders are now saving enough, or whether they will be well prepared financially for retirement. It is unknown whether current retirees can sustain their current level of consumption throughout their expected period of retirement. Similarly, it is unknown whether New Zealanders aged 50 years and over will have accumulated enough, by the time they wish to retire, to sustain their current level of consumption throughout their expected retirement period.

Prior research has shown that a number of factors affect retirement preparedness and the motivation to save for retirement. While Benartzi and Thaler (1995) and Guiso and Jappelli (2008) found that those with low financial literacy were less likely to save and plan for the future, other studies failed to explain why some financially literate people also failed to plan for retirement and were financially unprepared for their retirement (Lusardi & Mitchell, 2011a; Ameriks, et al., 2007).

### **2.2 Consumption Smoothing**

Retirement is a period when earned income ceases and accumulated savings are then utilised to maintain consumption. The concept of consumption smoothing refers to the process where people attempt to create a stable pattern of consumption over their lifetime, regardless of fluctuations in income. This section reviews some of the influential consumption smoothing theories.

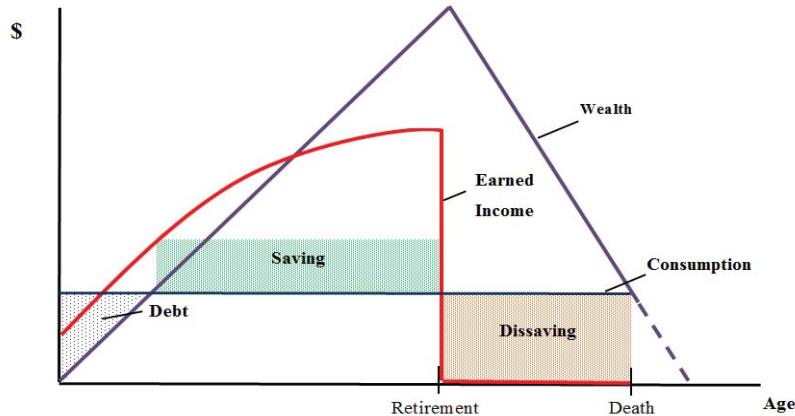
#### **2.2.1 Modigliani's Life Cycle Hypothesis**

The initial conceptual model of life-cycle consumption and savings was developed by Modigliani and Brumberg (1954), who argued that individuals will seek to smooth their marginal utility of consumption over their entire lifetime. As seen in Figure 1 below, younger people typically are willing to incur debt in the early low-income generating

years, in order to build human capital (education) or to invest in assets (such as a business or home). During middle age, when a person's income has increased surplus income can be saved and debt repaid. In old age, when work has either ceased entirely or has been significantly reduced, the wealth accumulated is then consumed (or dissaved) (Le, Gibson & Stillman, 2010). Jappelli and Modigliani (2005), however, argue that a major conceptual discrepancy arises when you consider the fact that wealth can change, not only through saving but through capital gains (and losses) or through inter vivos transfers and inheritances.

Deaton (2005) argues that consumption-smoothing theory is based upon the premise that people make rational, consistent, inter-temporal plans, and they act to maximise utility over their entire life. This is a theory of consumer choice and economic theory which assumes typical investors are rational, risk averse, utility maximisers, unbiased forecasters, motivated by self-interest, preferring more wealth to less, even when wealthy (non-satiation). De Bondt and Thaler (1994) believe, however, that economic theory unavoidably involves simplification, and often fails to fully explain human nature.

*Figure 1: Modigliani's life cycle hypothesis<sup>3</sup>*



### 2.2.2 Friedman's Permanent Income Hypothesis

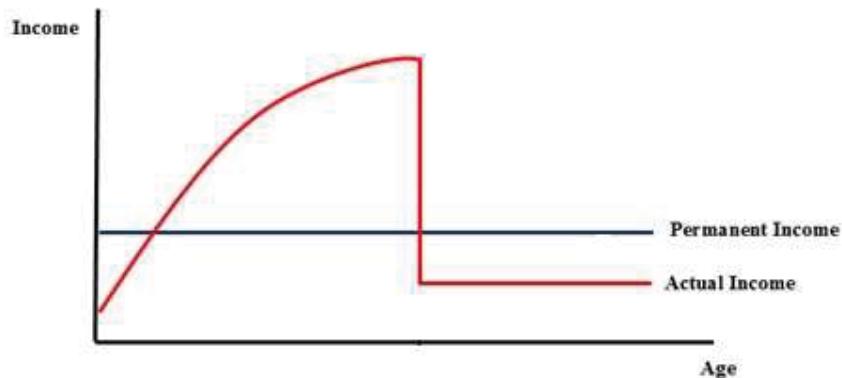
It was Friedman's (1957) contention, as seen in Figure 2 below, that individuals consume a constant proportion of their permanent income. Friedman argued that low income earners have a higher propensity to consume, as they consumed a higher fraction of their income than high income earners. Friedman's theory was based upon the assumption that both income and consumption consist of permanent and transitory components.

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<sup>3</sup>Source: Mankiw, (2003). Modified by author to better depict consumption around time of death.

'Permanent income', the expected long-term average income, was determined by an individual's assets; both physical (bonds, shares, property) and human (intellect, education and experience). Friedman argued that people have a perception of their permanent income, based upon the average of previous income levels, comparisons to other's income in similar situations, as well as having a view on anticipated future income levels.

*Figure 2: Friedman's Permanent Income Hypothesis<sup>4</sup>*



Friedman (1957) then goes on to argue that a one-off rise in income, such as an unexpected bonus or windfall, should have little effect on the level of permanent income perceived, and would be substantially saved. Savings, or at least certain components of savings, were a 'residual', being the balance above (or below) permanent income.

'Transitory income' could be either positive (save), such as windfalls and unexpected gains, or negative (dissave), being the difference between the actual income and the permanent income (anticipated and planned). Friedman's theory argues that wealth, rather than disposable income, is therefore the key determinant of consumption. Consumers, if acting rationally, only save when their current income is greater than expected long-term average income.

Dougherty (2011) concluded that Friedman's (1957) Permanent Income Hypothesis indicates that households would be willing to spend more today, if they can anticipate stable or increasing income in the future. Therefore, it is important to consider New Zealanders' perception of future retirement income, from NZ Superannuation, KiwiSaver and other sources, and how that perception affects their current consumption.

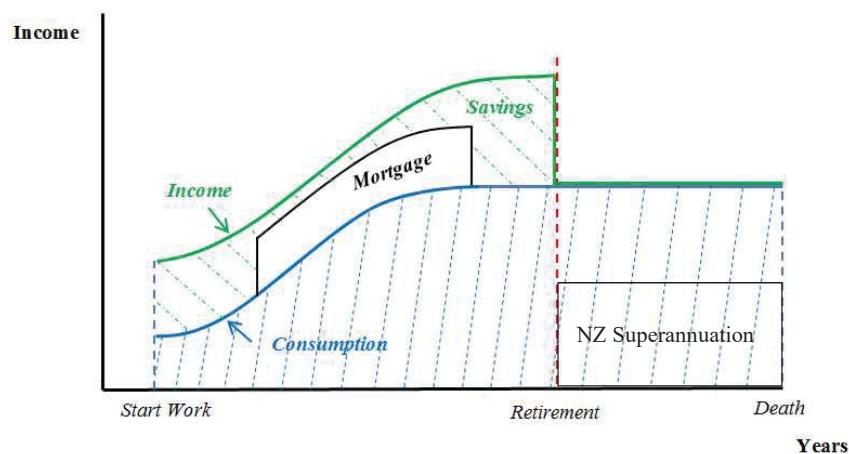
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<sup>4</sup> Source: Dougherty (2011).

### 2.2.3 Amended Life-cycle Consumption Model

Naylor's (2010) life-cycle consumption model, as seen in Figure 3 below, demonstrates how consumption and savings change when a house is purchased, creating an obligation to repay the home loan over a period of years. Once the home loan has been repaid, the ratio of savings to income lifts significantly until retirement, which when reached, is a life-stage where savings are no longer needed. The longer the period between repayment of the home loan and retirement, the greater amount saved.<sup>5</sup> Naylor's model shows that as the level of income rises, so does consumption. Upon retirement, actual consumption reduces to a level equal to the income.

*Figure 3: Amended life-cycle consumption model<sup>6</sup>*



As with all life-cycle models, death occurs at a known point, when in reality, time of death is uncertain. Naylor's model seems to better reflect the realities of life, and intimates that numerous iterations are conceivable though the timing of events, the uncertainty associated with future income, differing levels of consumption, how borrowing or liquidity restrictions impact consumption decisions, and differing housing arrangements.

These consumption-smoothing theories assume a constant level of consumption throughout retirement; however, contrary to this a recent New Zealand survey found that retirement consumption was highest in the first five years of retirement, a retirement

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<sup>5</sup> It is possible that a generational shift may have occurred with extended levels of debt shortening the period between home loan completion and retirement, thereby reducing savings, however, this does not form part of this thesis.

<sup>6</sup> Naylor's (2010) model has been slightly altered to better depict the savings prior to the commencement of the home loan, and the asset line has been removed as this needed a different scale. NZ Superannuation has also been added. It should be noted that Figure 3 reflects the situation where capital is able to be preserved. It does not represent the situation where capital is being consumed along with interest income in order to maintain consumption in retirement.

phase where retirees are still relatively active (Horizon Research, 2013). This indicates that a greater understanding of retirement consumption patterns and expectations is required, but is not a focus of this thesis.

Finally, Barrett & Kecmanovic (2013), when assessing the success of households in smoothing their financial transition to retirement, argues that retirement savings adequacy was based on individuals' ability to maintain their well-being across pre- and post-retirement periods.

### 2.3 Retirement Adequacy

To be able to determine how much to save it is important to have a clear understanding and definition of retirement adequacy. Authors such as Yuh (1999) and Reno and Lavey (2007) also considered retirement adequacy is achieved when households are able to maintain pre-retirement standards of living or consumption in retirement.

Expanding on this definition, Montalto (2001) determined that 'retirement adequacy' existed when "total retirement wealth<sup>7</sup> is equal to or greater than the total desired retirement consumption" (p.6). Montalto's measure or point-of-adequacy highlights the importance of identifying how much is needed to be accumulated before retirement in order to provide for household retirement consumption needs. This question underpins the issue of adequacy and is fundamental to determining retirement preparedness.

The literature reveals that two views of retirement adequacy exist. One looks at adequacy from a macro point-of-view, questioning if savings at an aggregate level are adequate, and if state pensions are sufficient to cover basic needs and to prevent retirees falling below the poverty line (Scobie, Gibson & Le, 2012). The second, micro-view looks at adequacy from the household's perspective. This study focuses on the second, the determination of retirement adequacy at the household level.

An assumption many studies make is that greater wealth infers a higher level of adequacy or preparedness for retirement, but fail to clearly define the term 'adequacy' (Yuh, et al., 1998; Martin & Finke, 2008). This led some academics to conclude that no general

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<sup>7</sup> Retirement wealth is defined as accumulated assets (financial assets plus non-financial assets, including home equity) plus the present value of pension income and retirement consumption defined as the present value of desired retirement consumption (Montalto, 2001).

consensus existed as to what constitutes an adequate level of retirement consumption, or what that standard should be (MacDonald, Bianchi & Drew, 2012; OECD, 2014).

Montaldo (2001) argued that a common limitation of some previous retirement wealth adequacy research was that uniform assumptions fail to allow for variation between households. Uniform assumptions often relate to planned retirement age, retirement needs, portfolio allocation, and growth rates for assets. Retirement adequacy estimates are therefore prone to over- or under-represent actual adequacy when household variations are not accounted for. This thesis intends to address this gap by accounting for household variation.

Scobie, et al. (2012) took the debate further and argued that adequacy cannot be properly determined without reference to the social and economic context, and considered retirement consumption was ‘adequate’ when it was capable of covering all possible eventualities, such as unanticipated health expenses or extended life expectancy. Their approach is less relevant in New Zealand given its good public health and long-term care systems, and the universal nature of NZ Superannuation (Berthold, 2013).<sup>8</sup>

Finally, a more detailed table of selected adequacy studies detailing the organisations or authors, the retirement adequacy benchmark used in their studies, their findings, and databases or surveys used and other notes can be found in Appendix 1.

Following the literature review, being financially prepared for retirement has been taken to mean that an individual or household has sufficient resources to sustain them, at or near their pre-retirement level of consumption, throughout the entire retirement period (Yuh, et al., 1998; Reno & Lavey, 2007; Montaldo, 2001).

## 2.4 Financial Preparedness for Retirement

### Introduction

‘Financial Retirement Preparedness’ is a theoretical construct for a concept of peoples’ state of financial readiness to sustain their level of consumption through the latter period

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<sup>8</sup> NZ Superannuation is a non-contributory, taxable, non-income tested universal state pension, paid at different rates and is determined by living arrangements. It is indexed to prices and wage adjusted so that couples do not fall below 66% of the net average wage (Dale & St John, 2016).

of their lives, after employment has ceased or has been significantly reduced, known as retirement (Yuh, et al., 1998; Jarvis, MacKenzie & Podskoff, 2003).

My review of the literature to date has failed to find a generally accepted definition of financial preparedness for retirement. The state of financial preparedness for retirement has sometimes been referred to as ‘readiness’<sup>9</sup> and ‘financial wellness’.<sup>10</sup> For the purpose of this thesis any reference to ‘preparedness’, ‘readiness’, or ‘adequacy’, is considered to relate to retirement and has a financial focus, rather than a social and physiological focus.

While it may be possible to calculate a point-of-adequacy, a ratio or some form of measure, in which to express the tipping-point of retirement adequacy or a state of preparedness, it also needs to reflect the level of income people feel they need or desire in retirement, and their level of confidence in its attainment, and sustainability throughout the retirement period (Kim, Kwon & Anderson, 2005; Aegon, 2014).

The literature review identified a number of variables with the potential to influence financial preparedness for retirement in New Zealand, however, while they have all been considered, and many were included in the on-line survey (refer Appendix 3), for brevity they have not all been commented on. The variables considered most relevant are discussed in subsequent sections, and wherever possible the New Zealand perspective has been given. For many retirees NZ Superannuation is a major contributor to their retirement income, to which income from other sources, including KiwiSaver funds and other savings and investments, build on this foundation.

#### 2.4.1 Household Income

Household income is an essential ingredient of saving and retirement adequacy, as the level of pre-retirement income impacts on the ability to save, as well as the ability to repay debt and accumulate wealth. The level of retirement income for retirees over and above their NZ Superannuation entitlement is an indication of both the level of retirement wealth accumulation and the rate of capital decumulation.

Statistics NZ (2013a) found that over 623,000 New Zealanders are entitled to NZ Superannuation. Given that NZ Superannuation provides a sufficient level of retirement

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<sup>9</sup> See for example the International Foundation for Retirement Education’s (InFRE) Retirement Readiness Index®, the Aegon Retirement Readiness Index, the US Employee Benefit Research Institute (EBRI) Retirement Readiness Rating,

<sup>10</sup> The Boston Research Group 2013 Financial Wellness Score and McGraw-Hill Federal Credit Union’s 2013 financial wellness.

income to ensure that the elderly do not fall below the poverty line, the level of aged poverty in New Zealand is considered to be relatively low (Dale & St John, 2016). The focus for pre-retirees therefore is on the necessity to save enough to support consumption levels above that minimum.

The 2013 Census showed that 19.4% of the total NZ population earned income from dividends, interest, rent, or other investment sources. Given 15.4% of the population is aged 65 or over (Statistics NZ, 2013a),<sup>11</sup> this would indicate that the proportion of the NZ population currently saving and generating income from their savings in New Zealand is low. The average income derived from investments for those aged 65 and over was \$4,420 (NZ Statistics, 2015).<sup>12</sup> The low income from other sources from the June 2015 NZ Income Survey also supports the findings of Horizon Research (2011) and Gorman, et al. (2013) that household savings in New Zealanders is, in general, low. Berthold (2013) believes that no comprehensive breakdown of information on the type and amounts held in various investments currently exists. Farrell and Grieg (2015) found that when asked, people tend to average their income and consumption, with 60% experiencing a 30% variation in monthly consumption.

Naylor (2010) found that only 3% of NZ males (and very few females) managed to augment their annual retirement income with \$40,000 or more from independent sources. A further 30% of males (and 10% of females) were considered to be comfortably well off, receiving between \$15,000 and \$40,000 annually from independent sources to augment their NZ Superannuation. Naylor also found that a large percentage of women (83%) were nearly completely dependent on NZ Superannuation, compared with 55% of men.

#### 2.4.2 The Saving Habit

Bank of America - Merrill Lynch (2013) and Garman (1998) found that many in the US were under financial stress, making it difficult to save for retirement. Garman (1998) found that two-thirds had faced at least one significant financial problem at some point. Despite this, Martin and Finke (2008)<sup>13</sup> and Hogarth, et al. (2006) found that it was

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<sup>11</sup> Using Statistics NZ (2013a) census figures, 18% of people aged under 65 years generate income from other investments.

<sup>12</sup> This figure appears to exclude KiwiSaver contributions (Statistics NZ, 2013a).

<sup>13</sup> Martin & Finke cited several sources: Bucks, Kennickell & Moore (2006); Hogarth & Anguelov, 2001; Schreiner, Clancy & Sherraden, 2002).

possible for poor people to save. This would imply that income was not the limiting factor for saving.

The habit of consuming less than is earned is an essential to wealth accumulation. Lusardi and Mitchell (2010) found that those engaged in retirement planning, on average, accumulated more wealth than non-planners. Retirement planning can also jump-start the savings process, with even small amounts of planning boosting wealth holdings (Lusardi & Mitchell, 2007a). Americks, Caplin and Leahy (2007) and Lusardi and Mitchell (2011a) argued that the lack of retirement planning was widespread, and was common amongst the educated as well as the less educated.

Lusardi and Mitchell (2010) concluded that knowing the required savings targets has a positive impact on wealth accumulation. In New Zealand the Financial Knowledge and Behavioural Survey (CFLRI, 2013) found in a prior three-month period, just over half (51%) earned more than they spent, 28% earned as much as they spent, and 20% spent more than they earned. As these results are not age-adjusted, these results could be a reflection of people's age, income, and life-stage rather than a reflection of their attitude towards spending or saving.

Lusardi and Mitchell (2010) found that those claiming to have worked out retirement calculations entered retirement with three times the amount of wealth of those who failed to plan, *ceteris paribus*. Lissington (2015) found that few New Zealanders are doing more than joining KiwiSaver and paying off their home loan in preparation for their retirement. It could be argued that compulsory savings schemes does little to add to total savings, as belonging to a retirement saving scheme, such as KiwiSaver, reduces the need for people to do their own calculations or to develop their own retirement plans or to identify their required level of savings. Lusardi and Mitchell (2011b) argued that retirement planning is 'complex'<sup>14</sup>, and this may explain why it is often neglected.

Retirement savings is more effective the younger people start, however the College for Financial Planning (2011) found that saving for retirement was seldom the primary focus of people under 40, as would have been anticipated.<sup>15</sup> Deaton (2005) found the likelihood

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<sup>14</sup> Hoover (2014) found that the Millennial Generation, born between the years 1977 and 2000, had a preference for complexity avoidance which hindered the learning process.

<sup>15</sup> The 2011 US College of Financial Planning survey found fewer than 6.5% aged under 39 years and just over half (51.3%) the client respondents aged 50 to 59 years reported that retirement planning become a focus of primary concern, with 29.9% being between 40 and 49 years, 11% between 60 and 69 years. The US College of Financial Planning 2011 and 2007 surveys produce similar results.

of having a retirement plan peaks between the ages of 45 to 54 years, with retirement savings starting in middle-age. In early adulthood people are actively involved in establishing relationships, families and homes.

McKay and Kempson (2003) found that 45 was the decisive age at which retirement savings was kicked-started. Their UK longitudinal study found that general savings behaviour was not stable, with less than one in ten saving every year from 1991 to 2000.

The 2013 Retirement Preparedness Survey (RPS) survey found 85% of US pre-retirees felt they were not saving enough, and 60% believed it would be very difficult to ever save enough to support their current standard of living during retirement. This lack of confidence could be one reason why 78% (72% in 2012) anticipated working into their late-60s and into their 70s. They found that several psychological and emotional factors had a negative impact on retirement savings, such as: not knowing how much they needed to accumulate (28%); having a belief that they could never save enough (24%); a general fear of investing (26%); uncertainty about how or where to invest (26%); competing financial obligations and desires (28%); and rising healthcare costs (28%) (Bank of America-Merrill Lynch, 2013). Notably absent from the list above was ‘low income’ or the ‘lack of money’.

If by nature people are frugal, then this will impact upon their attitudes towards spending, and perhaps more importantly, on their ability to save. Lissington and Matthews (2012) found that frugality, along with debt avoidance, and living within one’s means, were recurring themes within a recent intergenerational study into the transfer of financial literacy, in which current behaviour could be traced back to the parents’ and grandparents’ attitudes and experiences. They also found that current savers were less frugal than past generations.

#### 2.4.3 Wealth

Wealth, unlike savings which is intended for consumption in retirement exists in various forms, with some forms not intended for consumption in retirement, such as family heirlooms and lifestyle assets. Wealth may exist in the form of financial and non-financial assets, liquid or non-liquid assets. Some assets increase in value over time. While others, decrease in value. Some assets can generate income, while others Hogarth, et al. (2006) argues incur expense.

Hogarth, et al. (2006) argued that the impact of holding non-financial assets was greater on low-income families. Le, et al. (2010) found that those in the NZ lower wealth deciles held few assets beyond cars, household items, and bank accounts, and for the majority of New Zealanders, equity in family residences made up the largest portion of household wealth.

Le, et al. (2010) found that in New Zealand increases in net wealth, when they do occur, come largely from capital gains in housing. They concluded that the lack of saving and a reliance on property capital gains distorted investment choices, restricted liquidity, and made people vulnerable to lower wellbeing during retirement.

Accessing home equity through home equity release loans is seen as another decumulation option, according to Dale (2015). In New Zealand the use of home equity release loans is currently low and not common in practice for retirees. This could mean that people either do not favour this option, or if they are releasing home equity (or plan to) they use another method of doing so, such as selling and moving to a lower value property. This could also imply that people may consider accessing home equity more as a way of handling longevity risk or meeting unexpected expenses, rather than as an active retirement planning strategy. According to Heartland Bank (2016b) the main reasons retirees take out home equity release loans are: to carry out home maintenance or repairs; fund travel; meet sudden health costs; replace vehicles; or pay off debt rather than supplementing their retirement income.

While converting wealth into annuities is common practice in America and other developed countries, in New Zealand annuities are poorly understood, and with limited product choice and little promotion it is not surprising that annuities are rarely used in New Zealand (Berthold, 2013; Stewart, 2013). Berthold (2013) and Stewart (2013) argue that while annuities provide certainty of income, most do not prevent the loss of purchasing power.

#### 2.4.4 Home Ownership

Another factor influencing New Zealanders' retirement preparedness is home ownership. The alternative to owning your own home is renting. Retirees who rent incur higher retirement consumption than retirees who own their own home whenever the cost of renting is greater than the occupancy costs associated with home ownership. Rent is likely to make up a large portion of a retirees' retirement consumption. The median rental in

New Zealand is just under \$300 per week,<sup>16</sup> representing 82% of a single person's and 53% of a couple's (both qualifying) NZ Superannuation entitlement.<sup>17</sup>

Horizon's (2011) Savings Survey found that 20.3% of NZ respondents were home loan-free, with 14.4% being retired. They also found that a further 49.6% expected to be home loan-free before retirement. This infers that a third either rented or did not expect to be home loan-free before retirement. By comparison, the Securian Financial Group's (2012) survey found that nearly half of US retirees carried debt into retirement. Nearly half of those expecting to carry over home loan debt into retirement expected that debt to equal or exceed their savings at retirement.<sup>18</sup>

Horizon Research (2011) found that retirees owning their own dwelling without a home loan were more likely to say that their retirement income was adequate. They found that 75.1% of retired couples surveyed owned their home, and most were home loan-free. Naylor (2010) found most New Zealanders struggled to pay off their home loan before retirement, and many had saved little beyond repaying the home loan. This is also evidenced by the 15% of members who intended to use their KiwiSaver to repay debt (IRD, 2013). Some people viewed paying off a home loan as an enforced savings scheme (Lissington, 2015), however, accessing that equity in retirement can be difficult. According to Census 2013, 68.3% of New Zealanders own their own home, and it is known that home ownership rates rise steadily with both income and age. In 2006, those aged 75+ had the highest (78.7%) home ownership rate (Statistics NZ, 2016a).

According to Kendall (2016) there has been a statistically significant upward shift in real house prices since 1994. Between 1965 and 1994 real house prices grew by 1% per annum, and since then the growth rate has averaged 4% per annum. Since 1981 Auckland real house prices have increased more than other areas, with Auckland having risen 4.5% per year on average compared to 2.5% for regions outside Auckland (Kendall, 2016). This has meant that since the 1980s pre-retirees have faced higher costs when purchasing homes or relocating, compared to those who purchased their homes earlier. Higher

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<sup>16</sup> Rents can vary significantly between geographic location and between property types. Matthews (2013) found that in May 2012, the median weekly rent varied from \$350 to \$440 for Wellington and Auckland, and from \$200 to \$335 for the rest of New Zealand, (Hargreaves, 2012).

<sup>17</sup> In 2015 then entitlement for a single retiree was \$376 and \$576 for retired couples per week.

<sup>18</sup> The 2012 survey conducted by US Securian Financial Group <http://www.benefitspro.com/2013/04/30/majority-of-baby-boomers-wont-have-homes-paid-off> found that the number of pre-retirees who expect to carry mortgage debt into retirement rose 123% since the 2009 survey.

housing costs have a negative effect on retirement savings, with retirement funds being diverted to housing.

#### 2.4.5 Relationships

In New Zealand marital status is a factor which determines the level of NZ Superannuation entitlement. For many, NZ Superannuation constitutes a large proportion of retirement income, and so any change in marital status can have financial consequences. The death of a partner prior to, or early in retirement is likely to have a negative effect upon a household's financial position and level of retirement consumption. The impact the loss of a partner has on retirement adequacy is unknown and this gap is addressed in this thesis. Those who had never married were the least likely to own their own home, with only 12.3% doing so (Statistics NZ, 2013a).

Divorce, either before or during retirement has financial implications as well as creating complex family structures. Approximately three-quarters of divorced people remarry, changing the family dynamics. Having stepchildren and stepparents complicates financial planning (Bank of America-Merrill Lynch 2014). Bank of America-Merrill Lynch found that while the total US divorce rate has remained unchanged from 1980 to 2010, the divorce rate of those over 50 had more than doubled. Divorce in maturity can often create financial hardship, and more so for women.

#### 2.4.6 Financial Dependents

Another relevant factor impacting on retirement preparedness is the emotional pressure put on parents to provide financial support for their 'boomerang' adult children and other dependents, such as elderly parents and relatives in residential care (Duski, Munnell, Sanzenbacher & Webb, 2015; Bank of America-Merrill Lynch, 2014; Lissington & Matthews, 2012; Aegon, 2013). Duski, et al. (2015) found that US households save little while children are at home, and that savings only slightly increased once they leave home.

Hayhoe and Stevenson (2007) found that older US adults who reported stronger feelings of affection, lived in closer proximity, and had a smaller family, engaged in wealth transfers to adult children more frequently. This has implications on the timing of generational wealth transfers, as it is likely that future generations of retirees can expect increased calls for financial support from their adult children during their lifetime rather than waiting for an inheritance (Lissington & Matthews, 2012). Strong emotional pressure exists for parents to assist their children purchase of a home, or to help educate

grandchildren. More research is required on the impact of long-term financial dependency on retirement consumption; however, this thesis does not cover this issue.

#### 2.4.7 Money Management

Hastings, Madrian, and Skimmyhorn (2012) argue that essential money management skills should include having an understanding of key money management concepts, a working knowledge of financial institutions, systems, and services, and a range of basic literacy and numeracy skills. Garman (1998) argues that more financial problems stem from poor money management skills rather than from having too little money.<sup>19</sup> Crossan, et al. (2011) also highlighted the importance that money management has in the life-long consumption-smoothing process.<sup>20</sup>

Lusardi and Mitchell (2010) argued that keeping track of spending and budgeting is conducive to retirement saving. Kramer (2012) considered that these same skills are needed even when professional advice is sought, in order to assess the quality of the advice received, and to make fully informed decisions. Financial illiteracy is widespread geographically and across age groups (OECD, 2015).

#### 2.4.8 Retirement Expectations

Diehel (2012) argued that “today's consumers are striving to validate their retirement plans. Many people have overly optimistic expectations about retirement, particularly when it comes to lifestyles, timing, return on investments, and income sources” (p.57). A College for Financial Planning's (2011) survey found that while a majority (86%) of clients of US financial advisers indicated that they expected to maintain present levels of lifestyle in retirement. US advisers only expected 65% of their clients to do so. This would indicate that a number of US pre-retirees hold unrealistic retirement consumption expectations. Little is known about the level of retirement consumption expected in New Zealand, nor if those expectations are realistic.

The retirement start date is another important expectation, as this affects the time spent in retirement, the amount of savings required, and the time available to accumulate the necessary financial resources. Some pre-retirees may have aspirations of working beyond the normal retirement age. Even retirement planning based on working beyond age 65

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<sup>19</sup> Garman (1998) referenced a 1997 Military Family Institute survey of US Navy personnel.

<sup>20</sup> Financial literacy is defined as the ability of an individual to make informed judgments and effective financial decisions regarding the use and management of their money throughout their lifetime (Crossan, 2011).

may not prove to be realistic, as Aegon (2013) found nearly half (49%) the retirees they surveyed globally retired sooner than expected, and of those, 42% retired early due to health issues and 23% from job loss.

Research has found that frequently there is a drop in consumption at retirement. This drop is unexplained, and is regarded as the ‘retirement income puzzle’. Ameriks, et al. (2007) found that pre-retirement households generally expected to incur a sizable (around 20%) reduction in consumption after retirement, with less wealthy households expecting greater falls in consumption than wealthier households. Bernheim, Skinner and Weinberg (2001) had similar findings. Fisher, Johnson, Marchand, Smeeding, and Torrey (2008) argued that this could be explained, as there was little or no unanticipated consumption shock upon retirement as the retired were able to achieve lower prices through greater search efforts, greater planning, greater home production, and fewer self-control problems, resulting in retirement spending closely tracking retirement income. The motivation behind the extra effort involved is unclear, as it could be either a necessity in order to reduce consumption or a desired use of their time.

#### 2.4.9 Education

Behrman, et al. (2010) found that educational attainment was strongly linked to household wealth accumulation. Hayhoe and Stevenson (2007), Lusardi & Mitchell, (2009), and Behrman, et al. (2010) found that education is highly correlated to income levels and accumulated wealth, as higher qualifications allow higher paying employment opportunities. Just over half (54%) of adult New Zealanders hold no post-school qualifications, with 20% holding a level 7 qualification, Bachelor degree or higher qualification (Statistics NZ, 2013a).

Martin and Finke (2008) found that there was strong correlation between higher education and self-directed, do-it-yourselfers undertaking retirement planning. Lusardi and Mitchell (2014) and Campbell (2006) both found that poorer, less educated households were more likely to make financial mistakes, than wealthier and better educated households.

#### 2.4.10 Financial Literacy and Capability

Noctor, Stoney and Stradling (1992) defined financial literacy as “the ability to make informed judgments and take effective decisions regarding the use and management of money” (p.64). It is known that financial illiteracy is widespread among the old and young alike, with most people unaware of their own shortcomings (Lusardi and Mitchell, 2009;

Crossan, et al., 2011). Lusardi, Mitchell and Curto (2010) found that financial illiteracy persists for long periods and sometimes throughout a person's entire lifetime.

Lusardi and Mitchell (2009) found that those with advanced financial knowledge were more likely to be retirement-ready. Conversely, it is unproven whether financial literacy is a key determinant of retirement preparedness (Mandell, 2008; Huston, 2010). Guiso & Jappelli (2008) found that having a higher level of financial literacy also led to better investment decisions and accumulating higher wealth. Conversely, they surmised that higher wealth incentivised the acquisition of financial knowledge and expertise. Campbell (2006) argued that the strong link between income, education, and financial literacy does not prevent well educated people from making financial mistakes (Ameriks & Zelde, 2004; Lusardi & Mitchell, 2007b).

In prior research, financial literacy has been measured by assessing people's ability to correctly answer a small number of financial questions developed by Lusardi and Mitchell (2007b). These same questions have been used in this study and can be found in Appendix 3. Huston (2010) and Mandell (2008) found that efforts to raise financial literacy levels have had mixed results and do not necessarily result in improved financial behaviour or retained knowledge. Financial education which occurs at a time when consumers are unmotivated is not taken up, and timing needs to be aligned to 'teachable moments', such as at the start of new job, purchase of a car or home (Lissington & Matthews, 2012).

Financial literacy has often been narrowly defined, mainly in terms of knowledge and numeracy, as opposed to a broader definition of financial capability that includes "the manifestation of this knowledge in skills, attitudes, and behaviour" (Yoong, Mihaly, Bauhoff, Rabinovich & Hung, (2013), p.1). Yoong, et al. (2013) defined financial capability as "the internal capability to act in one's own best financial interest, given the socio-environmental conditions" (p.5). Taylor (2011) argued that financial capability is concerned with making appropriate financial decisions, understanding how to manage credit and debt, and identifying products and services that are appropriate to their needs. Mason and Wilson (2000) argued that it is the processes of decision-making and implementation that led to desired outcomes rather than simply possessing basic skills, and therefore the term 'capability' was more appropriate than 'literacy'. While financial literacy and financial capability are not exactly the same, they are often used interchangeably, which may be a cause of confusion.

Atkinson, et al. (2007) found that financial capability encompassed four key areas: managing money, planning ahead; choosing products; and staying informed. Taylor, Jenkins and Sacker (2009) identified five areas: making ends meet, keeping track of money, planning ahead, choosing products and staying informed.

Taylor, Jenkins and Sacker (2009) concluded that people with higher incomes, older people, and those couples with no dependent children have the greatest financial capability while those with lower incomes, younger people, in couples with dependent children, and single people to be the least financially capable. It is important to note that financial capability was found not to be highly correlated with income or educational levels (Yoong, et al. 2013; Atkinson, McKay, Collard and Kempson, 2007).

#### 2.4.11 Seeking Advice

Kramer (2012) and Campbell (2006) both argued that a number of self-directed investors make suboptimal investment decisions. The alternative to self-directed retirement planning is to seek professional financial advice. Advisers are financially more sophisticated than self-directed investors in terms of investment experience, financial education, and financial knowledge, and possess characteristics linked to improved decision-making (Stoughton, Wu & Zechner, 2011; Kramer, 2012). Debate exists whether professional advisers can deliver better results than direct investors (Kramer, 2012; Finke, 2013; Chalmers & Reuter, 2011).

Hung and Yoong (2010) found that wealthier people were more inclined to follow professional advice and enjoy better investment returns than those with less wealth. Those who seek professional financial advice have better diversified investments which results in reduced avoidable idiosyncratic risk than those who fail to seek advice (Kramer, 2012). Guiso and Japelli (2006) found that overconfidence reduces the likelihood that people will seek professional financial advice. Finke, Howe and Huston (2011) found that while financial decision-making ability declined with old age, confidence in the ability to make financial decisions did not. This can lead to issues with some older people over-estimating their financial decision-making abilities.

Finke (2013) found that people had problems with trust, with assessing service quality (pre and post-purchase), with measuring benefits, and with pricing of financial advice and this could account for the low numbers of people willing to seek professional financial advice. Finke (2013) argued that for advice to be effective, people must be motivated to

seek it out. He also found that those most likely to make financial mistakes are unfortunately least likely to seek professional financial advice.

#### 2.4.12 Risk Management

Most financial decisions impact the future, and associated uncertainties need to be addressed (Lusardi, 2013). Berthold (2013) believed that decision-making involved uncertainties and managing risk, stating “the better a risk is managed, the less severe its ill-effects are likely to be” (p.6). Results from Van Schie, Donkers and Dellaert (2012) indicated that uncertainty is moderated by two factors: an individual’s perceived adequacy of current savings, and their financial constraints.

Uncertainties create ambiguous conditions. In particular, Van Schie, et al. (2012) found having a degree of uncertainty increased the retirement contributions of those who believed they were saving adequately, but lessened retirement contributions of those who believed their savings were inadequate.

Finke (2013) argued that contingency planning is a key step in financial planning, yet few US workers have put much effort into risk management. Hilgert and Hogarth (2003) found that more than half the US households surveyed did not have adequate emergency funds, which they defined as being between two to six months of living expenses. The implication is that if households experience financial problems, without adequate reserves, they may have to access their retirement savings.

People’s attitude to risk management is affected by their level of risk tolerance as Joo and Grable (2004) argued that differing levels of risk tolerance resulted in differences in both decision-making and financial outcomes. Grable (2000) defined financial risk tolerance as “the maximum amount of uncertainty that someone is willing to accept when making a financial decision” (p.625). Campbell (2006) found that households with little or no tolerance to investment risk were less likely to participate in equities and the stock market, and interestingly Hanna (2011) found they were less likely to seek financial advice.

Cai and Yang (2012) found greater financial goal clarity influenced risk tolerance, with those with a capital accumulation motive being more risk tolerant than those with a capital security motive, who were more risk averse. Bommier and Rochet (2006) found risk aversion decreased with age, and there is empirical evidence to confirm that contrary to common thought, elderly people hold riskier portfolios than younger people (Guiso, Jappelli & Terlizzese, 1996; Americks & Zeldes, 2004).

Therefore, retirement planning that fails to consider the potential risks involved leaves gaps in the overall financial planning process. This makes such plans vulnerable to unexpected events which could negatively impact the actions taken in the past to prepare for retirement. Research into attitudes towards contingency planning in respect to retirement planning is limited.

#### 2.4.13 Longevity

Life expectancy is an essential factor in retirement planning and the determination of retirement adequacy (Berthold, 2013; Deaton, 2005). One risk retirees often face is living longer than expected, as extended lives extend financial needs, and they fear becoming a burden on the family (Bank of America - Merrill Lynch (2013)). A possible explanation is that those with family members who had lived to age 90 would have greater awareness of the need to save for a long retirement, and would consequently have higher savings.

Berthold (2013) highlighted the fact that an individual's longevity is uncertain, stating that "although your life expectancy is known, or thought to be known, your actual longevity is not. If you live longer than you expected and planned for, you run out of savings and your living standard then drops" (p.11).<sup>21</sup> It should be noted that life expectancy is at best an average and therefore any given person may die several years before or several years later than expected. Life expectancy distribution is skewed, with a long left-tail for early deaths, and then a sharp peak and a rapid fall to age 100. This indicates a 'compression' of mortality in the latter years

Dow & Jin (2013) found that US households adjusted their financial planning horizons according to changes in health status and expected life expectancy.<sup>22</sup> Stawski, et al. (2007) found that as well as having a tendency to overestimate the quality of their financial decisions, people also had a propensity to underestimate their own expected longevity.

#### 2.4.14 Decumulation

The cessation of fulltime employment upon retirement triggers the decumulation of savings. In New Zealand there are no constraints, few guidelines, and little assistance with managing KiwiSaver withdrawals on becoming eligible at age 65 (CFLRI, 2014; IRD, 2013). Dale (2015) raised the concern that there is a danger associated with retirees self-

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<sup>21</sup> Berthold (2013) pointed out that average life expectancies have increased over the past few decades. In 2013 the New Zealand average life expectancy for men was 79.1 years and 82.8 years for women (Statistics NZ, 2013b).

<sup>22</sup> Campbell (2006) found poor health also had an effect on asset allocation, forcing focus on current spending needs rather than future income.

managing their decumulation of wealth. Especially vulnerable are those subjected to family financial pressure, who lack financial capability, and those with declining cognitive ability.

The OECD (2014) concluded that some homeowners can be asset-rich, but income-poor due to the illiquid nature of housing. Home equity release schemes (lump-sum or regular payment loans) use the capital value of homes as security, and the amount borrowed together with accumulated interest usually has to be repaid when the owner sells or dies. Home equity loans allow older people access to some of the equity in their homes.<sup>23</sup> Berthold (2013) stated that “home equity conversion as presently available is at most a partial solution to the decumulation problem” (pp12-13). Lusardi and Mitchell (2007a) argue that Baby Boomers have greater reliance on home equity than their predecessors.

Gaining access to KiwiSaver funds, when considering Friedman’s (1957) Permanent Income Hypothesis could be seen as either a one-off transitory income event (windfall/unexpected), or could be treated as permanent income (anticipated/planned). If seen as an increase in permanent income, it could lead to an increase in current consumption levels.<sup>24</sup> If perceived as transitory income, there is a danger that without good money management skills and without any guidance or constraints, some people may rapidly consume their KiwiSaver retirement savings rather than being a retirement-long source of income generation (Heartland Bank, 2016b; CFLRI, 2014). The latter outcome would be directly contrary to the stated intention behind the KiwiSaver

## **Conclusion**

We have discussed a number of possible causal factors, while retirement savings is a useful determinant of retirement preparedness. On its own, it is an incomplete measure of retirement preparedness. Many of the factors discussed above have contributed to the construction of the on-line survey, the retirement adequacy measure, and the financial preparedness for retirement index.

Other contributing factors likely to have a major influence over retirement adequacy are longevity, the level of wealth, education, home equity, marital status, and financial dependents. Attitudinal and behavioural factors are also important such as the level of financial literacy and capability, money management attitudes and skills, retirement

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<sup>23</sup> Heartland Bank (2016a) loans provide access to a maximum of 45% of home equity by age 80.

<http://homeequityrelease.co.nz/>

<sup>24</sup> A view also supported by OECD, (2013).

consumption expectations, willingness to seek and accept professional financial advice, tolerance and management of risk, and the timing and approach to decumulation.

It is also important to factor in the New Zealand perspective when considering retirement preparedness, especially the impact that such things as NZ Superannuation and the lack of annuities will have on both the research methods and measurements employed, as well as the impact they have on the overall results.

## 2.5 Financial Preparedness Measures and Indices

This sub-section discusses a variety of extant retirement preparedness measures and indices deemed relevant to this thesis. Indices provide a quick, easy-to-interpret indication of the state of financial affairs, reflecting change over time, and providing useful benchmarks for comparison and the evaluation of change initiatives.

The review of preparedness and adequacy measures and indices occurs in the following four sections, in the order of relevance, from least relevant to most relevant. These sections being retirement adequacy measures, confidence simulation models, adequacy focused models, and multi-faceted models. A wide range of retirement preparedness or readiness indices were examined,<sup>25</sup> and only those considered relevant have been discussed. A number of retirement preparedness/readiness indicators reviewed consisted of on-line retirement savings calculators, while others focused on attitudinal or lifestyle adjustments upon retirement, but these all lacked sufficient scientific robustness to be considered further. Features and issues specific to each index have been commented on within each relevant section, whereas features common to several indices have been commented on in the discussion Section 2.5.5 to avoid repetition.

### 2.5.1 Retirement Adequacy Methods

At the household level, there are six generally accepted micro-methods of defining retirement adequacy and these are discussed below.

#### 1. Consumption Smoothing Approach

The consumption smoothing approach determines the amount of retirement wealth required to achieve pre-retirement level of consumption sustained throughout the whole

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<sup>25</sup> See Appendix 2 for a full list of retirement preparedness and readiness indices, both discussed and discarded.

retirement period (MacDonald, et al., 2012; Scobie, et al., 2012; Ghilarducci, 2010; Naylor, 2010; Cole & Liebenberg, 2008; Reno & Lavey, 2007; Montalto, 2001; Yuh, 1999). Pre-retirement consumption is often used as a proxy for desired retirement consumption by researchers (Yuh, et al., 1998; Cole and Liebenberg, 2008). Several researchers defined pre-retirement consumption levels as current earnings minus annual savings and annual home loan payments (Montalto, 2001; Cole & Liebenberg, 2008).

The consumption smoothing approach again aligns with consumption and utility smoothing theories (Modigliani & Brumberg, 1954; Friedman, 1957). Cole & Liebenberg (2008) referred to this approach as the consumption retirement rate (CRR), the ratio of expected retirement income to consumption. Current consumption levels can be projected forward to retirement and beyond, using an assumed rate of inflation. Next, savings and financial resources can also be projected forward, using an assumed rate of return on investments. By applying an assumed rate of return to the projected wealth at retirement it is possible to determine whether the annual return generated will be sufficient to provide the same amount of pre-retirement consumption (Yuh, et al., 1998; Binswanger & Schunk, 2012).

The total NPV amount of consumption required throughout retirement is then compared to the projected total NPV amount of accumulated financial resources. Retirement adequacy is said to exist when total accumulated financial resources are equal to or exceed total retirement consumption (Yuh, et al., 1998; Binswanger & Schunk, 2012). This approach relies upon obtaining reliable household data concerning investments, asset allocation, and investment-related rates of return. While households are unlikely to know the amount of their consumption, it can be estimated by taking away home loan repayments and savings contributions from their annual household income (Naylor, 2010; McKinsey, 2012).

## 2. Replacement Rate

The retirement income Replacement Rate (RR) is the ratio of retirement income to pre-retirement income (Biggs, 2016). The replacement rate approach determines the amount of post-retirement income required to finance retirement consumption as a proportion of pre-retirement income (Binswanger & Schunk, 2012; MacDonald, et al., 2012; Scobie, et al., 2012; Martin & Finke, 2008; Reno & Lavey, 2007; Neukam & Hershey, 2003; Yuh, 1999; Mitchell & Moore, 1998; Yuh, et al., 1998; Carver & White, 1994).

Mitchell & Moore (1998) defined the replacement rate as the “ratio of household income needed to finance desired retirement consumption divided by annual pre-retirement income” (p.375). This approach involves projecting forward earnings and financial resources up to the point of retirement. It is possible for households to make reasonable estimates of net worth and financial assets as well as projecting current income forward to the expected age of retirement. The replacement rate approach assumes stable taxation rates, continued savings contributions, continued employment and income, and continued good health, as well as estimated growth rates, returns on investments, and inflation (Mitchell & Moore, 1998; Martin & Finke, 2008).

Retirement income is expected to be at a level lower than pre-retirement income. This is because pre-retirement levels of consumption can match post-retirement consumption given that home loans have usually been repaid, retirement saving are no longer required, and most major assets would have been purchased prior to retirement (Huston, Finke & Smith, 2012; Horizon Research, 2011; Naylor, 2010).

Bernheim, et al. (2001) found that consumption dropped sharply at retirement, and decreased further post-retirement. Cole & Liebenberg (2008) considered that work-related expenses and dependent-related costs were no longer required, and possible taxation reductions further reduced the level of consumption required. Fisher, et al. (2008) together with MacDonald, et al. (2012) found that some household consumption patterns changed as retirement approached. Some start transitioning into retirement by working fewer hours, which led them to conclude that final earnings may not always accurately reflect lifetime earnings. Despite this weakness, they found that final earnings were most commonly used.

Binswanger & Schunk (2012) found minimum income replacement rates ranged between 45% and 95% in the US, and between 60% and 75% in the Netherlands. Results from Aegon’s (2013) Retirement Readiness Survey<sup>26</sup> of OECD countries found that a small

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<sup>26</sup> Aegon N.V. is a multinational life insurance, pensions and asset-management company headquartered in The Hague, Netherlands. In 2012 Aegon employed approximately 24,000 people worldwide, and has millions of customers. In the 2012 survey the twelve countries were: USA, UK, Canada, Netherlands, Sweden, Spain, Germany, Poland, Hungary, France, Japan, and China. They accounted for almost 85% of global pension assets (not including social security funds). By 2011, the US had amassed \$17.5 trillion in pension assets (56% of the global total). UK followed \$3 trillion, (10%, of global pension assets). 90% of respondents were pre-retirees and 10% were already retired. The survey excluded the unemployed, long-term disabled or the self-employed, as each of these groups faces specific challenges in planning for retirement. Instead, the objective of the survey was to provide a broader perspective based on the mainstream working population.

proportion (12%) of pre-retirees expected they would require more than 100% of their gross current annual income in retirement, 29% expected between 80% - 100%, 35% expected between 60% - 79%, and 24% expected less than 60%.

Naylor (2010) believes 60% - 70% of net pre-retirement income would provide a similar post-retirement lifestyle in New Zealand. A Treasury (2003) report suggested that NZ replacement rates were broadly similar across all wealth deciles, typically 70%. The OECD (2014) argued that while it may be possible to suggest an appropriate replacement rate generally, in reality for those on low pre-retirement incomes and for those close to the poverty line they are likely to require 100% of their pre-retirement income.

Reno and Lavey (2007) argued that a weakness of the replacement rate approach is that “traditional replacement rate studies measure income adequacy at retirement, but do not always track income and spending in old age” (p.2). This issue is important as health-related expenditure is expected to increase with age<sup>27</sup>, and retiree-specific inflation<sup>28</sup>, with the consequential loss of purchasing power can affect adequacy as retirees age.

### 3. Net Worth

The Net Worth approach determines the amount of net worth a household needs to cover their total retirement consumption requirements (MacDonald, et al., 2012; Scholz, Seshadri & Khitatrakun, 2006; Li, 1996).

The net worth approach considers that household resources are adequate when net worth exceeds the amount of financial resources required to meet retirement consumption needs. Financial resources available at retirement include all household financial resources together with the present value of pension income streams. The amount of financial resources required is calculated to incorporate desired replacement rates, pre-retirement income, and the number of years in retirement (Scholz, et al., 2006).

This approach has several weaknesses as some of the assumptions on which it is based are flawed. Net worth may include items a household may not wish to convert into a liquid form, such as home equity, vehicles, art, antiques, and family heirlooms. Researchers such as Li (1996) make the assumption that all assets can be converted into

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<sup>27</sup> Half (48.6%) of lifetime health expenditure occurs during senior years (65+) (Alemayehu & Warner, 2004).

<sup>28</sup> In New Zealand some items within the CPI basket of goods are less relevant to the elderly such as education, life insurance, new cars, cell phones, international travel, internet charges while others are more relevant, such as medical expenses and residential care costs (Statistics NZ, 2014).

cash or an annuity, including home equity, which rarely occurs in New Zealand (Stewart, 2013). This approach also assumes a constant rate of return on all assets, which will vary depending on the types of asset and the asset allocation.

A limitation that exists in New Zealand is that detailed information on a wide range of household assets and liabilities is not easily obtainable (O'Connell, 2013). This places reliance upon households to accurately disclose their true financial position and provide a detailed breakdown of their financial resources.

#### 4. Confidence Rating

The Confidence Rating approach uses simulations to determine the degree of confidence in achieving a predetermined level of adequacy (MacDonald, et al., 2012). Confidence ratings are constructed using a series of Monte Carlo simulations based upon a scenario of factors and assumptions. Based upon these simulations, it is possible to determine with a degree of confidence how likely a household would be to achieve a pre-determined level of adequacy (Munnell, Webb & Delorme, 2006; VanDerhei & Copeland, 2010), as well as those considered to be 'at risk'.<sup>29</sup> A weakness of this approach is that it requires a pre-determined measure for retirement adequacy.

#### 5. Prescribed Savings Rate

The Prescribed Savings Rate approach determines the rate of savings contribution required to achieve the level of adequacy required (MacDonald, et al., 2012; Mitchell, Moore & Phillips, 2000; Yuh, et al., 1998; Mitchell & Moore, 1998). This approach starts with current accumulated retirement savings, and calculates the contribution rate required to accumulate sufficient financial resources in order to achieve the level of adequacy required, assuming a constant rate of return on investments. Comparisons can then be made between current savings rates and required savings rates (Yuh, et al., 1998; Mitchell & Moore, 1998). Duncan, Mitchell and Morgan (1984) and Mitchell & Moore (1998) also calculated a 'needed saving rate', being the proportion of current income needed to be saved until retirement to meet the retirement goals.

There are weaknesses to this approach. This method again relies on pre-determining a level of adequacy, and fails to account for other existing pensions and assets that could be converted into retirement wealth. It also assumes uninterrupted savings contributions,

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<sup>29</sup> VanDerhei & Copeland (2010) defined 'at risk' as not having sufficient retirement resources to pay for "basic" retirement expenditures and uninsured health care costs.

continued full-time employment, and good health. There is an assumption that individuals are employed, thereby excluding the self-employed, which comprise a significant group in New Zealand,<sup>30</sup> and the annual income of the self-employed can vary greatly from year to year.

## 6. Multiples of Earnings

The Multiple of Earnings approach determines the total amount of accumulated financial resources (ex-house) required to provide an adequate level of consumption in retirement and divides this by annual earnings (JP Morgan Asset Management, 2015; MacDonald, et al., 2012; Baus & Drew, 2010; Stawski, et al., 2007; Booth and Yakoubov, 2000).<sup>31</sup> It is unclear whether this is after tax annual earnings. If not, there is a danger of the multiple being understated. It is also subject to changes in the rate of return, and therefore not robust.

The multiples of earnings suggested by Booth and Yakoubov (2000) of five times final earnings, and by Baus & Drew (2010) of eight times final earnings both exceed the two times earnings that Stawski, et al. (2007) found that most US households manage to save. Their research has not been repeated in New Zealand, however the multiple is likely to be lower given the contribution of NZ Superannuation.

JP Morgan Asset Management (2016) produced a ‘checkpoint’ table showing the amount of retirement savings that should be accumulated (as a multiple of current earnings) based upon age and current income. As an example, this showed that for a person in the US earning \$100,000 p.a., at age 50 they should have accumulated a sum equivalent to 4.5 times their earnings and by age 65, a sum 8.4 times their earnings.

### 2.5.2 Confidence Simulation Models

#### 2.5.2.1 Retirement Readiness Rating

The US Employee Benefit Research Institute (EBRI) (2011) has been running their annual Retirement Confidence Survey (RCS) survey since 1978. It is a nationally representative telephone survey of 1,000 working adults over age 25, and 500 retirees.

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<sup>30</sup> The 2013 census showed that 18% were either employers or self-employed with no employees.

<sup>31</sup> It should be noted that when gross earnings are used the multiple is understated by the amount of tax incurred.

The EBRI developed the Retirement Readiness Rating™ in 2010<sup>32</sup> to provide an assessment of the adequacy of projected retirement income.

The Retirement Readiness Rating (RRR) uses micro-simulation projections to determine the percentage of preretirement households ‘at risk’<sup>33</sup> of having inadequate retirement income, insufficient assets to cover retirement expenses, and uninsured medical costs in retirement. Having access to administrative records on tens of millions of 401(k) participants, going as far back as 1996, helped to simulate future wealth accumulation. Also added were other components of retirement income and accumulated wealth (such as defined benefit annuities and lump-sum distributions, IRAs, social welfare and net housing equity) at retirement age. The simulation ran 1,000 alternative retirement paths to determine the percentage of time the households were expected to ‘run short of money’ in retirement. Simulations were run to determine 50%, 70%, and 90% probability of having adequate retirement income, then calculating the proportion of current income needed to be saved in order to achieve that (VanDerhei & Copeland, 2010).

#### *2.5.2.2 National Retirement Risk Index (NRRI)*

The NRRI is a periodic, nationally representative survey that measures the percentage of US working-age households ‘at risk’ of being financially unprepared for retirement. ‘At risk’ is defined as households that fall 10% below their retirement income target. Balances in 401(k) plans are projected forward and an ‘income replacement rate’ (IRR) is calculated. This IRR is then compared with a benchmark rate considered to be sufficient to allow that household to maintain their pre-retirement living standard in retirement (Munnell, et al., 2006; VanDerhei & Copeland, 2010). It is unclear exactly how the benchmark rate has been determined.

NRRI measurement begins by extracting the household’s financial assets and net worth figures from the Survey of Consumer Finances (SCF), a three-yearly series run by the US Federal Reserve. The SCF surveys 4,500 households and is considered to be nationally

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<sup>32</sup> The 2010 Retirement Readiness Rating™ is a version of EBRI Retirement Security Projection Model (RSPM) developed in 2003 to track retirement preparation.

<sup>33</sup> Household projections were combined with the other components of retirement income/wealth (such as Social Security, defined benefit annuities and lump-sum distributions, IRA rollovers, non-rollover IRAs, and net housing equity) at retirement age, and run through 1,000 alternative retirement paths to determine the percentage of the time the households “run short of money” in retirement. The present value of the deficits generated in retirement are also computed, and divided by the accumulated remaining wages of the household to provide a percentage of compensation that would need to be saved in each year (in addition to any employee contributions simulated to be made to defined contribution plans and/or IRAs) to provide a 50, 70, or 90 percent probability of adequate retirement income.

representative. The household's financial position is projected forward to age 65. This longitudinal study found that based upon a household's current wealth accumulation position relative to their income group (top, middle or lower tercile), wealth accumulation occurred in constant proportions that remained consistent over time. The SCF survey showed stable age-related wealth-to-income ratio growth patterns. For example, a typical 35-year old is expected to have a median wealth-to-income ratio of one, which grows over the course of time to four by age 65.

Then by using the appropriate wealth-to-income ratio, it is possible to project retirement wealth forward to the age of retirement. Expected retirement income is based upon the assumption that households purchase an inflation-indexed annuity of equivalent value. An income adjustment is applied for homeowners, and varies according to projected home loan at the time of retirement (VanDerhei & Copeland, 2010).

VanDerhei and Copeland (2010) mentioned that 401(k) plans have failed to reach their potential in the past, which throws growth projections into question. Growth projections also assume continuous contributions until retirement, but fail to consider the number retiring earlier than planned, due to ill health or redundancy (Aegon, 2013).

The age-related wealth-to-income ratio is a useful concept for estimating future retirement wealth. While the income adjustment makes it possible to make relative comparisons between homeowners and renters, in New Zealand detailed financial data has not been regularly collected that would allow for a comparative longitudinal study.

### 2.5.3 Adequacy-focused Models

#### 2.5.3.1 Retirement Preparedness Survey (RPS)

The 2013 Retirement Preparedness Survey (RPS), an annual on-line survey carried out by the Bank of America-Merrill Lynch (2013), surveyed 5,415 respondents aged between 25 and 88 years. An additional group of affluent respondents aged 50 or over was also included, being those reporting investable assets (including liquid cash and investments, but excluding real estate) of at least \$250,000. They found that while US employees' focus on retirement goals had increased in recent years, most (85%) felt that they had not saved enough, with 60% believing that it would be difficult to save enough to maintain their standard of living during retirement.

### *2.5.3.2 Anticipation and Preparation for Retirement*

A US study by Kim, et al. (2005) investigated the characteristics associated with preparation for retirement and incorporated these in an Anticipation and Preparation for Retirement (APR) score. These variables included proximity to retirement, retirement funding calculations, retirement saving amount, confidence in social welfare programs, workplace financial education, and advice. Survey questions about government welfare programs reflected the low level of health and residential care support provided in the US, which does not exist in New Zealand. The APR also failed to define retirement adequacy.

### *2.5.3.3 Retirement Preparedness Measure*

Fidelity Investments<sup>®</sup> (2013) Retirement Preparedness Measure (RPM) measures whether working Americans are on track to cover their estimated total post-retirement expenses. Data was collected from Fidelity's regular Retirement Savings Assessment (RSA) on-line survey of 2,265 people working, aged 25 and over. The sample population was sourced from the GfK group's<sup>34</sup> Knowledge Panel.

RPM assumed that 80% of estimated retirement expenses were deemed 'essential consumption' based on Bureau of Labor Statistics Consumer Expenditure Survey data, again this assumes a constant level of retirement adequacy across the entire population. The RPM gave a base score, but allowed respondents the option to vary certain retirement expectations, such as delayed retirement, part-time work in retirement, extracting home equity, and the annuitisation of investment assets. Projections were based on the retirement investment assets and defined benefit plan amounts reported in the RSA survey, and estimations of earned income in retirement using Fidelity's in-house income replacement methodology.

A national score was achieved through an accumulation of individuals' RPM scores. This made it possible to calculate a percentage of US households that are on track to cover their essential retirement needs for the median US households, as well as for income and age cohorts. The RPM model again assumes continuous employment and income generation, adding a working part-time in retirement option of a limited duration, being a percentage of income based on individually stated pre-retirement income. A maximum

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<sup>34</sup> The GfK Group, established in 1934 as *Gesellschaft für Konsumforschung* (Society for Consumer Research) is Germany's largest market research institute, and the fourth largest market research organisation in the world.

duration for part-time work of five years was applied, with a minimum of one year. The RPM projections applied planning horizons based on life expectancy of 92 for a US male and 94 for a US female.<sup>35</sup> Longevity is an important element impacting on the time spent in retirement, a key factor in determining retirement adequacy (Fidelity, 2013). Once again, the effort of individualising household data has merit.

#### *2.5.3.4 McKinsey's Retirement Readiness Index*

A survey of over 10,000 working Canadian households gathered detailed information on households' assets, debt and savings habits. Respondents were vetted by income, age, region and household composition to generate a representative view of the Canadian population (McKinsey, 2012).<sup>36</sup> Statistics Canada consumption surveys showed current retirees in the first income quintile maintained approximately 80% of their pre-retirement consumption level, while all other retiree cohorts maintained approximately 65%. Households below these RRI thresholds were defined as 'not being on a path to adequate retirement income'. Since many retirees continued to save in retirement and were expected to leave inheritances beyond the value of their real estate, the average RRI of current retirees was expected to be higher than 65%-80%, as RRI measured spending capacity in retirement rather than actual consumption (McKinsey, 2012).

The RRI measures the ratio between projected disposable income in retirement and consumption level pre-retirement. Disposable income in retirement was obtained by projecting the current assets and future savings of each household to retirement age. Projected net assets at retirement (minus any remaining debt) were converted into annual income using current real annuity rates. Income from Old Age Security pensions, Guaranteed Income Supplement, Canada Pension Plans and defined benefit (DB) plans (if applicable) were added to the annuity. Income taxes were applied using the current tax tables. Consumption pre-retirement was measured as projected household income for the peak income year minus annual savings and home loan payments, if any.

McKinsey (2012) made several assumptions including appreciating pre-retirement assets at a long-term compounded real return on assets of 3.5% p.a., annuitisation of assets at

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<sup>35</sup> Longevity used in the RPM was based on the Society of Actuaries annuity tables (2000).

<sup>36</sup> McKinsey & Company is a Canadian based management consulting company operating in more than 40 countries worldwide. In 2011, McKinsey conducted detailed analysis of Canadian households' balance sheets and implied retirement readiness based on an extensive survey of more than 10,000 working-age households.

retirement,<sup>37</sup> and that defined benefit plans would deliver a promised level of retirement income. Home equity was excluded from their calculations. The focus of McKinsey's approach was on working Canadian pre-retirees, excluded the self-employed and those on social welfare, and relied on converting all financial resources into annuities, which are not common in New Zealand.

#### 2.5.4 Multi-faceted Models

##### 2.5.4.1 *InFRE Retirement Readiness Index*

The International Foundation for Retirement Education's (InFRE) Retirement Readiness Index® (IRRI) measured three dimensions of retirement life-stage planning: engagement, health, and wealth. The wealth dimension, as well as financial accumulation, also involved the effect of geography on a retiree's potential living costs, home equity, retirement income management, and contingency planning (InFRE, 2007).

Comment on IRRI's methodology is restricted as little detail has been disclosed. It was noted that IRRI failed to consider some contributing factors, such as financial knowledge, money management skills, or risk management. The effect that location has on retiree living costs and home equity values was noted and included.

##### 2.5.4.2 *Financial Wellness Score*

A nationwide on-line survey of 1,014 US employees enrolled in a 401(k) retirement savings plan, involving companies of all sizes was conducted in 2013 by the Boston Research Group. As well as retirement savings, financial wellness included: planning for health care costs, savings for college education, debt management, and budgeting. The 'Financial Wellness Score' (FWS) looked at the interconnectivity between employer benefits, household finances, and the behavioral aspects of a person's financial life.

Ten attributes were identified using factor analysis and individuals were scored on a 10-point scale. It found 65% of employees were in a poor financial position (scoring four or less), with 11% achieving 'financial wellness' (scoring 8 or higher). It is unclear what the ten attributes were, or how well they related to their theoretical construct of 'financial wellness' (Bank of America - Merrill Lynch, 2013) as no details were provided.

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<sup>37</sup> McKinsey's (2012) annuitisation of assets at retirement assumed protection against longevity risk, and that these annuities could be acquired over multiple years to manage market-timing risk.

#### *2.5.4.3 Clark, Knox-Hayes & Strauss's Preparedness Index*

The preparedness index by Clark, Knox-Hayes & Strauss (2009) generated a single preparedness score based upon the weighting of eight variables. UK respondents were asked to score their agreement with statements using a 5-point Likert response scale. The questions focused largely around financial capability, including: perceived retirement planning knowledge; knowledge about where to get more information; confidence in investment allocation; knowledge required to make investment choices; knowledge about annuities; confidence in retirement preparation progress; and affordability.

Concerns about the approach taken by Clark et al. (2009) are best expressed using their own self-assessment, as the study was carried out “without any assumptions made about whether the attitudes translated into action” (p.21). It appears that Clarke et al. (2009) failed to ask questions relating to the amount of implementation that had occurred. Also in New Zealand there are a lack of suitable annuities and the relatively small bond market renders the questions relating to asset allocation choices and knowledge of annuities irrelevant (Naylor, 2010; Stewart, 2013). This index failed to calculate or consider the adequacy of retirement income, money management or risk management strategies.

#### *2.5.4.4 Aegon Retirement Readiness Index*

In 2014 Aegon Retirement Readiness Index (ARRI) on-line surveys<sup>38</sup> were carried out with 16,000 pre-retirees and retirees from 14 countries<sup>39</sup>, excluding Australia and New Zealand. The ARRI identified six independent variables and they found influenced current saving activity, those being: personal responsibility for income in retirement, the level of awareness of the need to plan for retirement, understanding of financial matters, the level of retirement plan development, self-assessment of progress towards accumulation targets,<sup>40</sup> and the expected level of income replacement.

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<sup>38</sup> The fourteen countries covered by the survey account for almost 85% of global pension assets (not including social security funds). By 2011, the US had amassed \$17.5 trillion in pension assets (56% of the global total). UK followed \$3 trillion, (10%, of global pension assets). 90% of respondents were pre-retirees and 10% were already retired. The survey excluded the unemployed, long-term disabled or the self-employed, as each of these groups faces specific challenges in planning for retirement. Instead, the objective of the survey was to provide a broader perspective based on the mainstream working population.

<sup>39</sup> The fourteen countries survey included: USA, UK, Canada, Netherlands, Sweden, Spain, Germany, Poland, Hungary, Turkey, France, Brazil, Japan, China, and India.

<sup>40</sup> The terminology was changed for clarity. Aegon used the name “financial preparedness for retirement”. In this context, this factor refers to the state of the progress towards the individual’s accumulation target. The question asked is “Thinking about how much you are putting aside to fund your retirement, are you saving enough?”

These preparedness factors were individually scored, score weightings applied, then all factor scores were totalled to determine an individual ARRI score, with a maximum score of 10. An average preparedness score was calculated for each country. The ARRI scores for all 12 countries<sup>41</sup> fell in a relatively narrow range, with Japan lowest at 4.30 and Germany highest at 5.48, with a composite total score of 4.89, which was considered a ‘low’ level of retirement readiness. They found that the distribution of individual scores was heavily skewed towards the lower unprepared end, and that this was common across all countries. As a result of running the same survey in a number of countries, Aegon’s approach adds value as it provides an international perspective to the results, highlighting differences in cultural beliefs and attitudes, population size, economic conditions, as well as the types of superannuation schemes available, level of state-funded pensions and entitlement. As the ARRI index is in commercial use, it was not possible to obtain information on the indexation method used, or to replicate it within this study.

### 2.5.5 Discussion

The approach taken by McKinsey (2012) to vet survey respondents based on age, income, and region is a reasonable approach and helped ensure that a representative sample was obtained. The range of questions asked provide a good base from which to explore factors with the potential to influence retirement preparedness in New Zealand.

It is an accepted practice to project wealth and income forward, *ceteris paribus*, to establish final year’s earnings and consumption, and retirement wealth. The use of financial resources is preferred over net worth or wealth, as it excludes home equity, heirlooms, and other lifestyle assets unlikely to be converted into retirement wealth.

Converting home equity into annuities immediately upon commencement of retirement is an unrealistic assumption, given the actual timing of home equity conversion is difficult to predict. Unless all assets are converted into an annuity at the beginning of retirement, any calculations of income available for retirement consumption and growth of wealth will be overstated. As well, there is a lack of understanding of annuities and suitable annuity products in New Zealand. If investments are retained in their current form, and the rate of return is known, it is possible to more accurately estimate future returns.

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<sup>41</sup> ARRI index scores were calculated based on a sample of 10,800 employees and excluded those who had retired.

The RPM used life expectancy tables to determine the expected time spent in retirement for individuals, which is a rational approach. They also provided an option for a percentage of part-time work in retirement, allowing a minimum of one year and a maximum of five years. This approach is weakened by the high proportion forced to retire early, as there is no certainty that health will be maintained or part-time employment opportunities will exist. Finally, greater accuracy will be obtained by using household-specific data wherever possible and minimising the use of generalised assumptions.

It is more accurate to use individually calculated household adequacy rather than using generalised pre-determined adequacy measures against which to determine adequacy and is worthy of adoption. It is common to use pre-retirement consumption, being current household income minus annual savings and annual home loan payments to determine retirement consumption (Montalto, 2001; Cole & Liebenberg, 2008). A review of the literature associated with these measures and indices has shown that regression analysis (simple and OLS), factor analysis (FA), and principal component analysis (PCA) have all been used in many of the adequacy studies.<sup>42</sup>

## 2.6 Conclusion

Many economic and behavioural researchers have undertaken surveys to gather primary data in the past,<sup>43</sup> while others have used secondary data.<sup>44</sup> The majority of these indices are American and rely on accessing many years of 401(k) records and Bureau of Labor Statistics Consumer Expenditure Survey data, which cannot be replicated in other countries, such as New Zealand.

While saving and the amount that a household manages to accumulate before retirement is important, these are not the only factors influencing retirement adequacy. It is also important to identify and gain an understanding of which demographic, financial,

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<sup>42</sup> Lusardi & Mitchell, (2014); Scholz, et al. (2006); Montalto, (2001); Mitchell & Moore, (1998).

<sup>43</sup> Survey have been used by: Horizon Research (2013, 2011), Perry (2015); Lusardi & Mitchell, (2007, 2010, 2011); Jappelli & Modigliani (2005); Longitudinal study using the survey method include: US Consumer Finance (SCF); NZ Survey of Family; Income & Expenditure (SoFIE), US Health and Retirement Study (HRS); US Consumption & Activities Mail Survey (CAMS).

<sup>44</sup> Users of secondary survey data includes: Dow & Jin (2010); Le, Gibson & Stillman (2010); Dybvig & Liu, (2009); Topa Moriano, Depolo, Alcover & Morales (2010); Blau (2008), Fisher et al. (2007); Jappelli & Modigliani (2005).

attitudinal, and behavioural factors have the biggest influence on wealth accumulation and retirement preparedness in New Zealand, and this thesis does this.

The final sub-section discussed a range of economic indices that acted as easy-to-interpret state of financial affairs indicators, capable of reflecting economic change over time, and providing useful benchmarks for comparison and the evaluation of change initiatives. For various reasons outlined above, none of the existing indices are suitable or applicable to New Zealand in their entirety, and this thesis develops a financial preparedness for retirement index suitable for use in New Zealand.

Most indices work on the assumption that people are employed, often excluding self-employed people. Americans need to fund their own medical costs or maintain insurance for health and long-term residential care into retirement. This is not the case in New Zealand where there is a good public health system and long-term care of the aged. The employment structure in New Zealand is quite different from the US, as the majority are employed by small to medium-sized enterprises, and a large number are self-employed. As a result, there are few NZ employer-funded pensions and little financial or retirement advice offered to employees (Berthold, 2013).

Many indices assume all assets, investments, retirement savings and home equity are converted into an annuity and then the annuity's rate of return is applied to determine retirement income. Converting net worth into annuities is based not only upon timing, but upon some weak assumptions, and given the lack of understanding of annuities and the lack of suitable annuity products in New Zealand at present this is not an appropriate approach to take.

Several of the indices focused on adequacy of retirement income rather than consumption, and some failed to consider a full range of factors with the potential to influence retirement adequacy, such as financial capability, financial knowledge, need awareness, the development of plans, retirement expectations, money management skills, or risk management strategies. This thesis will correct these oversights and adjust adequacy factors to New Zealand conditions.

## **3.0 Data and Methods**

### **3.1 Introduction**

This research investigates how prepared New Zealand retirees and pre-retirees are to achieve adequate consumption in retirement. Firstly, this thesis sets out to determine the most appropriate way to measure retirement adequacy in New Zealand. This measure is then tested for robustness and its relevance in the New Zealand economic environment is assessed.

An on-line survey was commissioned to collect the necessary household financial data and to obtain attitudinal and behavioural responses to a series of retirement preparedness questions. The financial data collected from retirees was then used to measure adequacy in order to determine whether current household consumptions levels could be sustained throughout retirement. Following this, a number of analytical processes were evaluated to identify which process best replicated and explained the financially calculated retiree adequacy results using demographic, attitudinal, and behavioural factors. As a result of this evaluation process, the backward stepwise logistic regression was deemed to be most effective at identifying the independent variables involved.

The predictive equation generated by the backward stepwise logistic regression formed the basis for the construction of the Financial Preparedness for Retirement Index. Using the information collected from pre-retirees, the indexation process was repeated to produce Financial Preparedness for Retirement indexation scores for pre-retiree households. Finally, this allowed a comparison of retiree and pre-retiree indexation results to be made.

### **3.2 Data Collection**

A review of the literature and existing financial databases showed that the specific New Zealand information required for this thesis did not currently exist. An online survey of 1,044 New Zealanders between 50 and 80 years of age was carried out in September 2015 to collect the necessary financial, demographic, attitudinal, and behavioural information.

Unfortunately funding limitations meant that a random probability sample through a mail survey was not possible. AAPOR (2014) argued that careful survey management and survey construction, panel quality control, quotas, and weighting techniques are effective

ways of improving sample representativeness through the alternative use of on-line panels. It should be remembered that even by adopting these steps it does not fully replicate the randomness of probability sampling.

### 3.2.1 On-line Survey

The use of an on-line panel had a positive impact on the response rate, administration time, and data management. The target sample size of 1,000 respondents was exceeded, providing a sufficient spread across gender, age, geographical location, income, and wealth classifications to offer high levels of confidence following data stratification. The target population consisted of New Zealanders aged between 50 and 80 years, drawn from a representative on-line panel provided by Colmar Brunton, an experienced, New Zealand market research organisation, and part of the global Millward Brown research network. The sample population was divided into two cohorts, retirees, predominantly aged 65 to 80 years, and pre-retirees, predominantly aged between 50 and under 65 years.<sup>45</sup>

The age criteria (between 50 and 80 years) provided a 30-year spread which meant that most respondents shared similar societal and economic conditions during their income-generating years. Also, adults younger than 50 years of age often fail to appreciate the importance of retirement saving, as supported by the claim by Hershey & Mowen (2000) that “on average individuals do not become interested in retirement finances until they are 48 years of age” (p.687). By age 50, career paths and earnings have become more stable. It is also generally accepted that 80 is the upper age limit for survey participants, as the reliability and recall of events of those over 80 becomes questionable as cognitive decline becomes more advanced with age (Agarwal, Driscoll, Gabaix & Laibson, 2008; Lusardi & Mitchell, 2014) and generational conditions may differ.

Campbell (2006) found that there is a general reluctance to disclose financial information, whether in surveys or to professional financial advisers. After developing a series of relevant questions, a draft questionnaire was prepared. Experienced researchers assisted by reviewing the wording and order of questions to help eliminate any possible confusion or ambiguity, prior to constructing the on-line survey in Qualtrics.<sup>46</sup> The questionnaire wording achieved a 61.1 Flesch Reading Ease rating, meaning that it could easily be understood by students aged 13 to 15 years. Next, internal university-based and

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<sup>45</sup> Age 65 is the age of eligibility for NZ Superannuation. It is acknowledged that some people retire before age 65 and some retire after age 65.

<sup>46</sup> Although the research company had their own custom-build software, Qualtrics had the advantage of built in response-logic, and the finished survey can be printed out.

externally-run pilot tests of the on-line survey were carried out to check the comprehension of the questions and completion times prior to activating the survey.

### 3.2.2 Survey Statistics

After running a small pilot test internally, external research consultants, Colmar Brunton also ran a pilot test of 60 respondents before launching the online survey on 5 September 2015. Colmar Brunton randomly sent 3,268 invitations out to their on-line panel. The online survey closed after twelve days, achieving a 38.1% response rate. The call data and sample summary statistics have been listed in Table 1 below.

*Table 1: Call data summary*

Sample Summary Statistics	
Invited (invitation sent)	3,268
Started	1,370
Stopped (Active on the web)	124
Screened out (Didn't qualify)	70
Quota full	132
<b>Completed Survey</b>	<b>1,044</b>
Black Listed <sup>47</sup>	2
Refusal	14
Response Rate	38.1%
Start Rate	41.9%
Completion Rate	31.9%
Drop-out rate	9.1%
Incidence rate (Not screen out)	94.9%
Screened out rate	5.1%
Quota full rate	9.6%

### 3.2.3 Sample Population

Through Colmar Brunton's pre-screening process, the spread of sample key characteristics (age, gender, ethnicity, geographical location, and household income) were closely matched to those of the population of New Zealanders aged 50 years and over. Total respondents consisted of 43.5% being retired respondents ( $n = 454$ ) and 56.5% pre-retiree ( $n = 590$ ) respondents, geographically spread throughout New Zealand. Just over half (58.8%) of the respondents were under 65 years of age. Nearly three-

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<sup>47</sup> People who breach Colmar Brunton's term and conditions, such as multiple responding are blacklisted and prevented from participating in any further surveys.

quarters (70.3%) of retirees stated they were fully retired, with 29.7% currently in part-time employment. The mean age of retirees was 74.4 years, and included 15.2% under the age of 65, with 54.2% being female and 45.8% male.<sup>48</sup> The mean age of pre-retirees was 58 years, and included 7.6% aged 65 and over, with 50.7% being female and 49.3% male. For full details refer to Appendix 4.

### 3.2.4 Data Management

The data was analysed in its raw state, as it was recorded directly from the survey in Qualtrics. For calculation purposes, where answer options contained a dollar range, the mid-point of the range was used. When a ‘more than’ or ‘greater than’ answer option was selected from a range of amounts, the amount recorded was the highest stated amount plus 50% of the range differential in the previous range category. Where a respondent left a question unanswered or answered ‘Don’t Know’ (DK), for analysis purposes these were left out of that specific calculation. The standard approach of using inflation adjusted amounts with all financial calculations, including rates of return (Hanna, Kim & Chen, 2016) was adopted throughout.

Seven women in their seventies and eighties, despite receiving NZ Superannuation, stated their occupations as ‘housewife/husband – home duties’ rather than ‘retired’. There were four other respondents aged over 65 who stated that they were ‘unemployed or beneficiary’, and for the purpose of analysis all these respondents were deemed to be ‘retired’. Nineteen respondents aged 65 years and over, stated they ‘worked part-time’ rather than ‘retired – work part-time’, and a further twenty-five stated they were self-employed. For the purpose of analysis these people were deemed to be ‘retired – part-time’ as they were receiving NZ Superannuation.<sup>49</sup> Those respondents aged over 65 who stated that they worked full-time were deemed to be pre-retirees. The impact of this incorrect categorisation has meant that these respondents did not answer a few questions specific to retirees or to pre-retirees. Wherever possible, answers were transferred across to the appropriate variable heading in the database. Following these adjustments, there were a total of 454 retirees and 590 pre-retirees.

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<sup>48</sup> Note that those under the age of 50 and over 80 years were excluded.

<sup>49</sup> It should be noted that there may be a small proportion who do not meet the residency requirement for NZ Superannuation.

### 3.2.5 Statistical Analysis Methods

Utilising STATA analytical software, the information collected from the on-line survey was analysed with the aim of identifying significant correlations and relationships between the various contributing factors. From the raw survey data, a total of 57 financial, demographic, attitudinal, and behavioural variables relevant to both retirees and pre-retirees were considered as potentially relevant in determining retirement adequacy.

Throughout the majority of this thesis the dependent variable, *adequacy*, a dichotomous variable, has been used. When retirement consumption is deemed to be adequate it has the value of one (1) and when inadequate it has the value zero (0). The majority of the independent variables are non-parametric and categorical in nature, being nominal, ordinal or dichotomous data. This means the use of many of the standard parametric tests were not appropriate, such as simple regressions, ANOVA, and t-tests.

Several measures describe statistical independence, while other statistics report on the proportional reduction of error in prediction, and the strength of association. Unless otherwise stated, this section has largely been referenced from Hosmer, Lemeshow and Sturdivant (2013).

#### 3.2.5.1 Significance

Tests of significance involved a range of statistical tests, such as McFadden's test, used to determine the likelihood that the observed characteristics of a sample population occur by chance, or by sampling error. An observed characteristic is deemed to be statistically significant when the level of significance is less than 10% (or probability (*p*) less than 0.01) (Field, Miles & Field, 2012; Hamilton, 2012; Siegel & Castellan, 1988).

#### 3.2.5.2 Independence

When considering frequencies, as well as percentages, the Pearson's Chi-Square (Chi<sup>2</sup> or  $\chi^2$ ) test was used to test nominal (or categorical) data.<sup>50</sup> Pearson's Chi-Square test was used to investigate the relationships between two categorical variables by comparing the frequencies observed with the frequencies expected in those categories should they have occurred by chance (Kremelberg, 2011). The observed value should be greater than its critical value. When this occurs, a significant relationship is said to exist between the two

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<sup>50</sup> Categories can include types or sub-groups, where continuous data such as age or income is categorised into sub-groups.

variables. The chi-square test is insensitive to the effects of order when the degrees of freedom are greater than 1 (Siegel & Castellan, 1988).

Having a large sample population size, in excess of 1,000, helped overcome a weakness of chi-square, being the need for an appropriate distribution.<sup>51</sup>

The Pearson's Chi-Square and the Wald  $\chi^2$  tests were used to determine the significant differences between two independent groups. The hypothesis tested by the chi-square test is that two or more groups differ with respect to some characteristics. The alternative hypothesis is that the observations come from different distributions. This test checks if the differences in adequacy proportions exceed those proportions expected to occur by random variation or chance (Siegel & Castellan, 1988).

### **3.2.5.3 Goodness-of-fit**

Goodness-of-fit tests two or more categories to see whether a significant difference exists between an observed number of responses in each category and the expected number based upon the null hypothesis. The hypothesis is that groups or categories differ in frequency in prescribed ways (Siegel & Castellan, 1988). The goodness-of-fit test assesses the degree of correspondence between the actual, observed frequencies and the expected frequencies in each category. If the actual frequencies are significantly different from the expected frequencies, it is possible to conclude that a probable relationship exists between these variables.

As no mean exists with dichotomous variables, McFadden's (1974) pseudo- $R^2$  is used with logistic regression. This represents the proportion of error variance controlled by the model. The larger the pseudo- $R^2$  score, the more the model explains. The puesdayo- $R^2$  measure lacks the straightforward explain-variance interpretation of  $R^2$  in the OLS regression (Hamilton, 2012).

### **3.2.5.4 Structures and relationships between variables**

While logistic regression is useful in identifying relationships existing between the known dependent variable and the known independent variables, other statistical techniques, such as Factor Analysis (FA), Principal Component Analysis (PCA), Structural Equation

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<sup>51</sup> It should be noted that the larger the sample size, the closer the approximation becomes. The chi-square test has an assumption that each factor has an expected frequency of five or more. If a category has a frequency less than five, the Fisher's exact test was used as this test has no minimum frequency assumption.

Modelling (SEM) and Seemingly Unrelated Regression (SUR) are useful in testing potential hypotheses about latent structures and potential relationships between independent variables.

Velicer and Jackson (1990) discussed the advantages and disadvantages of both FA and PCA and argue in favour of using PCA in most applications. When comparing differences between FA and PCA, according to Field, et al. (2012) with 30 or more variables and communalities greater than 0.7 for all variables, different solutions are unlikely. Nevertheless with fewer than 20 variables and low communalities,<sup>52</sup> differences occur. When communality is low, then the variable is not well explained by the factors (StataCorp, 2015).

FA and PCA are variable reduction techniques deemed appropriate when variables are highly correlated, indicating the presence of unknown or latent factors. High correlation between variables is a sign of noise and high redundancy in the data, making variable reduction techniques useful to employ (Suhr, 2005). In this instance communality was considered to be too low. Despite this FA and PCA were performed, in an attempt to identify if any common latent characteristics or unknown structures existed. Unfortunately, these approaches did not yield any significant findings beyond those of regression, leaving a considerable amount of variability unexplained.

### 3.3 Objective 1: Methodology

**Objective 1:** *Assess which method of determining adequacy of retirement income is most appropriate for New Zealand households.*

A review of the literature identified ten methods of measuring retirement adequacy. Four macro approaches were identified but have not been discussed further as their emphasis was on measuring retirement adequacy at a national level rather than at a household level. The remaining six micro approaches were discussed earlier (Section 2.5.1). Recapping, the net worth, prescribed savings rates, confidence ratings, and multiples of earnings were considered methods of describing rather than calculating retirement adequacy. These

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<sup>52</sup> Communality = 1 – Uniqueness. Communality measures the percent of variance in a given variable explained by all the factors jointly and may be interpreted as the reliability of the indicator. Uniqueness is a percentage of variance for the variable that is not explained by the common factors. The greater the uniqueness, the more likely it is that it is more than just measurement error. Uniqueness values over 0.6 are considered high (StataCorp, 2015).

methods rely upon a prior determination of adequacy upon which to base their value or assessment, and are therefore seen as alternative ways of expressing or explaining adequacy, rather than as a primary method of determining adequacy for individual households. The replacement rate approach and consumption smoothing approach therefore remained the main contenders as primary measures of determining retirement adequacy, and were adopted for further investigation.

The Income Replacement approach determines the amount of annual retirement income generated (or projected to be generated) in retirement and compares it with the amount of annual replacement income required (or desired) in retirement. Adequacy is deemed to exist when the amount of annual retirement income generated is greater than or equal to the amount of annual replacement income required in retirement. This approach does not directly answer the question of how much is required over the entire period of retirement. Jeszeck, Collins, Glickman, Hoffrey, and Grover (2015) argued there is a lack of consensus around the amount required in retirement and that no single universal replacement rate can represent ‘success’ for retirement income, implying that replacement income rates therefore need to be household specific.

The alternative Consumption Replacement approach firstly determines the NPV total value of household financial resources, which will include the NPV of the retiree’s NZ Superannuation entitlement for the entire retirement period.<sup>53</sup> The NPV value of total household financial resources available for consumption is then compared to the NPV of total consumption required throughout retirement. Adequacy is deemed to exist when NPV value of total household financial resources is equal to or greater than the NPV of total retirement consumption.

Household financial resources can be utilised in two ways, either by preserving or consuming investment capital. The Capital Preservation method assumes that only the interest or investment returns generated are consumed, leaving the investment capital intact. The Capital Consumption method involves utilising both the investment capital and interest/returns over the retirement period.

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<sup>53</sup> As NZ Superannuation is universal, there is an assumption that all current retirees receive it, it should be noted that it is possible that some retirees are not eligible and therefore do not, however, receive NZ Superannuation.

In New Zealand, an option exists to access some of the home equity by utilising a home equity release loan.<sup>54</sup> Therefore, both resource utilisation scenarios and home equity release options were considered for both the Income Replacement and Consumption Replacement approaches. Table 2 and Table 3 list each of the adequacy approaches considered, to which details of their formulae follows.

*Table 2: Income Replacement approaches*

Income Replacement approaches	
Annual retirement income required (or expected) in retirement.	$HhldRetInc$
Projected Household Income, capital preservation approach excluding home equity.	$ProjHhldInc^{Ret}_P$
Projected Household Income, capital consumption approach excluding home equity.	$ProjHhldInc^{Ret}_C$
Projected Household Income, capital consumption approach including partial home equity.	$ProjHhldInc^{Ret}_C^{HEq}$

Using the financial data collected from the on-line survey, retiree adequacy calculations for each of the measures listed in Table 2 and 3 were performed. From there, an assessment was made as to the suitability and robustness of each adequacy measure.

*Table 3: Consumption Replacement approaches*

Consumption Replacement approaches	
NPV of Total Household Financial Resources, excluding partial home equity.	$PVTotHhldFinRes$
NPV of Total Household Financial Resources, including partial home equity.	$PVTotHhldFinRes^{HEq}$
NPV of Total Retirement Consumption, capital preservation approach.	$PVTotRetConP$
NPV of Total retirement consumption, capital consumption approach excluding home equity.	$PVTotRetConC$
NPV of Total retirement consumption, capital consumption approach including home equity.	$PVTotRetConC^{HEq}$

### 3.3.1 Adequacy Factors and Assumptions

Both the income replacement and consumption replacement approaches outlined above, are aligned to theories by Modigliani & Brumberg (1954) and Friedman (1957) (see 2.2.1 & 2.2.2). For both approaches a number of assumptions have been made. Hanna, et al.

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<sup>54</sup> Heartland Bank offers a maximum loan of 20% on home equity at age 65. <http://homeequityrelease.co.nz/>

(2016) stressed that careful consideration is required when considering investment accumulation and consumption assumptions, as they argued that this has been a weakness in some previous studies. In order to avoid generalised assumptions, and to be as accurate as possible, wherever possible individual household data has been used in the financial calculations. If assumptions were required to be made, these endeavoured to closely match the New Zealand economic environment.

### *3.3.1.1 Years in Retirement (YIR)*

Retirement, for the purposes of this thesis, is defined as the point at which full-time work is discontinued or is planned to be discontinued. For the majority, retirement is expected to occur at age 65, unless stated otherwise. Some people may plan to retire early, and this should be reflected through accelerated savings. Increasingly people are working beyond 65, whether by desire or through necessity (O'Connell, 2013; Berthold, 2013), in these cases adequacy estimates will improve.

Most studies either assume a standard retirement period (20 - 30 years), or use average life expectancy for the entire population. In this thesis the length of the retirement period was determined based on average life expectancy, adjusted for known gender and ethnicity differentials (Statistics NZ, 2013a). The key determinants of life expectancy are the respondents' gender, age, and year of birth, as per NZ Statistics 2015 life expectancy tables.<sup>55</sup> For retirees, YIR refers to the 'remaining' years in retirement based upon their life expectancy.

One issue associated with using average life expectancy is that 50% of the population are expected to live longer than their predicted life expectancy. For these people spending extra years in retirement, it would mean that their predicted adequacy is overstated. Conversely, for those who spend less years in retirement, their predicted adequacy would be understated. The adequacy measures have been based upon the life expectancy of the respondent, however, it should be noted that when in a relationship, the female partner could be expected to live slightly longer than the male respondent.<sup>56</sup>

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<sup>55</sup> Sourced from NZ Statistics 2015 cohort life tables 1876–2013, national population projections 2014 (base) – 2068, and 2014 mortality assumptions.

<sup>56</sup> Note that the age of the respondent's partner is unknown, so life expectancy is based upon the respondent's age only.

### 3.3.1.2 Real Rate of Return (RRoR)

Actual household RRoR whenever stated, or calculated, has been used in the financial calculations. When the RRoR has not been stated, the rates in Table 4 have been used. These returns are 30-year averages and are considered reasonable. There is an assumption that current RRoR can be maintained into the future. Financially capable retirees with greater wealth and a history of investing are more likely to remain invested in equities compared to those less financially capable (Campbell, 2006). Mitchell and Utkus (2012) found that retirees tend to hold more conservative investment portfolios in the last 10-20 years of retirement.

The KiwiSaver scheme has only been operating for a relatively short period, and for some may act as a substitute for private savings. It has not therefore been possible to reliably determine long-term real rates of return for KiwiSaver Funds. The returns in Table 4 reflect a stable New Zealand economy, and show the weighted real rate of return (after fees and taxes) expected for each KiwiSaver investment fund type and these returns were used in the financial adequacy calculations (Heuser, Kwok, Snethlarge & Watts, 2015). These returns are considered both conservative and realistic when considering that Brightman (2012) found US investment consultants and actuaries expected on average an annual 7.0% return on investments.

*Table 4: Real rates of returns*

This table shows for each KiwiSaver fund type the asset allocation, allocation percentage and the average real rate of return for that asset class. The weighted return (Source: Heuser et al., 2015; Brightman, 2012) is shown in bold in the last column.

KiwiSaver Fund Type	Bonds		Equity		Weighted Return
	Allocation	Return	Allocation	Return	
Default	79.7%	1.2%	20.3%	6.7%	<b>2.3%</b>
Defensive	79.7%	1.2%	20.3%	6.7%	<b>2.3%</b>
Conservative	66.4%	1.2%	33.6%	6.7%	<b>3.0%</b>
Balanced	44.4%	1.2%	55.6%	6.7%	<b>4.3%</b>
Growth	27.7%	1.2%	72.3%	6.7%	<b>5.2%</b>
High Growth	12.5%	1.2%	87.5%	6.7%	<b>6.0%</b>

Accumulated wealth is assumed to grow evenly throughout retirement at a real rate of return (after tax and fees) of 4.0%, based on the real rate of returns of a balanced investment fund. It is possible that the economy may experience an extended period of growth (or recession) over the coming years. If this is the case, then returns would be

expected to be higher (or lower) than under stable economic conditions. As this is an important issue, the effects of optimistic (or pessimistic) RRoR scenarios were considered. When projecting calculations forward, some assumptions have to be made regarding rates of growth. Should NZ Superannuation, which is indexed to the average wage, increase faster than retirement consumption costs, this would improve adequacy rates.

#### *3.3.1.3 Last Year Earnings (LYE)*

Retirees were asked to declare their last year's earnings (LYE) before retirement. Pre-retirees' last year's earnings before retirement was calculated using their current income and projecting it forward by the long-term wage earnings growth rate of 3.0%,<sup>57</sup> which was then multiplied by their replacement rate (RR) to calculate the required annual amount of retirement income. This was based upon the approach used by Hurd and Rohwedder (2011). Note that this excludes promotional based wage increases. While some pre-retirees' pre-retirement income may continue to increase up to retirement, others may decline.

It was noted that the mean income from all sources for each 5-year age band steadily declined from the 50-54 year age band upwards (Statistics NZ, 2015).<sup>58</sup> This decline could be a reflection that some pre-retirees may have started the transition process into retirement by reducing the number of hours worked, or the declining income could relate to declining health, or employment changes, such as redundancy (Hanna, et al., 2016; Bernheim, et al., 2001). The minimum annual retirement consumption was considered to be \$10,000. The halfway point of the lowest income category between zero and \$20,000, the NZ Superannuation single person entitlement (Sorted, 2015).

#### *3.3.1.4 Home Equity*

The value of retiree home equity is likely to be known at the time of the survey. This however is not the case for pre-retirees, as home equity will continue to change, making it necessary to project the value of home equity forward to the time of their retirement.

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<sup>57</sup> The average increase in weekly earning between 1989 and 2015 was 2.9%. Source: Statistics NZ. <http://www.stats.govt.nz/infoshare/ViewTable.aspx?pxID=0f303b04-3487-44ae-bbd5-96ec3f156e06>. NZ inflation and average hourly wages forecasts has been done by Trading Economics in March, 2015 and have been projected using an autoregressive integrated moving average (ARIMA) model. See: <http://www.tradingeconomics.com/new-zealand/wages/forecast>. Reserve Bank of NZ (2007) guideline aims to keep inflation between 1.0% and 3.0% p.a.

<sup>58</sup> Source: Statistics NZ: June quarter 2015 NZIS tables.

An allowance for house value growth, as discussed earlier in Section 2.4.4, and increased home equity due to the repayment of the home loan was included within the financial calculations. The change in house values was calculated by applying a 4.5% home equity growth rate for those respondents living in Auckland and 2.5% for those living in other regions (Kendall, 2016).

Where pre-retirees have home loans, it was possible to calculate the increase in home equity resulting from loan repayment up until retirement. Based upon a long-term average home loan interest rate of 6.5%, then over a 20-year period, the total interest paid equates to 45% of total home loan repayments. Therefore, for pre-retirees with home loans, 55% of their total home loan repayments to be made before retirement was added to their home equity.

#### *3.3.1.5 Home Loan*

A small percentage of retirees have home loans in retirement, supporting the assumption that a large majority of pre-retirees will have repaid their home loans before retirement, however, there is growing evidence that for some pre-retirees this may not be the case (Naylor, 2010; Horizon Research, 2011). It is assumed that when home loans are repaid, the regular home loan repayments are converted into savings based upon Naylor's (2010) life-cycle consumption model. This assumes that pre-retirees, upon repaying their home loan, would not increase their consumption and would add the amount of their repayment to their savings/investments, however, this is an unconfirmed assumption. Should a household choose to consume rather than save their home loan repayments after repayment of their home loan, then their retirement adequacy would be overstated.

Also, a degree of uncertainty exists around the length of term of home loans as it is possible for them to be extended at any point before or after retirement, or even repaid more quickly. This question was not asked of respondents and would be a topic for future research. Again, if home loans are not repaid when stated, the household's predicted adequacy would be overstated.

When known, the remaining years left on retirees' home loans was multiplied by the annual mortgage repayment and added to their total retirement consumption requirements. Those who did not know when their home loan would be repaid were treated conservatively with repayment assumed to be occurring when 75 years plus.

For pre-retirees, where the remaining number of years left on their home loan is greater than the number of years to retirement, the annual mortgage repayment is deducted from current income less savings to calculate their retirement consumption needs. Where the number of remaining years left on their home loan is less than the number of years to retirement, then the assumption was made that upon repayment, the annual mortgage payments are saved and not consumed. In this case, the number of years to retirement remaining after repayment of the mortgage is multiplied by the annual mortgage repayment and this sum is added to their savings/investments.

### *3.3.1.6 Financial Resources*

For the purposes of this study, non-appreciating lifestyle assets were excluded from household's financial resources, as lifestyle assets are not expected to generate any income and are known to depreciate in value over time. Total household financial resources, unless stated otherwise, exclude the use of home equity.

Hanna, et al. (2016) argued it is possible to calculate the amount of accumulated financial resources required to fund retirement consumption needs. For retirees the accumulated financial resources equation is:

$$\text{FinResources}^R = \text{Invest} + PV(\text{OPen}) + (\text{KS} \times (1 - \text{OPurp})) + PV(\text{NZSuper}) \quad [1]$$

For pre-retirees who expect to repay their home loan before they retire (where  $RHY \leq YTR$ ) the accumulated financial resources equation is:

$$\begin{aligned} \text{FinResources}^P = & FV(\text{Invest}) + PV(\text{OPEN}) + ((\text{KS} + \text{FCont}) \times (1 - \text{OPurp})) + \\ & PV(\text{NZSuper}) + (\text{HLoan} \times (YTR - RHY)) \end{aligned} \quad [2]$$

For pre-retirees expecting to repay their home loan after they retire (where  $RHY > YTR$ ) the accumulated financial resources equation is:

$$\begin{aligned} \text{FinResources}^{PHL} = & FV(\text{Invest}) + PV(\text{OPEN}) + ((\text{KS} + \text{FCont}) \times (1 - \text{OPurp})) + \\ & PV(\text{NZSuper}) \end{aligned} \quad [3]$$

Where:	$\text{FinResources}$	= Accumulated financial resources,
	$\text{Invest}$	= Total accumulated savings/investments,
	$\text{OPen}$	= Other Pension entitlements,
	$\text{KS}$	= KiwiSaver Balance,
	$\text{FCont}$	= Further KiwiSaver contributions,
	$\text{OPurp}$	= Percentage of KiwiSaver to be spent on other purposes,

NZSuper	= NZ Superannuation entitlement, <sup>59</sup>
HLoan	= Annual home loan repayments,
YTR	= Years to retirement,
RHY	= Remaining home loan repayment years.

Converting financial assets into annuities and the use of annuities is not common in New Zealand (Berthold, 2013; Stewart, 2013) and is therefore not seen by retirees as an option. Hanna, et al. (2016) supports the concept of projecting forward current savings contributions to retirement and warns about retirees using retirement savings for other purposes if they wish to accumulate sufficient funds before their retirement.

Hanna, et al. (2016) also stressed the importance of considering the impact that the use of retirement savings for other purposes has on retirement adequacy. No assumptions need to be made about other purpose spending as respondents were asked to state the percentage of their KiwiSaver retirement savings funds they intended to use for other purposes, such as travel, renovations, car replacement. This amount was calculated and deducted from their accumulated savings.

### *3.3.1.7 Investment Capital Utilisation*

It is possible for household investment capital and financial resources to be utilised in two differing methods. Investment capital or accumulated financial resources can be preserved or consumed. The amount of investment capital in retirement required using the capital preservation utilisation method was calculated by dividing retirement consumption by the real rate of return (RRoR). The capital consumption utilisation method involves the investment capital together with the returns from those investments being consumed over the retiree's expected lifetime. The annual amount of capital consumed together with investment returns was calculated by multiplying the annual investment returns by the capital consumption ratio.

Two adequacy approaches are considered in this thesis, the Income Replacement approach and the Consumption Replacement approach. For each approach there are two possible capital utilisation methods that need to be considered: capital preservation (depicted by subscript 'P') or capital consumption (depicted by subscript 'C'). Superscript 'R' is used to depict retirees and superscript 'P' is used to depict pre-retirees. Superscript 'HEq' is used to depict the partial use of Home equity.

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<sup>59</sup> In 2015 then entitlement for a single retiree was \$19,476 and for couples \$29,962.

### 3.3.1.8 Capital Consumption Ratio

An original Capital Consumption Ratio was devised during this study to determine the rate that interest and capital is consumed annually over a given period of time, where the expected real rate of return and amount of interest received annually from an investment are known.

$$CCR = (r / (1 - (1 + r)^{-n})) / r \quad [4]$$

Where:  $r$  = Real rate of investment return (after fees and taxes)  
 $n$  = Number of years expected in retirement

**Example:** \$500,000 invested at 4.0% return (after fees and taxes) generates \$20,000 per year, however if more consumption in retirement is required, the alternative is to consume capital and interest. If the expected number of years in retirement is 25 years, the annual capital and interest consumption amount is \$32,000.

In this example the Capital Consumption Ratio (CCR) can be calculated by dividing the amount of capital and interest (\$32,000) by the amount of interest received (\$20,000), equalling 1.6. This ratio remains constant regardless of the investment amount and is determined by knowing the rate and the period.

This can be expressed as:

Annual Interest payment received  $\times$  CCR = Annual capital & interest payment received

$$$20,000 \times 1.6 = \$32,000$$

Conversely, if the capital and interest amount is known, then dividing this amount by the CCR would give you the interest-only amount.

For example:<sup>60</sup>

Annual capital & interest payment received  $\div$  CCR = Annual interest payment received

$$\$32,000 \div 1.6 = \$20,000$$

---

<sup>60</sup> Mathematical Proof:  $CCR = (r / (1 - (1 + r)^{-n})) / r$   
=  $(0.04 / (1 - (1 + 0.04)^{-25})) / 0.04$   
= 1.60

<http://www.experts-exchange.com/articles/1948/A-Guide-to-the-PMT-FV-IPMT-and-PPMT-Functions.html>

### *3.3.1.9 Retirement Consumption*

Despite possible decreases of consumption upon entering retirement, known as the retirement consumption puzzle, discussed earlier in Section 2.4.8, retirement consumption is assumed to match pre-retirement consumption. Annual non-mortgage consumption is assumed to be even throughout both the period of pre-retirement and retirement. These assumptions have been made as future retirement consumption patterns are unknown and are difficult to accurately predict at a household level.

There is some evidence that a higher rate of retirement consumption may be experienced in the early active retirement years while retirees have good health (Horizon Research, 2013), and in the final years when there is the potential for expensive long-term residential care expenses to occur as health deteriorates. Bernheim, et al. (2001) found that US pre-retiree consumption dropped sharply upon retirement and continued decreasing. In contrast, a recent Australian study found that the drop in pre-retirement consumption was modest and did not decline through retirement (Auster & Foo, 2016).

Retirement consumption for retiree households was calculated by subtracting annual savings from the amount of current household income. For retirees with home loans, when known their total outstanding home repayments were added to their total retirement consumption requirements. Those with home loans who either did not know when their mortgage would be repaid or if it was expected it to be repaid when in their late 70s, it was assumed to have occurred after they were aged 75.

Retirement consumption for pre-retiree households was calculated by subtracting savings and home loan repayments from the amount of current household income, based upon the assumption that unless stated otherwise, that homeowners were expected to enter retirement home loan-free. This method of calculating consumption is the same as that used by both McKinsey (2012) and Naylor (2010).

For retirees the NPV<sup>61</sup> of total retirement consumption equation is:

$$\text{PVConsumption}^R = \text{PV}((\text{Inc} \times \text{YIR}) - (\text{Save} \times \text{YIR}) + (\text{HLoan} \times \text{RHY})) \quad [5]$$

For pre-retirees expecting to repay their home loan before they retire (where  $\text{RHY} \leq \text{YTR}$ ), the NPV of total consumption equation is: [6]

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<sup>61</sup> The NPV formula uses the household RRoR and the years in retirement (YIR).

$$PV\text{Consumption}^P = PV((FV(\text{Inc}) \times RR) - (\text{Save} \times YTR) + (H\text{Loan} \times (YTR-RHY)))$$

For pre-retirees expecting to repay their home loan after they retire (where RHY > YTR), the NPV of total consumption equation is:

$$PV\text{Consumption}^{PHL} = PV((FV(\text{Inc}) \times RR) - (\text{Save} \times YIR) - (H\text{Loan} \times 75\text{yrs} \times (RHY - YTR))) \quad [7]$$

Where:

Inc	=	Annual household income,
YIR	=	Years in retirement, <sup>62</sup>
Save	=	Monthly savings x 12,
HLoan	=	Annual home loan repayments,
RHY	=	Remaining home loan repayment years,
RR	=	Replacement ratio,
75yrs	=	Number of years between retirement and age 75. <sup>63</sup>

### 3.3.1.10 Replacement Rate

The retirement income Replacement Rate (RR), is a ratio of current or expected retirement income as a percentage of an individual's or household's earnings in their last full year of paid employment, and is calculated using Yuh, et al.'s (1998) formula. For retirees:

$$RR_i = RetInc_i / Y_i \quad [8]$$

Where:

RetInc <sub>i</sub>	=	Annual household income in retirement ± FS <sub>i</sub> ,
FS <sub>i</sub>	=	Financial support received (or provided),
Y <sub>i</sub>	=	Annual income in final year pre-retirement (LYE).

When known, the retirees' LYE was used, if unknown LYE was calculated as:

$$LYE_i = PV \sum_{t=1}^{YSR} CRetInc. \quad [9]$$

Where:

CRetInc	=	Current annual household income in retirement,
w	=	Average rate of wage increases over the past 20 years (3.0%),
YSR	=	Years already spent in retirement.

For pre-retirees LYE was calculated as:

$$LYE_i = FV \sum_{t=1}^{YTR} CPreRInc. \quad [10]$$

Where:

CPreRInc	=	Current annual household income of pre-retirees,
YTR	=	Years to retirement.

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<sup>62</sup> For couples, the assumption is that the respondent is the youngest partner.

<sup>63</sup> It is assumed if a home loan exists beyond age 75 the loan will remain for the entire retirement period.

### 3.3.2 Income Replacement Adequacy Method

Determining adequacy using the Income Replacement approach compares current household retirement income ( $HhldRetInc^R$ ) against retirement income required (or desired). Rather than relying on retirees' declared income, which may have been under-stated or over-stated, an alternative is to use projected household retirement income ( $ProjHhldInc^R$ ) calculated from the financial data supplied. Projected household retirement income is determined based upon the household's NZ Superannuation entitlement and the household's return on investments.<sup>64</sup>

Another alternative considered involved projected household retirement income including an annualised payment derived from the maximum amount of the age-related home equity release loan available ( $ProjHhldInc^R C^{HEq}$ ).<sup>65</sup>

Income replacement retirement adequacy can be defined as:

$$ProjHhldInc_i \geq RetInc_i \quad [11]$$

Where:  $RetInc_i$  = Required annual household income in retirement.

As discussed earlier, there are two possible ways to determine retiree retirement adequacy using the Income Replacement adequacy method, depending on whether the financial resources are preserved or consumed. When using the capital preservation method:

$$ProjRetInc_{iP} = PVTotHhldFinRes_i * r \quad [12]$$

Or when using the capital consumption method,

$$ProjRetInc_{iC} = PVTotHhldFinRes_i * \left[ 1 - \frac{\frac{1}{(1-r)^{YIR}}}{r} \right] \quad [13]$$

Where:  $PVTotHhldFinRes_i$  = Remaining household wealth in retirement,  
 $r$  = Real rate of return (RRoR) on total financial resources,  
 $YIR$  = Years (or years remaining) in retirement.

Using a formula by Yuh, et al. (1998), for retirees'  $PVTotHhldFinRes^R$  was calculated:

$$PVTotHhldFinRes_i = FinRes_{iR} + PV \sum_{t=1}^{YIR} Z_i + PV \sum_{t=1}^{YIR} DB_i \quad [14]$$

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<sup>64</sup> When know the household real rate of return is used or calculated according to the assumptions detailed in Section 3.3.1 on page 51.

<sup>65</sup> The Heartland Bank's (2016a) age-related home equity release loan maximum appropriate for each retiree, starting at 15% for those aged 60, increasing to 45% by age 85.

Whereas for pre-retirees  $PVTotHhldFinRes^P$

$$PVTotHhldFinRes_i = PV \sum_{t=1}^{YTR} FinRes_i + PV \sum_{t=1}^{YIR} Z_t / (1 + w)^t + PV \sum_{t=1}^{YIR} DB_t \quad [15]$$

Where:

- $FinRes_{iR}$  = Total accumulated financial resources at retirement,
- $FinRes_i$  = Current total accumulated financial resources,
- $Z_t$  = NZ Superannuation entitlement at age  $t$ ,
- $DB_t$  = Defined Benefit entitlements,
- $w$  = Average rate of wage increases over the past 20 years (3.0%),
- $YTR$  = Years to retirement,
- $YIR$  = Years (or years remaining) in retirement.<sup>66</sup>

For homeowners where home equity was included in the total household financial resources ( $PVTotHhldFinResource^{HEq}$ ), the amount of home equity derived from the age-related home equity release loan maximum appropriate for each retired respondent was added to the NPV of total household financial resources.

### 3.3.3 Consumption Replacement Adequacy Method

In the alternative Consumption Replacement adequacy approach, for adequacy in retirement to exist, the net present value (NPV) of total household financial resources ( $PVTotHhldFinRes$ ), either including or excluding home equity, must equal to or exceed total household retirement consumption ( $PVTotRetCons$ ) for the entire retirement period. Retirees' NPV of total household financial resources excluding home equity ( $PVTotHhldFinRes$ ) consists of total investment assets plus the NPV of NZ Superannuation (and/or defined benefit pension) for the years in retirement plus (or minus) any financial support received (or given). The NPV of total household financial resources including home equity ( $PVTotHhldFinRes^{HEq}$ ), in addition to the NPV of total household financial resources figure, also includes the maximum proportion of the appropriate age-related home equity release loan.

The Consumption Replacement approach is useful, as it compares current household consumption with the financial assets or resources of the retired household, projecting it forward for the number of retirement years remaining, based upon each respondent's age and gender specific life expectancy, as per NZ Statistics 2015 life expectancy tables.<sup>67</sup>

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<sup>66</sup> For retirees YIR refers to the 'remaining' retirement years based upon their age and life expectancy.

<sup>67</sup> Sourced from NZ Statistics 2015 cohort life tables 1876–2013, national population projections 2014(base) – 2068, and 2014 mortality assumptions. By definition, 50% of people will die before the specified life expectancy, and 50% will die after, possibly by many years.

Consumption replacement adequacy occurs when the NPV of total net household financial resources in retirement ( $PVTotHhldFinRes$ ) is equal to or is greater than the NPV of total household consumption in retirement ( $PVTotRetCon$ ), and is expressed as:

$$PVTotHhldFinRes_i \geq PVTotRetCon_i \quad [16]$$

In order to calculate the NPV of total retirement consumption ( $PVTotRetCon$ ), retirement consumption is accumulated for the years in retirement using future value and present value methods, as outlined in Brooks (2013):

$$PVTotRetCon_i = PV \sum_{t=1}^{YrR} RetCon_i * (1 + i)^{YIR} \quad [17]$$

Where:  $RetCon_i$  = Annual household retirement consumption,  
 $i$  = Expected rate of inflation,  
 $YIR$  = Years (years remaining) in retirement.

Annual household retirement consumption ( $RetCon$ ) is based upon the approach advanced by McKinsey (2012), Cole & Liebenberg's (2008) and Naylor (2010), that being:

$$RetCon_i = Y_i - (M_i + S_i) \pm FS \quad [18]$$

Where:  $Y_i$  = Annual household retirement income  
 $M_i$  = Annual home loan repayments (if any),  
 $S_i$  = Annual savings contributions (if any),  
 $FS$  = Annual financial support received (or provided).

### 3.3.4 Regression Methods

Difficulties exist when it comes to comparing the effectiveness of different regression models, as each uses different construction methods and assumptions. In order to make a meaningful comparison, a range of statistical tests, discussed earlier in Section 3.2.5, were performed to establish which model was the most effective at explaining the dependent variable, *adequacy*.

Any variables that could not be reproduced as both a retiree and a pre-retiree variable were eliminated, such as worked in retirement (*workretired*), retirement income adequate for desired lifestyle (*adequate*). A large number of variables were dropped for being either financial or had a low level of significant following their inclusion in the stepwise backward logistic regression process and were also eliminated. Other variables were dropped because of high correlations, collinearity issues, or problems with estimability.

In general, STATA's solution for handling the above errors is to drop the offending variables and associated observations, 57 non-financial variables remained.

The complete results of these diagnostic tests can be found in Section 4.4.2. It was concluded that the backwards stepwise logistic regression model was preferred, and formed the basis for the adequacy predictive model used in Section 4.3. Subsequently, the later sensitivity analysis confirmed the logistic regression model's suitability.

Hosmer, et al. (2013) argues that a stepwise regression process provides an effective means of screening a large number of variables by filtering a number of logistic regression equations simultaneously based upon the relative 'importance' of each variable. Inclusion or exclusion of variables is based upon fixed decision rules based upon measures of statistical significance of the coefficients. The stepwise regression process firstly calculates the number of observations where data exist for all possible variables, which has the effect of reducing the overall number of valid observations available, before commencing the elimination process.

Field, et al. (2012) argues that the backward stepwise regression is preferred as it has lesser suppressor effect than forward stepwise regression, meaning there is a lower risk of Type II error of excluding predictors involved. The backward stepwise regression used  $< 0.001$  as the inclusion point, and  $> 0.1$  as the exclusion point.

### 3.3.5 Robustness Analysis

The robustness of the results is dependent on their underlying assumptions. Scenario analysis was performed to provide an indication as to the sensitivity of a few key underlying assumptions. Movements in adequacy proportions arising from the analysis which are considered to be both logical and realistic would lend support to the adoption of backward stepwise logistic regression model as the preferred prediction method. Otherwise it would throw the preferred prediction model into question.

It is important to understand the impact that changes to key factors can have on retirement adequacy, such as changes to the rate of consumption, the real rate of return, life expectancy, or a reduction in NZ Superannuation following the loss of a partner in retirement. Robustness analysis is based upon the assumption that change occurs relating to the single factor being considered, and that all other factors remain unchanged. The resultant change in both size and direction of movement should be logical, and if so then provides a degree of confidence.

### 3.4 Objective 2: Methodology

**Objective 2:** *Using this measure of adequacy, determine the preparedness of retirees at the time of their retirement.*

Adequacy calculations using the financial data collected from the on-line survey determine which retirees are likely to be financially prepared for retirement, and from this group of retirees the non-financial characteristics determining ‘well-prepared’ are identified. The term ‘adequacy proportion’ is referred to in the results throughout Section 4.0 and relates to the percentage of a cohort membership that equalled or exceeded the point-of adequacy.

While it is understood that retirement adequacy of any particular household could fall somewhere along a continuum between very well prepared and very poorly prepared, for the purposes of this thesis retirement adequacy is said to exist when the point-of adequacy is equalled or exceeded. The point-of-adequacy equation is:

$$\text{PVTotHhldFinRes} = \text{PVTotRetConsc} \quad [19]$$

Financial data collected from the online survey respondents was entered into the adequacy equation, and households where their NPV of total financial resources equalled or exceeded the NPV of the accumulated retirement consumption were given a score of one (1), while zero (0) was given to those that did not.

Three alternative adequacy measures were considered, with a binary measure based on the point-of-adequacy being preferred. The binary measure used a dichotomous variable, ‘*adequacy*’ which was created to record a household’s measure of retirement adequacy, with classifications of ‘adequate’ (1) or ‘inadequate’ (0). The variable, ‘*adequacy*’ becomes the dependent variable and is the focus of further analysis of a range of financial, attitudinal and behavioural characteristics and is used in the construction of the financial preparedness for retirement index.

The *adequacy* results are later pooled together into a number of cohorts for analysis purposes as well as being summarised in a series of frequency tables. Adequacy results for a variety of demographic, financial, attitudinal, and behavioural characteristics together with data analysis have been reported in more detail in Appendices 6, 7 and 8.

An assessment of a retiree’s financial preparedness is made at the time of the on-line survey based upon their current financial position and whether it is adequate to sustain

their current level of consumption through the remaining years of their retirement. It would have been preferable to have made a determination about retirees' financial preparedness at the time retirement commenced, rather than during retirement when financial resources may be declining, however, this is not practical. It is a reasonable assumption that if retirees are in an adequate position now, then it is likely they would have been in an adequate position when they first commenced their retirement.

This approach excludes retirees who may have been adequately prepared upon their retirement, but due to poor financial management and/or unplanned events or circumstances, are no longer able to sustain their consumption at their current level for the entire retirement period. Where this occurred, adequacy proportions now would understate the retirees' adequacy position at time of retirement and reduces the adequacy percentage.

### 3.5 Objective 3: Characteristics of Adequately Prepared Retirees

**Objective 3:** *Identify the characteristics of retirees who had adequately prepared for retirement.*

The focus of the third research objective is on the demographic, attitudinal, and behavioural characteristics of the retirees who are likely to achieve adequacy. Having identified those retirees deemed adequately prepared for retirement and those who are not, frequency and measure of association analysis was carried out to identify which variables or common characteristics influenced the adequacy of well-prepared New Zealanders.

The survey questions linked to the significant variables identified through the backward stepwise regression process will assist in the preparation of a much simplified retirement questionnaire, available for use in the future.

#### 3.5.1 Adequacy Variables

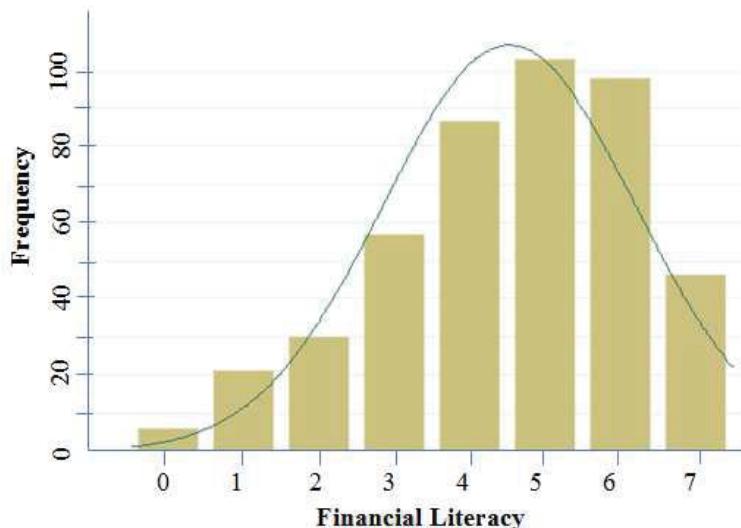
Besides the variables that recorded the demographic, attitudinal, and behavioural characteristics obtained directly from the on-line survey, there were a number of independent variables constructed from a combination of related variables or were the summation score from a collection of related questions. A complete list of variables can be found in Appendix 5. Variable names have been stated in italics.

Constructed variables were designed to represent an element of preparedness, such as risk tolerance, or the level of understanding about investment risk. Variables used in the creation of these constructed variables were excluded since each variable was represented within the construct itself.

### 3.5.1.1 Financial Literacy

There were seven financial literacy questions.<sup>68</sup> Each question was scored (1) for being correct, (0) for being incorrect. A financial literacy score, *finliteracy*, was created by summing the correct answers. Financial literacy scores ranged from 1 to 7.

*Figure 4: Distribution of retiree financial literacy scores*



Financial literacy worldwide is known to be low (Lusardi & Mitchell, 2009), and this includes New Zealand (Crossan, et al., 2011). Figure 4 above shows a large proportion of retirees achieved high financial literacy scores. Given that financial literacy is known to be low, this would indicate that the proportion (55.1%) of all current retirees surveyed with a high-financial literacy score of 5 or more appears too high. In comparison, the proportion (28.9%) of retirees surveyed with a high-financial capability score of more than 3.5 seems more realistic. Also the distribution of retiree financial capability scores, as seen in Figure 5 below, is closer to normal.

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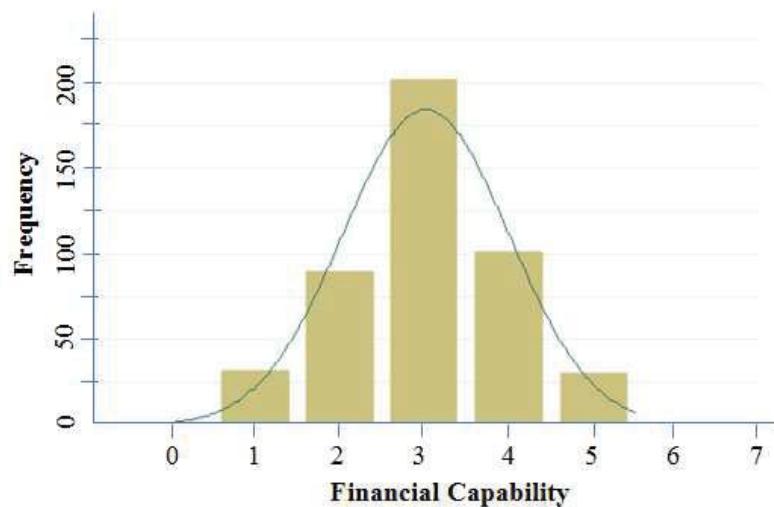
<sup>68</sup> Financial literacy questions (Q128 – Q132, Q134 and Q135) are the same used by Lusardi & Mitchell (2007b).

### 3.5.1.2 Financial Capability

The review of literature found that each aspect of financial capability has strong associations to wealth accumulation, such as ‘planning ahead’ where Lusardi & Mitchell (2010) found that those who planned accumulated more. Atkinson, et al. (2007) and Taylor, et al. (2009) argued that ‘choosing products’ and ‘staying informed’, ‘managing money’, ‘making ends meet’, and ‘keeping track of money / budgeting’ were key elements of financial capability and were linked to wealth accumulation.

A financial capability score, *fincapability*, is generated using the summation of answers to six financial capability questions. One question was unique to Atkinson, et al. (2007) and two unique to Taylor, et al. (2009), and three questions were common to both.<sup>69</sup> The ‘planning ahead’ question had ratings between 1 and 7 and was proportionally rescaled to match the other five questions, which were rated between 1 and 5. The scores for each question were summed together, before being divided by six to arrive at an average score. Respondents’ financial capability scores ranged between 1.72 and 4.5. Interestingly, a low correlation (0.21) existed between retiree financial literacy scores and retiree financial capability scores.

*Figure 5: Distribution of retiree financial capability scores*



<sup>69</sup> Financial capability questions include ‘planning ahead’ (Q19 and Q104), ‘choosing products’ (Q77.8), ‘staying informed’ (Q79.1), ‘managing money’ (Q77.1), ‘making ends meet’ (Q78.8) and ‘keeping track of money / budgeting’ (Q79.2).

### **3.5.1.3 Financial Literacy & Financial Capability Comparison**

Comparison between *finliteracy* and *fincapability* would indicate that financial capability has a closer fit to a normal distribution than financial literacy. While financial literacy focuses on mathematical skills, financial knowledge and understanding, as discussed earlier in Section 2.4.10, financial capability measures a wider range of financial behaviour and skills. Therefore, given low levels of financial awareness and the low financial capability results and normality of distribution, financial capability is considered to be a better ‘financial awareness’ measure than financial literacy for the purpose of analysis.

### **3.5.1.4 Investments**

The number of investments employed variable (*investments*) was a summation of 16 possible types of investments used within a respondent’s investment portfolio.<sup>70</sup>

### **3.5.1.5 Risk Management**

Similarly, the risk management variable (*riskmgnt*) was the summation of insurance and risk management strategies adopted by respondents, with a range from zero to ten.<sup>71</sup>

### **3.5.1.6 Types of Investments**

The investment type variable (*invtype*) made a distinction between households with no financial resources (1), investment only (2), home equity only (3) and investments plus home equity (4).

### **3.5.1.7 Risk Tolerance**

The *rtolerance* variable took the summed answers to five investment risk questions rated on a Likert scale 1 to 5, and then found the average.<sup>72</sup> With a minimum score of 1 and a maximum score of 5, *rtolerance* scores ranged from 1.4 to 4.2.

### **3.5.1.8 Understanding Investment Risk**

The ‘safety of investment’ variable (*investsafe*) was created from the question that respondents rated how ‘safe’ they felt nine different investments were. No definition of ‘safe’ was given, leaving this to the respondent’s understanding. Five types of investment

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<sup>70</sup> Investment sources included Q68 and Q123.

<sup>71</sup> Risk management questions included Q86.

<sup>72</sup> The answers to the investment risk questions Q80.2 to Q80.4 were reversed to create a positive directional flow. The investment risk questions selected were unambiguous.

products, each correctly assessed investment risk was summed to create the *investsafe* score.<sup>73</sup>

### 3.5.1.9 Self-assessed Preparedness

On two separate occasions respondents were asked to rate their financial preparedness for retirement. As well as providing confirmation, the reason for asking this question twice was to see if, as a result of the variety and depth of questioning, this heightened the respondents' awareness of the complexity and the state of financial preparedness for retirement. The first (pre-survey) self-assessment variable occurred early in the survey using a 1-5 Likert scale, represented by the first self-assessment variable (*prepd<sup>R</sup>*) for retirees and first self-assessment variable (*prepd<sup>P</sup>*) for pre-retirees. The second (post-survey) self-assessment occurred towards the end of the survey using a 1-10 Likert scale. This meant recoding the respondent's second response to match the earlier 1-5 scale. The second self-assessment variables were represented by the (*recode\_prepd2<sup>R</sup>*) code for retirees and the (*recode\_prepd2<sup>P</sup>*) code for pre-retirees. Only the pre-survey (*prepd<sup>R</sup>* and *prepd<sup>P</sup>*) scores were analysed, as there was uncertainty that the post-survey scores could be reliably replicated in future studies.

### 3.5.2 Analysis of Preparedness Variables

The on-line survey collected a wide range of descriptive and demographic data. By analysing a range of variables, the study attempts to explain why some people save and accumulate sufficient resources to enable them to be financially prepared for retirement, while others do not.

The logistic regression can be used to establish relationships between a range of nominal, ordinal, and scalar independent variables in order to predict the probability of achieving adequacy in retirement. As the dependent variable, *adequacy*, is binary the logistic regressions is considered more appropriate than alternative regressions. Logistic regression assumes that the normality assumption holds. Other issues considered include; where the normal distribution assumptions are violated by binary dependent variables, predicted probabilities can lie outside the 0 – 1 interval; and whether heteroskedasticity occurs.

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<sup>73</sup> Investment product types omitted from the 'investsafe' score included residential property, commercial property, and finance company debentures.

By utilising the power of the STATA analytical software it was possible to analyse the data with the aim of identifying the relationships, frequency and correlations between the various variables. Some variables were excluded as they were specific to retirees only and others were specific to pre-retirees. Some respondent specific variables were deleted, such as gender and ethnicity. Highly correlated variables, those with correlations above 0.7, were also excluded. The remaining 57 independent non-financial variables were used as these related to both retiree and pre-retiree households.

The robust regression option was used to reduce the effects of outliers on the estimates of coefficients, as some regression models are susceptible to distortion by extreme values (Vogt & Johnson, 2011). Regressions adjusted for robustness eliminate the need for leverage analysis (Hosmer, Taber & Lemeshow, 1991).

### 3.5.3 Analysis Cohorts

After reviewing the literature and research findings it appears that the level of household income, savings/investments, net worth, and financial capability have a stronger influence upon financial behaviour and retirement adequacy than many other factors. Four cohorts were created. New dichotomous variables were generated by splitting each cohort into two sub-groups, those with low values and high values. This was done to provide greater understanding of the influence that membership of each cohort may have on adequacy and how it influences other contributing factors.

It was not considered appropriate to create a gender cohort as there were only a few gender-specific questions. Most questions were answered by the respondent on behalf of their household and 79.4% responded on behalf of a couple, so there is little justification for discussing the results based solely upon gender. The same rationale is also applied to exclude educational qualifications, age, and ethnicity as cohorts, because these questions were again respondent-specific. With the benefit of hindsight, it would have been beneficial to have asked for the highest qualification of any household member, as well as the partner's age and ethnicity.

#### 3.5.3.1 Income

The mean income from all sources for New Zealanders aged 50 and over was \$46,176 (Statistics NZ, 2015). Household income (*income*) was divided into low income (0), those households with \$50,000 or less annual income, and high income (1), those households with more than \$50,000 annual income. Nearly two-thirds (61.5%) of the retirees were in

the low-income cohort group. This compares with 52.3% of those aged over 65 with incomes of \$50,000 or less.<sup>74</sup> Prior analysis found that household income for couples was deemed to be 1.6 times that of individuals' income (Statistics NZ, 2013a).

### 3.5.3.2 Savings and Investments

It is necessary to make a distinction between savings/investments and wealth. While savings and investments are components of wealth, wealth can include other lifestyle assets and home equity. While high savings may infer high wealth, high net worth does not infer high savings. Household savings/investments (*invest*) was divided into low-investment (0), those households with savings/investments of \$100,000 or less, and high-investment (1), those households with savings/investments of more than \$100,000. Just over a quarter (49%) of the retirees belong to the low-*invest* cohort group.

### 3.5.3.3 Net Worth

The net worth of households (*wealth*) was divided into low-net worth (0), those household with net worth of \$500,000 or less, and high-net worth (1), those households with net worth of more than \$500,000. This division point is appropriate given the mean savings/investments falls near the middle of the \$100,000 - \$250,000 range and the mean value of home equity falls towards the top end of the \$500,000 - \$1 million range. Over a third (38.1%) of retirees belong to the low-*wealth* cohort group.

### 3.5.3.4 Financial Capability

The financial capability scores<sup>75</sup> of respondents (*fincap*) were divided into low-financial capability scores (0), those with financial capability scores of 3.5 or less, and high-capability scores (1), those with financial capability scores of more than 3.5. Nearly three-quarters (71%) of retirees were in the low-*fincap* cohort group.

By comparison, financial literacy scores (*finliteracy*) were divided into low-financial literacy scores (0), those with financial literacy scores of 4 or less, and high-financial literacy scores (1), those with financial literacy scores of 5 or more. Just under half (44.9%) of retirees were in the low-financial literacy cohort. The high proportion in the high-financial literacy cohort was not deemed as representative as it is recognised that

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<sup>74</sup> It should be noted that over 30% of retiree respondents retired prior to age 65.

<sup>75</sup> Financial capability scores range from 0 - 6 being the summation of answers to six financial capability questions.

globally financial literacy levels are low (OECD, 2015). It is for this reason that the creation of a cohort based upon financial capability was preferred over financial literacy.

### 3.5.3.5 Cohort Relationships

The use of cohorts is a simple, yet effective approach to analysing the adequacy results in a meaningful way. A review of the cohort results, seen in Table 5 below, found that nearly a third of all current retirees belong to the high-*income* / High-*wealth* cohort group and a nearly a third belong to high-*income*/low-*wealth* cohort group. This latter group indicates a greater preference to consume rather than to accumulate wealth.

*Table 5: Income - wealth cohort composition*

This table shows the percentage of retirees who fall into differing low/high income and wealth cohorts.

High- <i>income</i> /High- <i>wealth</i>	31.1%
High- <i>income</i> /Low- <i>wealth</i>	30.4%
Low- <i>income</i> /High- <i>wealth</i>	7.2%
Low- <i>income</i> /Low- <i>wealth</i>	31.3%

A small proportion (7.2%) of retirees belongs to the low-*income*/high-*wealth* cohort group. This cohort group is sometimes referred to as ‘asset rich, income poor’, and little can be inferred regarding their preference to save or consume. The inference gained from the remaining low-*income*/low-*wealth* cohort group, is that their need for consumption is greater than their ability to save, making it difficult for them to accumulate wealth.

*Table 6: Distribution of retiree income by cohorts*

This table shows a further breakdown by income groups of savings/investment, net worth, and financially capable cohort membership. The percentage of retirees within each cohort is shown below each cohort heading.

	\$30,000 or less 33.7%	\$30,001 - \$70,000 42.5%	\$70,001 - \$150,000 20.5%	More than \$150,000 3.3%
Low- <i>invest</i>	63.8%	43.0%	32.2%	13.3%
High- <i>invest</i>	32.2%	51.8%	64.4%	86.7%
Low- <i>wealth</i>	59.9%	35.4%	15.5%	0.0%
High- <i>wealth</i>	40.1%	64.6%	84.5%	100.0%
Low- <i>fincap</i>	81.8%	66.3%	64.4%	46.7%
High- <i>fincap</i>	18.2%	33.7%	35.6%	53.3%

Table 6 above indicates that as household income increases the proportion in the high-sub-cohort increase in each of the savings/investment, wealth, and financial capability cohorts. Low-income<sup>76</sup> is associated with the low investment, low net worth, and low financially capable cohort memberships. High income is associated with the high savings, high net worth, and high financially capable cohort memberships. Those with greater wealth or higher income have a choice whether to save or consume more, but their level of wealth or income alone does not guarantee higher levels of investment. Nearly a third (31.1%) of all current retirees belongs to high-*income/high-wealth* cohort group, which may indicate a preference to save and accumulate wealth.

*Table 7: Cohort correlations*

This table shows the correlations between the four cohorts: *income*, *invest*, *wealth* and *fincap*.

	<i>income</i>	<i>invest</i>	<i>wealth</i>	<i>fincap</i>
<i>income</i>	1.00			
<i>invest</i>	0.05	1.00		
<i>wealth</i>	-0.05	0.33	1.00	
<i>fincap</i>	0.11	-0.03	-0.07	1.00

Table 7 above shows that these cohorts have low correlations with each other. These results also support Atkinson, et al.'s (2007) findings that financial capability and income are not correlated.<sup>77</sup> Table 8 below shows that *income*, *invest* and *wealth* all have a positive membership relationship with each other, and in most cases may serve as a proxy for each other. Low-income can infer that low-investment and low-wealth memberships are likely to exist, and high-income can infer that high-investment and high-wealth memberships are likely to exist. The common variant amongst the cohort memberships is *fincap* which because of its construct includes other non-monetary elements.

While the same proportions may be expected in the corresponding reverse cohort relationships in Table 8 below, this is not the case as each cohort's membership structure is different. By way of example, the low-*invest* cohort group makes up 60.1% of the

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<sup>76</sup> Note: Income includes NZ Superannuation and other government allowances and benefits.

<sup>77</sup> Note that Atkinson, et al.'s (2007) had no findings regarding correlations between wealth and financial capability.

membership of low-*income* cohort group, whereas the low-*income* cohort group makes up more of the low-*invest* cohort group membership (76.3%).

*Table 8: Cohort construction*

This table shows in three sections the percentage of retiree membership made up by the category split shown in the first column. Firstly, by the low cohort in the second column and secondly by the high cohort in the third column. Each block adds to 100%.

	<b>Low-income</b>	<b>High-income</b>
Low- <i>invest</i>	60.1%	30.7%
High- <i>invest</i>	39.9%	69.3%
Low- <i>wealth</i>	50.4%	18.8%
High- <i>wealth</i>	49.6%	81.2%
Low- <i>fincap</i>	74.9%	65.1%
High- <i>fincap</i>	25.1%	34.9%

	<b>Low-wealth</b>	<b>High-wealth</b>
Low- <i>income</i>	80.9%	49.0%
High- <i>income</i>	19.1%	51.0%
Low- <i>invest</i>	83.5%	25.8%
High- <i>invest</i>	16.5%	74.2%
Low- <i>fincap</i>	82.1%	62.7%
High- <i>fincap</i>	17.9%	37.3%

	<b>Low-invest</b>	<b>High-invest</b>
Low- <i>income</i>	76.3%	49.0%
High- <i>income</i>	23.7%	51.4%
Low- <i>wealth</i>	66.7%	12.0%
High- <i>wealth</i>	33.3%	88.0%
Low- <i>fincap</i>	80.6%	60.9%
High- <i>fincap</i>	19.4%	39.1%

	<b>Low-fincap</b>	<b>High-fincap</b>
Low- <i>income</i>	64.7%	53.5%
High- <i>income</i>	35.3%	46.5%
Low- <i>invest</i>	44.7%	22.7%
High- <i>invest</i>	55.3%	77.3%
Low- <i>wealth</i>	55.9%	32.2%
High- <i>wealth</i>	44.1%	67.8%

Table 9 shows that the correlations between high-low cohorts are generally low. The highest correlation related to high/low *invest* and high/low *wealth*. A variance inflation

factor (VIF) test was conducted to test for multicollinearity. The VIF outcome of 1.31 indicates that there is no indication of multicollinearity.

*Table 9: High-Low Cohort Correlations*

This table shows the correlations between the high and low cohorts for each cohort.

	Low-income	High-income	Low-invest	High-invest	Low-wealth	High-wealth	Low-fincap	High-fincap
<b>Low-income</b>	1.00							
<b>High-income</b>	-1.00	1.00						
<b>Low-invest</b>	0.28	-0.28	1.00					
<b>High-invest</b>	-0.28	0.28	-1.00	1.00				
<b>Low-wealth</b>	0.33	-0.33	0.56	-0.56	1.00			
<b>High-wealth</b>	-0.33	0.33	-0.56	0.56	-1.00	1.00		
<b>Low-fincap</b>	0.11	-0.11	0.21	-0.21	0.21	-0.21	1.00	
<b>High-fincap</b>	-0.11	0.11	-0.21	0.21	-0.21	0.21	-1.00	1.00

### 3.5.3.6 Cohorts

Besides these cohorts, other cohorts were created for analysis purposes, being ‘pre-retirees’, all ‘current retirees’, ‘active retirees’, ‘passive retirees’. ‘Passive’ refers to retiree households where their retirement consumption is at or below their NZ Superannuation entitlement. ‘Active’ refers to retiree households whose retirement consumption is above their NZ Superannuation entitlement and they are required to augment their NZ Superannuation. To avoid any confusion, another cohort ‘all current retirees’ was also created.

Again, for analysis purposes some independent variables were split into cohorts. Generally where a question provided a Likert scale answer option, the middle score (‘neither agree or disagree’) in the Likert scale was considered a neutral response, and excluded, being considered neither a low nor high value. The ‘disagree’ values became the low cohort and the ‘agree’ values became the high cohort. As the neutral responses have been excluded, it is unlikely that the population proportions of the low-cohort and the high-cohort group will sum to 100%.

## 3.6 Objective 4: Methodology

**Objective 4:** *Using the attributes and characteristics identified, develop a Financial Preparedness for Retirement Index for use in New Zealand.*

The backward stepwise logistic regression was useful in identifying which independent non-financial variables were significant in explaining retiree *adequacy*. The coefficients of the significant variables generated from this process were then used to create an adequacy predictive equation. This predictive equation formed the basis for the construction of the Financial Preparedness for Retirement Index, and is useful in predicting the likelihood that certain retirees and pre-retirees achieve retirement adequacy.

The review of literature revealed a number of factors which potentially influenced, either positively or negatively, people's financial preparedness for retirement.<sup>78</sup> These factors, discussed earlier in Sections 2.3 and Section 2.4, were the foundation for the development of the survey questions. In order to determine which variables are more significant than others and therefore suitable as predictors within a prediction model, their significance, measure of association, and goodness-of-fit first needs to be determined. Kempson, Collard and Moore (2006) argued that any financial scoring system should adopt the following criteria: reliability, validity, relevance, be comprehensible and longitudinal.<sup>79</sup>

Two alternative logistic regression models were considered, logistic (logit) regression and ordered logistic (ologit) regression. Given the large number of potential explanatory variables involved there was potential to 'over-fit' the prediction model making it likely to produce numerically unstable estimates. Therefore, it was important that the prediction model be as parsimonious as possible, so backward stepwise regression was employed for both logistic and ordered logistic regressions in order to identify significant independent variables, as advocated by Field, et al. (2012) and Hosmer, et al. (2013).

According to Peng, Lee and Ingersoll (2002) the recommended minimum observations-to-predictor ratio should be over 100, with a minimum ratio of 10 observations for every variable, or 50 plus a variable number that is a function of the number of predictors.

Another additional step available as part of stepwise regressions, is the robust option applied to reduce the effects of outliers on the estimates of coefficients, as regressions are sometimes susceptible to distortion by extreme values (Vogt & Johnson, 2011).

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<sup>78</sup> A full list of elements, components and variables can be found in Appendix 5.

<sup>79</sup> Being longitudinal is beyond the resources and timeframe of this thesis.

### 3.6.1 Backward Stepwise Regression

The retirement adequacy prediction model being developed is new. Had such a model existed it would have provided a known starting point upon which the construction of a predictive model could commence. The backwards stepwise regressions help avoid overfitting the model with variables that contribute little to understanding or predictability. Given the low correlations between predictors, this meant that the order of variable entry into the construction of a predictive equation had little effect (Field, et al., 2012). These were factors favouring the use of stepwise regressions.

Field, et al. (2012) argues that the backward stepwise regression is preferred as it has lower suppressor effect than forward stepwise regression.<sup>80</sup> This means that it has a lower risk of Type II error of excluding predictors involved. The backward stepwise regression function builds prediction models by adding variables then removes them until there are none left that meet the criteria for inclusion or elimination. A 10% significance level was set for the removal of variables from the model, and 1% significance level was set for the inclusion of variables into the model.

Both logistic prediction models and ordered logistic prediction models can apply backward stepwise regressions to construct their predictive equation.

### 3.6.2 Binary Logistic Regression

Binary logistic (logit) regressions are used to predict, based upon a number of continuous or categorical independent variables, the probability of an event occurring such as achieving adequate retirement consumption (1) or not achieving adequate retirement consumption (0).

In probit regressions there is a requirement that random variables are independent and identically distributed, which is not the case with logit. Both probit and logit regressions are expected to produce similar, not vastly different results. McCulloch and Neuhaus (2008) argued that probit regression relies on having a normal distribution and uses more complex mathematical manipulation. These factors tipped the balance towards favouring logistic regressions more. Also, logistic regression is favoured over other parametric analytical tests, given the dependent variable, *adequacy*, is dichotomous and the varied

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<sup>80</sup> Hosmer, et al. (2013) contains a more detailed explanation of the backwards stepwise elimination and forward selection process employed to identify significant explanatory variables.

and nonparametric nature of the independent variables (Hosmer, et al, 2013; Field, et al., 2012; Kremelberg, 2011; Vogt & Johnson, 2011; Siegel & Castellan, 1988).

Peng, et al. (2010) demonstrated that logit regression was an effective way to predict dichotomous outcomes.<sup>81</sup> Logit regression uses statistical inferences to estimate the fixed  $\beta$ s which it assumes is normally distributed, thereby making logit regression a stronger model as it parametrises all the  $\beta$  parameters. Logistic regression modelling uses a constant, a series of predictors, and an error term to calculate the probability of getting an actual *adequate* outcome.

### 3.6.3 Ordered Logistic Regression

The same independent variables can again be used, this time to identify significant variables in predicting the ordinal dependent variable, *adequacy3*. Ordered logistic regressions are used to predict ordinal outcomes over a logistic distribution in the error term.<sup>82</sup> Ordered-response logit regression modelling also uses a constant, a series of predictors, and an error term, this time to calculate the probability of getting one of three possible *adequacy3* outcomes of the *adequacy* measure: inadequate (1), marginally adequate (2), and adequate (3). Next, a series of diagnostic analyses are performed to assess the two models and to enable comparisons to be made in order to identify which predictive model was more effective.

### 3.6.4 Prediction Model Evaluation

The overall aim of prediction model evaluation is to find the model that is most parsimonious and contains the maximal explanatory value. Since the error term for both logit and ologit predictive models are expressed in the same format, it is possible to evaluate which model is more accurate with their classifications, in term of both sensitivity (true positives) and specificity (true negatives).

Multiplying retiree scores of each significant variable with the variable's coefficient value within the prediction equation, produces upon summation a predicted adequacy score. The retiree's predicted score is then used in the appropriate probability formula to

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<sup>81</sup> According to Peng, et al. (2002) the binomial distribution describes the distribution of that equal the actual  $Y$  minus the predicted  $Y$ . The binomial assumption is known to be robust as long as the sample is random.

<sup>82</sup> According to Peng, et al. (2002) the OLS regression assumes the predictor variables are distributed as a multivariate normal distribution with equal covariance matrix.

generate the probability of *adequacy* = 1. If the model's probability score is 0.5 or larger, then the model's probability predicted score is one (1), otherwise zero (0).

Particular focus was given to two predictive models, logistic (or logit) and ordered logistic (or ologit). The logit model predicts the dichotomous *adequacy*, with two possible outcomes, adequate or inadequate, whereas the ologit model predicts *adeauacy3*, with three possible outcomes, adequate, marginally adequate and inadequate.

Validation of the predicted probabilities against the actual outcome can determine if there is a high probability associated with events (being adequate) as well as a low probability associated with non-events (being inadequate). Hosmer, et al. (2013), Peng, et al. (2002) and Hosmer, et al. (1991) recommend a range of diagnostic statistics to check the assumptions and assess the effectiveness of prediction models. These include: significance tests of the model against the null model; significance test of each predictor; descriptive and inferential goodness-of-fit indices;<sup>83</sup> and predictive probabilities. As an overall model evaluation, a prediction model is said to be a better fit to the data when it is an improvement on the intercept only model (the null model), as demonstrated using likelihood ratio tests, the score test (not available in STATA), and Wald test.

Logistic regressions require McFadden's  $R^2$  or adjusted- $R^2$ , as a measure of association rather than the standard  $R^2$  used to evaluate the level of association within OLS regressions. Lemeshow and Hosmer (2000) and others argue that  $R^2$  measures lack the straightforward explain-variance interpretation of  $R^2$  in the OLS regression.<sup>84</sup> Conversely, Shtatland, et al. (2013) argues that McFadden's  $R^2$  can be interpreted in a similar way to Chi<sup>2</sup>, believing that McFadden's  $R^2$  can be interpreted in two ways.<sup>85</sup> Firstly, it can be interpreted as a proportional reduction in the -2log-likelihood statistic (Menard, 2000), and secondly, in terms of information<sup>86</sup> (Kent, 1983; Hastie, 1987).

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<sup>83</sup> Hosmer, et al. (1991) after reviewing a large number of research articles found few (5%) reported any model adequacy assessment. They argue that such assessment inferences may be misleading or totally correctly incorrect.

<sup>84</sup> A wide variety of pseudo  $R^2$  statistics exist and cannot be interpreted the same as the OLS regression  $R^2$ , which indicates the proportion of variance for the dependent variable explained by the predictors. As a result, there is a number of contradictory conclusions exist.

<sup>85</sup> Shtatland, et al., (2002) argues  $R^2$  measures can be interpreted based upon the measure's dependence on the base rate and its degree of susceptibility to over-dispersion.

<sup>86</sup> Shtatland, et al. (2002) argues R2 can be interpreted as the ratio of the estimated information gain when using the predictive model in comparison with the null model to estimate the potential information recoverable by including all possible explanatory variables.

Classification tables summarise the results of a logistic regression model by cross-classifying the dichotomous outcome variable ( $Y$ ) with the estimated logistic probabilities value. The combination of ‘true positives’ (or sensitivity) and ‘true negatives’ (or specificity) give an indication as to goodness-of-fit, similar to that of  $R^2$  (Vogt & Johnson, 2011). Brian’s (1971) link test effectively answers the question regarding omitted variables. In evaluating the link test results, both conditions must be met, that is  $\_hat$  needs to be significant and  $\_hatsq$  should be insignificant showing no specification error exists.

Hosmer, et al. (2013) considers the area under the Receiver Operating Characteristics (ROC) curve a better and more complete description of classification accuracy. The curve plots the probability of detecting true (sensitivity) and false signals (1- specificity) for an entire range of possible cut-off points. Akaike Information Criterion (AIC) is considered the most popular criterion in model assessment and selection (Shtatland, et al., 2002), favours models that fits well but has a minimum number of explanatory variables (i.e., simplicity and parsimony).

Some diagnostic statistics calculations were not available from STATA, so where the necessary information was available, scores were calculated using the appropriate equations. The ologit prediction model corresponding Pearson’s goodness-of-fit and Hosmer-Lemeshow goodness-of-fit scores, classification tables, and the area under the ROC curve is not available in STATA. While statistical omissions cannot assist with comparisons, when available, results that are positive (or negative) or significant (or insignificant) strengthens (or weakens) the argument for a model’s inclusion (or exclusion).

### 3.6.5 Retirement Preparedness Index

Before commencing the index development stage, a review of all deleted or excluded variables was carried out to see if any significant omitted variables had been excluded in error. This resulted in the addition of a further twenty potential variables into the mix. While a simple prediction model containing all non-financial variables could explain a reasonable proportion of the variance in *adequacy*, it became obvious that there were too many insignificant variables included within this model to gain any real understanding from the subsequent results. Using the active retiree database the stepwise backward logistic regression was repeated with total of 57 variables.

There was a multi-collinearity problem between ‘expect to use home equity’ (*usehe*) & ‘owning one’s own home’ (*ownhome*). Alternating these two variables found the *usehe* produced the higher pseudo-R<sup>2</sup> score, so *ownhome* was dropped. Correlations over 0.30 indicate that a weak linear relationship could exist (Taylor, 1990) and as a result 28 correlated variables, with a correlation of 0.30 or greater, were investigated. One variable, ‘following financial matter in the media’ (*bmedia*) when included in the stepwise backward regression reduced the pseudo R<sup>2</sup>, so it was deleted.<sup>87</sup>

Following the results of the diagnostic tests and evaluation of the various predictive models, the preferred model was adopted as the foundation for the construction of the preparedness index. The preferred prediction model will be used to produce a range of coefficient weightings for each predictor, and these together with the constant when summed produced a predictive adequacy score for each retiree.

This predictive value is then multiplied by ten (10) to produce an index score between zero (0) and ten (10), rounded to the nearest whole number. For example, a predictive adequacy score of 0.67 would convert into an index value of 7. An alternative considered was to multiply the logit predictive value by one hundred (100). While this offers greater division of results, it adds little to interpretation. For instance, there is little real difference between people with a score of 67.1 and those with a score of 63.2.

Once a measure of Financial Preparedness for Retirement (FPfR) has been calculated for a retiree household, it will then be possible to calculate a mean score for the sample population of retirees. The mean score provides an indicative level of the general state of retirees’ financial preparedness for retirement.

### 3.7 Objective 5: Determining Pre-retiree Preparedness for Retirement

**Objective 5:** *Using the index, determine how prepared current pre-retirees are for retirement.*

As a result of undertaking the steps previously outlined in sections 3.1 to 3.5 above, it is now possible to determine pre-retirees’ preparedness for retirement. Firstly, a measure of adequacy appropriate for use in New Zealand is defined, then that measure is used to

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<sup>87</sup> Where a possible correlation existed between two variables, the variable having the lower impact on R<sup>2</sup> was deleted.

measure retirement adequacy amongst retirees. This enabled identification of which retirees are adequately prepared, and which are not. Following this, a review of adequately prepared retirees' characteristics will help identify the factors that would most likely explain why current retirees saved enough of their pre-retirement income and accumulated enough wealth to ensure that their expectations for retirement consumption were able to be met.

### 3.7.1 Applying Retirement Adequacy Measure to Pre-retirees

While it is preferable to determine financial preparedness at the start of retirement, this is not possible when assessing financial preparedness for pre-retirees. Therefore, an assessment of adequacy based upon the assumption that all things remain the same in the remaining pre-retirement years. It is possible to project forward their current financial position using current income and investment returns. Then an assessment about their retirement adequacy can be made using the same methodology applied to retirees.

Having used retiree data to develop the Financial Preparedness for Retirement Index (FPfR), the same indexation equation can be used together with the survey data collected from pre-retirees to determine individual pre-retiree FPfR scores. Using the pre-determined point-of-adequacy, established in Section 3.6, it will be possible to determine which pre-retirees are well prepared financially for retirement. Pre-retirees' scores can also be compared to their self-assessment of their expected retirement adequacy, to see if any correlation exists between their self-assessment and their individual FPfR scores.

Finally, by following the steps and methods outlined in Sections 3.1 – 3.7 above it provides an answer to our main research question: How prepared are New Zealanders to achieve adequate consumption in retirement? In addition, by focusing on the significant factors identified as contributing to retirement adequacy, it enables identification of the areas needed to be addressed by pre-retirees in order to improve their retirement preparedness.

## 3.8 Ethics

Massey University has a Code of Ethics which applies to any research that involves human participants, which aims to minimise the risk of harm. All necessary ethical processes deemed appropriate for this thesis, as set out by Massey University's Human Ethical Committee, have been completed.

This research has been assessed as low-risk. All personal information collected has been handled confidentially. All prospects were randomly selected for participation from the panel population of over 55,000 New Zealanders, and had the right to refuse to take part, or refuse to answer any question, or to withdraw from the process at any stage.

Securing participants' informed consent involves disclosure of the research objectives and participant's rights detailed in an open letter at the beginning of the survey. The participant by completing the on-line survey has been deemed to have given their informed consent.

## 4.0 Research Results and Discussion

This section reports on and discusses the key findings for each of the five research objectives. First, there is an assessment of the preferred approaches to determining adequacy, Income Replacement and Consumption Replacement. A determination is then made as to which adequacy calculation method is most appropriate for New Zealand households. Calculations using this adequacy measure will then determine which retirees are adequately prepared for retirement. Following this, the backwards stepwise logistic regression analysis is used to identify which characteristics are significant<sup>88</sup> factors affecting retiree retirement adequacy and to develop the indexation equation, which can then be used to identify which pre-retirees are expected to be adequately prepared at retirement and to provide a benchmark level of retirement adequacy for pre-retirees.

### 4.1 Objective 1 Results and Discussion

**Objective 1:** *Assess which method of determining adequacy of retirement income is most appropriate for New Zealand households.*

#### Introduction

To decide the best method of determining adequacy of retirement it is necessary to identify, compare, and assess the differences and the suitability of the two adequacy calculation methods. Determining the most appropriate method is based not only on the results obtained, but also which is the most suitable method given the unique New Zealand retirement funding environment.

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<sup>88</sup> Note: Significant differences have been reported and discussed, insignificant differences have not.

Using the Income Replacement approach, adequacy is deemed to exist when a retiree's current household income (from all sources, including investments) is equal to or greater than the amount of retirement income required. Using the Consumption Replacement approach, adequacy is deemed to exist when retirees' NPV of total household financial resources, excluding partial home equity, is equal to or greater than the retirees' calculated NPV of total household retirement consumption. Both the capital preservation (consuming earnings only) and capital consumption (consuming earnings and capital) utilisation methods were considered with both approaches.

Three variations of adequacy were considered. Firstly, as a dichotomous variable, *adequacy*, where adequate equals one (1) or inadequate equals zero (0). Secondly, as a continuous variable, *adequacy2*, being a percentage above (or below) the point-of-adequacy. Lastly, *adequacy3*, where retirees who are inadequate equals zero (1), marginally adequate (based  $\pm$  20% of the point-of-adequacy) equals (2), and adequate equals (3).

#### 4.1.1 Retirees' Retirement Income Expectations

The higher a person's retirement income expectation, the greater the expected motivation and effort put into achieving that outcome. Expectations of required income in retirement were expressed by retirees both as a percentage or ratio of LYE in employment (ReqInc(%)) or as a weekly dollar amount (ReqInc(\$)). It was anticipated that income required in retirement whether expressed as a dollar figure or as a percentage would be reasonably similar, however, the results indicate that the majority of retirees had expected a greater amount when retirement income is expressed as an annualised percentage (ReqInc(%)) than when expressed as a weekly dollar amount (ReqInc(\$)).<sup>89</sup>

The mean current retiree household income is \$54,207, so based upon the retirees' reported earnings in the last year before retirement (LYE) the actual mean Replacement Rate (RR) for all current retirees is 61.9%. The actual calculated RR is slightly less than the mean required replacement rate as reported by retirees of 64%. Alternatively, using the mean current household retirement consumption ( $HhldRetCons^R$ ) as the retirees' mean replacement rate ( $RR = HhldRetCons^R/LYE$ ) this resulted in a slight decrease in the mean  $RR = 61.4\%$ .

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<sup>89</sup> As discussed earlier in Section 2.4.8, it is not normal for 100% of pre-retirement income to be required in retirement as retirement consumption appears to fall within a range of 60% - 75% of pre-retirement income.

Table 10 below shows there is a tendency for the required RR reported by retirees to increase as household incomes increase.<sup>90</sup> The required RR falls within the range of 60% - 70% suggested by Naylor (2010) and within the 45% - 95% range found by Binswanger and Schunk (2012). It was noted that fewer respondents (6.2%) provided the necessary information to calculate required retirement income as a weekly dollar amount than the required retirement income as an annualised amount. This would indicate that respondents found it easier to express their retirement income requirements as a percentage of LYE than as a dollar amount.

*Table 10 Retiree's mean replacement rate by income groups*

This table shows the actual mean replacement rate (RR) based upon retiree's last year's earnings (LYE) for all current retirees' household income by income cohorts (before tax).

<b>Income Groups</b>		<b>Replacement Rate (RR)</b>
\$20,000 or less	<i>n</i> = 27	57.2%
\$20,001 - \$30,000	<i>n</i> = 126	58.6%
\$30,001 - \$50,000	<i>n</i> = 126	63.3%
\$50,001 - \$70,000	<i>n</i> = 67	62.4%
\$70,001 - \$100,000	<i>n</i> = 53	65.9%
More than \$100,000	<i>n</i> = 55	66.2%
<b>Total Population</b>	<b><i>n</i> = 454</b>	<b>61.9%</b>

Three-quarters of all current retirees (76.6%) had higher expectations of the annualised required retirement income when expressed as a percentage (or as a RR) than when expressed as a weekly dollar amount. A low correlation (0.16) exists between ReqInc(\$) and ReqInc(%). Spearman's correlation found that *rrequired<sup>R</sup>* and *rrratio<sup>R</sup>* were independent of each other, *r<sub>s</sub>* = 0.14, *p* < 0.01

Over two-thirds (70%) of all current retirees had a current household income higher than their expected required retirement income when expressed as weekly dollar amount. This proportion is reversed when required retirement income is expressed as a percentage, with 41.8% of retiree households having a higher current household income than their required retirement income when it is expressed as weekly dollar amount and then annualised.

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<sup>90</sup> While all the necessary figures were available using the Consumption Replacement approach, 12.1% stated they were employed when retired, and as a result were not asked about their LYE. Not all current retirees (6.2%) were able or willing to provide all the necessary information to enable the calculations under the Income Replacement approach. This would indicate that respondents found it easier to express their retirement income requirements as a percentage of LYE than as a dollar amount.

Current retirees' expectations of the annualised required retirement income is generally higher when expressed as a percentage than when expressed as a weekly dollar amount, with over half (55.3%) of current retirees having an annualised percentage amount more than 50% greater than their annualised weekly dollar amount. Over a third (39.2%) of current retirees had an annualised percentage amount of more than 100% greater than their annualised weekly dollar amount.

Table 11 below shows that the majority (57.7%) of all current retirees have an expectation gap, either under or over, greater than a 50% variance between required retirement income when expressed as weekly dollar amount or when expressed as a percentage. There were also a number of extreme variances.

*Table 11: Variance in retirement income expectations*

This Table shows the variation in all current retirees' retirement income expectations (both under and over) as a percentage of all current retirees. Expectation variations (both under and over) were split into four groups: 25% or less, 26% to 50%, 51% to 100%, and above 100%. The first section shows the variation between required retirement income when expressed as weekly amount (ReqInc(\$)) and when expressed as a percentage (ReqInc(%)). The second section shows the variation between current household retirement income (HhldInc<sup>R</sup>) and required retirement income expressed as a weekly amount (ReqInc(\$)), and the third section shows the variation between current household retirement income (HhldInc<sup>R</sup>) and required retirement income when expressed as a percentage (ReqInc(%)).

<i>Expectation gap</i>		1% - 25%	26% - 50%	51%- 100%	>100%
More ReqInc(\$) than ReqInc(%)	n=112	10.9%	9.3%	5.7%	0.0%
Less ReqInc(\$) than ReqInc(%)	n=314	12.6%	9.5%	15.9%	36.1%

<i>Expectation gap</i>		1% - 25%	26% - 50%	51%- 100%	>100%
More HhldInc than ReqInc(\$)	n=318	20.1%	20.8%	22.6%	5.3%
Less HhldInc than ReqInc(\$)	n=136	15.5%	0%	9.1%	6.6%

<i>Expectation gap</i>		1% - 25%	26% - 50%	51%- 100%	>100%
More HhldInc than ReqInc(%)	n=178	13.7%	6.9%	1.9%	1.1%
Less HhldInc than ReqInc(%)	n=248	17.6%	12.4%	1.1%	45.3%

This gap between expectation expressions creates a dilemma as to which expression of the required retirement income is more accurate and therefore better to apply. Current retiree household income falls in the middle of both required retirement income expressions. Current retiree household income is higher than the required retirement income when expressed as a weekly dollar amount, but lower when expressed as a

percentage. There is little to indicate which required retirement income expression is more accurate.

The variation in retiree retirement income expectations is a similar result to that found by Farrell and Grieg (2015). It is unclear what causes this variation. If not previously calculated, retirement income amounts would therefore be unknown and estimations would be extremely subjective. This would indicate that the majority of retirees have not prepared retirement plans or budgets. Other alternative explanations could relate to retirees having only considered regular cash expenditure and failed to include automatic payments and/or periodic payments such as rates, insurance, car registration and maintenance costs. The purpose of apparent ‘savings’ could have been overlooked, such as saving for car or appliance replacement.

Further research is required to better understand why there is a sizable variation between these two expressions of required retirement income as this thesis did not explore this issue in any detail. Using adequacy measurements based on unreliable retirement income expectations would not be considered robust, especially when large variances between current and expected retirement income and a number of extreme values are known to exist.

#### 4.1.3 Adequacy of Retirement Income

As discussed previously in Section 3.3, two adequacy approaches are considered in this thesis, the Income Replacement approach and the Consumption Replacement approach. Both approaches are discussed in more detail so an evaluation can be made.

##### 4.1.3.1 *The Income Replacement Approach*

Those retiree households where current household income or projected household income equals or exceeds the required level of retirement income are deemed to be adequate. So when considering the weekly amount ReqInc(\$) as the required retirement income adequacy level, then 57.7% of all current retiree households would be likely to have adequate retirement income.

When considering the percentage of LYE ReqInc(%) as the required retirement income adequacy level, then the results reverse with 30% of retired households being considered adequate. This reversal of adequacy results can be explained by looking at the differences between the mean ReqInc(\$) of \$35,753, the mean ReqInc(%) of \$68,793, and the fact that the mean current retiree household income of \$54,207 falls midway between the two.

The mean projected household retirement income with capital preservation is \$45,811. Given that the mean current retiree household income is \$54,207 and the mean current household retirement consumption is \$52,173, this indicates that the capital preservation utilisation method would not generate enough income to cover current retirement consumption.

The mean projected household income using the capital consumption approach excluding home equity is \$108,767. The mean projected household income using the capital consumption approach including partial home equity is \$112,498. The small difference between including and excluding home equity is due to the small amount of extra income generated from the consumption of a small portion of home equity that is permitted to be released.<sup>91</sup> Another influence on this difference is the small number of retirees who do not own their own homes.

The mean projected household retirement income using the capital consumption approach, either excluding home equity or including home equity, are both much larger than the mean current household retirement consumption. This could imply that either some people do not plan to consume all their financial assets within their lifetime, and have the intention of leaving some for the use of future generations, or are unaware of the extent of the resources available to them in their retirement.

Table 12 above shows a lower proportion of retiree households achieved retirement adequacy using the capital preservation utilisation method than when using the capital consumption utilisation method. The capital preservation utilisation method requires a larger accumulation of financial resources than is needed with the capital consumption utilisation method in order to generate a similar cashflow.

The proportion of adequate retiree households is higher due to the additional inflows associated with home equity than when home equity is excluded. The difference between including and excluding home equity is small as a longer retirement period decreases the significance of a lump-sum, and the extra income generated from the small proportion of accessible home equity is low. The low permitted maximums on home equity loans restrict the amount of home equity available to be released, thereby limiting retirement adequacy. It could be argued that retirement adequacy could be improved by extending

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<sup>91</sup> Note: As the borrowing interest rates are generally greater than the investment interest rate, it is not possible to generate positive cashflow from investing home equity release loans.

home equity release lending criteria, or through alternative methods of accessing home equity, such as downsizing or relocating.

*Table 12: Retiree adequacy using income replacement approaches*

In this table projected household retirement income (excluding home equity) using the preservation method is depicted as  $\text{ProjHhldInc}_P$  and projected household retirement income (excluding home equity) using the capital consumption method is depicted as  $\text{ProjHhldInc}_C$ . Projected household retirement income (including home equity) using the capital consumption method is depicted as  $\text{ProjHhldInc}_C^{\text{HEq}}$ . The first section shows the adequacy of  $\text{ReqInc}(\$)$  using these methods, while the bottom section shows the adequacy of  $\text{ReqInc}(\%)$  using these methods.

<b>Relative to <math>\text{ReqInc}(\\$)</math></b>		<b>Adequate</b>	<b>Inadequate</b>
$\text{ProjHhldInc}_P$	$n = 452$	57.7%	42.3%
$\text{ProjHhldInc}_C$	$n = 452$	99.3%	0.7%
$\text{ProjHhldInc}_C^{\text{HEq}}$	$n = 452$	99.3%	0.7%

<b>Relative to <math>\text{ReqInc}(\%)</math></b>		<b>Adequate</b>	<b>Inadequate</b>
$\text{ProjHhldInc}_P$	$n = 426$	30.0%	70.0%
$\text{ProjHhldInc}_C$	$n = 426$	81.7%	18.3%
$\text{ProjHhldInc}_C^{\text{HEq}}$	$n = 426$	82.6%	17.4%

For the vast majority of all current retirees, the mean projected household income using the capital consumption approach excluding home equity of \$123,246 is greater than mean current household retirement consumption of \$52,173. This would indicate that while retirees are consuming their capital, they are consuming their capital at a conservative level. This could be a reflection of retirees' conservative nature; a desire to leave a legacy; retirees' lack of awareness of the amount available; or it could be a mechanism to cope with the uncertainty surrounding longevity. It is also an indication that retirees' rate of retirement consumption could be raised, if so desired or through necessity.

Using the capital consumption utilisation method excluding home equity, 87.9% of retirees' projected household income is greater than their current household retirement consumption. This compares with the capital preservation utilisation method where 39% of retirees' projected household retirement income is greater than their current household retirement consumption. As nine out of ten all current retirees' projected household income, using the capital consumption approach excluding home equity, is higher than their current retiree household income, it would be more appropriate to place greater

emphasis on current retiree household income rather than on projected household income, using the capital consumption utilisation method excluding home equity.

These results would indicate that regardless of which utilisation method is used, the majority of retiree households are unable to preserve their capital based upon their current consumption levels and is a sign that the majority of households are currently consuming rather than preserving their investment capital. While the majority of all current retirees surveyed stated that they were happy with their current level of retirement income, the critical question is “Will it last?” The Income Replacement approach, fails to consider whether retirement income will last throughout retirement and this is seen as a weakness of this approach.

#### *4.1.3.2 The Consumption Replacement Approach*

The Consumption Replacement approach overcomes this weakness by comparing the household’s financial assets or resources with current household consumption projected forward to the end of the retirement period. Using the Consumption Replacement approach, retirement adequacy is therefore deemed to exist when the NPV of total household financial resources, excluding home equity, is equal to or greater than the calculated NPV of total household retirement consumption.

*Table 13: Retiree adequacy using consumption replacement approaches*

This table shows retirement adequacy based upon NPV of total household financial resources using the consumption replacement approach ( $\text{TotHhldFinRes}$ ) and NPV of total household financial resources including home equity ( $\text{PVTotHhldFinRes}^{\text{HEq}}$ ) is greater than NPV calculated stock of total household retirement consumption using the consumption replacement approach ( $\text{PVTotRetCons}$ ). NPV calculated stock of total household retirement consumption using the preservation method is depicted as  $\text{PVTotRetCons}_\text{P}$  and NPV calculated stock of total household retirement consumption using the capital consumption method is depicted as  $\text{PVTotRetCons}_\text{C}$ .

	<b>Adequate</b>	<b>Inadequate</b>
$\text{PVTotHhldFinRes} \geq \text{PVTotRetCons}_\text{C}$	60.4%	39.6%
$\text{PVTotHhldFinRes} \geq \text{PVTotRetCons}_\text{P}$	12.1%	87.9%
$\text{PVTotHhldFinRes}^{\text{HEq}} \geq \text{PVTotRetCons}_\text{C}$	73.6%	26.4%
$\text{PVTotHhldFinRes}^{\text{HEq}} \geq \text{PVTotRetCons}_\text{P}$	17.4%	82.6%

Table 13 above shows very low adequacy figures (<20%) being generated using the capital preservation utilisation method, indicating that the preservation of capital would be an option for a small proportion of New Zealand’s retired population. This means that for more than eight out of ten retirees, capital consumption is likely to be the only option

available to them in order to maintain adequacy of consumption throughout their retirement.

The results in Table 13 above also show that under the Consumption Replacement approach, there is a greater adequacy differential between including and excluding home equity than the differential using the Income Replacement approach seen earlier in Table 12. Just over a quarter of all current retiree households (26.4%) fail to achieve retirement adequacy regardless of which capital utilisation method is used. The implication is that these households have insufficient investment assets and either no home equity to call upon, or what home equity they can access is insufficient to meet their current retirement consumption needs.

#### *4.1.3.3 Evaluation of Approaches*

In order to determine the most appropriate measure of retirement adequacy in New Zealand three questions need to be answered. Firstly, which measurement approach is better, Income Replacement or Consumption Replacement? Secondly, which capital utilisation method is better, Capital Preservation or Capital Consumption? Thirdly, should home equity be included in the calculations or not?

In considering the first of these questions, there are four main points supporting the use of the Consumption Replacement approach rather than the Income Replacement approach to measure retirement income adequacy in New Zealand. Firstly, there is the large variation between required retirement income expressed as a weekly dollar amount and when expressed as a percentage using the Income Replacement approach. Both expressions had a number of extreme variances.

Little is known about the cause of this variation in the expressions of required retirement income or which is more accurate. More respondents had ready access or were willing to supply the necessary financial information to enable the Consumption Replacement calculations to be performed, whereas fewer respondents were able to estimate required retirement income when expressed as a percentage than when expressed as a weekly dollar amount used to calculate the Income Replacement figures.

Secondly, the Consumption Replacement approach can be considered more reliable as the calculations are based on objective financial information provided, compared to the income requirements of the Income Replacement approach, which are considered to be subjective and less accurate. Thirdly, the Consumption Replacement approach answers

the question whether retirees' financial assets will be sufficient to last the entire retirement period, unlike the Income Replacement approach, which does not evaluate this aspect. It was therefore deemed that the consumption replacement approach is preferred and this is used in the remainder of this thesis.

Finally, now focusing on the Consumption Replacement approach, having determined that it is the better option of the two approaches, the second question to consider is whether to preserve or consume financial resources. The capital preservation utilisation method yielded unacceptably low adequacy results (refer Table 13). If these results were a true reflection of the current retirement situation, this implies that the majority of retirees are struggling financially in retirement. Conversely, this does not appear to be the case as nearly half (46.5%) of respondents stated they felt that their current retirement income was more than sufficient for their desired retirement needs.<sup>92</sup>

The low adequacy results also indicate that the preservation of capital is an option available to a relatively small proportion of retirees, with eight out of ten retirees needing to consume some or all of their financial resources in order to achieve adequacy and to be able to maintain their level of consumption throughout retirement. It is also more rational that capital is consumed rather than preserved; as discussed earlier in Section 2.2, the consumption smoothing theory assumes that not all the income from the earning period is consumed, rather consumption is deferred for use in the non-earning retirement period. Therefore, the consumption replacement approach using the capital consumption method is favoured over the capital preservation method and will be used in the remainder of this thesis. We will deal with the longevity issue later.

The last question to be answered relates to whether to include home equity in the adequacy measure. A marginal increase of 20% in adequacy achieved by including home equity in the Consumption Replacement approach provides some weight to the argument for its inclusion. The associated problems surrounding home equity release discussed earlier in section 3.3.1, however, counter its inclusion. These problems included the inability to conserve the value of home equity when utilising home equity release loans, low maximum drawdown limits, and low home equity release loan adoption rates. The exclusion of home equity provides a degree of conservatism and allows retirees the option

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<sup>92</sup> Retirees were asked on a 7-point Likert scale how adequate or inadequate their current level of retirement income was in funding their desired retirement lifestyle, 19.6% were indifferent a middle score of 4, with 33.9% a score of 3 or less.

of accessing their home equity at a later date. Overall, there is merit in adopting an adequacy measure that excludes home equity and this is a similar approach to the one taken by McKinsey (2012).

Upon this basis the Consumption Replacement approach using the capital consumption utilisation method excluding home equity is the preferred measure of retirement adequacy. Retirement adequacy is therefore deemed to exist when the NPV of total household financial resources (excluding partial home equity) equals or exceeds the NPV of total household retirement consumption ( $PVTotHhldFinRes^R \geq PVTotRetCons^R_C$ ), as discussed earlier in Section 3.3.3. This preferred measure of retirement adequacy is used in the remainder of this thesis.

#### *4.1.3.4 Adequacy Statistics*

After completing financial calculations using the adequacy equation ( $PVTotHhldFinRes^R \geq PVTotRetCons^R_C$ ) to determine the point-of-adequacy it was found that 60.4% of all current retiree households are likely to achieve adequate consumption throughout their entire retirement. These results fall within the 50% - 70% range of results from similar studies where the point-of-adequacy was used.<sup>93</sup>

To this point, adequacy has been defined as retirees having sufficient financial resources and results in them being classified as either adequate or inadequate. In reality it is difficult to be so precise, as the future is unpredictable and modelling assumptions could be flawed, and therefore a degree of uncertainty exists. Often there is very little difference between some households close to achieving adequacy or not, as a slight change in circumstances or economics can easily tip them over or under the point of adequacy. Consequently, adequacy could also be considered as existing somewhere along a continuum, rather than being on one side or other of a precise financial point. Extreme adequacy exists at one end of this spectrum, with extreme inadequacy at the opposite end.

Retirees with twice the financial resources required have a greater probability of being able to maintain their consumption throughout their retirement, than retirees who barely qualify as adequate. For these borderline retirees, future events could easily transpire to convert their status from adequate to inadequate. The same could be said about those who had slightly less financial resources. Future events could favour them, transforming their

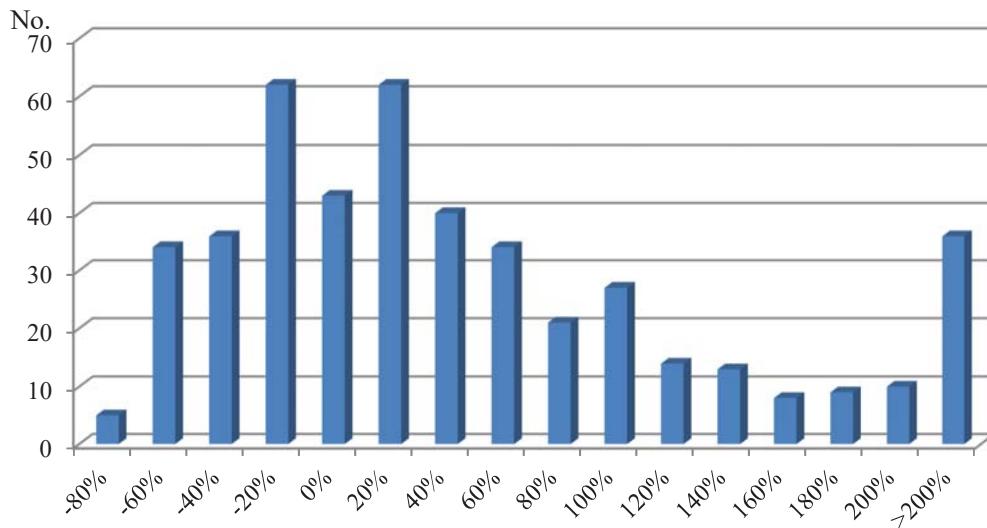
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<sup>93</sup> Refer Section 2.3.3.

inadequacy into adequacy. For those just on either side of the precise financial point-of-adequacy (or the middle of the adequacy spectrum), adequacy is possible but not assured. This is an area of marginal adequacy, requiring a greater degree of financial care and prudence.

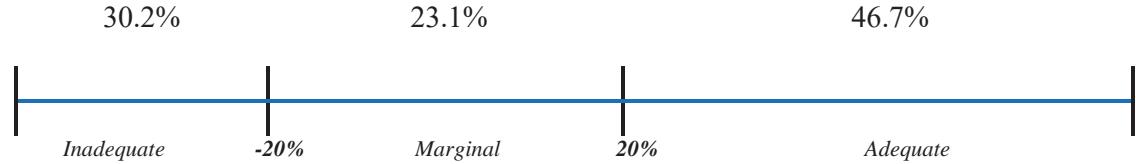
The distribution of *adequacy2* was found not to be normal or symmetrical. A positive skewness score of 3.5 confirms a strong right-hand tail, and a kurtosis score of 22.7 shows that the distribution is sharply peaked. The right-skewed distribution of *adequacy2* violates the homoscedasticity assumption. Figure 6 below shows the distribution of retiree adequacy in 20% bands, which peaked between 20% under, and 20% over the adequacy point (0%) and had a long right-hand tail towards extreme adequacy. There are ten positive outliers with scores over 500%, derived from retirees with extremely low consumption together with high financial resources. Figure 6 shows the number of retirees peak either side of the 0% adequacy differential point.

*Figure 6: Active Retirees' Adequacy Differential*



The variable, *adequacy3*, was generated by splitting the adequacy differential, *adequacy2*, into three groups: inadequate (1), those  $\pm 20\%$  of the point-of-adequacy as marginal adequacy (2), and adequate (3). Within this  $\pm 20\%$  band, due to the future unpredictability and model assumptions, retirees' adequacy could be considered to be marginal. Below Figure 7 shows that 23.1% of retirees fall within this band of marginal adequacy.

Figure 7: The Adequacy Continuum



Splitting adequacy into three has the advantage of highlighting the group of marginally adequate retirees, the retiree households most vulnerable to changes in economic conditions and personal circumstances. This approach of identifying marginally adequate households has certain benefits from an educational or communication perspective, especially when considering decisions based upon cost effectiveness.

In order to justify which measure of adequacy is most appropriate it is important to compare the effectiveness of predicting and explaining *adequacy*, *adequacy2* and *adequacy3* analytically. For this reason, logistic (or logit) and probit regressions were used to evaluate the effectiveness of explaining the dichotomous dependent variable, *adequacy*. OLS regressions were used to evaluate the effectiveness of explaining *adequacy2*, and ordered (or ologit) logistic regressions have been used to evaluate the effectiveness of explaining the ordered dependent variable, *adequacy3*.

### Logistic Regression

Table 14: Logistic regression results – All Retirees

Logistic regression		Number of obs		=	179
		Wald chi2 (8)		=	39.87
		Prob > chi2		=	0.00
Log pseudolikelihood =		-74.80	Pseudo R2	=	0.38
<i>adequacy</i>		Robust Coef. Std. Err.	t	P>t	[95% Conf. interval]
<i>ksall</i> <sup>R</sup>	0.53	0.24	2.21	0.03	0.06 0.99
<i>plandev</i> <sup>R</sup>	0.34	0.14	2.35	0.02	0.06 0.62
<i>nzsuf</i> <sup>R</sup>	-0.59	0.24	-2.51	0.01	-1.05 -0.13
<i>prep</i> <sup>R</sup>	0.67	0.27	2.50	0.01	0.15 1.20
<i>invtype</i>	3.14	0.71	4.42	0.00	1.75 4.54
<i>accomtype</i>	1.06	0.22	4.75	0.00	0.62 1.50
<i>bsother</i>	0.43	0.21	2.03	0.04	0.01 0.85
<i>longevity</i>	-1.01	0.40	-2.50	0.01	-1.80 -0.22
_cons	-20.12	4.09	-4.92	0.00	-28.15 -12.10

Using the backwards stepwise logistic (or logit) regression, the dependent variables were put through a backward stepwise logistic regression using the robust option with the dependent variable *adequacy* and produced the above results in Table 14. Table 14 shows the logistic regression predictor model identified eight predictors which had significant partial effects in the full model, and were able to account for 38% of the variance in adequacy, with McFadden's  $R^2 = 0.38$  similar to the Pseudo  $R^2$ , and McFadden's adjusted  $R^2 = 0.32$ . Wald  $\chi^2 = 39.9(8, n = 179)$ ,  $p < .001$ , Pseudo- $R^2 = 0.18$ . The logistic regression predictor model correctly classified 83.8%.

### Probit Regression

Using the probit regression, 57 dependent variables were again put through a backward stepwise probit regression using the robust option with the dependent variable *adequacy* and produced the following results.

*Table 15: Backward stepwise logit regression results – Current retirees*

Probit regression				Number of obs	=	179
				Wald chi2 (9)	=	59.69
				Prob > chi2	=	0.00
Log pseudolikelihood =		-73.92	Pseudo R2		=	0.39
<i>adequacy</i>	Coef.	Robust Std. Err.	t	P>t	[95% Conf. interval]	
<i>divers</i>	0.41	0.23	1.74	0.08	-0.05	0.86
<i>plandev<sup>R</sup></i>	0.20	0.09	2.32	0.02	0.03	0.37
<i>bsother</i>	0.24	0.12	2.00	0.05	0.01	0.48
<i>nzssuf<sup>R</sup></i>	-0.30	0.14	-2.18	0.03	-0.56	-0.03
<i>invtype</i>	1.75	0.33	5.38	0.00	1.12	2.39
<i>accomtype</i>	0.60	0.12	5.12	0.00	0.37	0.83
<i>ksall<sup>R</sup></i>	0.32	0.14	2.30	0.02	0.05	0.59
<i>prep<sup>dR</sup></i>	0.38	0.15	2.54	0.01	0.09	0.67
<i>longevity</i>	-0.64	0.24	-2.74	0.01	-1.11	-0.18
cons	-11.68	1.88	-6.21	0.00	-15.37	-8.00

Table 15 shows the logistic regression predictor model identified nine predictors which had significant partial effects in the full model, and were able to account for 39% of the variance in adequacy, with McFadden's  $R^2 = 0.39$ , and McFadden's adjusted  $R^2 = 0.32$ . Wald  $\chi^2 = 59.7 (7, n = 179)$ ,  $p < .001$ , Pseudo- $R^2 = 0.19$ . The probit regression predictor model correctly classified 81.6%.

## Ordered Logistic Regression

Using the ordered logistic (ologit) regression, the 57 independent variables were put through a backward stepwise ordered regression using the robust option with the dependent variable *adequacy3* and produced the following results.

*Table 16: Backward stepwise ologit regression results – Current retirees*

Ordered logistic regression						
		Number of obs		=	179	
		Wald chi2 (9)		=	61.69	
		Prob > chi2		=	0.00	
	Log pseudolikelihood = -124.41	Pseudo R2		=	0.35	
<i>adequacy3</i>	Coef.	Robust Std. Err.	t	P>t	[95% Conf. interval]	
<i>exppast</i>	-0.57	0.30	-1.89	0.06	-1.16	0.02
<i>alternative</i>	0.37	0.19	1.93	0.05	-0.01	0.75
<i>managefin</i>	0.51	0.27	1.87	0.06	-0.02	1.03
<i>finliteracy</i>	0.24	0.10	2.35	0.02	0.04	0.43
<i>invtype</i>	3.51	0.57	6.21	0.00	2.40	4.62
<i>bsother</i>	0.68	0.19	3.63	0.00	0.31	1.05
<i>accomtype</i>	1.17	0.21	5.59	0.00	0.76	1.58
<i>nzssuf<sup>R</sup></i>	-0.38	0.16	-2.39	0.02	-0.68	-0.07
<i>prep<sup>dR</sup></i>	0.99	0.25	4.02	0.00	0.51	1.47
/cut1	23.72	3.44			16.97	30.46
/cut2	25.96	3.60			18.90	33.02

As seen in Table 16, the ordered logistic regression predictor model identified nine predictors, and were able to account for 35% of the variance in *adequacy3*, with McFadden's  $R^2 = 0.35$ . Wald  $\chi^2 = 61.7$  (9, n = 179),  $p < .001$ , Pseudo- $R^2 = .35$ .

## OLS Regression

As seen in Table 17 below the ordered logistic regression predictor model identified seven predictors which had significant partial effects in the full model, and were able to account for 17% of the variance in *adequacy2*,  $\chi^2 = 0.38$  (7, n = 179),  $p < .001$ . McFadden's  $R^2 = 0.17$  and McFadden's adjusted  $R^2 = 0.14$ .

*Table 17: Backward stepwise OLS regression results – Current retirees*

OLS linear regression					
		Number of	=	179	
		F(7, 171)	=	13.05	
		Prob > F	=	0.00	
		R-squared	=	0.35	
		Root MSE	=	0.71	
adequacy2	Coef.	Robust Std. Err.	t	P>t	[95% Conf. interval]
<i>majpurch</i>	0.14	0.07	1.89	0.06	-0.01 0.29
<i>divers</i>	0.22	0.10	2.20	0.03	0.02 0.42
<i>prepdr</i>	0.25	0.06	4.48	0.00	0.14 0.37
<i>ksallr</i>	0.18	0.07	2.76	0.01	0.05 0.31
<i>invtype</i>	0.71	0.10	7.34	0.00	0.52 0.90
<i>acomctype</i>	0.19	0.04	4.60	0.00	0.11 0.28
<i>bsother</i>	0.18	0.05	3.61	0.00	0.08 0.29
cons	-5.36	0.60	-8.91	0.00	-6.54 -4.17

### 4.1.3.5 Evaluation of Regression Methods

Difficulties exist when it comes to comparing the effectiveness of different regression models, as the models use different construction methods and assumptions. The number of observations is less than the number of retirees, as some information is missing and this lowers the amount of valid data available for comparison. Due to the structure of the predictive models and the variety of statistical analysis techniques employed, this produced a variation in Chi<sup>2</sup> results. It was, however, possible to compare the predictive models' results using McFadden's  $R^2$  and McFadden's adjusted  $R^2$ . Unfortunately, it was not possible to produce classification results for the ologit and OLS predictive models, and for this reason the evaluation focused mainly on the logit and ologit regression models.<sup>94</sup>

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<sup>94</sup> A full justification for selecting the logistic model can be examined in Section 4.4.3.

While not identical, the logistic and probit predictive models have very similar results, with the probit predictive model able to account for 39% of the variance in *adequacy*, compared to 38% using the logistic predictive model. Both the logit and probit regressions generated eight of the same significant predictors: *invtype*, *accomtype*, *plandev<sup>R</sup>*, *nzsuf<sup>R</sup>*, *prep<sup>R</sup>*, *longevity*, *ksall<sup>R</sup>* and *bsother*, with *udiverst* unique and in addition to the probit model. The logit regression produced eight significant variables compared to nine from the probit regression, making it slightly more parsimonious. In conclusion, based upon the logistic regression model being more parsimonious, the logistic regression prediction model was considered to be preferable and will be used in the remainder of this thesis.

## Conclusion

The Consumption Replacement approach is deemed more appropriate than the Income Replacement approach, due to the variance between the required retirement income, expressed as a weekly dollar amount or expressed as a percentage. The current household income falls in the middle of the two expressions. This made it difficult to determine which of these subjective income replacement figures is accurate and more reliable. As a result, the Income Replacement was discounted in favour of the Consumption Replacement approach as it had the added advantage of covering the entire retirement period, another weakness of the Income Replacement approach.

The Consumption Replacement approach using the capital consumption utilisation method was deemed more appropriate than the Consumption Replacement approach using the capital preservation utilisation method. This is due to the fact that when using the capital preservation utilisation method the predicted adequacy proportions were unrealistically low when compared to retiree satisfaction levels with current retirement income.<sup>95</sup>

The Consumption Replacement approach using the capital consumption utilisation method which excluded the use of the home equity was deemed more appropriate than that approach including the use of any home equity. Little wide-scale adoption of home equity release loans and the minimal increase it brings to adequacy proportions makes home equity an unrealistic option. The exclusion of home equity also provides a degree of conservatism to the adequacy measure.

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<sup>95</sup> Three-quarters (76.3%) of all current retirees and 80.7% of active retirees felt their current retirement was adequate to their desired retirement lifestyle. This compares to 80% of US retirees in believed they had enough to live comfortably (Biggs, 2016).

It was concluded that the Consumption Replacement approach using the capital consumption utilisation method excluding home equity is the preferred measure of *adequacy*. Using this as the method of financially calculating financial adequacy found that 60.4% of all current retirees were likely to achieve adequacy.

Comparisons between the dichotomous dependent variable, *adequacy*, used in logistic regressions; the continuous adequacy differential, *adequacy2*, used in OLS regressions; and the ranked ordinal adequacy, *adequacy3*, used in ordered logistic regressions concluded that the logistic predictive model using the dichotomous dependent variable, *adequacy*, was found to be more statistically robust and reliable.<sup>96</sup> This method of determining retirement adequacy is consistent with the definition by Montaldo (2001) where adequacy is said to exist when a household's projected financial resources available for consumption during retirement is equal to or greater than their projected retirement consumption needs.

Lastly, changes to the key underlying assumptions, such as changes in consumption, life expectancy, real rates of returns, and a reduction in retirement income following the loss of a spouse or partner, resulted in movements in adequacy proportions which remained realistic and robust. These robustness checks helped confirm the logistic prediction model as the preferred model.

## 4.2 Objective 2 Results and Discussion

**Objective 2:** *Using this measure of adequacy, determine the financial preparedness of retirees for their retirement.*

### Introduction

It is important to understand how those adequately prepared retirees prepared for their retirement. People's preparation for retirement can take many different forms and can be shaped by people's attitudes and behaviours, as well as being influenced by a range of situational factors. Having determined *adequacy*, this section looks briefly at the survey results and how they relate to the analysis cohorts: income, savings, wealth and

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<sup>96</sup> For full details of regression comparison results refer to section 4.4.3.

financial capability. Identifying the characteristics of those who have actively taken steps to prepare for retirement is important, and these characteristics are expected to be quite different from the characteristics of those who achieve adequacy solely through their entitlement to NZ Superannuation. Subsequently, it was felt necessary, in order to achieve meaningful analysis, to divide retirees into two cohorts: active and passive retirees.

#### 4.2.1 Retirement Preparedness

Retirement preparedness means having sufficient financial resources to cover all consumption requirements throughout the entire retirement period, including some allowance for unplanned events or emergencies. The implications are that well-prepared retirees can live within their means, achieving the retirement lifestyle they desire through the various stages of retirement, and remain in control of their financial affairs. They are focused on tomorrow, while still living for today.

Being prepared does not necessarily mean having the necessary knowledge and skills, or educating themselves to the point where they can competently manage their own finances and investments, as it is possible for people to seek professional financial advice. They will, however, have to be willing to follow that financial advice. They must plan ahead, make informed decisions, exercise a degree of self-control avoiding debt and over spending, as well as regularly reviewing and monitoring their investments, ownership structures, and estate planning. Financial calculations using the point-of-adequacy resulted in 60.4% of all current retirees achieving retirement adequacy.

Prepared retirees should be aware that they may have to transition through various stages of retirement, from active early retirement to possible assisted living in the latter stages. Also, their living arrangements may change throughout retirement from their family home, to a townhouse or apartment, to a retirement village, or into residential care. Fiscal responsibility is required, so that one retirement stage does not negatively impact another. For example, excessive spending during the first active stage of retirement could restrict choices in the latter stages, or one living arrangement may restrict the transition into others.

*Table 18: Current retirees' cohort adequacy*

This table shows the proportion of adequacy achieved by all current retiree, with each cohort split into two categories – low and high.

	<b>Adequacy</b>
Low- <i>income</i>	50.0%
High- <i>income</i>	31.0%
Low- <i>invest</i>	19.1%
High- <i>invest</i>	70.3%
Low- <i>wealth</i>	45.7%
High- <i>wealth</i>	71.9%
Low- <i>fincap</i>	20.6%
High- <i>fincap</i>	34.3%

The positive relationship, seen in Table 18, between both savings/investment and retirement adequacy is predictable. The low adequacy rates associated with financial capability is largely a reflection of the large proportion (71.1%) of all current retirees who make up the low-financially capable cohort, rather than a reflection on their financial preparedness for retirement. Interestingly, the low adequacy proportion of the high-*income* cohort indicates the consumption of high-*income* retirees could be unsustainable throughout retirement.

#### 4.2.1.1 Household Income and Adequacy

Understanding the relationship that exists between adequacy and retiree household income is important and provides a solid foundation for understanding retirement preparedness. Financial calculations found that the highest proportion of retirement adequacy was achieved by retiree households with the lowest incomes, with 50% of the low-*income* cohort achieving retirement adequacy, compared to 31% of the high-*income* cohort. This result is due primarily to the fact, that for many, NZ Superannuation makes up a large proportion of their retirement income.

Breaking down all current retiree household income into seven income cohorts (*incgroup*) reveals a trend not immediately obvious from the high-low income cohorts. Figure 8 below shows that retirement adequacy proportions decrease as income levels increase. The expectation was that adequacy would form a clearly defined U-shape, with low-income households achieving high levels of adequacy due to the contribution of NZ Superannuation, falling in the middle then rising for the extremely wealthy. An unusual

U-shape eventuated as there was an unexpected fall in adequacy proportions with the “\$100,001 to \$150,000” income cohort.

*Figure 8: Retiree adequacy by seven income cohorts*

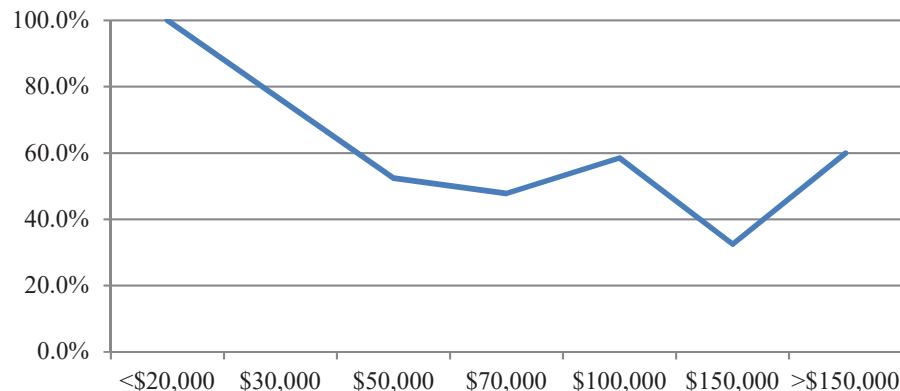


Figure 8 above shows evidence that a negative relationship exists between the level of New Zealand retiree household income and adequacy, as the higher the level of income, the lower the adequacy proportion. This is an unexpected finding as it contradicts the findings of Guiso and Jappelli (2008) that show that income is positively related to wealth accumulation, and by inference retirement adequacy. This reduction in adequacy could relate to the diminishing marginal utility of wealth as retiree income increases.

Investigation into the low adequacy anomaly of the \$100,001 to \$150,000 income cohort showed that 47.5% of this cohort’s members retire prior to 65 years of age. This proportion is nearly double that of the ‘more than \$150,000’ income cohort, with the next highest cohort, with 26.7% of their members aged under 65. This result was unexpected, and indicates that retiree households within the \$100,000 to \$150,000 income range have not accumulated as much as would have been anticipated for a high-*income* household. The adequacy proportions rise again to 60% for the ‘more than \$150,000’ household income cohort. This is slightly more than the 58.5% of the ‘\$70,001 to \$100,000’ income cohort. It could have been expected that the extremely wealthy high-*income* cohort may have yielded a higher adequacy proportion. This could indicate that a degree of over-consumption has occurred.

The decreasing adequacy proportions of the high income retiree households would imply either that their current consumption is too high to be maintained over the entire retirement period; the amount of extra income required to augment NZ Superannuation is too high for their financial resources on hand; or that their assumptions regarding the

necessary pre-retirement accumulation amount was too low. Alternatively, it could imply that income and consumption peaked prior to retirement, with the last year's earnings not being a true reflection of lifetime earnings.

Over-consumption by some high income retiree households could relate to a failure to adjust or to sufficiently reduce retirement consumption. These retirees may have enjoyed high levels of pre-retirement consumption, often associated with high pre-retirement incomes, and be reluctant to reduce standards of living or lifestyle in retirement, or they have failed to consider how long their current rate of consumption can be maintained.

#### *4.2.1.2 Retirement Income Deficiency*

NZ Superannuation comprises a greater proportion of retirement income for low-income retiree households than it does for high-income retiree households. Therefore, the replacement income gap needed to be filled by high-income retiree households is larger than for low-income retiree households. In order to generate sufficient investment income to sustain high levels of retirement consumption, high-*income* retiree households are required to accumulate larger amounts of investment capital to augment their NZ Superannuation.

Many low-*income* households achieve retirement adequacy by sole virtue of the fact they receive the universal NZ Superannuation, which matches or exceeds their pre-retirement income. This means that regardless of whether good or poor money management practices occur, due to NZ Superannuation some low-*income* households achieve high adequacy proportions by default. Therefore, given NZ Superannuation has a major influence on the adequacy results, caution is required when interpreting all current retiree results. The impact that NZ Superannuation has upon the adequacy of low-*income* and high-*income* retirees led to the decision to split retirees into two groups - passive and active, and this is discussed in more detail later.

#### *4.2.1.2 Household Savings/Investments and Adequacy*

Table 19 below shows that the mean savings/investments of the '\$100,001 to \$250,000' cohort falls within the \$100,001 to \$150,000 range of the retiree household income. Those in the '\$100,001 to \$150,000' income cohort have accumulated less than those in the '\$70,001 to \$100,000' income cohort and as a result their adequacy proportion of 32.5% is less than the 58.5% of the '\$70,001 to \$100,000' income cohort.

*Table 19: Current retiree savings/investments by income group*

This table shows the adequacy proportions and the mean savings/investments amount for five household retiree income groups.

<b><u>Household Income</u></b>	<b>Adequacy</b>	<b>Mean Savings/ Investments</b>
Less than \$50,000	67.8%	\$0 - \$100,000
\$50,001 - \$70,000	47.8%	\$100,001 - \$250,000
\$70,001 - \$100,000	58.5%	\$250,001 - \$500,000
\$100,001 - \$150,000	32.5%	\$100,001 - \$250,000
More than \$150,000	60.0%	\$1m - \$1.5m

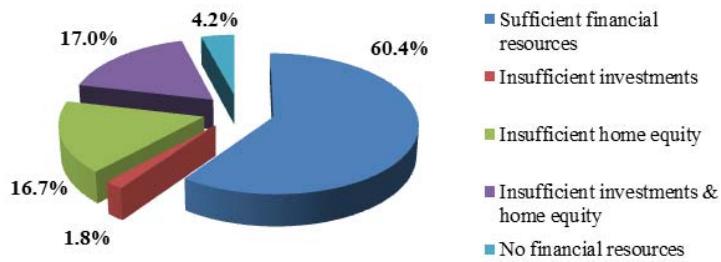
Excluding the ‘Less than \$50,000’ cohort, adequacy increases as the mean amount of savings/investments increases, except for those in the ‘\$100,001 to \$150,000’ income cohort where the mean saving/investment amount decreased. It is unknown why this group has lower mean saving/investment than the ‘\$70,001 to \$100,000’ income cohort. This issue was not a focus of this thesis, but it could be worthy of investigation in subsequent research.

#### *4.2.1.3 Household Wealth and Adequacy*

The vast majority of all current retirees (95.4%) have at least some forms of investment to help fund their retirement consumption. The few retirees without any form of investment represent 10.6% of the inadequately prepared retirees and just 0.7% of the adequately prepared retirees. A small proportion (6.2%) of all current retirees only has investments with no home equity, and they represent 4.4% of the inadequately prepared retirees. Over a quarter (26.2%) of all current retirees only have home equity, and represent 42.2% of inadequately prepared retirees. The majority of all current retirees (63%) have both investments and home equity, and represent 42.8% of the inadequately prepared retirees. While the composition of investment type is of interest, the real issue is whether retirees have sufficient resources to fund their retirement.

Figure 9 below shows the proportion of retirees having sufficient or insufficient resources to achieve adequacy. These results indicate that nearly four out of ten (39.6%) of all current retirees have insufficient financial resources to sustain their current rate of retirement consumption.

*Figure 9: Sufficiency of retirees' resources*



#### *4.2.1.4 Robustness Analysis*

Table 20 below shows a series of changes to key assumptions, and the resulting change to the proportions of adequately and inadequately prepared retirees. While retirees can adjust the consumption levels of some living expenses, such as food, clothing, power and petrol, other living costs remain beyond their influence, such as rates, insurance, car registration, and power. There are other factors, over which retirees have little or no control, such as life expectancy, the loss of a partner, or RRoR that can influence the adequacy of their retirement preparations.

The factor with the greatest negative impact upon adequacy occurs, for those in a relationship, following the loss of a partner, as the adequacy proportion reduced by 25.9%. The reduction was due to the change in the couple's NZ Superannuation entitlement to a single entitlement.

An increase in a person's longevity means a greater number of years are spent in retirement, requiring a larger amount of investment capital; conversely a decrease in longevity would mean that less retirement savings are required. A 2.9% reduction in adequacy proportions occurs when life expectancy is increased by 1 year, a 5.5% reduction in adequacy proportions when life expectancy is increased by 2 years, and a 9.1% reduction in adequacy proportions when life expectancy is increased by 5 years, a similar period to a standard deviation in NZ life expectancy. These small variations would indicate that the length of retirement is not as critical as other factors.

*Table 20: Adequacy robustness analysis*

This table shows in the first column the percentage change in all current retirees' adequacy, and in the second column inadequacy,<sup>97</sup> subject to changes in assumptions based upon being widowed rather than a couple, an increase or decrease in life expectancy, and an increase or decrease in the long-term average real rate of return.

	Adequate	Inadequate
<b>Base</b>		
PVTotHhldFinRes >= PVTotRetConsC	<i>n</i> = 274 60.4%	<i>n</i> = 180 39.6%
<b>NZ Superannuation</b>		
Single Entitlement	-25.9%	39.4%
<b>Change in Consumption</b>		
Increase by 15%	-11.7%	17.8%
Increase by 10%	-9.9%	15.0%
Increase by 5%	-5.8%	8.9%
Reduce by 5%	5.1%	-7.8%
Reduce by 10%	8.0%	-12.2%
Reduce by 15%	11.7%	-17.8%
<b>Change in Life Expectancy</b>		
+5 years	-9.1%	13.9%
+2 years	-5.5%	8.3%
+1 year	-2.9%	4.4%
-1 year	2.2%	-3.3%
-2 years	2.9%	-4.4%
-5 years	7.7%	-11.7%
<b>Change in Real Rate of Return</b>		
+3% RRoR	16.4%	-25.0%
+2% RRoR	9.9%	-15.0%
+1% RRoR	5.8%	-8.9%
-1% RRoR	-8.4%	12.8%
-2% RRoR	-13.1%	20.0%
-3% RRoR	-27.0%	41.1%

A reduction in the retirement consumption of 5% would result in a 5.1% increase in the adequacy proportion, whereas a 10% reduction would result in an 8% increase in the adequacy proportion, with a 15% reduction resulting in an 11.7% increase in the adequacy proportion. The level of consumption is one factor over which retirees have some control,

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<sup>97</sup> Note that a corresponding shift in the number of retirees from adequate to inadequate produces a greater change in the proportion of inadequate results than in the proportion of adequate results, due to the initial inadequate base being less than the initial adequate base.

and these results imply that adequacy levels can improve directly through retirees' consumption decisions.

There is a strong positive relationship between RRoR and retiree adequacy. Table 20 above highlights that changes in RRoR have a greater impact on adequacy levels than the number of years spent in retirement, or minor reductions in retirement consumption. An increase in the long-term average real rate of return of 1% resulted in a 5.8% increase in adequacy proportions, and a 3% increase in RRoR resulted in a 16.4% increase in adequacy proportions. Whereas a decrease in the long-term average real rate of return of 1% resulted in an 8.4% decrease in adequacy proportions, and a 3% decrease in RRoR resulted in a 27% decrease in adequacy proportions. Retiree adequacy proportions are affected more by reductions in the long-term average real rate of return, than by corresponding increases in the long-term average real rate of return. Retirement adequacy decreases as the degree of conservatism increases.

Changes to RRoR could result from changes in economic conditions, or changes to the OCR, which are beyond the control of retirees; however, retirees do have a degree of influence over the RRoR they receive, through their choice of investments and asset allocation. Critical to retirees' investment decision-making is their understanding of investment risk, diversification, and the time value of money. Other influencing factors also include tolerance to risk, and the willingness to seek professional financial advice.

Overall, when considering the direction and impact on adequacy results following changes in some of the underlying assumptions, the resulting changes in adequacy proportions were plausible and realistic in regards to the size or the direction of movements. These robustness results strengthen the confidence in the financial calculations as changes to the underlying assumptions appear both relatively stable and robust.

## **Conclusion**

The initial analysis found that there are a high number of low-income / high-adequacy households which created an income/adequacy imbalance distorting results, and the results contradict logic and past research findings. It was decided to compare the results of those retirees who achieved adequacy with their current household retirement consumption at or below their NZ Superannuation entitlement, with those who needed to

augment their NZ Superannuation through investing and wealth accumulation in order to achieve adequate household consumption in retirement.

#### 4.2.2 Active and Passive Retirees

Clear advantages emerged from splitting the retiree database into two groups: ‘passive’ retirees (households with retirement consumption at or below their NZ Superannuation entitlement); and ‘active’ retirees (households needing to augment their NZ Superannuation).

In reality, passive retirees are expected to achieve retirement adequacy regardless of their financial behaviour and actions they take, or fail to take. Inclusion of passive retirees dilutes or disguises significant demographic, attitudinal, and behavioural factors of those retirees who are required to take action to augment their NZ Superannuation in order to maintain their desired level of consumption throughout their retirement. Exclusion helps avoid the low-*income*/high-adequacy distortion bias seen in the earlier results.

As a result of splitting retirees into ‘passive’ retirees and ‘active’ retirees, there were 108 passive retirees (23.8%) and 346 active retirees (76.2%), which shows that less than a quarter of retiree respondents were deemed to be ‘passive’ retirees. Financial calculations found that 48.6% of the active retirees are likely to achieve retirement adequacy. This compares to the earlier finding that all current retirees are likely to achieve an adequacy proportion of 60.4%.

*Table 21: Passive and active cohort proportions*

This table shows the proportions of income, saving/ investment, net worth, and financially capable cohorts who are classified as either passive or active retirees.

	Passive	Active
Low - <i>income</i>	100.0%	49.4%
High - <i>income</i>	0.0%	50.6%
Low - <i>invest</i>	62.1%	44.8%
High - <i>invest</i>	37.9%	55.2%
Low - <i>wealth</i>	51.5%	34.0%
High - <i>wealth</i>	48.5%	66.0%
Low - <i>fincap</i>	79.6%	68.5%
High - <i>fincap</i>	20.4%	31.5%

Table 21 above illustrates the fact that the passive retirees make up the majority of the low-*invest*, low-*wealth*, and low-*fincap* cohorts. All the passive retirees belong to the low-*income* group, whereas half(49.4%) of the active retirees belong to the low-*income* group. Excluding the passive retirees has the effect of lowering the membership numbers, especially those of the low-cohort groups.

*Table 22: Active retiree cohort adequacy*

This table shows the active retiree adequacy achieved by each low/high cohort in the first column and the all current retiree adequacy achieved by each low/high cohort in the second column.

	<b>Active Retiree Adequacy</b>	<b>All Current Retirees Adequacy</b>
Low- <i>income</i>	48.5%	67.7%
High- <i>income</i>	48.6%	48.6%
Low- <i>invest</i>	12.2%	37.9%
High- <i>invest</i>	82.9%	85.9%
Low- <i>wealth</i>	22.5%	45.7%
High- <i>wealth</i>	65.6%	71.9%
Low- <i>fincap</i>	40.5%	55.7%
High- <i>fincap</i>	66.1%	71.8%

A comparison between Table 18 (earlier) and Table 22 (above) shows an increase in the adequacy proportions of all cohorts, the low-cohorts experienced slight increases, while the high-cohorts experienced greater increases. The largest increase occurred in the high-*income* cohort. These active retiree cohort adequacy levels are more realistic, with equal proportions for both the low-*income* and high-*income* cohorts.

The strength of splitting retirees can be seen when analysing some of the preparedness characteristics. An illustrative example of the clarity gained through the split can be seen when comparing the different adequacy proportions of ‘all current retirees’ and ‘active retirees’ educational qualifications.

Table 23 shows little notable difference in adequacy proportions between the levels of educational qualifications of all current retirees, yet a clear positive relationship exists between adequacy and the educational qualifications of active retirees. This example illustrates the effect caused by the low-income/high-adequacy distortion and the bias introduced. The results generated by using the ‘active retiree’ database correct this

anomaly, confirming earlier research findings regarding educational qualifications by Hayhoe and Stevenson (2007), Lusardi and Mitchell, (2009), and Behrman, et al., (2010).

*Table 23: Adequacy comparison – Educational qualification*

This table shows in the first and third columns the number of observation. The second column shows the resulting adequacy proportion of all current retirees and in the fourth column, the resulting adequacy proportion of active retirees. The last line of the table shows the corresponding coefficient from logistic regressions using both the all current retiree and active retiree databases.

		All Current Retirees	Active Retirees
No Qualifications	n = 36	60.0%	n = 18
School Qualifications	n = 87	61.3%	n = 44
Trade Cert / Diploma	n = 82	60.3%	n = 51
Bachelor Degree	n = 35	61.4%	n = 27
Postgrad	n = 33	60.0%	n = 28
Logit Coefficient		-0.014	0.425

It was therefore concluded that the use of the ‘active retiree’ database is preferred over the ‘all current retiree’ database. Using the active retiree database eliminates the low-income/high adequacy distortion bias, notwithstanding the reduction in the number of observations.

## Conclusion

Financial calculations using the financial data supplied found that 60.4% of all current retirees and 48.6% of active retirees are likely to be adequately prepared financially for retirement. It was determined that the inclusion of passively prepared retirees had little relevance in the analysis process as, irrespective of their attitudes or behaviour, they would simply achieve adequacy through the receipt of their NZ Superannuation entitlement. Active retirees have to make decisions and take action in order to be able to supplement their NZ Superannuation in order to achieve retirement adequacy.

The division of the retiree database into two cohorts allows focus on the active retirees and avoids the low-income/high-adequacy distortion bias present in earlier results. This also helps provide greater emphasis on the key demographic and financial behaviours and actions that active retirees take in order to achieve retirement adequacy. It is on this basis that the focus going forward is on active retirees, rather than all current retirees.

## 4.3 Objective 3 Results and Discussion

**Objective 3:** *Identify the characteristics of active retirees who had adequately prepared for retirement.*

### Introduction

Active retirees must make some financial decisions and take some form of action in order to be able to supplement their NZ Superannuation to a level that will satisfy their retirement consumption requirements. It is this active involvement in the process of preparing for retirement that allows analysis to identify which demographic, behavioural, and attitudinal characteristics have greater significance in determining *adequacy* than others.

#### 4.3.1 Description of an Adequately Prepared Active Retiree

The following caricature of an adequately prepared active retiree describes the general characteristics associated with achieving retirement adequacy. This descriptive portraiture is based upon the medians of the characteristics associated with those active retirees found to have obtained retirement adequacy from the data collected from the online survey.

An adequately prepared active retiree is more likely to have a partner and be of European descent, owning their own debt-free home.<sup>98</sup> They will have had two children, neither of whom are financially dependent on their parents, and they are likely to have never been separated or divorced. They are likely to hold a Trade Certificate or Diploma qualification.

Their health is currently rated ‘good’, they are non-smokers, who never experienced being absent from work due to illness for a period of three months or longer, and most retired at age 65.

Their net worth is likely to fall within the \$500,000 to \$1 million range, with their home equity falling within the \$500,001 - \$1 million range, and they are likely to have an average of 2.5 different types of investments falling within the \$100,001 to \$250,000 range. They expect to consume all of their investment capital and all of their home equity during their retirement. They are quite confident that their financial resources will be sufficient to last them their entire retirement.

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<sup>98</sup> Some of these characteristics are also predominantly found within the general population.

Currently their gross retirement income is likely to fall within the \$50,001 - \$70,000 range, which is expected to replace approximately 66% of their last year's earnings. They believe that they are currently 'doing alright' financially, their level of retirement income is considered to be adequate in meeting their desired retirement lifestyle, and they manage to save between \$100 and \$250 each month. They rarely receive or provide financial support to others, and have ready access to financial reserves which cover three months or more worth of household expenditure.

With regards to their financial behaviour and attitudes, the typical adequately prepared active retiree believes that they are organised when it comes to managing their money, are not impulsive spenders, put a lot of thought into major purchases, and are focused on tomorrow more so than living for today. Seldom would they use payday or short-term loans, would prefer to save to buy what they want rather than use credit, and never utilise the full limits on their credit cards. Discussions with their partner about their long-term living arrangements are rare. They believe that individuals have a degree of responsibility in providing financially for their own retirement, and that it should not be left solely to the Government.

The typical adequately prepared active retiree's investment risk tolerance appears to be low, with the average RRoR being 3.2%, and they understand that investment risk means that returns vary from year to year. They believe diversification comes from spreading investments amongst different banks. On average they have five risk management and estate planning strategies or instruments in place. Their mean financial literacy is higher than the all current retirees' average, correctly answering 4.8 out of the seven financial literacy questions. Finally, their mean financial capability score (3.3) was slightly higher than the all current retirees' average score (3.1).

*Table 24: Cohort adequacy for active retirees*

This table shows for each active retiree cohort the adequacy proportion for the entire cohort membership..

	<i>income</i>	<i>invest</i>	<i>wealth</i>	<i>fincap</i>
Adequacy	48.6%	51.2%	50.9%	48.6%

### Cohorts

Active retiree adequacy proportions are generally similar amongst the four main cohorts. The *invest* cohort achieved the highest adequacy proportions of the four, as seen in Table

24 above. These cohorts together with educational qualifications and the capital consumption ratio, are discussed in more detail below.

### Income

The amount of income that flows into a household not only affects the level of consumption possible, it also impacts on the ability to prepare financially for retirement. As seen in Table 24, half (48.6%) of active retirees belong to the low-*invest* cohort, with a 12.2% adequacy proportion. This compares to an 82.9% adequacy proportion of the high-*invest* cohort. This indicates that a positive relationship exists between the level of savings/investments and retirement adequacy.

In Table 25 below the high-*invest* (more than \$100,000) active retirees, regardless of whether their income is low (\$50,000 or less more) or high (more than \$50,000), achieved higher adequacy proportions than low-*invest* (\$100,000 or less) active retirees. The low-*income/low-invest* cohort has an extremely low adequacy proportion (3.7%), indicating that with their lower income they are less able to accumulate savings/investments, and therefore they are poorly prepared for retirement. By contrast, the high-*income/high-invest* cohort have a 100% adequacy proportion, indicating that those with a higher income are able to achieve high levels of savings/investments, and as a result are well prepared for retirement.

*Table 25: Distribution & adequacy of active retirees - Income*

This table shows the active retirees who belong to the low-*income* cohort in the first section, and active retirees belonging to the high-*income* cohort in the second section. The first and third columns show the proportion of active retirees with each cohort who obtained retirement adequacy. The second and fourth columns show the proportion of population making up each cohort, totalling 100%.

	<b>Low-income</b>		<b>High-income</b>	
	<b>Adequate</b>	<b>Sample</b>	<b>Adequate</b>	<b>Sample</b>
Low- <i>invest</i>	3.7%	25.0%	35.9%	23.8%
High- <i>invest</i>	78.3%	25.3%	100%	25.9%
Low- <i>wealth</i>	30.0%	24.5%	62.5%	24.5%
High- <i>wealth</i>	70.4%	24.8%	98.8%	26.1%
Low- <i>fincap</i>	18.2%	25.4%	23.3%	26.0%
High- <i>fincap</i>	38.6%	24.0%	47.1%	24.6%

Those active retirees with high-*wealth* (more than \$500,000) achieved higher adequacy proportions than active retirees with lower net worth (\$500,000 or less) regardless of whether their levels of income were high or low. Similarly, the highly financially capable active retirees (having a financial capability score of more than 3.5) regardless of whether their income was high (more than \$50,000) or low (\$50,000 or less) achieved higher adequacy proportions than low-*fincap* (a financial capability score of 3.5 or less) cohort.

The *incgroup*<sup>99</sup> difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (5, n = 346) = 9.26, p < 0.1$ . A weak correlation (0.01) exists between *incgroup* and *adequacy*, Spearman's correlation found that both were dependent on each other,  $r_s = 0.01, p < 0.1$ .

### Savings

As would be expected, the higher the amount of accumulated savings/investments (*savings*), the greater the probability retirees would achieve adequacy in retirement. Results show that the high-*invest* cohort has higher levels of income, wealth, and financial capability. Other analysis showed that they also have a better understanding of risk, have a greater ability to save in retirement, are less likely to have been through a separation or divorce, have a higher degree of financial planning, avoid the use of credit, and have more alternative arrangements in place should things not go as planned.

Interestingly, nearly a quarter (23.5%) of active retirees did not know how much savings/investments they currently had, and this group had an adequacy proportion of just 1.3%. The adequacy proportion increases as the amount of accumulated savings/investment (*savings*) increases, from 8.1% of active retirees with savings/investment of \$50,000 or less, to 94.4% for those with more than \$2 million of savings/investments. This would indicate that a positive relationship exists between the level of savings/investments and retirement adequacy. These results also indicate that a positive relationship between knowing the actual amount of current savings/investments and retirement adequacy exists. The lack of awareness and inability to recall, even within an appropriate range band, the amount of current savings/investments, indicates a lack of interest or knowledge. The vast majority (89.7%) of active retirees, who did not know how much savings/investments they currently had, belong to the low-*fincap* cohort. Just under half (44.8%) of active retirees belong to the low-*invest* cohort, with a 12.2%

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<sup>99</sup> The variable, *Incgroup*, is used to indicate household income defined within seven categories or income bands.

adequacy proportion. This compares to an 82.9% adequacy proportion of the high-*invest* cohort. These results indicate a positive relationship exists between the level of savings/investments and retirement adequacy.

*Table 26: Distribution & adequacy of active retirees - Savings*

This table shows the active retirees who belong to the low-*invest* cohort in the first section, and active retirees belonging to the high-*invest* cohort in the second section. The first and third columns show the proportion of active retirees with each cohort who obtained retirement adequacy. The second and fourth columns show the proportion of population making up each cohort, totalling 100%.

	Low <i>invest</i>		High <i>invest</i>	
	Adequate	Sample	Adequate	Sample
Low-income	38.8%	39.3%	90.3%	9.5%
High-income	0.0%	5.5%	56.7%	45.7%
Low-wealth	36.1%	38.4%	83.3%	9.4%
High-wealth	41.2%	5.3%	89.9%	46.9%
Low-fincap	16.3%	39.3%	38.7%	9.5%
High-fincap	50.0%	5.5%	42.0%	45.7%

Table 26 shows that high-*invest* active retirees, regardless of whether their income is low or high, achieved higher adequacy proportions than low-*invest* active retirees. Interestingly, the high-*income*/low-*invest* cohort had a lower adequacy proportion than the low-*income*/low-*invest* cohort, indicating that despite their higher income they saved less, thus were less well prepared. Also the low-*income*/high-*invest* cohort had a higher adequacy proportion than the high-*income*/high-*invest* cohort, indicating they were better prepared.

Those with higher net worth achieved higher adequacy proportions than those with lower net worth. High-*invest* active retirees, regardless of whether their net worth was low or high, achieved higher adequacy proportions than low-*invest* active retirees. Whereas, high-*fincap* active retirees regardless of whether their savings/investments were low or high achieved higher adequacy proportions than the low-*fincap* cohort.

The *savings* difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2(9, n = 328) = 192.3, p < 0.001$ . While a strong correlation (0.74) exists between *savings* and *adequacy*, Spearman's correlation found that both were independent of each other,  $r_s = 0.74, p < 0.001$ . A strong relationship exists between the level of savings/investments

and retirement adequacy. Therefore, it can be construed that any increase in savings/investments is likely to result in a corresponding increase in retirement adequacy.

*Table 27: Annual return on savings/investments*

This table shows in the first column the percentage of active retirees with accumulated savings shown. In the second column the annual interest-only amount received for the top amount of each band based on a RRoR of 3.0%<sup>100</sup>, and in the third column the annual amount of interest and capital consumed with the mean CCR of 3.14 for the top amount of each bandwidth.

	<b>Percent</b>	<b>Int. Only</b>	<b>Int. + Cap</b>
\$10,000 or less	6.0%	\$ 300	\$ 942
\$10,001 - \$50,000	8.8%	\$ 1,500	\$ 4,710
\$50,001 - \$100,000	13.1%	\$ 3,000	\$ 9,420
\$100,001 - \$250,000	15.1%	\$ 7,500	\$ 23,550
\$250,001 - \$500,000	18.3%	\$ 15,000	\$ 47,100
\$500,001 - \$1M	15.1%	\$ 30,000	\$ 94,200
\$1.0M - \$1.5M	11.2%	\$ 45,000	\$ 141,300
\$1.5M - \$2.0M	5.2%	\$ 60,000	\$ 188,400

Table 27 above shows that \$100,000 accumulated savings/investments would provide an extra \$3,000 per year given a 3.0% RRoR. Considering the interest-only approach, just under a third (27.9%) of active retirees with savings/investments of \$100,000 or less, were able to supplement their NZ Superannuation by \$3,000 or less. Using the capital consumption method. this would provide a maximum extra \$9,420 per year on top of their NZ Superannuation. Interestingly, 16% of all current retirees and 14.9% of active retirees believed they needed \$100,000 or less. This also shows that a number of active retirees had understated their required pre-retirement accumulation estimates when actually they had managed to accumulate more savings/investments than they believed they needed.

Six out of ten (63%) active retirees believed that they needed to accumulate up to \$500,000 before retirement in order to provide them with a comfortable lifestyle. Interestingly, 38.6% of active retirees currently have \$500,000 or more of savings/investments. As retirees are already in retirement, there is a possibility that some may have already consumed a sizable proportion of their accumulated retirement savings or they may not have accumulated as much as they believed they needed in the first place.

Nearly two-thirds (63.6%) of active retirees believed they had saved enough (*senoug<sup>R</sup>*) for their retirement, more than the proportion of active retirees who actually achieved

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<sup>100</sup> Using the conservative RRoR from Table 4.

retirement adequacy (48.6%). Since only one in seven (14.2%) of active retirees were aware that they had not saved enough for their retirement, this could mean that over a third (36.4%) of active retirees underestimated the amount that they were required to accumulate before retirement.

### Net Worth

Active retirees' net worth (*nworth*) consists of their savings/investments as well as lifestyle assets and the equity held in their home. The *nworth* difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2(10, n = 326) = 71.08, p < 0.001$ . While a moderate correlation (0.44) exists between *savings* and *adequacy*, Spearman's correlation found that both were independent of each other,  $r_s = 0.46, p < 0.001$ . A positive relationship exists between the level of net worth and retirement adequacy. It can therefore be construed that any increase in net worth results in a corresponding increase in retirement adequacy.

*Table 28: Distribution & adequacy of active retirees – Net worth*

This table shows the active retirees belonging to the low-*wealth* cohort in the first section and active retirees belonging to the high-*wealth* cohort in the second section. The first and third columns show the proportion of active retirees who obtained retirement adequacy and the second and fourth columns show the proportion of population making up each cohort, totalling 100%.

	<b>Low-wealth</b>		<b>High-wealth</b>	
	<b>Adequate</b>	<b>Sample</b>	<b>Adequate</b>	<b>Sample</b>
Low-income	34.9%	26.4%	67.6%	22.7%
High-income	4.0%	7.7%	59.6%	43.3%
Low-invest	19.4%	26.1%	62.5%	21.7%
High-invest	58.0%	7.9%	98.5%	44.3%
Low-fincap	6.0%	26.4%	29.7%	22.7%
High-fincap	32.0%	7.7%	45.4%	43.3%

As seen in Table 28, the high-*wealth* cohort, regardless of whether their income is high or low, or whether their savings/investment are high or low achieved higher adequacy proportions than the low-*wealth* cohort. The high-*fincap* cohort achieved higher adequacy proportions than low financially capable active retirees regardless of whether their net worth is high or low. Adequacy proportions increase as the level of net worth increases, from 0% for active retirees with a net worth of \$50,000 or less, to 84.6% for active retirees with a net worth of more than \$1 million.

### Financial Capability

The level of financial understanding and effectiveness of financial decision making is largely influenced by a person's financial capability. The *fincapability* difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2(3, n = 344) = 25.59, p < 0.001$ . While a low correlation (0.28) exists between financial capability and *adequacy*, Spearman's correlation found that both were independent of each other,  $r_s = 0.29, p < .001$ . A positive relationship exists between the level of financial capability and retirement adequacy therefore it can be construed that any increase in financial capability results in a corresponding increase in retirement adequacy.

As seen in Table 29 below the high-*fincap* cohort, regardless of whether their income is high or low achieved higher adequacy proportions than low-*fincap* cohort. Active retirees with high saving/investments, and high net worth achieved higher adequacy proportions than Active retirees with low savings/investment and low net worth regardless of whether their financial capability is high or low. Adequacy proportion increase as active retirees' financial capability score increases, from 21.1% for active retirees with a financial capability score of 1, to 66.7% for active retirees with a financial capability score of 5.

*Table 29: Distribution & adequacy of active retirees – Financial capability*

This table shows the active retirees belonging to the low-*fincap* cohort in the first section and active retirees belonging to the high-*fincap* cohort in the second section. The first and third columns show the proportion of active retirees who obtained retirement adequacy and the second and fourth columns show the proportion of population making up each cohort, totalling 100%.

	Low- <i>fincap</i>		High- <i>fincap</i>	
	Adequate	Sample	Adequate	Sample
Low-income	48.9%	40.8%	56.8%	10.7%
High-income	46.9%	27.7%	55.6%	20.8%
Low-invest	15.0%	38.7%	36.4%	10.1%
High-invest	90.6%	29.3%	87.5%	22.0%
Low-wealth	41.6%	38.3%	62.9%	10.7%
High-wealth	81.9%	28.8%	88.9%	22.1%

The *fincapability* difference in relation to *nworth* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2(30, n = 325) = 41.09, p < 0.1$ . While a low correlation (0.28) exists between *fincapability* and *nworth*, Spearman's correlation found that both were independent of each other,  $r_s = 0.29, p < .001$ .

The *fincability* difference in adequacy proportions in relation to *income* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (3, n = 344) = 6.10, p < 0.1$ . While a low correlation (0.11) exists between *fincability* and *income*, Spearman's correlation found that both were independent of each other,  $r_s = 0.12, p <.05$ .

The *fincability* difference in adequacy proportions in relation to *invest* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (3, n = 327) = 25.55, p < 0.001$ . While a low correlation (0.28) exists between *fincability* and *invest*, Spearman's correlation found that both were independent of each other,  $r_s = 0.27, p <.001$ .

#### Educational Qualifications

Educational attainment is a key factor in determining the type of employment opportunities available and influences the level of income generated. Adequacy proportions increase with higher educational qualifications (*edqual*), from 42.9% for active retirees with no educational qualifications to 56% for active retirees with postgraduate qualifications. The *educate* (low/high education) difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was not significant,  $\chi^2 (1, n = 343) = 7.2, p < 0.01$ . Therefore, a positive relationship can be said to exist between educational qualifications and retirement adequacy. These results confirm Behrman, et al's (2010) findings that higher education is correlated to household income.

As seen in Table 30 below, highly educated (tertiary educated) active retirees, regardless of whether their income is high or low, achieved higher adequacy proportions than low-educated (school or no qualifications) active retirees. This would indicate that retirees' educational qualifications are a better predictor of adequacy than the level of active retirees' income.

High-*invest* active retirees, regardless of their level of educational qualifications, achieved higher adequacy proportions than low-*invest* active retirees. This would indicate that the level of retiree savings/investments is a better predictor of adequacy than active retirees' educational qualifications.

*Table 30: Distribution & adequacy of active retirees – Education*

This table shows the active retirees without a tertiary qualification (low-*educate* cohort) in the first section and those with a tertiary qualification (high-*educate* cohort) in the second section. The first and third columns show the proportion of active retirees obtaining retirement adequacy. The second and fourth columns show the proportion of the population making up each cohort, totalling 100%.

	Low Education		High Education	
	Adequate	Sample	Adequate	Sample
Low-income	41.0%	22.7%	56.7%	28.3%
	41.9%	18.1%	55.7%	30.9%
Low-invest	17.4%	21.2%	21.3%	27.3%
	87.1%	19.0%	90.6%	32.5%
Low-wealth	38.9%	22.2%	53.5%	26.5%
	80.3%	18.8%	87.6%	32.4%
Low-fincap	19.2%	22.7%	21.6%	28.3%
	37.1%	18.1%	46.2%	30.9%

High-net worth active retirees, regardless of their level of educational qualifications, achieved higher adequacy proportions than low net worth active retirees. This would indicate that retirees' net worth is a better predictor of adequacy than active retiree educational qualifications.

A greater proportion of higher educated retirees were highly financially capable. High-financially capable active retirees, regardless of their level of educational qualifications, achieved higher adequacy proportions than low financially capable active retirees. This would indicate that retirees' financial capability is a better predictor of adequacy than active retiree educational qualifications.

These results support earlier findings of Hayhoe and Stevenson (2007), Lusardi and Mitchell (2009), and Behrman, et al. (2010) that education had a positive relationship effect on savings/investment, household wealth accumulation, and financial capability.

#### Capital Consumption Ratio

As discussed earlier (see Section 4.1.2), retirement adequacy is based on consumption replacement involving capital utilisation where income from all sources (NZ Superannuation and investment returns) is consumed along with the consumption of accumulated capital over the expected retirement period. The Capital Consumption Ratio variable (*ccratio*), as detailed earlier in Section 3.3.1.8, is a construct built upon two key

factors: the household's real rate of return (RRoR) and the expected years in retirement (YiR).

The higher the CCR, the higher the rate of consumption of capital and investment returns. Generally, from a capital utilisation point of view, a low CCR would be considered desirable, as accumulated investment capital is consumed at a slower rate. A short retirement period and/or a low RRoR have the effects of increasing the CCR as seen in Table 31 below. High CCRs are therefore achieved by either having a low RRoR, a short retirement period, or a combination of both. Conversely, low CCRs are achieved by either having a high RRoR, a long retirement period, or a combination of both.

*Table 31: Capital Consumption Ratios*

This table shows the actual capital consumption ratio (CCR) that results from the relationship between (in the rows) the number of years in retirement (YiR) and (in the columns) the real rate of return (RRoR).

YiR	3%	4%	5%	6%
10 years	3.91	3.08	2.59	2.26
15 years	2.79	2.25	1.93	1.72
20 years	2.24	1.84	1.61	1.45
25 years	1.91	1.60	1.42	1.30
30 years	1.70	1.45	1.30	1.21

The higher CCR the fewer years in retirement which means that capital is consumed at a faster rate. Conversely, the more years spent in retirement the greater number of years the accumulated capital has to be consumed over and capital is consumed at a slower rate and resulting in a lower CCR. Table 31 illustrates that the CCR increases as the number of years in retirement decreases and as the RRoR decreases.

When the RRoR is low, the investment returns are low and accumulated capital is consumed at a faster rate. A lower RRoR therefore results in a higher CCR. Higher RRoRs results in higher levels of income generated, reducing the rate capital is being consumed. This highlights the fact that RRoR is critical to retirement adequacy as it determines the amount of income generated from savings/investment.

From the retiree's point of view if their current rate of consumption is below the CCR, it would be possible for them to lift their level of retirement consumption. If the retiree's current rate of consumption is above the CCR, they need to reduce their retirement

consumption in order to ensure that their investment capital can be sustained throughout their expected retirement period.

Analysis of the impact that the CCR has on adequacy found that active retirees with a CCR of 1 achieved an adequacy proportion of 88.9%, compared to 46.5% for active retirees with a CCR of 5. The lower the CCR, the lower the rate of capital consumption and the longer accumulated funds will last. Table 32 shows that the high-cohort membership for each cohort is greatest for those with a CCR of 1, with membership decreasing as the CCR increases.

*Table 32: Cohort distribution by Capital Consumption Ratios*

This table shows the percentage of the high-cohort membership achieving the corresponding Capital Consumption ratio score (rounded).

	High-income	High-invest	High-wealth	High-fincap
CCR = 1	100.0%	100.0%	100.0%	66.7%
CCR = 2	59.5%	59.6%	69.8%	33.9%
CCR = 3	47.1%	55.3%	67.2%	30.1%
CCR = 4	45.9%	51.4%	54.3%	29.7%
CCR = 5	30.2%	34.2%	51.4%	23.3%

There is a strong positive relationship between the level of the savings/investments and the CCR. The *savings* difference in relation to *ccratio* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (36, n = 328) = 68.3, p \leq 0.001$ . While a low correlation (0.21) exists between *ccratio* and *savings*, Spearman's correlation found that both were independent of each other,  $r_s = -0.21, p < 0.001$ .

There is also a strong relationship between the level of retiree wealth (net worth) and the CCR. The *nworth* difference in relation to *ccratio* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (40, n = 326) = 69.9, p < 0.01$ . While a low correlation (-0.21) exists between *ccratio* and *nworth*, Spearman's correlation found that both were independent of each other,  $r_s = -0.25, p < 0.001$ .

Again, there is a strong relationship between the level of retiree income and the CCR. The *incgroup* difference in relation to *ccratio* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (20, n = 346) = 53.4, p < 0.001$ . While a low correlation (-0.26) exists between *ccratio* and *incgroup*, Spearman's correlation found that both were independent of each other,  $r_s = -0.27, p < 0.001$ .

#### 4.3.2 Significant Characteristics of Preparedness

The analysis of cohort results discussed in the section above provides a baseline of understanding regarding the retirement adequacy of active retirees, nevertheless there exists a large number of potentially significant variables that prior research has identified, (see in Section 2) that could warrant inclusion. It is unclear which variables have greater influence within the unique New Zealand situation.

In Section 4.2, financial information was used to calculate the likelihood that a retiree would achieve retirement adequacy. Next, this study attempts to identify if financial preparedness for retirement could be identified using non-financial information, such as financial behaviour, attitudes, and demographic data. To this end, a stepwise backward logistic regression using the robust option was employed to identify which variables, from the large number of independent variables, were significant. The proportion of active retirees achieving adequacy using logistic predictive model found that 50.2% of retirees were likely to achieve retirement adequacy. While results are similar to those obtained using the calculation method (48.6%), they helped confirmed the logistic predictive model as being the most effective model to use to determine the retirement adequacy of retirees.

The dichotomous adequacy measurement, *adequacy*, indicates whether an active retiree achieved adequacy (1) or not (0). After carrying out a backward stepwise logistic regression on the 57 independent variables (refer to Appendix 5 for a complete list of variables) affecting active retirees' *adequacy*, eight were found to be significant, two variables are significant to 1%, and six variables were significant to 5%, and these are detailed in Table 33 below and discussed below.<sup>101</sup>

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<sup>101</sup> ‘Don’t knows’ and sub-groups with 5 or less responses, were generally excluded from analysis discussion as their results were deemed unreliable due to the small size of responses or varied interpretation.

*Table 33: Significant variables from logistic regression - adequacy*

This table shows the significant variables associated with achieving *adequacy* using backwards stepwise logistic regression. The first column names the variable, the second column shows the question asked, the third column shows the coded response options, the fourth column shows the direction of the effect. The last column provides a brief explanation of the result.

Variable	Question	Coding	Effect	Rationale
<i>Significant to 1%</i>				
<i>Invtype</i>	This variable was calculated based upon types of asset/investments held.	No assets (0) Investment only (1) Home equity only (3) Investments & home equity (4).	-ve	Those with their own home and investments are in a stronger financial position and more likely to be better prepared financially for retirement.
<i>accomtype</i>	What best describes your accommodation arrangements?	Own home with mortgage (1) - other (8).	+ve	Owning your own home without home loans improves retirees' ability to fund their retirement.
<i>Significant to 5%</i>				
<i>longevity</i>	In the past, have any members of your family reached the age of 90?	Yes (1) No (2).	-ve	Those who have had family members reach the age of 90 are in stronger financial positions than those who did not.
<i>prepdr</i>	I believe I am well-prepared financially for retirement.	Strongly Disagree (1) – Strongly Agree (5).	+ve	Those who believe that they are well-prepared financially for retirement are in stronger financial positions than those who believe they are not.
<i>nzssuf<sup>R</sup></i>	I believe that NZ Superannuation would be sufficient for my retirement.	Strongly Disagree (1) – Strongly Agree (5).	-ve	Those who do not believe that NZ Superannuation alone will be sufficient are more likely to take action to supplement their retirement income, and therefore have a stronger financial position.
<i>plandev<sup>R</sup></i>	How well developed or undeveloped would you say your financial plans for retirement were <b>before</b> you retired?	No financial plan (1) – Well developed (7).	+ve	Those with well-developed retirement plans are expected to be better prepared than those with no or poorly developed retirement plans.
<i>ksall<sup>R</sup></i>	KiwiSaver should provide enough.	Strongly Disagree (1) – Strongly Agree (5).	+ve	Due to its recent introduction, few retirees would have invested in KiwiSaver, and any investments are likely to be seen as a bonus.
<i>bsother</i>	It is important to just spend wage/salary, and save any income from other sources.	Strongly Disagree (1) – Strongly Agree (5).	+ve	This aligns with Friedman's (1957) Permanent Income hypothesis that bonus income would be saved.

The correlations, seen in Table 34 below, between the eight significant independent variables are generally low, except for strong correlations between  $plandev^R$  and  $prepdr^R$ , which would be expected as those with a well-developed plan would believe they are better prepared for retirement. Another strong correlation exists between  $prepdr^R$  and  $invtype$ , again those with both investments and home equity would believe they are better prepared for retirement.

*Table 34: Correlation of significant factors*

	<i>invtype</i>	<i>accomtype</i>	<i>bsother</i>	<i>nzssuf<sup>R</sup></i>	<i>ksall<sup>R</sup></i>	<i>prepdr<sup>R</sup></i>	<i>longevity</i>	<i>plandev<sup>R</sup></i>
<i>invtype</i>	1							
<i>accomtype</i>	-0.28	1						
<i>bsother</i>	0.03	-0.13	1					
<i>nzssuf<sup>R</sup></i>	-0.09	-0.11	-0.11	1				
<i>ksall<sup>R</sup></i>	0.13	-0.09	0.01	0.11	1			
<i>prepdr<sup>R</sup></i>	0.47	-0.03	0.21	-0.04	-0.16	1		
<i>longevity</i>	-0.06	0.03	0.05	0.05	0.28	-0.13	1	
<i>plandev<sup>r</sup></i>	0.54	-0.03	0.08	-0.13	-0.02	0.68	-0.08	1

#### 4.3.2.1 Variables Significant to 1%

There are two independent variables significant to 1%, being: *invtype*, and *accomtype*

##### Types of Investments

Active retirees were grouped into four investment types (*invtype*). A small percentage (5.5%) of active retirees have no investments of any description, with just under a quarter (22.9%) only having home equity available to them as a financial resource. A small percentage of retirees (6.7%) have investments-only, with the majority (65.9%) having both investments and home equity. The cohort with the lowest adequacy (0%) was active retired households with no investments/financial resources, followed by the cohort with only home equity. The largest cohort, active retirees with both investments and home equity, achieved the highest adequacy proportion. The *invtype* difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (3, n = 346) = 118.3, p < 0.001$ . While a moderate correlation (0.38) exists between *invtype* and *adequacy*, Spearman's correlation found that both were independent of each other,  $r_s = 0.47, p < 0.001$ .

### Accommodation Type

The vast majority (89.4%) of retired respondents owned their own home, and achieved an adequacy proportion of 64%. The lowest adequacy proportion (45.8%) occurred in the cohort of retirees who flattered, rented, or leased.

The type of accommodation (*accomtype*) in which retirees live has significant effect on adequacy proportions, in particular those living in their own homes. The vast majority of active retirees (88.1%) lived in their own homes, with 74.2% owning their own home without a home loan. The *accomtype* difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (6, n = 345) = 29.7, p < 0.001$ . While a low correlation (0.11) exists between *accomtype* and *adequacy*, Spearman's correlation found that both were independent of each other,  $r_s = 0.37, p < 0.05$ .

#### **4.3.2.2 Variables significant to 5%**

There are six independent variables significant to 5%, being: *longevity*, *prepd<sup>R</sup>*, *nzssuf<sup>R</sup>*, *plandev<sup>R</sup>*, *ksall<sup>R</sup>*, and *bsother*.

### Longevity

The hypothesis that those with family members who had lived to age 90 (*longevity*) would have greater awareness of the need to save for a long retirement, and would consequently also have the highest adequacy proportion. The findings proved this to be incorrect. The cohort of active retirees who had a family member who had lived to age 90 had a lower adequacy proportion (39.6%) compared to the those who had family members who had not lived to age 90 (56.7%).

The *longevity* difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (1, n = 341) = 9.9, p < 0.01$ . A low correlation (-0.17) exists between *longevity* and *adequacy*, Spearman's correlation found that both were independent of each other,  $r_s = -0.17, p < 0.01$ .

Retirees with longevity in their families sometimes inherit less as their parents live longer and consume more wealth over their extended lifetimes. Also retirees may have had to financially support their aging parents for longer, or consume more when attending to their parents' needs. Active retirees without longevity in their families may have had the advantage of receiving inheritances earlier, adding to their net worth.

### Self-assessed Preparedness

The majority of active retirees can make a reasonable self-assessment as to their state of financial readiness for retirement. The  $prep^R$  difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (4, n = 341) 35.3, p < 0.001$ . While a moderate correlation (0.32) exists between  $prep^R$  and *adequacy*, Spearman's correlation found that both were independent of each other,  $r_s = 0.31, p > 0.001$ .

*Table 35: Active retiree pre- and post-survey self-assessed preparedness*

This table shows active retirees' self-assessment of the adequacy of their financial preparedness for retirement pre- and post-survey.

<b>Self-assessed preparedness - Pre-survey</b>		<b>Sample</b>	<b>Adequate</b>
Poorly-prepared	<i>n</i> = 68	15.20%	45.60%
Neither poorly or well-prepared	<i>n</i> = 83	18.60%	57.80%
Well-prepared	<i>n</i> = 296	66.20%	64.90%

### **Self-assessed preparedness - Post-Survey**

Poorly-prepared	<i>n</i> = 87	19.20%	43.70%
Neither poorly or well-prepared	<i>n</i> = 107	23.60%	56.10%
Well-prepared	<i>n</i> = 260	57.30%	68.80%

Further analysis found that there was a significant reduction in self-assessed financial preparedness for retirement between the pre-survey and post-survey results.<sup>102</sup> Some retirees who reduced their post-survey assessment realised that they were not as well-prepared as they had originally thought. No gender difference exists between the retiree pre-survey and post-survey results or the mean preparedness scores of males and females. Female retirees have a wider spread of scores than male retirees. A gender difference exists with the post-survey results with a reduction in female retiree scores and mean preparedness score reduced, with male retiree results and mean preparedness score remaining similar to their pre-survey scores.

Just under half (45.8%) of retirees made a change to their post-survey result, indicating an initial lack of awareness of the strength (or weakness) of respondents' financial position, or the tendency to either overstate their financial strength or underestimate their financial weaknesses. After exposure to the survey questions and experiencing the survey process respondents, particularly female pre-retiree respondents, gained a better

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<sup>102</sup> Refer to section 3.5.1.9

awareness of their own financial circumstances and are able to make a more accurate assessment of their preparedness with their second assessment.

#### NZ Superannuation is Sufficient

Nearly two thirds (64.1%) of active retirees did not agree that NZ Superannuation alone is enough to fund their retirement, and therefore took positive action to supplement their retirement income. This cohort achieved an adequacy proportion of 58.6%. This compares with those active retirees (17.9%) who agreed that NZ Superannuation alone is enough to fund their retirement. This cohort achieved a lower adequacy proportion of 51.2%.

*Table 36: Active retiree distribution & adequacy – NZ Super is enough*

This table shows in the first section the active retirees belonging to the low-NZ Superannuation is enough cohort and in the second section, active retirees belonging to the high-NZ Superannuation is enough cohort. The first and third columns show the proportion of active retirees who obtained retirement adequacy.<sup>103</sup> The second and fourth columns show the proportion of the population making up each cohort.

	Disagree NZ Super is Enough		Agree NZ Super is Enough	
	Adequate	Sample	Adequate	Sample
Low-income	59.8%	30.6%	54.3%	11.3%
	24.4%	12.2%	50.0%	5.6%
Low-invest	10.0%	27.5%	85.8%	12.8%
	7.3%	12.8%	84.1%	5.0%
Low-wealth	25.0%	18.6%	68.6%	47.1%
	13.2%	11.9%	66.7%	10.1%
Low-fincap	52.2%	32.1%	64.1%	15.7%
	19.6%	5.1%	65.7%	6.0%

The  $nzssuf^R$  difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (4, n = 337) 25.6, p < 0.001$ . While a moderate correlation (-0.27) exists between  $nzssuf^R$  and *adequacy*, Spearman's correlation found that both were independent of each other,  $r_s = -0.25, p < 0.001$ . There is a negative relationship between retirees' belief that NZ Superannuation would be sufficient alone and retirement adequacy.

As seen in Table 36 above, those who agreed that NZ Superannuation would be enough to fund retirement, regardless of the level of savings/investments, net worth or financial

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<sup>103</sup> Note that respondents with neutral (neither agree nor disagree) response have been exclude from the population percentage, therefore this will not add up to 100%.

capability, achieved higher adequacy proportions than those who disagreed. This could be because those in stronger financial positions were more optimistic about the contribution NZ Superannuation makes towards funding their retirement. Interestingly, just under a third (30.6%) of active retirees belong to the low-*income* cohort, and despite disagreeing that NZ Superannuation would be enough to fund retirement achieved the highest proportion of adequacy of the income cohort. Further research would be required in order to gain a better understanding of this phenomenon.

#### Development of Retirement Plans

Active retirees were asked, on a 1-7 Likert scale, to rate the development level of their retirement planning (*plandev<sup>R</sup>*). The high-*planning* cohort (75%) of active retirees had a rating of 5 or higher, whereas the low-*planning* cohort (25%) of active retirees had a rating of 3 or lower. The low-*planning* cohort of active retirees achieved an adequacy proportion of 23.9%, compared with 60.7% of the high-*planning* cohort of active retirees. Less than half the active retirees had a formal retirement plan (47.5%), and they achieved an adequacy proportion of 57.2%, whereas those who had no formal plan achieved a lower adequacy proportion of 41.5%. These results confirm Lusardi and Mitchell (2010) findings that greater levels of planning result in higher accumulation of wealth.

The *plandev<sup>R</sup>* difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (6, n = 340) = 48.6, p < 0.001$ . While a moderate correlation (0.34) exists between *plandev<sup>R</sup>* and *adequacy*, Spearman's correlation found that both were independent of each other,  $r_s = 0.34, p < 0.001$ . These results would indicate that a positive relationship exists between the level of retirement planning and retirement adequacy, which confirms the findings of Lusardi and Mitchell (2010) that those engaged in retirement planning, on average, accumulated more wealth than non-planners.

Those retirees with 'well-developed' (rated 7) retirement plans achieved an adequacy proportion of 75.9%, decreasing steadily with each preceding plan development rating until the lowest adequacy proportion of 5.9% for active retirees with no financial retirement plan. These results indicate that the better developed active retirees' retirement plans are before their retirement (*plandev<sup>R</sup>*) the greater is their probability of obtaining retirement adequacy.

Over half (60.7%) of active retirees said they had a ‘well-developed’ retirement plan<sup>104</sup>, conflicting with the 47.5% that stated that they had a formal plan. Either some retirees’ version of ‘well-developed’ included some who didn’t have their plan written down, or as Dunning, et al. (2004) found, a degree of self-enhancement has occurred. Nearly all (97.0%) of the low-planning cohort belong to the low-*fincap* cohort, and nearly all (97.7%) of the high-planning cohort belong to the high-*fincap* cohort. The high-planning cohort of active retirees, regardless of whether their level of financial capability is high or low, achieved higher adequacy proportions than the low-planning cohort of active retirees.

*Table 37: Active retiree distribution & adequacy – Planning*

This table shows in the first section the active retirees belonging to the low-*planning* cohort and in the second section, active retirees belonging to the high-*planning* cohort. The first and third columns show the proportion of active retirees who obtained retirement adequacy. The second and fourth columns show the proportion of the population making up each cohort, totalling 100%.

	Low-planning		High-planning	
	Adequate	Sample	Adequate	Sample
Low-income	37.3%	19.0	53.2%	29.5%
High-income	25.0%	6.0%	55.7%	45.5%
Low-invest	6.4%	18.6%	29.4%	26.9%
High- invest	87.5%	6.3%	89.3%	48.2%
Low- wealth	31.3%	18.9%	55.7%	27.6%
High-wealth	75.0%	6.3%	86.7%	47.2%
Low- <i>fincap</i>	2.0%	19.0%	31.6%	29.5%
High- <i>fincap</i>	6.3%	6.0%	50.0%	45.5%

The *planning* (low/high planning) difference in relation to *adequacy* using Pearson’s Chi<sup>2</sup> test was significant,  $\chi^2 (1, n = 268) = 27.3, p < 0.001$ . While a moderate correlation (0.32) exists between *planning* and *adequacy*, Spearman’s correlation found that both were independent of each other,  $r_s = 0.32, p < 0.001$ . As seen in Table 37 above, the high-*planning* cohort of active retirees, regardless of whether their income is high or low, achieved higher adequacy proportions than the low-*planning* cohort of active retirees. The *planning* difference in relation to *incgroup* using Pearson’s Chi<sup>2</sup> test was significant,  $\chi^2 (5, n = 268) = 16.9, p < 0.01$ . While a low correlation (0.17) exists between *planning*

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<sup>104</sup> Those retirees with rating of 5 to 7 were deemed to have ‘well-developed’ retirement plans.

and *incgroup*, Spearman's correlation found that both were independent of each other,  $r_s = 0.19$ ,  $p < 0.01$ . This would indicate that retirees' level of retirement planning is a better predictor of adequacy than the level of active retirees' household income.

High-*invest* and high-*wealth* active retirees, regardless of their level of retirement planning, achieved higher adequacy proportions than low-*invest* and low-*wealth* active retirees. This would indicate that the level of retirees' savings/investments and the level of net worth are better predictors of adequacy than active retirees' level of retirement planning. The *planning* difference in relation to *savings* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (10, n = 254) = 38.5$ ,  $p < 0.001$ . While a moderate correlation (0.36) exists between *planning* and *savings*, Spearman's correlation found that both were independent of each other,  $r_s = 0.37$ ,  $p < 0.001$ . The *planning* difference in relation to *nworth* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (10, n = 254) = 38.5$ ,  $p < 0.001$ . While a moderate correlation (0.39) exists between *planning* and *nworth*, Spearman's correlation found that both were independent of each other,  $r_s = 0.37$ ,  $p < 0.001$ .

The *planning* difference in relation to *fincap* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (1, n = 268) = 36.1$ ,  $p < 0.001$ . A moderate correlation (0.37) exists between *planning* and *fincap*, Spearman's correlation found that both were independent of each other,  $r_s = 0.537$ ,  $p < 0.001$ . These results would indicate that retirees' level of retirement planning is a better predictor of adequacy than the level of active retirees' financial capability and shows that financial capability has a strong positive relationship with the level of retirement planning. These results confirm the findings of Lusardi and Mitchell (2007b) that financial literacy influenced planning.

The *plandev<sup>R</sup>* difference in relation to *prep<sup>dR</sup>* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2 (24, n = 340) = 145.5$ ,  $p < 0.001$ . A strong correlation (0.49) exists between *plandev<sup>R</sup>* and *prep<sup>dR</sup>*, Spearman's correlation found that both were independent of each other,  $r_s = 0.49$ ,  $p < 0.001$ . A positive relationship exists for retirees between the level of retirement planning and the level of financially preparedness for retirement.

#### KiwiSaver Would Provide Savings Required

Respondents were asked whether they believed that KiwiSaver would provide enough savings to fund retirement. It should be remembered that few retirees in this survey would have invested in KiwiSaver, and those that did, only did so for a few years. Most retirees would view any KiwiSaver funds accumulated as a bonus.

The  $ksall^R$  difference in relation to *adequacy* using Pearson's Chi<sup>2</sup> test was significant,  $\chi^2(5, n = 331) = 38.5, p < 0.5$ . While a low correlation (-0.03) exists between *plan* and *adequacy*, Spearman's correlation found that both were dependent of each other,  $r_s = -0.02, p < 1.0$ .

*Table 38: Active retiree distribution & adequacy – KiwiSaver is enough*

This table shows in the first section the active retirees who belong to the Disagree-KiwiSaver is enough cohort and in the second section, active retirees belonging to the Agree-KiwiSaver is enough cohort. The first and third columns show the proportion of active retirees who obtained retirement adequacy.<sup>105</sup> The second and fourth columns show the proportion of the population making up each cohort.<sup>106</sup>

	Disagree KiwiSaver is Enough		Agree KiwiSaver is Enough	
	Adequate	Sample	Adequate	Sample
Low-income	47.9%	21.5%	49.4%	26.3%
High-income	47.6%	6.3%	60.0%	3.0%
Low-invest	10.8%	20.6%	83.3%	26.7%
High-invest	22.2%	5.7%	100.0%	3.8%
Low-wealth	22.1%	23.1%	66.3%	47.1%
High- wealth	10.0%	4.8%	71.5%	10.1%
Low-fincap	42.5%	32.1%	61.5%	15.7%
High- fincap	35.3%	5.1%	71.4%	4.2%

As seen in Table 38 above, those active retirees who agreed that KiwiSaver would be enough to fund retirement, regardless of the level of income, savings/investments, net worth, or financially capability, achieved higher adequacy proportions than active retirees who disagreed. As few active retirees would have benefited much from joining KiwiSaver, this result is counter-intuitive. It could be possible that active retirees in stronger financial positions were more optimistic about the impact KiwiSaver was likely to make to pre-retirees in the future. Further research would be required in order to gain a better understanding of this phenomenon.

#### Save Other Income

Just over a quarter (27%) of active retirees agreed that before retiring it was important to just spend wage/salary, and save any income received from other sources, rather than

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<sup>105</sup> Note: Respondents with neutral (neither agree nor disagree) response have been exclude from the population percentage, therefore this will not add up to 100%.

<sup>106</sup> Note the proportion of the population making up each cohort does not total 100% as it excludes neutral answers.

increase their consumption. This cohort achieved an adequacy proportion of 45.2%. This compares with the active retiree cohort who ‘disagreed’ (36.6%) who achieved adequacy proportions of 43.7%. There is a positive relationship between retirees’ decisions to deliberately save income received from other sources such as bonuses and investments and retirement adequacy.

The *bsother* difference in relation to *adequacy* using Pearson’s Chi<sup>2</sup> test was significant,  $\chi^2 (4, n = 344) 8.7, p < 0.1$ . While a low correlation (0.02) exists between *bsother* and *adequacy*, Spearman’s correlation found that both were not independent of each other,  $r_s = 0.02, p > 0.5$ .

## 4.4 Objective 4 Results and Discussion

**Objective 4:** *Using the key attributes and characteristics identified, develop a Financial Preparedness for Retirement Index for use in New Zealand.*

### *Introduction*

Using the active retiree database and having completed the analysis as detailed in Sections 4.1, 4.2 and 4.3, eight significant non-financial characteristics were identified as important contributors able to explain the construction of the dependent variable, *adequacy*. These significant variables together with their coefficients and the equation’s intersect (constant) formed the foundations for the development of the Financial Preparedness for Retirement indexation equation.

Active retiree’s individual responses to each significant variable were then put into the indexation equation to produce a probability value, which was then multiplied by ten and rounded to give an indexation score between ten (10 – adequate) and zero (0 – inadequate). Following this step, these predictive indexation scores were then compared against the financially-calculated adequacy scores. Earlier in Section 3.3.4 the logistic (logit) predictive model was preferred as the most appropriate predictive model, its results were again compared to probit, ologit, and OLS regression models to reconfirm that the logistic predictive model remained the preferred model.

### 4.4.1 Logistic Prediction Model

The logistic prediction model is:  $\ln \left[ \frac{\pi}{1-\pi} \right] = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + \varepsilon$

Using the results from the backward stepwise logistic regression shown in Table 39 below the logistic regression model can now be expressed in the following way:

$$\begin{aligned} \text{Pr}(Y=1 | x_i) = & -20.12 [\text{intercept}] + (\text{invtype}) \times 3.14 + ((\text{accomtype}) \times 1.06) + ((\text{longevity}) \\ & \times -1.01) + ((\text{prepd}^R) \times 0.67) + ((\text{NZSSuf}^R) \times -0.59) + ((\text{plandev}^R) \times 0.34) \\ & + ((\text{ksall}^R) \times 0.53) + ((\text{bsother}) \times 0.43) + [\text{error term}]. \end{aligned} \quad [20]^{107}$$

#### 4.4.2 Logistic Prediction Model Evaluation

Again, for comparison purposes in order to reconfirm the logistic prediction model as the preferred model upon which to build an index, the ologit, probit, and OLS predictive models were reconsidered. A range of analytical tests were applied to all four predictive models discussed. A few tests could not be performed due to the nature and constraints associated with the analysis procedures of some of the predictive models. Hosmer, et al. (2013) and Peng, et al. (2010) recommended evaluating the effectiveness of prediction models using significance tests of the model against the null model, significance test of each predictor, goodness-of-fit, and predictive probabilities.

The results of those tests are detailed in Table 39 below. Due to limitations, variations in the model structure or formulae involved with the comparison of the four models, some diagnostic tests could not be performed in STATA or calculated manually and some direct comparisons were unavailable. The number of diagnostic tests is not as critical as the quality of the results. Shtatland, et al. (2002) prioritise McFadden's adjusted  $R^2$  above AIC, as the most definitive of test scores.

The logit and probit models passed nearly all of the diagnostic tests, the only exception being the McFadden's  $R^2$  which was slightly low. Both the logit and probit models proved to be superior to the ologit and OLS models, with most of the diagnostic tests on the logit and probit models producing results with relatively little difference between them. Due to the number of similarities in model construction, it was expected that the logit and probit models would produce very similar results. In the majority of the diagnostic tests the logit model produced slightly higher results than probit, and the logit model has the higher percentage of correctly classified results than the probit model.

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<sup>107</sup> Note that the variable name in the brackets represents the respondent's score for that variable.

*Table 39: Model evaluation*

This table compares the effectiveness of four models. Logit and Probit Models: Dependent Variable: *adequacy* (Adequate = 1, Inadequate = 0). Ologit Model: Dependent Variable: *adequacy3* (Adequate = 3, Marginally Adequate = 2, Inadequate = 1). The OLS model uses the continuous adequacy differential. Constant is also included but its coefficients are not reported here.

	<b>Logit Model</b>	<b>Probit Model</b>	<b>Ologit Model</b>	<b>OLS Model</b>
Number of observation	179	176	176	176
Number of parameters ( <i>including intercept</i> )	9	10	10	8
Likelihood Ratio (LR)	92.42	<b>94.18</b>	-	78.4
Log Pseudo likelihood	<b>-74.80</b>	-73.92	-124.41	-189.19
Wald $\chi^2$	39.87	-	<b>61.69</b>	-
McFadden's R <sup>2</sup>	0.38	<b>0.39</b>	0.35	0.17
McFadden's Adjusted R <sup>2</sup>	<b>0.32</b>	<b>0.32</b>	0.31	0.14
R <sup>2</sup>	-	-	-	0.38
Deviance goodness-of-fit	149.6	<b>147.84</b>	248.83	378.39
Pearson goodness-of-fit	0.30	<b>0.45</b>	-	-
Hosmer-Lemeshow goodness-of-fit (group: 10)	<b>0.91</b>	0.30	-	-
Correctly Classified	<b>83.80%</b>	81.56%	-	-
Link test ( <i>p</i> -values):				
_hat	<b>0.00</b>	<b>0.00</b>	0.56	<b>0.00</b>
_hatsq	0.55	<b>0.83</b>	0.86	0.05
Area under ROC Curve	<b>0.89</b>	<b>0.89</b>	-	-
AIC*n	<b>0.94</b>	<b>0.94</b>	1.19	2.21
AIC	<b>169.60</b>	169.84	270.83	396.39

Given there are similar results between the logit and probit models, and that there is little difference in the McFadden's  $R^2$  results and the fact that the logit model has a higher percentage of correctly classified results and with fewer variables was more parsimonious, this tilts the balance in favour of the logit prediction model as being slightly better than the probit prediction model. The ologit model, passed few tests and was ranked third out of four, below both the probit and logit models. The OLS model was ranked fourth.

After considering all the results of the analytical tests performed and discussed above, the logistic predictive model is confirmed as the most statistically effective and represents a parsimonious and sufficiently explanatory model. The consistency between the logistic

(logit) prediction model results against the traditional calculation approach results provides confidence that the logit prediction model is robust.

#### 4.4.3 Development of Preparedness Index

Using just the eight significant factors (*invtype*, *acomtype*, *longevity*, *prep<sup>dR</sup>*, *nzssuf<sup>R</sup>*, *plandev<sup>R</sup>*, *ksall<sup>R</sup>*, and *bsother*) within the logistic prediction equation [20], the logistic prediction model then produces a logit probability value, between zero (0) and one (1). Those active retirees with a probability value of 0.5 or more were deemed likely to achieve retirement adequacy.

As the preparedness index has the potential for a wider application than use by just financial analysts it was considered that a whole number indexation score would allow for simple interpretation by the general public. The logit probability value was therefore multiplied by ten (10), and then rounded to the nearest whole number, to give an indexation score ranging from zero (0) to ten (10). For example, a logit probability value of 0.62 would be given an indexation score of 6.

Using the indexation equation meant there were 5.5% fewer active retiree observations than the number of financially calculated observations, as less behavioural information was available to complete each respondent's indexation equation. The mean indexation score for active retirees was 4.8, with a median score of 5. The standard deviation is 3.57, with a variance of 12.73, skewness of -0.09 and kurtosis of 1.47.

By taking an indexation score of 5 as being the point-of-adequacy, based upon logit probability, resulted in an adequacy proportion for active retirees of 49.5%. This is slightly more than the 48.6% achieved using the financial calculated *adequacy* for active retirees seen previously in Section 4.2. This compares with an adequacy proportion of 60.4% achieved by all current retirees. Comparison between the calculated adequacy and predicted adequacy found that the predictive logistic equation correctly predicted 83.8% of the calculated adequately prepared active retirees, with a sensitivity (true positives) of 79.3% and a specificity (true negatives) of 80.4%. A positive result overall.

### **Retiree Financial Preparedness for Retirement Equation**

The backward stepwise logistic regression, as well as identifying the significant independent variables, also produced coefficient values for each variable and an intercept value which form the basis for the Financial Preparedness for Retirement (FPfR) Indexation equation:

$$((invtype) \times 3.14) + ((accomtype) \times 1.06) + ((longevity) \times -1.01) + ((prepd^R) \times 0.67) + ((NZSSuf^R) \times -0.59) + ((plandev^R) \times 0.34) + ((ksall^R) \times 0.53) + ((bsother) \times 0.43) + -20.12 \text{ [intercept].} \quad [21]^{108}$$

This resulted in the FP<sub>f</sub>R indexation scores having a non-normal U-shape distribution of scores. Given the binary structure of the logit prediction model this was expected, with distribution weighted towards the extremes.

*Figure 10: FP<sub>f</sub>R Index score distribution for active retirees*

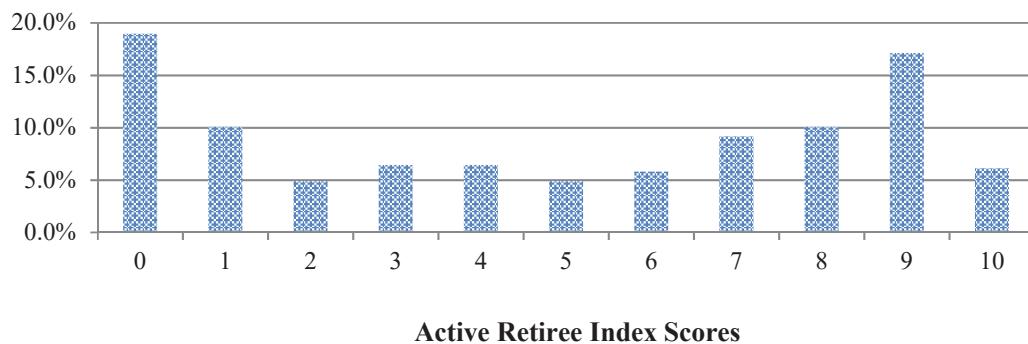


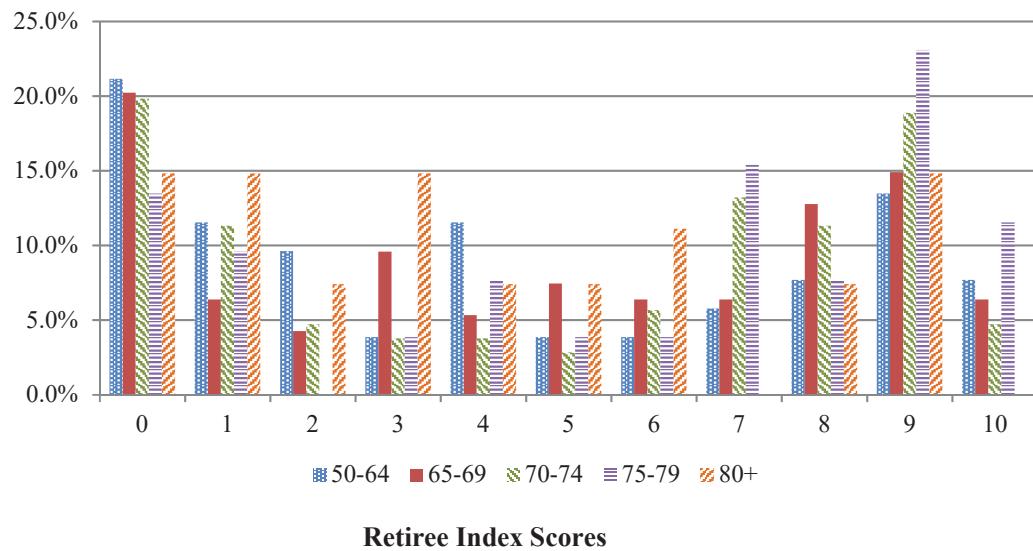
Figure 10 shows the U-shaped distribution of active retiree indexation scores, with the largest portion (19%) of active retirees having an index score of zero, with smaller proportions having scores between 2 and 6. Then the proportion of active retirees rises again with 17.1% having an index score of 9, then falls to 6.1% having an index score of 10. With 17.1% of active retirees had indexation scores of four (4) and six (6), this range is close to the ±20% band of marginal adequacy discussed earlier in Section 4.1.

The age group results seen in Figure 11 below shows for each indexation score the proportion of each age group with that index score. The oldest age group (80 years or over) have the highest proportion (66.7%) of active retirees with index scores of 5 or less, indicating that the active retirees aged 80 and over are the least adequate age group. This is understandable given the length of their retirement consumption period.

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<sup>108</sup> Note that the variable name in the brackets represents the respondent's score for that variable.

*Figure 11: FP<sub>f</sub>R Index score distribution for active retirees by age*



The youngest age group (50 – 64 years) has the next highest proportion (61.5%) of active retirees with index scores of 5 or less. Only a third (35.8%) of active retirees aged 50 – 64 years of age, who retired before being eligible for NZ superannuation, achieved retirement adequacy. This indicates that the majority of active retirees who retired early did so without being adequately prepared financially. It is unclear whether factors other than financial considerations, such as ill health or redundancy, could have influenced to their decision to retire early.<sup>109</sup>

## Conclusion

The approach to building a preparedness index is based upon taking the probability values produced by the logistic predictive model and the logit predictive equation [21], multiplying the resulting probability values by ten (10), then rounding to the nearest whole number. This was considered to be the simplest, most robust, and most easily understood method of expression of retirement preparedness. To achieve confirmation would involve carrying out longitudinal research, putting it beyond the capabilities of this study. Caution should be applied to these results, as with any retirement adequacy predictions, as confirmation can only occur at the end of retirees' retirement period. These predictions are also dependent on the level of retirement consumption households choose to adopt and the RRoR deemed acceptable.

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<sup>109</sup> Jeszeck, et al. (2015) found half US retirees retired earlier than planned due to health problems, changes at work, and other factors, and as a result under estimated their future retirement income.

## 4.5 Objective 5 Results and Discussion

**Objective 5:** *Using the index, determine how prepared pre-retirees aged 50 and over are for retirement.*

### Introduction

This investigation looks at two distinct cohorts of New Zealanders, retirees and pre-retirees. Pre-retirees are in a position of greater uncertainty than retirees. While retirees are uncertain about their future state of health and their likely longevity, they generally know what financial resources they have accumulated, the level of income coming into their household, and how much they currently consume. For pre-retirees these many factors are unknown.

While some pre-retirees are certain of their current financial position, there are additional uncertainties. Will earnings remain constant (grow or decline) before retirement? Will their (and their partner's) health and job be retained until retirement? How much can they save before retirement? How much will they consume during retirement?

The amount of financial resources accumulated before retirement is subject to a raft of variables – rates of return, risk tolerance, investment risk exposure, rate of consumption, saving rate, future asset replacement, and family demands on finances to name just a few. Pre-retirees' financial position is subject (and vulnerable) to constant change, both before and after retirement. For pre-retirees, preparedness means accumulating the necessary financial resources, repaying debt and home loans, being future focused, being in control of their finances, and educating themselves in financial matters. Projecting their savings and accumulated financial assets forward to retirement, based upon their RRoR and saving rate and all things remaining equal, shows whether they are likely to have accumulated sufficient financial resources to cover their retirement consumption needs.

Not having accurate financial information on the retirees before their retirement makes it difficult to make robust comparisons with pre-retirees. While the pre-retiree and retiree datasets are similar, the data has been collected at differing life-stage points. This is where a preparedness index becomes a useful addition to the financial calculations.

Pre-retirees need to be aware of the critical success factors that will impact on the accumulation of financial resources. These critical success factors include consumption

reduction, debt reduction, and saving. Essential to saving is being aware of, and factoring in, their required rate of savings, derived from the sum required, the remaining savings period, expected rate of return, their tolerance for investment risk and asset allocation.

By using the Financial Preparedness for Retirement equation [21] developed in Section 4.4.3, a Financial Preparedness for Retirement (FPfR) indexation scores were produced for pre-retirees over 50 years of age. This section investigates the Financial Preparedness for Retirement (FPfR) Index results and some of the key pre-retiree demographics. Comparison between the pre-retiree and retiree indexation results show that the pre-retirees are likely to be less prepared financially for retirement than current retirees.

#### 4.5.1 Pre-retiree Demographics

There were 590 pre-retiree respondents who completed the on-line survey. Although there were some slight variations in the overall demographics, overall pre-retirees had similar demographic proportions to active retirees as far as gender, marital status, and location. Pre-retirees had a more representative distribution of ethnicities than retirees, who had a higher proportion of Europeans. Slightly more pre-retirees (53.2%) lived in large cities (100,000 or more) than all current retirees (46%). This is consistent with NZ statistical data.<sup>110</sup> A greater proportion of pre-retirees (63.3%) hold tertiary qualifications as compared to all current retirees (55.1%).<sup>111</sup> Nearly three-quarters (73.9%) of pre-retirees aged 50 years and older are members of the KiwiSaver retirement saving scheme, with 63% of respondent partners also belonging. There were slightly fewer (83.6%) pre-retirees than all current retirees (89.4%) who owned their own home, with a greater proportion (46.1%) of pre-retirees having a home loan than all current retirees (14.8%).

The characteristics used in the construction of the Financial Preparedness for Retirement Index were the same for both retirees and pre-retirees. Caution should be applied to these results, as with any retirement adequacy predictions, confirmation can only occur once for pre-retirees, when they reach retirement, and for retirees once the retirement period ends.

Pre-retiree family size is slightly smaller than all current retirees, with a mean of 2.2 compared with the mean of all current retirees of 2.6. A large variation exists in the proportion of financial dependents, with 34.6% of pre-retirees having some financial

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<sup>110</sup> Refer to Appendix 4.

<sup>111</sup> The increase in educational qualifications could reflect a generational difference that occurred following a period of full-employment when qualifications were considered essential to obtaining employment.

dependents compared to just 5.2% of all current retirees. It is possible that some pre-retirees have young children, have dependent adult children still living at home, and/or are supporting elderly parents. The demographic differences between groups could simply reflect generational and societal changes which have occurred in New Zealand society over past years, such as increased immigration (Statistics NZ, 2016b).<sup>112</sup> These differences between retirees and pre-retirees may introduce some comparative uncertainty.

#### 4.5.2 Pre-retiree Retirement Adequacy

In the following discussion on pre-retiree adequacy results the calculated measure, *adequacy*, is used based upon the financial information supplied by the respondents through the on-line survey and the *point-of-adequacy* ( $PVTotHhldFinRes = PVTotRetConsc$ ). Later, the logistic predictive model uses the significant demographic, behavioural, and attitudinal variables to determine an indexation score for retirement adequacy.

After projecting their current financial information forward to their expected retirement year, using the same financial calculations applied to the retirees, it was found that 31.2% of pre-retirees aged over 50 years were likely to obtain financial adequacy should they maintain their current rate of income generation, savings and RRoR. The calculated retirement adequacy proportion for all pre-retirees is less than both the calculated adequacy proportion of 60.4% for all current retirees and 48.6% for active retirees. For full details on pre-retiree *adequacy* results see Appendix 8. For full details on all current retirees' *adequacy* results see Appendix 6 and for active retirees see Appendix 7.

In considering pre-retirees with the potential of being ‘passive’ pre-retirees, there is 10.5% of pre-retirees with household incomes of \$30,000 or less. Allowing for ‘passive’ retirees further reduces the ‘active’ pre-retiree financially calculated adequacy proportion to 25.9%. Caution is required when predicting the number of potential ‘passive’ pre-retirees, as many are self-employed and could be understating their current income in order to avoid tax, or could be undergoing a temporary period of losses or low profit. This could see adequacy lift closer to, or upon retirement. Conversely, unplanned changes in employment or health could see adequacy fall closer to, or upon retirement. Due to this

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<sup>112</sup> Source: Statistics NZ (2016b). In 2007 65% of immigrants to New Zealand were born overseas (78,300), 29% from Asian countries, 27% from the UK, and 17% from other countries.

uncertainty, it was determined it would be more appropriate to include all pre-retirees in the analysis.

### Pre-retiree Cohorts

The composition of the pre-retiree *invest*, *wealth*, and *fincap* cohorts, as seen Table 40 below, differs from the composition of the all current retiree and active retiree cohorts. There are a higher proportion of high-*income* pre-retirees than both ‘all current retirees’ and ‘active retirees’, and a higher proportion of low-*invest*, low-*wealth* and low-*fincap* than ‘all current retirees’ and ‘active retirees’.

It is expected that there will be a drop in required household income (but not consumption) when retirement commences, which is consistent with the consumption smoothing theories discussed earlier in Section 2.2. Given the percentage of low-*income* pre-retirees is markedly lower than all current retirees and active retirees, there is a possibility that both the level of retirement income and the reduction from pre-retirement income could be greater for pre-retirees than previously experienced by current retirees.

*Table 40: Pre-retiree cohort membership*

This table shows for each cohort the proportion of pre-retirees, all current retirees, and active retirees. The first column shows the proportion of pre-retirees belonging to the low-cohort and in second column belonging to the high-cohort. The third column shows the proportion of all current retirees belonging to the low-cohort and in fourth column belonging to the high-cohort. The fifth column shows the proportion of active retirees belonging to the low-cohort and in sixth column belonging to the high-cohort.

	Pre-retirees		All Current Retirees		Active Retirees	
	Low	High	Low	High	Low	High
<i>income</i>	24.2%	75.8%	61.5%	38.5%	49.4%	50.6%
<i>invest</i>	58.3%	41.7%	49.0%	51.0%	44.8%	55.2%
<i>wealth</i>	44.3%	55.7%	38.1%	61.9%	34.0%	66.0%
<i>fincap</i>	82.2%	18.0%	71.1%	28.9%	68.5%	31.5%

### Age Composition

Below, Table 41 shows a small percentage (7.6%) of pre-retirees in full-time employment and aged over 65, the NZ Superannuation entitlement age. It also shows that the proportions of calculated adequacy increase with age, a similar trend as with the retirees. Those working full-time in the 65-69 age group achieve a higher adequacy proportion

than those working in the 60-64 age group. A drop in the adequacy proportion then occurs for those pre-retirees aged 70 and over, and they have the lowest pre-retiree adequacy proportion (25%). This is a strong indication that pre-retirees in the 65-69 age group still in full-time employment are working out of financial necessity rather than by choice.

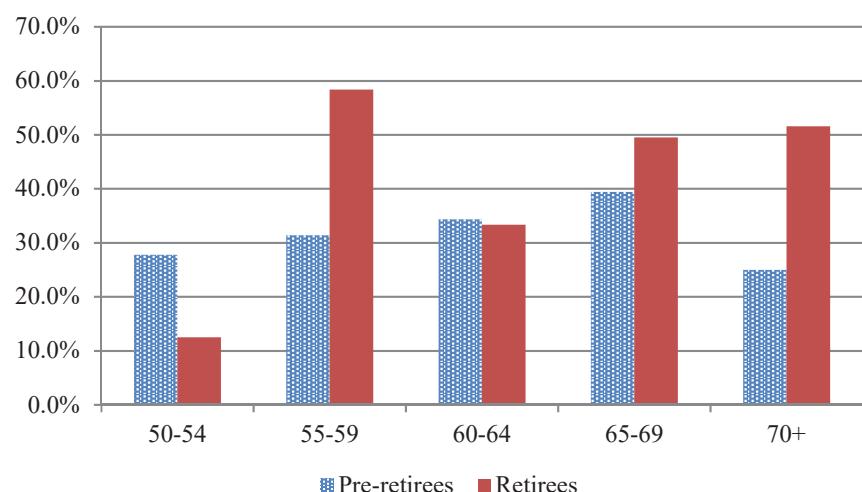
*Table 41: Pre-retiree adequacy by age group*

This table shows in the second column the adequacy proportion achieved by pre-retirees by age group. The third column shows the proportion of pre-retirees in each age group.

Age Group	Adequate	Sample %
50-54	27.7%	32.4%
55-59	31.4%	37.8%
60-64	34.4%	22.2%
65-69	39.4%	5.6%
70+	25.0%	2.0%
<b>Total</b>	<b>31.2%</b>	<b>100%</b>

Figure 12 below compares the adequacy of the various pre-retiree and active retiree age groups. While pre-retirees have a higher adequacy proportion in the 50-54 age group than the active retirees, retirees have a higher adequacy proportion in the 55-59, 65-69, and 70+ age groups than the pre-retirees. It should be remembered that 15.3% of retirees retired before age 65, and just 3.5% were in the 55-59 age group. Overall Figure 12 shows that pre-retirees are less well-prepared for retirement than active retirees.

*Figure 12: Distribution of pre-retiree & active retiree adequacy by age*



## Retirement Age

The mean intended retirement age of pre-retirees (65.6 years) and the mean actual retirement age of all current retirees (65.6 years) are similar. Pre-retirees intending to retire before 65 have a higher expected retirement age (58.5 years) than all current retirees who actually retired (57.7 years) before age 65, indicating that pre-retirees expect to work slightly longer than all current retirees did. Also, fewer (22.4%) have the intention of retiring before age 65, compared to all current retirees who actually retired before age 65 (34.8%).

As seen in Table 42 below, all current retirees who worked beyond the age of 65, appear to have actually worked longer (to 72.5 years) than those pre-retirees expecting to work beyond age 65 (71 years). Given the low adequacy proportions of pre-retirees, this suggests that those pre-retirees expecting to work beyond age 65, despite aiming to retire earlier than their all current retiree counterparts, could potentially work for longer than they anticipate.

The other major difference is the percentage of pre-retirees intending to retire at age 65 (36.1%) when compared to the percentage of all current retirees (27.8%) who actually retired at age 65. Again, if the same retirees' experience is repeated for pre-retirees, a greater number of pre-retirees could end up working beyond age 65 than first anticipated.

*Table 42: Pre-retiree & retirees retirement age summary*

This table shows in the first two columns retirees actual retirement ages and the proportion for each cohort. In the third and fourth columns pre-retirees intended retirement ages and the proportion for each cohort.

	Retirees Actual		Pre-retirees Intended	
	Mean Retire Age	Sample %	Mean Retire Age	Sample %
Retire before 65	57.7 years	34.8%	58.5 years	22.4%
Retire at 65	65 years	27.8%	65 years	36.1%
Retire after 65	72.5 years	37.3%	71.0 years	31.5%

The decision when to retire has to consider several factors, such as the availability of work, enjoyment, health, as well as a wide range of family matters and personal goals. A key determinant is whether the pre-retiree believes they have accumulated enough financial resources to see them through their retirement. Just over a quarter (26.4%) of pre-retirees believe they need to accumulate less than \$250,000 in order to live

comfortably in retirement, 26.6% believe they need to accumulate between \$250,001 and \$500,000, 27.4% believe they need to accumulate between \$500,001 and \$1 million, and 19.5% believe they need to accumulate in excess of \$1 million. Just under a third (30.5%) of pre-retirees believed that they were saving enough, compared to 59.8% of all current retirees who believed they had saved enough. Interestingly, just over two-thirds (69.6%) of pre-retirees also believed that they will be unlikely to achieve their accumulation target.

There is a risk that the pre-retirees who plan to work longer may over-consume and undersave today, will for unforeseen reasons end up working fewer years than they planned. Not only will they have saved less, the length of time in retirement is longer, and their total retirement consumption is higher than they had anticipated. Jeszeck, et al. (2015) points out that pre-retiree expectations of retiring later may prove unrealistic, or fail to come to fruition, putting their retirement adequacy at risk should they work for fewer years than they planned.

### **Retirement Income**

It is difficult to predict future retirement income based purely on current household income, as pre-retirees financial position can change markedly before retirement or once they have converted or liquidated business assets into an income generating form. Pre-retiree household incomes are markedly higher than all current retirees. The mean replacement rate ratio for pre-retirees (66%) is slightly higher than the mean replacement rate ratio for retirees (64%).

Table 43 below shows that as the pre-retiree household income increases the adequacy proportion declines. This is a reversal of the retiree household income to adequacy trend, which while not as clear, shows that retiree adequacy increases with an income increases.

*Table 43: Pre-retiree & retiree adequacy by household income*

This table shows in the first column the household income group related-adequacy proportions, and in the second column the household income group related-adequacy proportions.

	<b>Pre-retirees</b>	<b>Active Retirees</b>	
	<i>Sample</i>	<i>Sample</i>	
\$30,000 or less	57.6%	10.5%	39.10%
\$30,001 - \$50,000	50.6%	13.7%	52.00%
\$50,001 - \$70,000	26.9%	15.8%	47.80%
\$70,001 - \$100,000	17.3%	18.6%	58.50%
\$100,001 - \$150,000	20.4%	28.3%	32.50%
More than \$150,000	22.1%	13.1%	60.00%

Pre-retirees' expectations regarding accumulation amounts, retirement income, and earlier retirement ages appears optimistic given the low overall adequacy, together with the decreasing household income adequacy rates. This is an indication that many pre-retirees may face a large adjustment upon retirement, one that involves a major reduction from pre-retirement consumption to retirement consumption, much larger than many pre-retirees anticipate.

#### 4.5.3 Pre-retirees' FPfR Indexation Score

The same Financial Preparedness for Retirement (FPfR) indexation process, developed in Section 4.4.3 for retirees, was used to produce an FPfR index score for pre-retirees aged over 50 years. Analysis shows the mean and median FPfR indexation score for pre-retirees ( $n = 576$ ) is 0, with a standard deviation of 0.97 and a variance of 0.93, which a range of indexation score from zero (0) to seven (7). The L-shape distribution of pre-retiree FPfR indexation scores is non-normal, with the vast majority having an indexation score of zero (0). The mean Financial Preparedness for Retirement (FPfR) index score for pre-retirees is 0, indicating that pre-retirees aged over 50 years are less prepared for retirement than all current retirees and active retirees, who had a mean Financial Preparedness for Retirement (FPfR) Index score of 5.

*Figure 13: FPfR Index Score Distribution for Pre-retirees & Retirees*

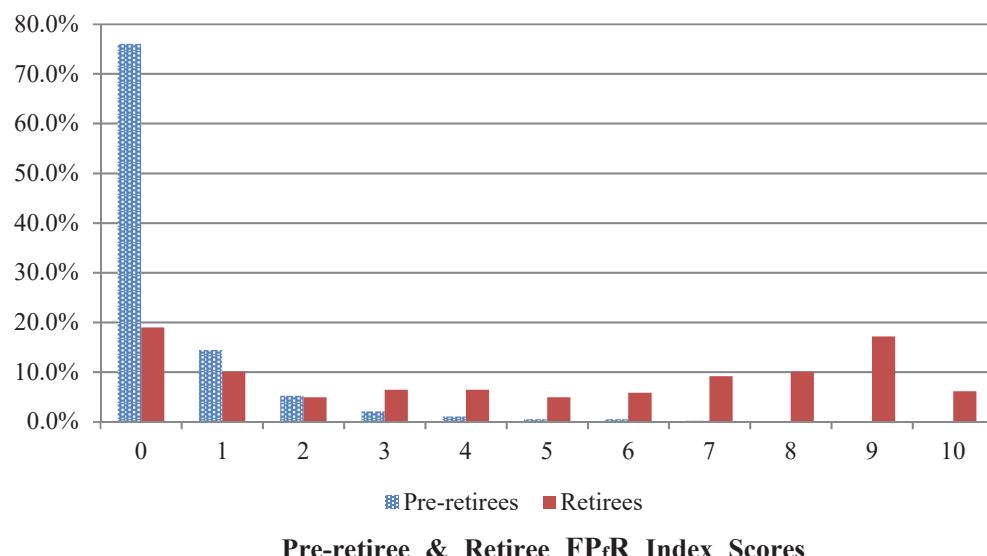
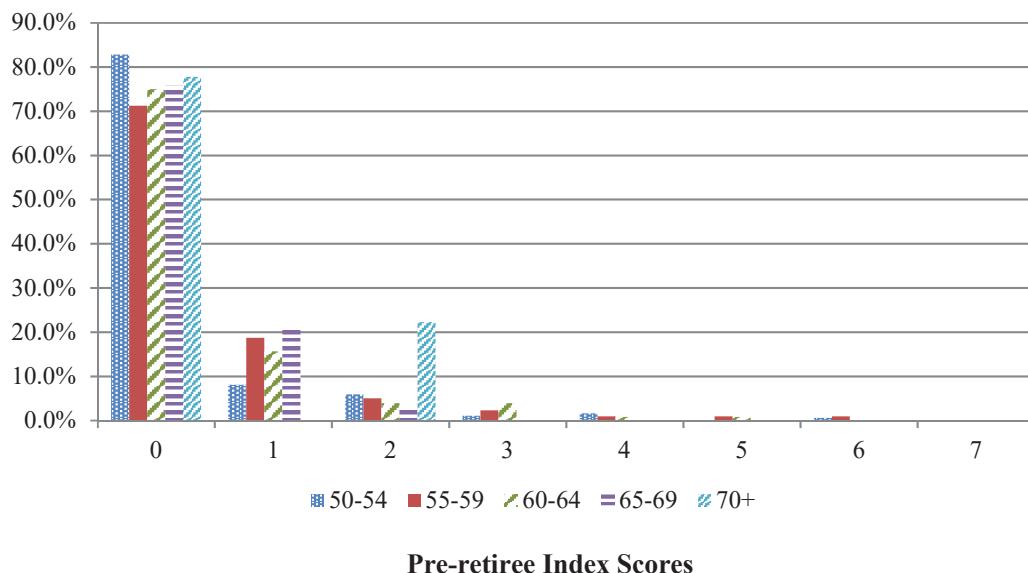


Figure 13 above shows there is a concentration (76%) of pre-retirees with an indexation score of zero, with smaller proportions of scores between 1 and 7. The L-shaped

distribution of the pre-retirees index scores is dissimilar to the retiree index score distribution. Due to the heavy concentration of zero (0) indexation score it is not possible to calculate a ±20% band of marginal adequacy for pre-retirees.

Figure 14 below shows that the 50-54 age group was the group with the highest proportion (82.8%) with an indexation score of zero (0). Following that, the proportion with an indexation score of zero (0) then increases with age, from 71.2% of the 55-59 age group to 75% of the 70+ age group. The proportion of pre-retirees with indexation scores of two or less is high for the 65-69 and 70+ age groups. Again, this indicates that the majority of these age groups may be working for financial reasons.

*Figure 14: FPfR Index score distribution by age group for pre-retirees*



As discussed in Section 4.4, a point-of-adequacy of 5 on the FPfR Index produced an adequacy proportion of 50.2% for active retirees. Applying the same point-of-adequacy of 5 on FPfR Index for pre-retirees resulted in 1.2% of pre-retirees achieving adequacy, meaning that the vast majority of pre-retirees are likely to be financially unprepared for retirement. As a global comparison, Aegon's (2013) survey of 12 countries, excluding Australia and New Zealand, found that 66% had pre-retiree ARRI indexation scores<sup>113</sup> below 5, which was considered a 'low' level of retirement readiness.

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<sup>113</sup> ARRI index scores were calculated based on a sample of 10,800 employees and excluded those who had retired.

Nearly a third (31.2%) of pre-retirees are likely to be adequately prepared using the calculated adequacy proportion based on the financial information supplied. Unlike the active retirees where the proportion of financially calculated adequacy and the FPfR Indexation scores produced similar results, for pre-retirees the results are vastly different. Unfortunately, it would therefore be unwise to apply the same FPfR Indexation equation used for retirees to pre-retirees as a predictor of retirement adequacy.

This discrepancy in results would indicate that the demographic, attitudinal, and behavioural factors driving active retiree retirement adequacy are not evident in pre-retirees. It is unclear what has caused this. It is possible that differences in the societal and economic conditions that occurred during the income-generating years of both retirees and pre-retirees have resulted in a major generational shift in financial attitudes and behaviour. Further research would be required to identify the key changes in financial attitudes and behaviour and to gain a better understanding of this phenomenon.

#### 4.5.4 Pre-retiree Financial Preparedness for Retirement Equation

The high number of zero pre-retiree indexation scores and the small number of pre-retiree indexation scores of one (1) to seven (7) was unexpected. It was decided to perform a backward stepwise logistic regression of the same 57 independent variables using the pre-retirees' data to see if a pre-retiree FPfR indexation equation would produce more comparative results. The pre-retiree backward stepwise logistic regression identified eleven significant variables, four were common to the retirees (see Section 4.3.2), being *invtype*, *accomtype*, *nzsuf*, and *prepdr<sup>R</sup>*, and seven new factors, being: *region*, *bpaycc*, *hasmortg*, *health*, *findep*, *absence*, and *managfin*.

The resulting coefficient values for each variable and an intercept value which form the basis for the pre-retiree Financial Preparedness for Retirement (FPfR<sup>P</sup>) Indexation equation:

$$((invtype) \times 0.75) + ((accomtype) \times 0.45) + ((NZSSuf^R) \times 0.38) + ((prepdr^R) \times 0.48) + ((region) \times -0.05) + ((bpaycc) \times 0.19) + ((hasmortg) \times 1.19) + ((health) \times -0.33) + ((findep) \times -0.40) + ((absence) \times 0.22) + ((managfin) \times -0.023) + -5.92 \text{ [intercept].} \quad [22]^{114}$$

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<sup>114</sup> Note that the variable name in the brackets represents the respondent's score for that variable.

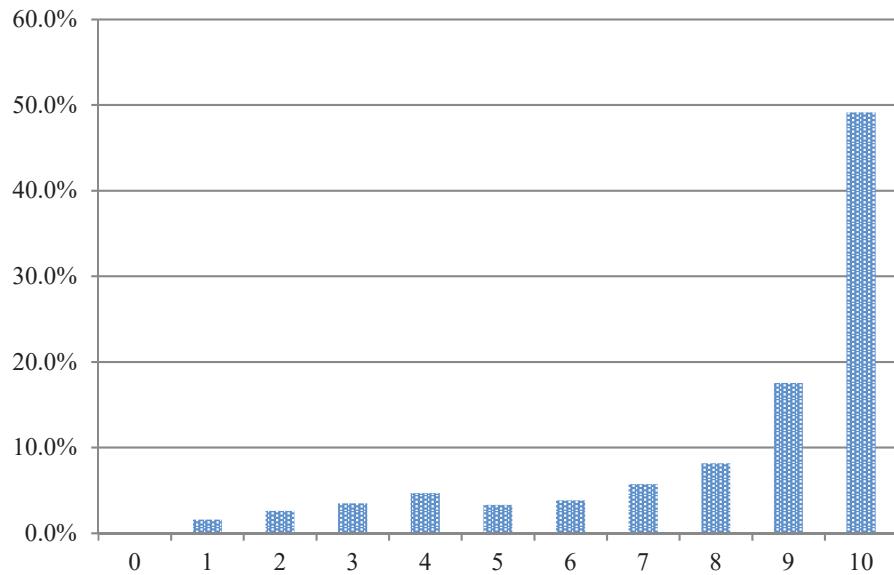
Table 44 below shows that there were four significant variables, being *invtype*, *acomtype*, *plandev<sup>P</sup>* and *prepdp<sup>P</sup>* common to both, and seven unique to either equation.

*Table 44: Backward stepwise logistic regression - Pre-retirees*

Logistic regression				Number of obs	=	443
				Wald chi2(11)	=	59.32
				Prob > chi2	=	0
Log pseudolikelihood =		-239.46		Pseudo R2	=	0.13
<i>adequacy</i>	Coef.	Robust Std. Err.	t	P>t	[95% Conf. interval]	
prepdp	0.48	0.13	3.81	0.00	0.23	0.73
nzssufp	0.38	0.12	3.05	0.00	0.14	0.63
region	-0.05	0.02	-2.31	0.02	-0.10	-0.01
bpaycc	0.19	0.10	2	0.05	0.00	0.39
hasmortg	1.19	0.52	2.27	0.02	0.16	2.22
invtype	0.75	0.22	3.42	0.00	0.32	1.18
health	-0.33	0.18	-1.82	0.07	-0.68	0.02
acomtype	0.45	0.22	2.06	0.04	0.02	0.87
findep	-0.40	0.15	-2.62	0.01	-0.69	-0.10
absence	0.22	0.11	2.05	0.04	0.01	0.44
managefin	-0.23	0.13	-1.74	0.08	-0.50	0.03
cons	-5.92	1.62	-3.66	0.00	-9.09	-2.75

The new FP<sub>f</sub>R<sup>P</sup> indexation equation once again produced an abnormal distribution curve for the FP<sub>f</sub>R<sup>P</sup> Index scores. Interestingly, the distribution curve seen in Figure 15 below shows a reversal of the retiree FP<sub>f</sub>R indexation score distribution seen in Figure 13 above. The mean FP<sub>f</sub>R<sup>P</sup> index score is 8.2, with fewer (36.3%) FP<sub>f</sub>R<sup>P</sup> index scores being correctly classified. Nearly half of the correctly classified retiree FP<sub>f</sub>R index scores. Neither the results using the FP<sub>f</sub>R indexation equation nor the results using the FP<sub>f</sub>R<sup>P</sup> indexation equation were considered robust enough to provide any predictive value. Given this, the analysis in this section is based largely on the comparison between the pre-retiree and retiree financial calculations.

Figure 15:  $FPjR^P$  Indexation Score Distribution for Pre-retirees



#### 4.5.5 Pre-retiree & Retiree Factor Comparison

The next step in the investigation process was to identify if differences existed in the financial attitudes and behaviour between pre-retirees and retirees. This was done by looking at the major proportional differences between the pre-retiree and retiree factors identified through the backward stepwise logistic regression process.

As seen in Table 45 below, there is a slight (4.6%) reduction in the overall home ownership between retirees and pre-retirees, as seen in the accommodation type (*accomtype*), however the most notable change occurs with regards to home loans with more (46.1%) pre-retirees still with a home loan, compared to 14% of retirees. Another notable difference is the reduction in the number of homes held in trust, with fewer pre-retiree homes owned in a trust than retiree homes.

Also, fewer pre-retirees believed that the level of their retirement plans (*plandev*) were well-developed (61.3%), compared to 82.8% of retirees. A similar high correlation (0.63) between  $plandev^P$  and  $prepdp^P$  for pre-retirees as exists for retirees (0.68). Interestingly, the proportion of pre-retirees who believed that they are poorly-prepared financially for retirement (*prepdp*) was twice that of retirees, and this is another indication that pre-retirees are not as well-prepared for retirement as retirees.

Table 45: Pre-retirees & retirees adequacy & population differences

This table shows the significant factors common to both pre-retirees & retirees. For each variable response, the adequacy and population proportions for pre-retirees appear in the first two columns, and the adequacy and population proportions for retirees in the third and fourth columns. For each data section the population (*sample*) figure shows each factors makeup, totalling 100%. <sup>115</sup>

	Pre-retirees		Retirees	
	Adequacy	Sample	Adequacy	Sample
No investments	24.0%	8.5%	0.0%	5.5%
Investments only	16.0%	8.5%	65.2%	6.6%
Home Equity only	26.3%	26.3%	1.3%	22.0%
Investments + Home Equity	35.6%	63.7%	65.9%	65.9%
Own home with home loan	29.2%	37.4%	26.5%	9.9%
Trust home with home loan	41.2%	8.7%	14.3%	4.1%
Own home with no home loan	34.1%	28.5%	53.1%	51.3%
Trust home with no home loan	41.5%	9.0%	60.8%	22.9%
Flat / Rent / Board / Lease	18.6%	16.4%	36.6%	11.9%
<i>plandev</i> - Poorly developed	20.0%	26.5%	39.5%	11.0%
<i>plandev</i> - Well-developed	35.4%	61.3%	52.3%	82.8%
<i>prepdp</i> - Poorly prepared	29.0%	35.8%	19.7%	19.7%
<i>prepdp</i> - Well prepared	35.4%	43.9%	58.8%	58.8%

Table 46 below shows that twice as many retirees compared to pre-retirees believe that NZ Superannuation will be sufficient for them in retirement (*nzsuf*). Interestingly, the adequacy proportion (51%) of pre-retirees holding this belief was higher than retirees holding the same belief (25%). This indicates that pre-retirees who believed that NZ Superannuation would be sufficient are financially well-prepared for retirement, and differs from retirees with the same belief. Conversely, retirees who disagreed that NZ Superannuation is sufficient achieved higher adequacy rates than pre-retirees. Retirees holding the belief that NZ Superannuation is insufficient to meet their retirement needs achieved higher levels of adequacy indicating that they have taken more action to augment their NZ Superannuation than pre-retirees.

There is a reduction in the proportion of pre-retirees, as compared to retirees, who had a member of their family reach the age of 90 (*longevity*). Both pre-retirees and retirees without longevity in their family achieved lower adequacy proportions than pre-retirees

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<sup>115</sup> Note: Respondents with neutral (neither agree nor disagree) response have been excluded from the population percentage, therefore this will not add up to 100%.

and retirees with a history of longevity in their family. This would indicate that those with a history of longevity in their family are aware of the potential for a longer than normal period in retirement, and accumulate more financial resources than those with no such history.

*Table 46: Unique retiree adequacy & population differences*

This table shows the significant factors unique to retirees. For each variable response the adequacy and population portions for pre-retirees are shown in the first two columns, the adequacy and population portions for retirees in the third and fourth columns.<sup>116</sup>

	Pre-retirees		Retirees	
	Adequacy	Sample	Adequacy	Sample
<i>nzsuf</i> - Disagree	26.8%	70.1%	56.5%	64.1%
<i>nzsuf</i> - Agree	51.0%	8.4%	25.0%	17.8%
<i>longevity</i> - No	20.0%	26.5%	39.5%	11.0%
<i>longevity</i> - Yes	35.4%	61.3%	52.3%	82.8%
<i>ksall</i> - Disagree	30.8%	54.4%	52.3%	86.7%
<i>ksall</i> - Agree	31.6%	45.6%	23.9%	13.3%
<i>bsother</i> - Disagree	61.9%	3.6%	53.8%	3.8%
<i>bsother</i> - Agree	37.8%	16.8%	41.3%	13.4%

Table 46 shows that three times as many pre-retirees (45.6%) than retirees (13.3%) believe that belonging to the KiwiSaver retirement savings scheme should provide enough for them in retirement (*ksall*). While this may be true for those who join in their 20s, given the low adequacy proportion of pre-retirees this is not the case for those who join KiwiSaver in their mid-40s or in their 50s, as the number of contributing years and time in the investment market is less. It is concerning that just under half of the pre-retirees hold this flawed belief.

Small, but similar proportions of pre-retirees and retirees believe in saving any income from sources other than wages and salaries (*bsother*). Interestingly, the small proportion of pre-retirees, who disagreed with saving income from other sources, achieved a high adequacy proportion. There does not appear to be any clear rationale for this outcome and is contrary to Friedman's (1957) Permanent Income Hypothesis, which suggests extra income over and above their perceived permanent income would be saved. This phenomenon may warrant further research.

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<sup>116</sup> Note: Respondents with neutral (neither agree nor disagree) response have been exclude from the population percentage, therefore this will not add up to 100%.

There is little proportional difference between the various geographical regions (*region*), seen in Table 47, between pre-retirees and retirees. Auckland's retiree adequacy proportion is slightly less than the overall current retiree adequacy proportion (48.8%), in contrast to the other two main centres, Wellington and Canterbury, which are slightly higher. This phenomenon is reversed with Auckland's pre-retiree adequacy proportion being slightly higher than the overall current retiree adequacy proportion (31.2%), contrasting the other two main centres, Wellington and Canterbury, which are slightly less. There is no obvious rationale for this difference and it could warrant further research.

*Table 47: Unique pre-retiree adequacy & population differences*

This table shows the significant factors unique to pre-retirees. For each variable response the adequacy and population proportions for pre-retirees is shown in the first two columns, the adequacy and population proportions for retirees in the third and fourth columns.<sup>117</sup>

	Pre-retirees		Retirees	
	Adequacy	Sample	Adequacy	Sample
<i>region</i> - Auckland	33.3%	36.0%	45.2%	33.2%
<i>region</i> - Wellington	25.0%	12.2%	54.3%	10.0%
<i>region</i> - Canterbury	22.1%	13.1%	52.3%	12.7%
<i>region</i> - Other North Island	35.7%	26.1%	50.0%	33.5%
<i>region</i> - Other South Island	31.0%	12.0%	44.4%	10.4%
<i>bpaycc</i> - Disagree	20.0%	26.5%	39.5%	11.0%
<i>bpaycc</i> - Agree	35.4%	61.3%	52.3%	82.8%
<i>hasmortg</i> - No	30.8%	54.4%	52.3%	86.7%
<i>hasmortg</i> - Yes	31.6%	45.6%	23.9%	13.3%
<i>health</i> - Poor	61.9%	3.6%	53.8%	3.8%
<i>health</i> - Fair	37.8%	16.8%	41.3%	13.4%
<i>health</i> - Good	29.6%	53.7%	49.0%	61.2%
<i>health</i> - Excellent	26.3%	26.0%	52.7%	21.6%
<i>absence</i> - No	52.9%	88.4%	40.0%	85.4%
<i>absence</i> - Yes	31.6%	11.6%	50.7%	14.6%
<i>finddep</i> - No	34.2%	65.4%	48.3%	94.8%
<i>finddep</i> - Yes	25.1%	34.6%	50.0%	5.2%
<i>managefin</i> - Disagree	29.7%	15.6%	19.2%	7.5%
<i>managefin</i> - Agree	31.7%	63.1%	55.8%	80.6%

Both pre-retirees and retirees who pay off their credit card in full to avoid finance charges (*bpaycc*) achieve higher adequacy proportions than those who fail to pay off their credit

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<sup>117</sup> Note: Respondents with neutral (neither agree nor disagree) response have been exclude from the population percentage, therefore this will not add up to 100%.

card in full. Table 47 above shows that twice as many pre-retirees as retirees fail to pay off their credit card, which indicates a shift in financial behaviour, which may warrant further research.

There is little proportional difference between pre-retirees' and retirees' state of health (*health*) and absence for six months or longer from work due to ill health (*absence*) seen in Table 47. It is unclear why the adequacy proportion of pre-retirees and retirees with poor health is higher than those with better health. This could be a reflection of the question wording, as respondents' health varies and could deteriorate over time and their answer could reflect their current state of health, rather than their general state of health over the extended period before retirement. This could also be due to the spouse working or having income protection cover.

Notably, while the adequacy proportion of pre-retirees who had not been absent for six months or longer from work due to ill health was notably higher than the overall pre-retiree adequacy proportion. It is understandable that those less absent from work due to long periods of ill health would accumulate greater amounts of financial resources. This could also indicate that the incidences of long periods of absence from work due to ill health are more likely to occur closer to retirement. However, the adequacy proportion of retirees who had not been absent for six months or longer from work due to ill health was lower than retirees who had been absent, and both were lower than the overall current retiree adequacy proportion.

While there is little difference between retirees with financial dependents (*findep*) and those without, this is not the case for pre-retirees. Pre-retirees without financial dependents achieved a slightly higher adequacy proportion than the overall pre-retiree adequacy proportion. Conversely, pre-retirees with financial dependents achieved a lower adequacy proportion than the overall pre-retiree adequacy proportion. Nearly a third (29.4%) more pre-retirees had one or more financial dependents than retirees, which could be a reflection of their current life stage. Note that the model assumes no future financial support from current dependents to pre-retirees.

There is a marked reduction in the proportion of pre-retirees (63.1%) who stated that they were currently managing financially (*managefin*), compared to retirees (80.6%). The proportion (15.6%) of pre-retirees stating that they were finding it difficult to manage financially is twice that of retirees (7.5%). The fact that a greater proportion of pre-retirees

compared to retirees are finding it difficult to manage financially could provide an explanation as to why pre-retirees are less prepared financially for retirement than retirees. It should be remembered that some of the difference discussed above could simply reflect differing life stages.

#### 4.5.6 Savings Deficit of Pre-retirees

It is likely that at least two-thirds of pre-retirees are unlikely to achieve retirement adequacy, yet only a third (34.5%) of pre-retirees recognised that their retirement planning is poorly-developed. This means that a large proportion of retirees do not realise they need to be saving more. Duncan, et al. (1984) and Mitchell & Moore (1998) as discussed earlier in Section 2.3.1, considered the savings deficit of pre-retirees by calculating the ‘needed savings rate’, when considering the savings rate necessary to accumulate the necessary financial resources before retirement. **Error! Reference source not found.** below shows that only a small proportion of pre-retirees, by making additional savings from their annual household income or by reducing consumption, could accumulate enough to cover their projected retirement savings deficit. The savings deficit being the difference between total retirement consumption less total financial resources ( $HhldRetCons - PVTotHhldFinRes$ ).<sup>118</sup>

*Table 48: Savings deficit as proportion of pre-retiree household income*

This table shows the proportion of pre-retiree annual household income required in additional savings each year until retirement to fulfil their current savings deficit.<sup>119</sup>

<u>Additional annual savings required</u>	% Sample
25% or less	9.4%
26% - 50%	21.4%
51% - 75%	19.5%
76% - 100%	15.4%
More than 100%	34.4%
<b>Total</b>	<b>100.0%</b>

<sup>118</sup> NOTE: Total household financial resources exclude any home equity.

<sup>119</sup> Note that the reduced total number of pre-retirees is caused by a number of pre-retirees aged 65 and over who did not state a retirement age, making the compounded annual savings required impossible to calculate.

Potentially a number of these near-adequate pre-retiree households are capable of reducing their current level of pre-retirement consumption in order to save more. This has a dual benefit. As well as achieving the additional saving required, it also reduces total retirement consumption expectations and requirements. There is a good possibility that the majority of pre-retiree households required to save an additional 25% or less could achieve their additional savings target through reducing their current level of consumption.

The savings challenge facing pre-retirees is non-linear. That is, the income gap pre-retirees needed to fill, as a percentage of their income increases exponentially. Initially the pre-retirement income requirement differential increases faster than the surplus income available, then as income rises the increase in the percentage of income required to fill the gap increases at a slower rate than income. This shows that the savings task is harder in the middle.

It seems unlikely that the large percentage (90.6%) of pre-retiree households who still require additional savings of more than 25% of their annual income will achieve their required savings target within the remaining pre-retirement years, especially for those households with high levels of debt. Given that 69.3% of pre-retiree households require additional annual savings of over 50% of their current annual income, it would appear that two-thirds of pre-retirees are incapable of making sufficient additional savings within their remaining pre-retirement years.

Any increase in savings will improve the pre-retirees' financial position and reduce the savings deficiency gap. Any reduction in consumption also helps reduce the savings deficiency gap. Given these results, it is anticipated the comparison of demographic and behavioural characteristics will reveal some valuable insights into potential causes of this adequacy differential between pre-retirees and retirees.

#### 4.5.7 Discussion

With less than 15 years before becoming entitled to NZ Superannuation, only a third of pre-retirees are likely to achieve retirement adequacy based the financial calculations, this would indicate that New Zealanders aged 50 and over are less financially prepared for retirement than older generations. It is possible that the older generations had more favourable economic conditions which allowed them to accumulate wealth, have inherited sooner, or retiree attitudes towards saving and consumption are different from

that of pre-retirees. Given that more pre-retirees compared to retirees are finding it difficult to manage financially, is another indication that generational differences exist.

It should be recognised that before the advent of the KiwiSaver retirement saving scheme in 2007, retirement savings was left entirely to the pre-retirees' own volition. The introduction of KiwiSaver should theoretically have resulted in a greater number of pre-retirees being financially well-prepared for retirement than if the KiwiSaver retirement savings scheme had not been introduced. While growth in pre-retirees' KiwiSaver investments have been factored in, it appears that the KiwiSaver retirement scheme has had little impact on the retirement adequacy of pre-retirees aged 50 and over, due to the short period of participation.

An unknown factor is the amount of inheritance pre-retirees potentially could receive at some point in the future, and the impact that could have on pre-retiree adequacy proportions. It is also possible that the last fifteen years prior to age 65, or less if they plan to retire at sooner, are the most important wealth accumulation years where it is possible for greater wealth accumulation to occur than is projected. The high proportion of households with large saving deficits and low adequacy proportions, having little chance of achieving adequacy, could be an indication that there could be a marked increase in the future in the number of people age 65 and over who will need to continue working for financial reasons. Note that while this may be their intention, ill-health or reduced employment opportunities may interfere.

Demographic as well as financial, attitudinal, and behavioural differences underlie some causes behind the reduction in the adequacy proportions experienced by pre-retirees. The large variation in the mean pre-retiree and retiree indexation scores signals the need for further research and in-depth analysis in order to better understand the reasons behind those differences. Future research would also act to verify the underlying significant variables and FP<sub>f</sub>R Index construction.

## **Conclusion**

The mean FP<sub>f</sub>R index score for pre-retirees of 0 is low when compared to the mean FP<sub>f</sub>R index score of 4.8 for active retirees. Applying a point-of-adequacy of 5 on FP<sub>f</sub>R Index found that just 1.2% pre-retirees are likely to achieve retirement adequacy, compared to 50.2% retirees who achieved retirement adequacy, indicating that pre-retirees are likely

to be less financially prepared for retirement than current retirees were for their retirement.

The KiwiSaver retirement savings scheme may act as a substitute for private savings, as discussed earlier in Section 3.3.1. It is important to remember that this survey was undertaken in 2015, at which time the KiwiSaver retirement savings scheme had been in place for seven years. Therefore, any pre-retirees who joined KiwiSaver should theoretically have been in their forties or older. It is apparent that retirement savings of pre-retirees aged 50 years and over, prior to and since the recent introduction of KiwiSaver have been insufficient.

With the KiwiSaver retirement savings scheme having been in place for a number of years, given the associated promotion and discussion, pre-retirees should be more aware of the need to save for their retirement. It is likely however, that the level of their KiwiSaver funds will not be sufficient by the time they reach age 65, meaning that additional retirement savings would therefore be required. With a third of pre-retirees believing that their retirement planning is under-developed, this means that a large proportion of pre-retirees aged 50 and over have failed to realise that they are not as well-prepared as they believe they are. A large percentage of pre-retiree households are required to make additional savings of more than 25% of their annual income. Many, especially for those households with high levels of debt, appear incapable of making sufficient additional savings within their remaining pre-retirement years. Without these additional savings, it can be expected that a greater number of pre-retirees will either have to reduce their level of consumption in retirement or be engaged in full-time employment beyond age 65. It is likely that pre-retirees who expect to retire at age 65 will, for financial reasons, not be able to do so. Lower proportions of pre-retirees belong to the high-*invest*, high-*wealth*, and high-*fincap* cohorts than the all current retirees and active retiree groups. These are contributing factors to wealth accumulation and retirement adequacy, and while it is possible for these factors to improve in the remaining years before retirement, these results again support the conclusion that pre-retirees are not as well-prepared as existing retirees.

Comparison of results found that fewer pre-retirees than retirees believe that NZ Superannuation would be sufficient to fund their retirement, yet this has not translated into the sufficient accumulation of financial resources. A greater proportion of pre-retirees than retirees believe that belonging to the KiwiSaver retirement scheme will

provide enough for them in retirement, yet pre-retirees appear unaware that the scheme's contribution to their retirement income is restricted by the small number of years' contribution. More pre-retirees than retirees financially support others. Slightly fewer pre-retirees than retirees own their own homes, and of those that do, more still have a home loan. More pre-retirees than retirees are failing to pay their credit cards off in full, and incur additional finance charges as a result. More pre-retirees than retirees are finding it difficult to manage financially, and it is unclear why this is the case. This could be due to high levels of debt or high levels of consumption. Further research into the pre-retiree and retiree differences in demographic, attitudinal, and behavioural characteristics would aid understanding, as well as help to explain the variation in pre-retiree and retiree results.

While some pre-retiree households may be able to make the necessary adjustments to their current rate of savings and levels of consumption, it appears that most inadequately prepared pre-retirees are unlikely to fill the accumulated savings gap before reaching their intended age of retirement. Nine out of ten inadequately prepared pre-retirees would need to save more than 25% of their current household income in order to achieve their required retirement savings accumulation targets. It is unlikely pre-retiree households with large savings deficits will be able to accumulate their required retirement savings targets unless major changes to lifestyle or consumption occur, especially for those households with high levels of debt.

When comparing pre-retiree adequacy upon retirement with retiree's current adequacy, care is needed as there is a possibility that a number of retirees have financial positions that are now substantially worse than they were at the start of their retirement. This would mean that some retirees would have been classified as adequate when they started their retirement, but as a result of over-consumption, poor financial management, and unplanned events or circumstances they are now classified as inadequate. There is a possibility that retiree adequacy results and indexation scores at the point of retirement could have been higher than at the time of survey. This would make the current retirement adequacy gap between pre-retirees and current retirees even greater. Overall, these FPfR indexation results support the conclusion that New Zealand pre-retirees are less prepared financially for retirement than current retirees.

## 5.0 Conclusion

### 5.1 Introduction

This thesis sets out to answer the question “How prepared are New Zealanders to achieve adequate consumption in retirement?” A review of literature in Section 2 investigated the definition of financial preparedness for retirement and of adequate retirement consumption, together with how retirement adequacy is determined and measured, as well as identifying a number of factors having the potential to influence adequacy levels. The review also revealed a number of relevant indices that currently exist which could provide a retirement preparedness benchmark at both an individual and national level. Section 3 discussed the data collection methods employed and the methodology behind the attainment of each research objective. Finally, the results of each research objective were detailed and discussed in Section 4. The major findings and their consequences are summarised in this final section.

Retirement adequacy is defined as occurring when projected resources available for spending during retirement are equal to or greater than the projected retirement need (Kim, Hanna & Chen, 2016; Montalto Hurd-Rohwedder, 2012; Yuh, Hanna & Montalto, 1998). This definition is used to determine the point-of-adequacy ( $PVTotHhldFinRes = PVTotRetConsc$ ). Following an extensive evaluation process, it is determined that the dichotomous dependent variable, *adequacy*, is the most effective and statistically robust measure of retirement adequacy suitable for use in New Zealand.

Using financial data supplied from the on-line survey, the adequacy calculations found that 60.4% of all current retirees and 48.6% of active retirees are likely to achieve adequate consumption throughout their retirement. The backward stepwise logistic regression identified eight demographic, attitudinal, and behaviour variables that were significant in determining *adequacy*, and these were used in developing the Financial Preparedness for Retirement (FP<sub>f</sub>R) index. Analysis of all the individual FP<sub>f</sub>R indexation scores revealed a mean New Zealand FP<sub>f</sub>R indexation score for active retirees of 4.8, out of a maximum score of 10. Using 5 as the point-of-adequacy for the FP<sub>f</sub>R index resulted in 50.2% of retirees achieving retirement adequacy.

Again using financial data supplied from the on-line survey, the adequacy calculations found that 32.1% of pre-retirees are likely to achieve adequate consumption throughout

their retirement. Pre-retirees had a lower mean FP<sub>f</sub>R index score of 0. Using the same FP<sub>f</sub>R index point-of-adequacy as retirees resulted in just 1.2% of pre-retirees achieving retirement adequacy.

An attempt was then made to see if an alternative pre-retiree indexation (FP<sub>f</sub>R<sup>P</sup>) equation would produce more robust results. While the FP<sub>f</sub>R<sup>P</sup> index scores for pre-retirees resulted in a reversal of the earlier FP<sub>f</sub>R index scores, it proved to be less robust. It was concluded that the FP<sub>f</sub>R index could be reliably applied to retirees, but neither the FP<sub>f</sub>R index nor the FP<sub>f</sub>R<sup>P</sup> index could be reliably applied to pre-retirees.

Overall these results still confirm the conclusion that a large number of New Zealand current retirees are likely to achieve adequate consumption throughout their retirement, whereas, should all things remain the same, the majority of pre-retirees aged 50 years and over are unlikely to achieve adequate consumption throughout their retirement, and are therefore less prepared financially for retirement than current retirees.

## 5.2 Methodology

As no database existed that contained the required information, it was necessary to develop an on-line survey for New Zealanders between the ages of 50 and 80. Using an on-line panel, a representative sample of 1,044 completed the on-line survey, with 454 retirees and 590 pre-retirees. Retirement was defined as the point at which full-time work is discontinued or is planned to be discontinued.

Retirement consumption consisted of current household income, less savings and outstanding home loan repayments. This study used the definition by Montaldo (2001) which states that retirement adequacy occurs when the projected resources available for spending during retirement are equal to or greater than the projected retirement needs. Several approaches for measuring retirement adequacy were considered, and by focusing on relevant household measures, these were narrowed down to the capital consumption approach which was deemed to be the most appropriate. The adequacy equation ( $PVTotHhldFinRes = PVTotRetConsc$ ) was used to determine the point-of-adequacy. If a household equalled or exceeded the point-of-adequacy they were said to be adequate, well-prepared, or had achieved retirement adequacy. A binary dependent variable, *adequacy*, was created.

Factors that could potentially contribute to retirement adequacy were extracted from the raw survey data, and these included a variety of demographic, financial, attitudinal, and behavioural characteristics. A number of constructed variables were also created from the raw data, such as a financial literacy score, a financial capability score, risk tolerance, risk management, and a capital consumption ratio. Independent variables that were retiree-specific or pre-retiree-specific, highly correlated variables, period-specific or variables unlikely to be replicated by future research were eliminated before the analysis process.

A range of diagnostics and statistical calculations checked the assumptions and assessed the effectiveness of the prediction models. A number of statistical analysis methods, including OLS, logistic, probit, and ordered logistic regressions were evaluated. The preferred logistic prediction model formed the basis upon which the indexation equation was constructed. By inputting the respondents' scores for each significant variable then summing these scores, then multiplying by ten and rounding produced an indexation score for each household. The mean indexation score then provided indexation point-of-adequacy as well as a benchmark score for both retirees and pre-retirees. Following this indexation development process made it possible to make a determination as to how financially well-prepared New Zealanders are to achieve adequate consumption in retirement.

## 5.3 Conclusions and Implications

### 5.3.1 Objective 1

Objective 1 aimed to assess which method of determining adequacy of retirement income for New Zealand households is the most appropriate. Several methods of measuring adequacy in retirement were considered, however, most were dismissed as either being a macro-economic measure of retirement adequacy or were alternative ways of describing adequacy, rather than being a method of calculating adequacy itself. Two main contenders remained, being the Income Replacement approach and the Consumption Replacement approach.

With the Income Replacement approach there was a high variance between two methods of determining the amount of annual retirement income required, expressed either as a weekly dollar-amount or as a percentage of the last year of pre-retirement earnings. The fact that the mean current retiree household income fell in the middle of these two

expressions of required retirement income made it difficult to determine which income replacement figure was more accurate and more reliable.

While the Income Replacement approach matched the household's current retirement income against required household retirement income, it failed to address the issue of retirement income sustainability throughout the entire retirement period, which is an advantage of the Consumption Replacement approach. The sustainability weakness, together with the uncertainty caused by the variation in required retirement income measures created a degree of unreliability. As a result, the Consumption Replacement approach was deemed more appropriate.

Two capital utilisation options existed. Retirees can either consume part of their capital together with the returns from their savings/investments (capital consumption) or consume just the returns from their savings/investment (capital preservation). The low level of calculated *adequacy* achieved with the capital preservation method was considered unrealistic given the high level of retiree satisfaction with their current retirement income together with the low level of aged poverty (Dale & St John, 2016).<sup>120</sup> When these factors were taken into consideration, the capital consumption utilisation method was preferred.

The final factor requiring consideration was whether to include home equity in the adequacy equation. Home equity release loans, along with other home equity release options, enable partial access to the equity held within the family home. Should the family home be sold, retirees would still need accommodation, and given rents are higher than the costs associated with owning a home (Matthews, 2012), selling the family home is not seen as being a viable option. While it is possible in New Zealand to gain access to a portion of home equity through home equity release loans, it is however, limited by an age-related maximum. Analysis found that if the home equity loan was taken out at age 65, the maximum amount of the home equity available never exceeded 20%. The resulting contribution to retiree retirement income was therefore small, making a minimal *adequacy* differential between including and excluding home equity. Therefore, given these results, together with factoring in the current low retiree adoption rate of home equity release loans, led to the conclusion that it was more appropriate to exclude home equity from the calculation of retirement adequacy. It is recognised that by excluding

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<sup>120</sup> Dale & St John stated that 9% of those 65 and over had incomes below the unofficial poverty line (60% constant value, after housing costs, equivalised income) citing Perry (2015).

home equity a degree of conservatism is also introduced, allowing retirees at some later date to gain partial access to home equity, should it be required.

Following this evaluation process, it was therefore concluded that the Consumption Replacement approach using the capital consumption utilisation method excluding home equity is the preferred measure of retirement income adequacy. The point-of-adequacy equation [19] being:  $PVTotHhldFinRes = PVTotRetConsc$ .

There were three possible approaches to using this point-of-adequacy. The first uses the dichotomous dependent variable, *adequacy*, scoring respondents either adequate (1) or inadequate (0), used in logit and probit regressions. The second uses the continuous adequacy differential, *adequacy2*, the percentage of financial resources over (or under) the point-of-adequacy, used in OLS regressions. The third uses the ranked ordinal adequacy, *adequacy3*; adequate, marginally adequate ( $\pm 20\%$  from the point-of-adequacy), or inadequate, used in ologit regressions.

Finally, robustness analysis looked at the effects change had on four key drivers: consumption, life expectancy, real rates of returns, and a reduction in retirement income following the loss of a spouse or partner. The loss of a spouse or partner was the change driver having the greatest influence on adequacy proportions, followed by the real rate of return as having greater influence than changes in life expectancy or changes in retirement consumption. This analysis confirmed that the preferred adequacy measure, *adequacy*, remained robust against a range of changes to these four key drivers. As a result of this investigation it was determined that the logistic regression using the dichotomous dependent variable, *adequacy*, produced the most effective and statistically robust measure of retirement adequacy suitable for use in New Zealand.

### 5.3.2 Objective 2

Objective 2 then used the preferred measure of adequacy, *adequacy*, to determine the level of preparedness of retirees. Following the manipulation of the financial data supplied, the financial calculations found that 60.4% of all current retirees were likely to achieve adequate consumption throughout their retirement. This result falls within the 50% - 70% range of results from similar studies where retirement adequacy was considered as being able to maintain pre-retirement consumption.<sup>121</sup>

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<sup>121</sup> These similar adequacy studies are detailed within Section 2.3.3.

Further examination of the initial adequacy results found that some outcomes were inconsistent with prior research. Upon reflection, it was identified that NZ Superannuation had an unexpected impact on the adequacy of low-income households that introduced a low-income/high-adequacy bias. It was recognised that ‘passive’ retirees were able to achieve retirement adequacy by default, whereas ‘active’ retirees needed to make decisions and take action to augment their NZ Superannuation in order to achieve adequate household consumption in retirement. Scholz, Seshadri and Khatriakum (2006) found a similarly high proportion of retirement adequacy for lower-income US earners was due to the benefit of social security.

To avoid the low-*income*/high-adequacy bias it was decided to exclude passive retirees and focus on the active retirees in order to identify which factors had a strong influence on retirement adequacy. Using the financial data supplied, the proportion of retiree adequacy was calculated and found that 48.6% of active retirees were likely to be adequately prepared financially for retirement.

### 5.3.3 Objective 3

Objective 3 consisted of the identification and analysis of the significant characteristics of adequately prepared active retirees. Prior research identified a range of demographic, behavioural, and attitudinal factors with the potential to predict the level of retirement adequacy. Four key cohort groups based on income, savings/investments, net worth and financial capability, were used as the first step in assessing retiree adequacy proportions. Analysis showed that the results and impact of the significant variables upon retirement adequacy was consistent with earlier findings. Similarly, the results found that poor money management and undesirable financial behaviours have a negative effect upon wealth accumulation, and consequentially, upon retirement adequacy. The results also showed that poor money management behaviours are more predominant in the low-income households as well as in the low-financially literate households.

Following this, it was considered that backward stepwise regressions were the most effective method of analysing the significance of these potential factors in predicting retirement adequacy. There were four regression models considered, being: logistic (logit) regression, probit regression, ordered (ologit) logistic regression, and OLS regression. After an evaluation process it was deemed that backwards stepwise logistic regression using the robust option was the most effective model at predicting the retirement adequacy of retirees. This model was then used to identify eight significant

variables. Post-regression analysis found that the logistic regression model could correctly classify 83.3% of the financially-calculated retiree adequacy result, and had a McFadden's  $R^2$  of 0.38 and an adjusted McFadden's  $R^2$  of 0.32.

#### 5.3.4 Objective 4

Objective 4 involved the development of the Financial Preparedness for Retirement (FP<sub>f</sub>R) Index for use in New Zealand. The eight demographic, attitudinal, and behavioural variables found to be significant in determining *adequacy* for active retirees formed the basis for the development of the Financial Preparedness for Retirement indexation equation. The active retiree responses to the significant variables were then entered into the indexation equation to produce a probability value, which was then multiplied by ten and rounded to give an indexation score for each retiree household.

The Financial Preparedness for Retirement (FP<sub>f</sub>R) Indexation equation is:

$$((invtype) \times 3.14) + ((accomtype) \times 1.06) + ((longevity) \times -1.01) + ((prepdr) \times 0.67) + ((NZSSuf^R) \times -0.59) + ((plandev^R) \times 0.34) + ((ksall^R) \times 0.53) + ((bsother) \times 0.43) + -20.12 \text{ [intercept].} \quad [21]$$

Analysis of all the individual FP<sub>f</sub>R indexation scores revealed a mean New Zealand FP<sub>f</sub>R indexation score for active retirees of 4.8 out of a maximum score of 10. In comparison, Aegon's (2013) survey of 12 countries, excluding Australia and New Zealand, found that 66% had pre-retiree ARRI indexation scores below 5,<sup>122</sup> which was considered a 'low' level of retirement readiness. Using an FP<sub>f</sub>R index score of 5 as a point-of-adequacy found that 50.2% of retirees were likely to achieve retirement adequacy. Given that the financially-calculated adequacy for retirees was 48.6%, it was concluded that the Financial Preparedness for Retirement (FP<sub>f</sub>R) indexation equation was representative, robust and reliable.

#### 5.3.5 Objective 5

Objective 5 then applied the FP<sub>f</sub>R indexation equation to the pre-retiree respondents to determine a measure of financial preparedness for NZ pre-retirees aged 50 and over. Applying the same index score of 5 as the point-of-adequacy found that just 1.2% pre-retirees were deemed likely to be well-prepared financially for retirement. The mean FP<sub>f</sub>R index score for pre-retirees of 0 is considered to be extremely low when compared to the

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<sup>122</sup> ARRI index scores were calculated based on a sample of 10,800 employees and excluded those who had retired.

mean FP<sub>f</sub>R index score of 4.8 for active retirees. Unfortunately, the index is not suitable for use with pre-retirees, and as a result the differences between retirees and pre-retirees were explored to understand why the index was not applicable. The subsequent discussion reflected that exploration.

Overall results indicate that New Zealand pre-retirees aged 50 years and older are less well-prepared financially for retirement than retirees, with at best 32.1% pre-retirees, compared to near half of the retirees, likely to achieve retirement adequacy. The low pre-retiree adequacy proportion means that a greater number of pre-retirees are likely to be engaged in full-time employment for financial reasons beyond age 65, than is the case for previous generations.

These results indicate that pre-retirement savings prior to and since the introduction of the KiwiSaver retirement savings scheme by pre-retirees aged 50 years or over have been insufficient. KiwiSaver has been in place for a number of years, and its introduction has increased awareness for the need for retirement savings and that additional retirement savings will therefore be required, yet there is a lack of evidence of any real improvement in pre-retirees' retirement adequacy.

Pre-retirees had lower proportions belonging to the high-*income*, high-*wealth*, and high-*fincap* cohorts than the all current retirees and active retiree cohorts. Income, savings, wealth and financial capability are key contributing factors to wealth accumulation and retirement adequacy, and while it is possible that some pre-retiree households may be able to make the necessary adjustments to their lifestyle and their level of consumption and savings in order to fill the savings deficit gap before reaching their intended age of retirement. It is important that pre-retirees be made aware that there is a saving deficit and that they are motivated to close the gap.

It is, however, likely that most inadequately prepared pre-retirees aged 50 years and over will not be able to do so, given that nine out of ten of the inadequately prepared pre-retirees would need to save more than 25% of their current household income in order to achieve their required retirement savings accumulation targets. For some, the savings deficit is too large and for others their level of debt is too high, however, any attempt to close the savings gap will only serve to improve their retirement consumption outcomes. Overall, these results support the conclusion that New Zealand pre-retirees aged 50 years and over are less prepared financially for retirement than current retirees.

## 5.4 Research Limitations

While these results are specific to the New Zealand situation, with careful extraction and modification many of these findings have application to other countries.

AAPOR (2010) stated that “full and complete disclosure of how results were obtained is essential. It is the only means by which the quality of research can be judged and results replicated (p. 5)”. For this reason, it must be made clear that the observations and results relate to the age groups surveyed, excluding those aged under 50 and over 80. Although it is important to start saving for retirement early, 50 was selected as the lower cut-off point because retirement savings does not become an area of focus much before the age 50 (Hershey & Mowen, 2000).

Using on-line surveys restricts the sample to those with access to computers. In 2012, 1.3 million NZ homes (80%) had some form of internet connection (Statistics NZ, 2013b). Although access panels have higher response rates, they reduce, rather than eliminate nonresponses, so a degree of nonresponse bias still exists (AAPOR, 2010). The use of an on-line panel may impact on the sample’s representativeness, however, when taking into consideration budgetary constraints, this was deemed the most cost effective method of collecting reliable data. Even by adopting the steps recommended by AAPOR (2014) to improve improving sample representativeness, it is recognised that through undertaking these steps it does not fully replicate the randomness of probability sampling. The sample population was prepared to ensure that it was generally representative of the New Zealand population.

Caution should be applied to these results as confirmation of retirement adequacy can only occur once pre-retirees have retired, and the retirement period completed. To achieve this would require carrying out a longitudinal study, putting it beyond the capabilities of this thesis. AAPOR (2010) argue that it would be erroneous to report on margins of error, useful when calculating the sampling error for a probability sample, but not with a non-probability sample. Therefore, any conclusions reached have to be limited to the panel population rather than to general population.

One limitation of this investigation is that it relies on the use of self-reported data, and there is no way to confirm the financial data supplied by respondents. Their validity is dependent on respondents knowing or having a reliable estimation of the value of their net worth, home equity, financial assets and debts. It is assumed that if there are

inaccuracies or biases in individuals' estimates, these errors are not systematic in nature, but rather random with respect to actual amounts and levels of behaviour. Potentially some respondents could fail to include all sources of household income or investments. Another issue could be that retired respondents may have difficulty distinguishing between capital and revenue transactions, affecting the accuracy of stated income. These risks were minimised through careful wording of survey questions.

It is worth noting that the assumed rates of return may vary from the respondents' actual rates of return, both pre-retirement and post-retirement, which in turn will affect retirement adequacy. Returns are dependent on asset class returns, asset allocations, risk tolerance, and any professional advice received. The amount of historical data on KiwiSaver funds and their performance is limited due to the limited time since introduction. Past performance is no indication of future returns. The current returns on KiwiSaver funds and other income-generating assets may not be sustained, before or during retirement.

It is also assumed for pre-retirees that current earnings reflect their final year's earnings when projected forward to retirement, and that the final year's earnings also reflect lifetime earnings. This may not be true in all cases. Given a normal distribution, those with increasing income towards retirement, are expected to offset those with falling income towards retirement.

Another limitation is associated with using life expectancy in adequacy calculations in that 50% within each age group of the population are expected to live longer than their projected life expectancy, and this would affect their resulting adequacy. Robustness analysis found that small shifts in retirement adequacy occurred following changes in life expectancy. As the adequacy calculations were based upon the life expectancy of the respondent, it should also be noted that when in a relationship female partners could be expected to live slightly longer than the male respondent.<sup>123</sup>

Finally, it should be remembered that while it is possible to determine a measure of retirement adequacy, as Campbell (2006) points out, ultimately the household financial positions, and consequently whether retirement adequacy is achieved, is dependent on pre-retirees and retirees having a good level of financial capability, having the right

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<sup>123</sup> In 2013 the New Zealand average life expectancy for men was 79.1 years and 82.8 years for women (Statistics NZ, 2013b).

attitude towards savings and consumption, making the right financial decisions, as well as taking the appropriate action.

## 5.5 Further Research

Research sets out to address a specific research question, and often the results generated create a greater number of questions or lines of enquiry that goes beyond the original research question. This research is not different in that regard. With a limitation on the number of questions and the time it takes to complete an on-line survey it is not possible to ask every possible question. This leaves an opportunity for future research to investigate some of these issues in greater depth in order to gain greater insights.

Concern surrounds the large numbers of people with high retirement income expectations, and the large differential that exists between the required retirement income when expressed as weekly dollar amount and when expressed as percentage of annual earnings. Further research is required in order to gain a better understanding as to why a notable variation in retirement income expressions and expectations exist.

There remains a knowledge gap in understanding how the level of household debt relates to household income and retirement adequacy. One assumption made was that pre-retirees, upon repaying their home loan would not increase their consumption and would add the amount of their repayment to their savings/investments. No questions were asked to seek confirmation of this assumption, and this issue would be a topic worthy of future research. Also useful, would be identifying whether a significant change in the time-gap between home loan completion and retirement has occurred between the retiree and pre-retiree cohorts, as extended home loan repayment periods are likely to have an effect on retirement adequacy. When respondents were asked about their net worth, while it accounted for household debt, it would have been useful to have known the actual level of household debt, respondent's expected repayment timelines and how debt relates to financial behaviour and retirement adequacy.

Given that as many as half of the active retirees and seven in ten pre-retirees may need to release some or all of their home equity in order to help fund their retirement, it is important to understand how New Zealanders intend to access their home equity, should it become necessary. It is unknown whether retirees and pre-retirees intend to take out

home equity release loans or gain access to their home equity through alternative methods, such as downsizing or relocating.

There was an expectation that few retirees would be able to regularly save each month, however, over two-thirds of active retirees stated that they were able to save something each month. It is unclear whether the amounts saved by retirees represent ‘real’ savings or simply deferred consumption. It would be helpful to understand the motivation behind retiree savings. It would be worthwhile understanding whether retirees save in order to cover infrequent or periodic expenses, or for a specific purpose such as holidays, travels, or bequests.

It is unknown why active retirees in the ‘\$100,001 to \$150,000’ income cohort has a lower level of mean savings/investments than those in the ‘\$70,001 to \$100,000’ income cohort. This result was unexpected and was not a focus of this thesis. Future research could also investigate why 90% of pre-retirees need to save more than 25% of their current income in order to maintain their current level of consumption in retirement.

The variation in the pre-retiree financially calculated adequacy and pre-retiree indexation scores signals the need for further research and further in-depth analysis to better understand the reasons behind these differences. The comparison between pre-retiree and active retiree results highlighted some change had occurred in financial attitudes and behaviours, such as a shift away from paying off credit cards in full, and not saving income from other sources, with fewer managing financially. Gaining a better understanding of the pre-retiree and retiree differences in demographic, attitudinal, and behavioural characteristics would help explain the variation in pre-retiree and retiree results.

This study did not set out to answer all the issues uncovered relating to retirement savings and adequacy discussed above. This study does provide a good indication that there is still an abundance of related topics worthy of further enquiry and future research.

## 5.6 Policy Recommendations

Currently 39.6% of all current retirees, 51.4% of active retirees, and 67.1% of pre-retirees have not accumulated sufficient financial resources needed to provide the level of desired

retirement consumption that can be sustained throughout the entire retirement period.<sup>[1]</sup> These results are an indication that pre-retirees aged 50 years and over are not as well-prepared financially for retirement as current retirees.

Over several generations a heavy reliance has been placed on NZ Superannuation to prevent poverty within the elderly, and this has acted as the foundation upon which New Zealanders could build their retirement savings in order to achieve a level of retirement consumption desired. It is important that the NZ Superannuation is retained, in both its current form and level of purchasing power.

The study's findings would support several of the Commission for Financial Capability (CFFC) recommendations from their 2016 review of retirement income policies. For instance, the CFFC's recommendation to increase both employer and employee KiwiSaver contribution rates, with an automated increase option built in, with an opt-out option available would increase the KiwiSaver funds accumulated. Also given the potential for a large number of pre-retirees working beyond the age of 65, extending the age eligibility for KiwiSaver membership along with the age of NZ Superannuation eligibility would increase the accumulation period and total retirement savings (CFFC, 2016). These measures would result in an increase in the overall level of retirement adequacy.

The study's results indicate that retirement consumption expectations of the majority of pre-retirees are poorly aligned with the reality that their financial resources are capable of providing. The CFFC recommends improving financial capability, which this study found made a marked improvement in the retirement adequacy of active retirees (CFFC, 2016). The recent decline in interest rates has increased the lump-sum many pre-retirees need to accumulate. This implies that some pre-retiree retirement saving plans may require some adjustment. Greater emphasis is needed to identify realistic retirement expectations and retirement consumption requirements as well as setting achievable retirement savings targets for pre-retirees. The CFFC also recommended the further development of financial tools and information (CFFC, 2016). Tools that assist pre-retirees identify their retirement income needs, the size of their savings deficiency gap,

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<sup>[1]</sup> These calculated adequacy proportions are based upon the financial information supplied.

and provide a range of tactical options will help pre-retirees close their savings deficiency gaps.

There needs to be greater awareness that a retirement savings gap exists. Greater recognition is needed that the retirement savings of pre-retirees aged 50 years and over, even with KiwiSaver, are still too low. Pre-retirees need to realise that membership of KiwiSaver alone is unlikely to ensure adequate consumption in retirement. Pre-retirees can increase their level of savings either by increasing their contributions to KiwiSaver, or start (or increase) regular savings into investments. Key to increasing the levels of pre-retiree savings is identifying the accumulation amount required then developing plans for its attainment. While some, due to heightened awareness will perform the necessary self-directed calculations and plans themselves, others will need encouragement and assistance from financial institutions or professional financial advisers.

There is shortage of accurate household financial information, such as the sums invested, the various types of investments, and the returns of investments, the amounts and types of debt, home valuation, and equity. Quality financial information would enable policy makers and financial institutions to better understand financial behaviour in New Zealand, and help to identify trends, better promote retirement savings, as well as providing a foundation upon which to provide better research as well as appropriate financial advice to both pre-retirees and retirees. Having access to longitudinal financial data would reduce the number of assumptions and would provide a robust foundation for retirement and investment research.

Retirement consumption is assumed to be evenly spread throughout retirement, however, this may not always be the case as long-term residential care may be required in the later years of retirement. There are also indications that higher levels of consumption occur in the early retirement years, with some retirees wanting to travel while still fit and active. Should accumulated funds be poorly managed or KiwiSaver funds diverted away from income generation in retirement, contrary to their original purpose this would mean that the low pre-retiree adequacy proportions predicted will be even lower. At present there is no requirement that any KiwiSaver funds accumulated before retirement have to be used to generate retirement income.

One approach could be to put some limits on the use of KiwiSaver funds, that is, unless retirees can provide evidence that they have sufficient financial resources for their

retirement, lump-sum withdrawals would be limited. For instance, allowing 10% to 25% to be available to be withdrawn as a lump-sum,<sup>124</sup> with the remainder being left in KiwiSaver for regular withdrawals or invested as an annuity with regular withdrawals over time.<sup>125</sup>

While some people may have concerns that withdrawal rules place restrictions on personal freedom and choice, past experience has shown that without help or direction many people are unlikely to do the ‘prudent’ thing. It should be remembered that KiwiSaver was introduced because New Zealanders, when left to their own devices, failed to save. It is important to consider whether there is merit in providing retirees with protection from unwise, uncontrolled overspending, and a degree of protection from financially needy children in order to help eliminate the likelihood of having insufficient retirement income. KiwiSaver withdrawal rules would serve to provide retirees with a degree of protection. It would also provide the government with a degree of protection from potential fiscal issues caused by a large number of inadequately prepared retirees requiring further financial assistance and support at some point in the future.

Most pre-retirees and retirees have a large proportion of their accumulated wealth stored within the equity of their homes. For some, given the low level of retirement adequacy amongst pre-retirees aged over 50, accessing home equity may become a necessity. One option may be to use home equity release lending, but this is generally a suitable option for a minority of retirees. It should be noted that the current lending criteria for home equity release loans are restrictive, and it is important that appropriate advice is taken to ensure the borrower fully understands the terms and conditions of the loan, and the impact this has on inheritance and future accommodation options, such as rest homes.

Robustness analysis found that the factor having the greatest impact on adequacy, after the death of a spouse or partner, was the real rate of return (RRoR). Some may consider the rate of return on investments to be beyond the influence of the investor. While that may be true to a certain extent, the rate of return on investments can be largely determined by the investor’s choice of investments along with their appetite for investment risk. Often

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<sup>124</sup> The mean proportion of intended KiwiSaver spend on purpose other than providing retirement income as stated by pre-retirees falls within the 10% - 25% range.

<sup>125</sup> Previously the issue of annuities in NZ has been non-existent due larger to the lack of promotion and unattractive product features. NZ Income Guarantee Limited has addressed these product flaws with their recently launched flexible ‘lifetime income’ product returning a guaranteed tax-paid 5%, with ownership remaining with the investor (or their estate), until age 85 when an insurance policies come into force.

financial institutions and professional advisers are quick to move investors into conservative or defensive asset allocation when investors approach or reach retirement age. In the long-term this may prove to be a disservice, as investors around the age of 65 may still have a reasonably long (20+ years) retirement period ahead of them. Accepting lower investment risk requires a higher level of accumulated financial resources in order to maintain investment returns at a level necessary to satisfy retirement consumption demands. For pre-retirees already struggling to save for retirement, the prospect of low investment risk and the consequential low investment returns may make the accumulation targets appear unrealistic and unobtainable, and could lead to retirement savings inertia and demotivation.

These factors, together with the low level of financial capability are indications that many pre-retirees will need financial support, mechanisms and structures to assist with their financial transition into retirement. Huston (2010) and Mandell (2008) questioned the effectiveness of investing large amounts of money and effort into educating and lifting the level of financial literacy and financial knowledge within the general public, however, education efforts targeting the marginally adequate cohort may prove highly effective. While those retirees and pre-retirees at the extremes of the adequacy spectrum can be predicted with a degree of certainty, for those close to the point-of-adequacy, predicting who will actually obtain adequacy is less certain, and where any change in savings or consumption is likely to make a marked difference. It is therefore recommended that in the short-term it would be more cost-effective to focus first on improving the adequacy levels of those within the marginally adequate cohort, rather than those with larger saving deficiency gaps within the inadequate cohort, as they will require a longer term approach.

## 5.7 Academic Contribution

New Zealand is an example of a small, open economy and it has some factors affecting retirement adequacy that are unique, such as the universal nature of NZ Superannuation and the KiwiSaver retirement savings scheme. Despite this, it is possible for other countries to apply some of these findings to their own retirement savings environments.

In New Zealand, the retirement adequacy rate was unknown until this thesis provided an answer. The approach used in this study makes a determination whether retirement consumption can be maintained throughout the entire retirement period, which is lacking in other methods of determining retirement adequacy that use predetermined criteria at a

specific point-in-time. This thesis has taken a unique approach in linking a household's calculated financial measure of retirement adequacy with the household's predicted measure of retirement adequacy using significant demographic, attitudinal, and behavioural factors. Other studies have relied on the use of a pre-determined point-of-adequacy, rather than the individualised approach taken with this study. Little was known about the income, investment, wealth and financial capability composition of NZ retirees and pre-retirees.

No quick method of calculating and comparing capital utilisation methods existed. The original development of the Capital Consumption Ratio (CCR) has proved to be useful as it determines the rate of capital consumption based upon the relationship between the real rate of returns and a period of time. The higher the CCR, the faster the consumption rate of accumulated capital. A low CCR is therefore considered to be desirable as accumulated investment capital can be consumed at a slower rate. A longer retirement period and/or a higher RRoR will lower the CCR. When a retiree's current rate of consumption is below the CCR, it would be possible to lift their level of retirement consumption. Conversely, when the retiree's current rate of consumption is above the CCR, a reduction in retirement consumption may be required in order to ensure that investment capital is sustained throughout the expected retirement period.

The impact of NZ Superannuation on retirement adequacy was previously unknown. This was the first study to split retirees into passive and active retirees, and the first to identify the existence of low income / high adequacy bias and how this distorted the behavioural and attitudinal traits normally associated with retirement savings. It was found that NZ Superannuation created a low-income/high-adequacy distortion bias. This situation is not unique to New Zealand as this bias exists in other countries in the world where state-funded pensions are provided. This led to a classification split of respondents into 'passive' retirees and 'active' retirees as a means to correct this distortion bias.

The New Zealand retirement income replacement rate was unknown and little was known about the level of retirement consumption expected in New Zealand, and this study is one of the first to identify the desired income replacement rate of 64% for NZ 'all current' retirees, 66% for NZ 'active' retirees, and 70% for NZ pre-retirees. This provides confirmation of the NZ Treasury (2003) report that suggested that NZ replacement rates were broadly similar across all wealth deciles, typically 70%.

These findings support the findings of Horizon Research (2011) and Gorman, et al. (2013) that household savings in New Zealanders is, in general, low with 52.9% of retiree having savings/investments of \$100,000 or less. It also confirms Naylor's (2010) findings that a small portion of New Zealanders manage to augment their annual retirement income with \$40,000 or more from independent sources.

Findings that only 15.6% of NZ pre-retirees, aged 50 years and over, found it difficult to save for retirement was in contrast to the findings of Bank of America - Merrill Lynch (2013) and Garman (1998) that the majority of US pre-retirees were under financial stress and found it difficult to save for retirement. Findings that only 16% of NZ pre-retirees contrast with the 2013 Retirement Preparedness Survey (RPS) survey which found 85% of US pre-retirees felt they were not saving enough.

This study confirmed the findings of Behrman, et al. (2010), Lusardi and Mitchell, (2009), and Hayhoe and Stevenson (2007) that education is highly correlated to income levels and wealth accumulation. It also confirmed the findings of Yoong, et al. (2013), and Atkinson, McKay, Collard and Kempson, (2007) that financial capability was not highly correlated with income levels.

This thesis also identified that a variance in retirement income expectations exist between expected retirement income when expressed as a weekly dollar amount and when expressed as a percentage. This would support Farrell and Grieg (2015) findings that a majority of people experience a large variation in the estimates of their monthly consumption. Further research is required to better understand this phenomenon.

No retirement preparedness index existed in New Zealand that utilises demographic, behavioural and attitudinal factors. It was unknown whether there was a robust alternative method, incorporating behavioural and attitudinal factors, to calculating retirement adequacy rather than using financial calculations, or whether that alternative method was effective for measuring both retiree and pre-retiree retirement adequacy. The development of the Financial Preparedness for Retirement (FPfR) Index is New Zealand's first retirement preparedness construct. The FPfR indexation equation uses a number of demographic, attitudinal, and behavioural factors to create an individual household preparedness score, and a mean preparedness score can then be found for any sample or group. A mean preparedness score provides New Zealand with a useful benchmark against which to evaluate current and future levels of retirement preparedness of

individuals, cohorts, and the nation as a whole. Unfortunately, the FPfR index proved less effective in predicting pre-retiree retirement adequacy.

It was unknown how prepared pre-retirees, aged 50 years and over, are for retirement. There is no benchmark existing upon which changes in preparedness can be measured to judge the effectiveness of KiwiSaver and other future retirement savings initiatives. The financially-calculated adequacy together with the FPfR indexation scores were both useful in identifying and quantifying the differences between retiree and pre-retiree financial preparedness for retirement. The size of retirement savings deficiency gaps are unknown, the proportion of pre-retirees with deficiency gaps, and the likelihood of eliminating those deficiency gaps. This study is the first to identify the retirement savings deficiency gaps in New Zealand and the proportion of income required to fill those gaps.

While there has been a variety of economic conditions and various societal changes that have occurred over the years, it is unknown if behavioural or attitudinal generational differences have transpired at the same time. This study highlighted the fact that some shift in demographic, financial attitudinal and behaviour has occurred in recent years to have caused the FPfR index to become less effective for pre-retirees. Again, further research is required to identify what change has occurred. Overall, these results indicate that NZ pre-retirees aged 50 years and over are less financial well-prepared than current NZ retirees to achieve adequate consumption in retirement.

## 5.8 Conclusion

The purpose of this research was to identify how prepared New Zealand retirees and pre-retirees were to achieve adequate consumption in retirement. It has concluded that the Consumption Replacement approach using the capital consumption utilisation method excluding home equity is the preferred measure of retirement income adequacy. Using this calculation method and the financial data supplied it was possible to determine that the proportion of adequacy achieved by all current retirees is 60.4%, and 48.6% by active retirees. The calculated adequacy proportion of 32.1% achieved by pre-retirees was considerably low. These results would indicate that the majority of pre-retirees' retirement savings prior to and since the recent introduction of the KiwiSaver retirement savings scheme is insufficient to maintain pre-retirees' current level of consumption throughout their retirement.

By way of comparison, development of the Financial Preparedness for Retirement (FP<sub>f</sub>R) indexation equation made it possible to determine retirement adequacy using the non-financial data supplied. The mean FP<sub>f</sub>R index score for active retirees of 4.8 out of a maximum score of 10 is notably higher than the mean FP<sub>f</sub>R index of zero for pre-retirees. The FP<sub>f</sub>R indexation results were able to confirm the financially calculated adequacy results for retirees, but did not confirm the financially calculated adequacy results for pre-retirees, which was an indication that a shift in some demographic factors or some change in financial attitudes and behaviours has occurred in recent years. The conclusion reached is that the majority of New Zealand retirees are likely to achieve adequate consumption throughout their retirement, whereas the majority of pre-retirees aged 50 years and over are less prepared financially for retirement than retirees and are unlikely to achieve adequate consumption throughout their retirement.

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## APPENDICES

### Appendix 1: Table of Selected Retirement Adequacy Studies

Organisation (Year)	Retirement adequacy benchmark <sup>126</sup>	Percentage of sample projected to or above benchmark	Other notes and statistics
Yuh, Hanna & Montalto (1998)	Enough resources to maintain pre-retirement consumption	52% of households are on track to accumulate enough to maintain current predicted spending, assuming investment assets earn historical mean returns. Based on pessimistic projection of investment returns, only 42% are on track.	Sample from 1995 Survey of Consumer Finances.
Scholz-Seshadri-Khitatrakun (2006)	Wealth consistent with predictions of lifecycle model	84% of households overall; 70% of lowest-income decile, 95% of highest-income decile.	Sample from 1992 wave of the Health and Retirement Study. Progress Social Security benefits, other transfers, and children leaving households account for much of the lower-income savings adequacy.
Haveman, Holden Wolfe & Sherlund (2006)	Enough resources to maintain pre-retirement consumption	50% of new retirees have sufficient resources in retirement, and 60% will have 70% of earnings.	1982 & 1991 New Beneficiary Survey
Love, Smith & McNair (2008)	Comprehensive wealth relative to poverty-line wealth	82% of households have more wealth than would be needed to generate 150% of poverty-line income over their expected future lifetimes.	1998-2006 Health and Retirement Surveys.
Employee Benefit Research Institute (2012)	Sufficient to meet basic expenses, throughout retirement	56% of 1948-1954 birth cohorts; 13% of lowest income quartile, 87% of highest income quartile	Assumes age-65 retirement. Assumes housing equity converted to savings only when other resources are exhausted.

<sup>126</sup> Retirement Adequacy stated as replacement rate unless otherwise specified.

<b>Organisation (Year)</b>	<b>Retirement adequacy benchmark</b>	<b>Percentage of sample projected to or above benchmark</b>	<b>Other notes and statistics</b>
Aon Hewitt (2012)	85%, or 11 times at age 65.	15% of sample, including 29% of employees with potential to participate in employer plan for 30 years.	Estimates that savings shortfall relative to target for full-career contributing employee is 2.2 times pay.
Urban Institute (2012)	75% replacement rate at age 70	70-60% of 1956-65 birth cohort	Calculates working-years income using age 50-54 income and 35 years highest earnings.
Investment Company Institute (2012)	Able to maintain standard of living in retirement but no specific target stated.	N/A	Declining poverty rates of 65-and-older population, and smaller percentage of 65-and-older in poverty than 18-64; Social Security and housing equity comprise key components for lower-wealth workers; most 55-64 year covered by some pension wealth.
Hurd-Rohwedder (2011)	Enough resources to maintain pre-retirement consumption and die with bequeathable assets.	70% of age 66-69-year-olds; 77% of married households, 49% of single persons.	Estimate consumption trajectories based on pre-retirement consumption. Assumes housing wealth not depleted until other forms of wealth are. Lowest rates of preparedness for people with shortest financial planning horizons and with least education. 1995–2007 Consumption and Activities Mail surveys.

Organisation (Year)	Retirement adequacy benchmark	Percentage of sample projected to or above benchmark	Other notes and statistics
Munnell, Webb & Golub-Sass (2012)	Replacement rate needed to allow households to maintain their pre-retirement standard of living in retirement.	47% of American households will be likely to maintain their standard of living in retirement.	The percentage of households with adequacy decreased by 9 percentage points between the 2007 and 2010 SCF surveys
Center for Retirement Research at Boston College (2014)	69% for highest-third income, 72% for middle, 79% for lowest.	48% overall; 40% of low-income and 57% of high-income households	Projects retirement income at age 65. Assumes annuitization of wealth, including housing equity.
Kim, Hanna & Chen (2016)	Enough resources to maintain pre-retirement consumption	Adequacy ranges from 44% in 1995 to 58 % in 2007	Ignoring retirement income stages results in adequacy proportions being 23–28 percentage points higher. Uses 1995–2007 SCF
Biggs-Schieber (2014)	Able to maintain standard of living in retirement, but no specific target stated	N/A	For those who work to full retirement age, Social Security typically replaces 62% of final-average earnings; income from 401(k) and IRS underreported by SSA.
National Institute of Retirement Security (2015)	85%, or 8 times income at age 67	34% of working households age 25-64; 30% of age 55-64 household.	Estimates that 62.4% of households aged 55-64 fall short of target using a 25% lower savings goal.

## Appendix 2: List of Retirement Preparedness Indices

<b>Index</b>	<b>Author</b>	<b>Model Type</b>	<b>Section Reference</b>
Retirement Readiness Rating (RRR)	EBRI (US)	Confidence simulation	See 2.5.2.1
National Retirement Risk index (NRRI)	Center for Retirement Research (US)	Confidence simulation	See 2.5.2.2
Retirement preparedness Survey (RPS)	Bank of America - Merrill Lynch	Adequacy-focused	See 2.4.8 & 2. 5.3.1
Anticipation and Preparation for retirement (APR)	Kim, Kwon & Anderson (US)	Adequacy-focused	See 2.5.3.2
Retirement Preparedness Measure (RPM)	Fidelity (US)	Adequacy-focused	See 2.5.3.3
McKinsey's Retirement Readiness Index (MRRI)	McKinsey (Canada)	Adequacy-focused	See 2.5.3.4
InFre's Retirement Readiness Index (IRRI)	InFre (US)	Multi-faceted	See 2.5.4.1
Financial Wellness Score (FWS)	Bank of America - Merrill Lynch	Multi-faceted	See 2.5.4.2
Preparedness Index (PI)	Clark, Knox-Hayes & Strauss (UK)	Multi-faceted	See 2.5.4.3
Aegon's Retirement Readiness Index (ARRI)	Aegon (Netherlands)	Multi-faceted	See 2.5.4.4

<b>Discarded Indices<sup>127</sup></b>	<b>Author</b>	<b>Model Type</b>	<i>Reason for rejection</i>
Retirement Readiness Index	Americans for a Secure Retirement (US)	Adequacy-focused	Compares differences between US cities and states
Pension Microsimulation Model (PENSIM)	US Dept of Labor (US)	Simulation	Focus only on life histories
Retirement Confidence Survey (RCS)	EBRI (US)	Survey	Focus only on attitudes and behaviours
ANZ Readiness Index	ANZ Banking (Australia & NZ)	Adequacy-focused	Retirement calculation tool
MetLife Retirement Readiness Index (MRRI)	MetLife (US)	Retirement transition	Retirement transition tool
Retirement Income Certainty (RIC)	Prudential (US)	Adequacy-focused	Retirement calculation tool
Financial Preparedness Index (FPI)	Planner Portal (US)	Adequacy-focused	Retirement calculation tool
Retirement Readiness Snapshot (RRS)	Fidelity (Canada)	Adequacy-focused	Retirement calculation tool
Fiduciary's Retirement Readiness Index (FRRI)	Fiduciary (US)	Adequacy-focused	Retirement calculation tool

<sup>127</sup> [http://www.fidelity.ca/cs/Satellite/en/public/education\\_planning/calculators/snapshot](http://www.fidelity.ca/cs/Satellite/en/public/education_planning/calculators/snapshot),  
<https://www.calxml.com/calculators/financial-preparedness-index> ,  
<http://incomecertainty.prudential.com/>

## **Appendix 3: Adequacy Preparedness Survey**

### **Financial Preparedness for Retirement Survey**

Q1. Hi, my name is Bob Lissington, and I am conducting this survey as an essential part of PhD research being undertaken to provide a greater understanding of New Zealanders' attitudes and behaviour towards preparing financially for retirement. I would really appreciate your help by completing this on-line survey.<sup>128</sup>

The information being collected is important, and I will use the findings from this research project in my doctoral thesis. I also plan to use the findings as a basis for articles in appropriate academic journals and/or conference papers. I am interested in how you actually react to or feel about certain issues raised. There are no right or wrong answers. This survey anonymous and confidential and will take between 20 - 25 minutes. You can stop at any time and restart again where you left off. Remember your participation is voluntary, you do not have to answer any given question. We appreciate that surveys can be onerous and we have tried to make the survey as brief as possible, while still being comprehensive, and hope that you will find it interesting and enjoyable.

If you have any questions or concerns please contact me (R.J.Lissington@massey.ac.nz) or my Supervisor, Dr Claire Matthews (C.D.Matthews@massey.ac.nz) from the Massey Business School. This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher named above is responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher, please contact Dr Brian Finch phone 06 356 909 extn 86015, email: humanethics@massey.ac.nz.

Q2. My sincere thanks for your help. Without your help this important research could not take place.

#### **Readability**

<i>Indication of the number of years of formal education that a person requires in order to easily understand the text on the first reading</i>	
Gunning Fog index :	13.38
<i>Approximate representation of the U.S. grade level needed to comprehend the text :</i>	
Coleman Liau index :	6.18
Flesch Kincaid Grade level :	10.82
ARI (Automated Readability Index) :	9.38
SMOG :	11.95

Flesch Reading Ease : 61.12

(60.0 - 70.0 = Easily understood by 13 to 15 years students)

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<sup>128</sup> Q1 and Q2 are statement paragraphs entered in Qualtrics as a question, with no answers.

Q3. These next few questions will help ensure that the questions will be relevant to your circumstances. Which best describes your current marital status?

- Single (1)
- Married (2)
- Partnered (3)
- Divorced (4)
- Widowed (5)

Q4. Please note that in order to keep the questions brief, the term 'partner' has been used to represent any form of long-term live-in relationship irrespective of the type of relationship.

Q5. Which best describes your employment status?

- Employed - Full time (30+ hours) (1)
- Employed - Part time (< 30 hours) (2)
- Self-employed (4)
- Unemployed or beneficiary (5)
- Unpaid in family business (6)
- Student (7)
- Permanently disabled (8)
- Housewife/husband - Home duties (9)
- Retired - Work part-time (10)
- Retired - Fully (11)
- Other (please specify) (12) \_\_\_\_\_

Q6. Which best describes your partner's employment status?

- Employed - Full time (30+ hours) (1)
- Employed - Part time (< 30 hours) (2)
- Self-employed (4)
- Unemployed or beneficiary (5)
- Unpaid in family business (6)
- Student (7)
- Permanently disabled (8)
- Housewife/husband - Home duties (9)
- Retired - Work part-time (10)
- Retired - Fully (11)
- Other (please specify) (12) \_\_\_\_\_

7 At what age do you plan to retire from full-time work?

- |                                     |                               |                               |                                     |
|-------------------------------------|-------------------------------|-------------------------------|-------------------------------------|
| <input type="radio"/> Before 50 (1) | <input type="radio"/> 58 (58) | <input type="radio"/> 67 (67) | <input type="radio"/> 76 (76)       |
| <input type="radio"/> 50 (50)       | <input type="radio"/> 59 (59) | <input type="radio"/> 68 (68) | <input type="radio"/> 77 (77)       |
| <input type="radio"/> 51 (51)       | <input type="radio"/> 60 (60) | <input type="radio"/> 69 (69) | <input type="radio"/> 78 (78)       |
| <input type="radio"/> 52 (52)       | <input type="radio"/> 61 (61) | <input type="radio"/> 70 (70) | <input type="radio"/> 79 (79)       |
| <input type="radio"/> 53 (53)       | <input type="radio"/> 62 (62) | <input type="radio"/> 71 (71) | <input type="radio"/> 80 (80)       |
| <input type="radio"/> 54 (54)       | <input type="radio"/> 63 (63) | <input type="radio"/> 72 (72) | <input type="radio"/> After 80 (88) |
| <input type="radio"/> 55 (55)       | <input type="radio"/> 64 (64) | <input type="radio"/> 73 (73) |                                     |
| <input type="radio"/> 56 (56)       | <input type="radio"/> 65 (65) | <input type="radio"/> 74 (74) |                                     |
| <input type="radio"/> 57 (57)       | <input type="radio"/> 66 (66) | <input type="radio"/> 75 (75) |                                     |

Q8. Is it your intention to undertake any paid part-time employment **after** you retire?

- Yes, less than 15 hours per week (1)
- Yes, between 15 and 29 hours per week (2)
- Yes, 30 or more hours per week (3)
- No (4)
- Don't know (5)

Q9. How many years do you plan to work in paid employment **after** you retire?

- Less than 3 years (1)
- 3 years - 5 Years (2)
- More than 5 years (3)
- Don't know (4)

Q10. How many children of any age, including adult children, if any, do you have?

- |                             |                                       |
|-----------------------------|---------------------------------------|
| <input type="radio"/> 0 (0) | <input type="radio"/> 9 (9)           |
| <input type="radio"/> 1 (1) | <input type="radio"/> 10 (10)         |
| <input type="radio"/> 2 (2) | <input type="radio"/> 11 (11)         |
| <input type="radio"/> 3 (3) | <input type="radio"/> 12 (12)         |
| <input type="radio"/> 4 (4) | <input type="radio"/> 13 (13)         |
| <input type="radio"/> 5 (5) | <input type="radio"/> 14 (14)         |
| <input type="radio"/> 6 (6) | <input type="radio"/> 15 (15)         |
| <input type="radio"/> 7 (7) | <input type="radio"/> 15+ (16)        |
| <input type="radio"/> 8 (8) | <input type="radio"/> Don't Know (88) |

Q11. What is the number of financial dependents, other than your partner, (those young and old) you support financially?

- |                             |                                |
|-----------------------------|--------------------------------|
| <input type="radio"/> 0 (0) | <input type="radio"/> 9 (9)    |
| <input type="radio"/> 1 (1) | <input type="radio"/> 10 (10)  |
| <input type="radio"/> 2 (2) | <input type="radio"/> 11 (11)  |
| <input type="radio"/> 3 (3) | <input type="radio"/> 12 (12)  |
| <input type="radio"/> 4 (4) | <input type="radio"/> 13 (13)  |
| <input type="radio"/> 5 (5) | <input type="radio"/> 14 (14)  |
| <input type="radio"/> 6 (6) | <input type="radio"/> 15 (15)  |
| <input type="radio"/> 7 (7) | <input type="radio"/> 15+ (16) |
| <input type="radio"/> 8 (8) |                                |

Q12. What is the age of your **youngest** dependant (excluding your partner)?

- Under 5 years (1)
- 5 - 18 years (2)
- 19 - 30 years (3)
- 31 - 65 years (4)
- 65+ years (5)

Q13. What is the age of your **eldest** dependant (excluding your partner)?

- Under 5 years (1)
- 5 - 18 years (2)
- 19 -30 years (3)
- 31 - 65 years (4)
- 65-80 years (5)
- 80+ years (6)

Q14. What is the age of your dependant (excluding your partner)?

- Under 5 years (1)
- 5 - 18 years (2)
- 19 - 30 years (3)
- 31 - 65 years (4)
- 65-80 years (5)
- 80+ years (6)

Q15 To what extent do you agree or disagree with the following statements?

	Strongly agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
I believe I am well-prepared financially for retirement. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am aware of the need to plan financially for my retirement (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel confident when it comes to understanding financial matters (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The future seems very vague and uncertain to me (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Retirement is of concern to me (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At present, retirement seems a long way off (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have established long-term goals and am working to fulfill them. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q16 How much thought have you given to the following?

	A lot (5)	Some (4)	Little (3)	Hardly any (2)	None (1)
Your quality of life in retirement (1)	<input type="radio"/>				
Funding your retirement (2)	<input type="radio"/>				
The length of your retirement (3)	<input type="radio"/>				

Q17. How should the responsibility for having sufficient income in retirement be split between the individual and the government?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
It's the individual's responsibility :							
It's the Government's responsibility (1)	<input type="radio"/>						

Q18. Thinking about your last major purchase (e.g. TV, whiteware, car, etc.), how much thought and preparation would you (and your partner) have put into making that major financial decision?

- A lot (1)
- Some (2)
- A little (3)
- Hardly any (4)
- None (5)

Q19. How well developed or undeveloped would you say your financial plans for retirement currently are?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
I don't have a financial retirement plan : My financial retirement plans are well developed (1)	<input type="radio"/>						

Q20. Have you (and your partner) ever developed a formal financial plan for retirement?

- Yes, I / we have (1)
- No, I / we have not (2)
- Don't know (3)

Q21. Have you (or your partner) tried to figure out how much you need to save for your retirement?

*(Please tick as many boxes as you need.)*

- No (1)
- Yes, as a weekly or monthly savings amount (2)
- Yes, as yearly amount required to be saved (3)
- Yes, based on the annual income required in retirement (4)
- Yes, as a total amount needed to accumulated before retirement (5)
- Don't know (6)

Q22. **Excluding** any equity in your home, how much do you think you (and your partner) will need to accumulate **in total** by the time you retire so that you can live comfortably in retirement?

- \$100,000 or less (1)
- \$100,001 - \$250,000 (2)
- \$250,001 - \$500,00 (3)
- \$500,001 - \$1million (4)
- \$1.0 million - \$1.5 million (5)
- \$1.5 million - \$2.0 million (6)
- More than \$2 million (7)
- Don't know (8)

Q23. Which of the following comes closest to describing the method you (or your partner) used to determine the amount you would need to save or accumulate for retirement?

*(Please tick as many options as you need.)*

- Did not make any calculations (1)
- Estimated or guessed (2)
- Had it calculated by a financial adviser (3)
- Had it calculated by staff at a bank (4)
- Used a worksheet I created myself (5)
- Applied a simple rule-of-thumb (6)
- Used an on-line calculator or computer software (7)
- Used a paper worksheet from a financial services company, educational publication, or other source (8)
- Don't remember (9)
- Other (Please specify) \_\_\_\_\_

Q24. Is this financial plan for retirement written down?

- Yes (1)
- No (2)

Q25. Generally, are you (and your partner) able to stick to your financial plan?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- All of the time (5)

Q26. How much is the weekly (after tax) amount of NZ Superannuation for a single person?

- \$230 - \$270 per week (1)
- \$330 - \$370 per week (2)
- \$430 - \$470 per week (3)
- Don't know (4)

Q27 How much is the weekly (after tax) amount of NZ Superannuation for a couple?

- \$330 - \$370 per week (1)
- \$530 - \$570 per week (2)
- \$730 - \$770 per week (3)
- Don't know (4)

Q28. **Including** NZ Superannuation, what level of income (after tax) per week do you (and your partner) think you will need to live comfortably in retirement?

- Less than \$350 per week (1)
- \$350 - \$600 per week (2)
- \$601 - \$1,000 per week (3)
- \$1,001 - \$1,500 per week (4)
- \$1,501 - \$2,000 per week (5)
- More than \$2,000 per week (6)
- Don't know (7)

Q29. As a percentage of your current household income, what would you expect to need in retirement?

*(Please move the slide to adjust your answer.)*

\_\_\_\_\_ Required annual retirement income (as a % of current income) (1)

Q30. How likely or unlikely are you to achieve this required annual income when you are in retirement?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Highly unlikely : Highly likely (1)	<input type="radio"/>						

Q31. Do you anticipate **providing** financial support to any other family member (other than your spouse/partner) or organisation when you are retired?

*(Please tick as many options as you need.)*

- Yes, one-off payment of \$(please state expected amount) (1)
- \_\_\_\_\_ Yes, occasional payments of \$(please state expected amount per year) (2)
- \_\_\_\_\_ Yes, regular on-going payments of \$(please state regular amount) (3)
- \_\_\_\_\_ No (4)
- \_\_\_\_\_ Don't know (5)

Q32. How often do you expect to **provide** this regular financial support?

- Weekly (1)
- Fortnightly (2)
- Monthly (3)
- Every three (3) months (4)
- Every six (6) months (5)
- Yearly (6)

Q33. Which person or organisation will you be **providing** this financial support to?

*(Please tick as many options as you need.)*

- Children (1)
- Parents (2)
- Grandchildren (3)
- Other relations (4)
- Church (5)
- Charities (6)
- Other (please specify) (7) \_\_\_\_\_

Q34. Do you anticipate **receiving** financial support from any other family member (other than your spouse/partner) or organisation when you are retired?

*(Please tick as many options as you need.)*

- Yes, one-off payment of \$(please state expected amount) (1)
- Yes, occasional payments of \$(please state expected amount per year) (2)
- Yes, regular on-going payments of \$(please state regular amount) (3)
- No (4)
- Don't know (5)

Q35. How often do you expect to **receive** this regular financial support?

- Weekly (1)
- Fortnightly (2)
- Monthly (3)
- Every three (3) months (4)
- Every six (6) months (5)
- Yearly (6)

Q36. From which person or organisation will you be **receiving** this financial support? (Please tick as many options as you need.)

- Children (1)
- Parents (2)
- Grandchildren (3)
- Other relations (4)
- Church (5)
- Charities (6)
- Work and Income NZ (WINZ) (7)
- Other (please specify) (8) \_\_\_\_\_

Q37. Thinking about putting aside funds for your retirement, to what extent do you agree or disagree with the following statements?

	Strongly Agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
NZ Superannuation will be sufficient for my retirement (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am saving enough to fund my desired lifestyle in retirement (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KiwiSaver should provide enough (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In my current situation, it is impossible to save for retirement (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I just know that I will have sufficient financial resources (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend using the equity in my house to help fund my retirement (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q38. Apart from NZ Superannuation, what other sources of income do you expect to have in your retirement?

*(Please tick as many options as you need.)*

- Social welfare allowances and benefits, other than NZ Superannuation (1)
- Employer-provided pension or pension scheme (2)
- Part-time work (3)
- Regular withdrawals from KiwiSaver (4)
- Interest from savings account or term deposits (5)
- Interest from finance company debentures (6)
- Interest from fixed interest bonds (7)
- Dividends from shares (8)
- Profits from business/farm operations (9)
- Distributions from Trust/s (10)
- Rental income from residential property (11)
- Rental from non-residential property (12)
- Sell house to downgrade and invest the difference (13)
- Home equity release (14)
- Financial support from family (15)
- No other income sources in retirement (16)
- Other (please specify) (17) \_\_\_\_\_

Q39. How often do you review and adjust how your savings are allocated among different investments?

- I / we don't have any current savings (1)
- Never (2)
- Once every three years or more (3)
- Once every two years (4)
- Once a year (5)
- More than once a year (6)
- Other (please specify) (7) \_\_\_\_\_

Q40. What do you believe is the **main** purpose of the KiwiSaver scheme?

- A general all-purpose saving scheme (1)
- A saving scheme to help fund retirement (2)
- A combination of all-purpose saving and retirement saving scheme (3)
- A first-home saving scheme (4)
- I don't know the purpose (5)
- Other (please specify) (6) \_\_\_\_\_

Q41. Are you personally a current member of KiwiSaver?

- Yes, but have not made any withdrawal (1)
- Yes, and have made partial withdrawal (2)
- No, I joined but made full withdrawal (3)
- No, I opted out (4)
- No, I never joined (5)
- Don't know (6)

Q42. Is your partner a current member of KiwiSaver?

- Yes, but have not made any withdrawal (1)
- Yes, and have made partial withdrawal (2)
- No, joined but made full withdrawal (3)
- No, opted out (4)
- No, never joined (5)
- Don't know (6)

Q43. Do or did you (or your partner) belong to any other government or employer superannuation / pension scheme?

- Yes (1)
- No (2)
- Don't know (3)

Q44. How long have you been (or were you) a member of KiwiSaver?

- Less than a year (1)
- Between 1 - 3 years (2)
- More than 3 years, but less than 7 years (3)
- From the start - 7 years plus (4)
- Not sure (5)

Q45. My personal KiwiSaver contribution rate is currently (or was):

- 3% (1)
- 4% (2)
- 8% (3)
- More than 8% (4)
- Have stopped contributions (5)
- Don't know (6)
- Other (7) \_\_\_\_\_

Q46. Which investment type best describes your KiwiSaver fund?

- Default (1)
- Defensive (2)
- Conservative (3)
- Balanced (4)
- Growth (5)
- Aggressive or High Growth (6)
- Don't know (7)
- Other (please specify) (8) \_\_\_\_\_

Q47. In general, how much risk are (or were) you prepared to take with your KiwiSaver Funds?

- I don't want to take any risk with my KiwiSaver funds at all (1)
- I would accept a little more risk for a better return (2)
- I am quite prepared to accept a higher level of risk for a much better return (3)
- I'm not sure (4)

Q48 How aware or unaware are you of all the withdrawal options available to you when you are (or were) eligible to withdraw from KiwiSaver?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Very unaware : Very aware (1)	<input type="radio"/>						

Q49. **In total**, how much money do you (and your partner) currently have in KiwiSaver?

- \$1 - \$5,000 (1)
- \$5,001 - \$10,000 (2)
- \$10,001 - \$20,000 (3)
- \$25,001 - \$50,000 (4)
- \$50,001 - \$100,000 (5)
- \$100,001 - \$250,000 (6)
- More than \$250,000 (7)
- Don't know (8)

Q50. **In total**, how much money do you believe you (and your partner) will have in KiwiSaver when you come to **retire**?

- \$10,000 or less (1)
- \$10,001 - \$50,000 (2)
- \$50,001 - \$100,000 (3)
- \$100,001 - \$250,000 (4)
- \$250,001 - \$500,000 (5)
- \$500,001 - \$1 million (6)
- \$1 million - \$1.5 million (7)
- \$1.5 million - \$2.0 million (8)
- More than \$2.0 million (9)
- Don't know (10)

Q51. When eligible to withdraw, what purposes do you intend to use your KiwiSaver for?

*(Please tick as many boxes as you need.)*

- Only use to provide retirement income (1)
- Use some to provide retirement income (2)
- Travel (3)
- Repay mortgage (4)
- Repay other loans and debt (5)
- Buy a house to live in (6)
- Buy a rental property (7)
- Refurnish home (8)
- Make a major purchase (car, boat, TV) (9)
- Financially assist children (10)
- Financially assist relatives (11)
- Give to church (12)
- Give to Charity (13)
- Other (please specify) (14) \_\_\_\_\_

Q52. What percentage of your KiwiSaver do you expect to use for purposes other than retirement funding?

- 0% (1)
- Less than 10% (2)
- 10%-25% (3)
- 26% - 50% (4)
- 51% - 75% (5)
- 76% - 100% (6)
- Don't know (7)

Q53. If you were lucky enough to win over \$250,000 in Lotto or receive it from an unexpected source, what would you do with this?

*(Please tick as many boxes as you need.)*

- Only use to provide retirement income (1)
- Use some to provide retirement income (2)
- Travel (3)
- Repay mortgage (4)
- Repay other loans and debt (5)
- Buy a house to live in (6)
- Buy a rental property (7)
- Refurnish home (8)
- Make a major purchase (car, boat, TV) (9)
- Financially assist children (10)
- Financially assist relatives (11)
- Give to church (12)
- Give to Charity (13)
- Other (please specify) (14) \_\_\_\_\_

Q54. What type of government or employer superannuation / pension scheme is it?

- Defined benefit scheme (1)
- Defined contribution scheme (2)
- Don't know (3)

Q55. Please describe the Defined Benefit and/or the amount you expect to receive when you retire?

Q56. In total, how much money do you (and your partner) currently have in this government or employer superannuation / pension scheme?

- \$5,000 or less (1)
- \$5,001 - \$10,000 (2)
- \$10,001 - \$25,000 (3)
- \$25,001 - \$50,000 (4)
- \$50,001 - \$100,000 (5)
- \$100,001 - \$250,000 (6)
- More than \$250,000 (7)
- Unsure (8)

Q57. This section asks questions around current home ownership. What best describes your accommodation arrangements?

- Own home with mortgage - in own name (1)
- Own home with mortgage - in a Trust name (2)
- Own home without mortgage - in own name (3)
- Own home without mortgage - in a Trust name (4)
- Flat or Rent or Lease (5)
- Board with parents (6)
- Board with others (7)
- Lifetime lease to occupy (9)
- Other (please specify) (8) \_\_\_\_\_

58. How much rent (without food, power, phone, etc. contributions) do you pay each week?

- |   |   |
|---|---|
| <input type="radio"/> Less than \$100 (1) | <input type="radio"/> \$401 - \$500 (5)   |
| <input type="radio"/> \$101 - \$200 (2)   | <input type="radio"/> \$501 - \$600 (6)   |
| <input type="radio"/> \$201 - \$300 (3)   | <input type="radio"/> \$601 - \$750 (7)   |
| <input type="radio"/> \$301 - \$400 (4)   | <input type="radio"/> More than \$750 (8) |

Q59. At what age did you purchase your first home?

- |                               |                               |                               |                               |                                |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|
| <input type="radio"/> < 25(1) | <input type="radio"/> 35 (35) | <input type="radio"/> 46 (46) | <input type="radio"/> 57 (57) | <input type="radio"/> 68 (68)  |
| <input type="radio"/> 25 (25) | <input type="radio"/> 36 (36) | <input type="radio"/> 47 (47) | <input type="radio"/> 58 (58) | <input type="radio"/> 69 (69)  |
| <input type="radio"/> 26 (26) | <input type="radio"/> 37 (37) | <input type="radio"/> 48 (48) | <input type="radio"/> 59 (59) | <input type="radio"/> 70 (70)  |
| <input type="radio"/> 27 (27) | <input type="radio"/> 38 (38) | <input type="radio"/> 49 (49) | <input type="radio"/> 60 (60) | <input type="radio"/> 71 (71)  |
| <input type="radio"/> 28 (28) | <input type="radio"/> 39 (39) | <input type="radio"/> 50 (50) | <input type="radio"/> 61 (61) | <input type="radio"/> 72 (72)  |
| <input type="radio"/> 29 (29) | <input type="radio"/> 40 (40) | <input type="radio"/> 51 (51) | <input type="radio"/> 62 (62) | <input type="radio"/> 73 (73)  |
| <input type="radio"/> 30 (30) | <input type="radio"/> 41 (41) | <input type="radio"/> 52 (52) | <input type="radio"/> 63 (63) | <input type="radio"/> 74 (74)  |
| <input type="radio"/> 31 (31) | <input type="radio"/> 42 (42) | <input type="radio"/> 53 (53) | <input type="radio"/> 64 (64) | <input type="radio"/> 75 (75)  |
| <input type="radio"/> 32 (32) | <input type="radio"/> 43 (43) | <input type="radio"/> 54 (54) | <input type="radio"/> 65 (65) | <input type="radio"/> >75 (76) |
| <input type="radio"/> 33 (33) | <input type="radio"/> 44 (44) | <input type="radio"/> 55 (55) | <input type="radio"/> 66 (66) |                                |
| <input type="radio"/> 34 (34) | <input type="radio"/> 45 (45) | <input type="radio"/> 56 (56) | <input type="radio"/> 67 (67) |                                |

Q60. How old were you when you fully repaid the mortgage on your current home?

- |                               |                               |                               |                               |                                |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|
| <input type="radio"/> < 25(1) | <input type="radio"/> 35 (35) | <input type="radio"/> 46 (46) | <input type="radio"/> 57 (57) | <input type="radio"/> 68 (68)  |
| <input type="radio"/> 25 (25) | <input type="radio"/> 36 (36) | <input type="radio"/> 47 (47) | <input type="radio"/> 58 (58) | <input type="radio"/> 69 (69)  |
| <input type="radio"/> 26 (26) | <input type="radio"/> 37 (37) | <input type="radio"/> 48 (48) | <input type="radio"/> 59 (59) | <input type="radio"/> 70 (70)  |
| <input type="radio"/> 27 (27) | <input type="radio"/> 38 (38) | <input type="radio"/> 49 (49) | <input type="radio"/> 60 (60) | <input type="radio"/> 71 (71)  |
| <input type="radio"/> 28 (28) | <input type="radio"/> 39 (39) | <input type="radio"/> 50 (50) | <input type="radio"/> 61 (61) | <input type="radio"/> 72 (72)  |
| <input type="radio"/> 29 (29) | <input type="radio"/> 40 (40) | <input type="radio"/> 51 (51) | <input type="radio"/> 62 (62) | <input type="radio"/> 73 (73)  |
| <input type="radio"/> 30 (30) | <input type="radio"/> 41 (41) | <input type="radio"/> 52 (52) | <input type="radio"/> 63 (63) | <input type="radio"/> 74 (74)  |
| <input type="radio"/> 31 (31) | <input type="radio"/> 42 (42) | <input type="radio"/> 53 (53) | <input type="radio"/> 64 (64) | <input type="radio"/> 75 (75)  |
| <input type="radio"/> 32 (32) | <input type="radio"/> 43 (43) | <input type="radio"/> 54 (54) | <input type="radio"/> 65 (65) | <input type="radio"/> >75 (76) |
| <input type="radio"/> 33 (33) | <input type="radio"/> 44 (44) | <input type="radio"/> 55 (55) | <input type="radio"/> 66 (66) |                                |
| <input type="radio"/> 34 (34) | <input type="radio"/> 45 (45) | <input type="radio"/> 56 (56) | <input type="radio"/> 67 (67) |                                |

Q61. At what age do you plan to have repaid your mortgage?

- |                                      |
|--------------------------------------|
| <input type="radio"/> 50 - 55 (1)    |
| <input type="radio"/> 56 - 60 (2)    |
| <input type="radio"/> 61 - 65 (3)    |
| <input type="radio"/> 66 - 70 (4)    |
| <input type="radio"/> 71 - 75 (8)    |
| <input type="radio"/> >75 (6)        |
| <input type="radio"/> Don't know (7) |

Q62. Roughly what percentage of your current **household** income do mortgage repayments represent?

- Less than 10% (1)
- Between 10% - 19% (2)
- Between 20% - 29% (3)
- Between 30% - 39% (4)
- Between 40% - 49% (5)
- Between 50% - 59% (6)
- Between 60% - 69% (7)
- Between 70% - 80% (8)
- More than 80% (9)
- Don't know (10)

Q63. At some point in the past, have you extended your mortgage?

- Yes (1)
- No (2)
- Don't know (3)

Q64. For what reason/s did you extend your mortgage?

*(Please tick as many options as you need.)*

- Purchase a more expensive home (1)
- Home renovation (2)
- Relocated to another centre (3)
- To make a major purchase (e.g. car, boat, etc.) (4)
- To repay personal or business debt (5)
- To consolidate debt (6)
- To assist children (7)
- To travel (8)
- To invest (9)
- Other (Please specify) (10) \_\_\_\_\_

Q65. Is it your intention to own your home in the future?

- Yes (1)
- No (2)
- Don't know (3)

Q66. By what age do you plan to purchase your own home?

- |                                   |                                      |
|-----------------------------------|--------------------------------------|
| <input type="radio"/> 50 - 55 (1) | <input type="radio"/> 71 - 75 (5)    |
| <input type="radio"/> 56 - 60 (2) | <input type="radio"/> After 75 (6)   |
| <input type="radio"/> 61 - 65 (3) | <input type="radio"/> Don't know (7) |
| <input type="radio"/> 66 - 70 (4) |                                      |

Q67. At what age do you plan to have repaid your mortgage?

- |                                   |                                      |
|-----------------------------------|--------------------------------------|
| <input type="radio"/> 50 - 55 (1) | <input type="radio"/> 71 - 75 (5)    |
| <input type="radio"/> 56 - 60 (2) | <input type="radio"/> After 75 (6)   |
| <input type="radio"/> 61 - 65 (3) | <input type="radio"/> Don't know (7) |
| <input type="radio"/> 66 - 70 (4) |                                      |

Q68. What **assets** or sources of capital do you expect to use to fund your retirement?

*(Please tick as many options as you need.)*

- No other assets or sources of capital (1)
- The sale of a business or farm (2)
- The sale of personal assets (3)
- The sale of a rental property (4)
- Downsizing family home (5)
- Equity release from home (6)
- Business profits or retained earnings (7)
- KiwiSaver (8)
- Cashing up insurance policies (9)
- Forestry (10)
- Term Deposits (11)
- Fixed interest bonds (12)
- Shares (13)
- Investment portfolio (14)
- Inheritance (15)
- Other (please specify) (16) \_\_\_\_\_

Q69. **In total**, how much money would you (and your partner) currently have in savings, rental property and investments, **NOT including** the value of your **primary residence**?

- |  |   |
|--|---|
| <input type="radio"/> \$10,000 or less (1)     | <input type="radio"/> \$500,001 - \$1.0 million (6)     |
| <input type="radio"/> \$10,001 - \$50,000 (2)  | <input type="radio"/> \$1.0 million - \$1.5 million (7) |
| <input type="radio"/> \$50,001 - \$100,00 (3)  | <input type="radio"/> \$1.5 million - \$2.0 million (8) |
| <input type="radio"/> \$100,001 - \$250,00 (4) | <input type="radio"/> More than \$2.0 million (9)       |
| <input type="radio"/> \$250,001 - \$500,00 (5) | <input type="radio"/> Don't know (10)                   |

Q71. Do you expect to spend your investment capital in retirement?

- Yes, I expect use all my investments (3)
- Yes, I expect to use part of my investments (2)
- No, I want to preserve all my investments (1)
- Don't know (4)

Q72. Do you expect to use the value of your home equity in retirement?

- Yes, I expect to use all my home equity (3)
- Yes, I expect to use part of my home equity (2)
- No, I want to preserve all my home equity (1)
- Don't know (4)

Q70. What would you (and your partner) estimate your net worth to be currently?

Your net worth is equal to all your assets less all your debt/loans.

Please include your home as an asset and your mortgage, if any, as a debt/loan in calculating your net worth?

- Less than \$0 (1)
- \$0 - \$10,000 (2)
- \$10,001 - \$50,000 (3)
- \$50,001 - \$100,000 (4)
- \$100,001 - \$250,000 (5)
- \$250,001 - \$500,000 (6)
- \$500,001 - \$1.0 million (7)
- \$1.0 million - \$1.5 million (8)
- \$1.5 million - \$2.5 million (9)
- \$2.5 million - \$5.0 million (10)
- More than \$5 million (11)
- Don't know (12)

Q73. How well would you say you personally are managing financially **currently**? Would you say you were ...

- Finding it very difficult (1)
- Finding it quite difficult (2)
- Just about getting by (3)
- Doing alright (4)
- Living comfortably (5)

Q74. Do you personally think you are better off, worse off or about the same financially than you were **12 months ago**?

- Worse off (1)
- About the same (2)
- Better off (3)

Q75. **In 12 months' time** do you personally think you will be better off, worse off or about the same financially than you are now?

- Worse off (1)
- About the same (2)
- Better off (3)

Q76. Which statement best describes your current ability to save?

- I save a regular amount each pay (1)
- I have no regular savings plan, and try to save what is left over (2)
- It is impossible to save as all my income is spent (3)
- I have not given savings any thought (4)

Q77. To what extent do you agree or disagree with the following statements?

	Strongly Agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
I am organised with regards to managing money (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am impulsive and buy things even when I can't really afford them (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I buy things on credit rather than waiting and saving up (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more of a saver than a spender (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I live for today and let tomorrow take care of itself (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found it more satisfying to spend money than save it for the long term (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I save money for a rainy day (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know enough about financial products (loans, investments, etc) to choose ones that meet my needs (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q78. To what extent do you agree or disagree with the following statements?

	Strongly Agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
In a typical month, I find it difficult to pay all my bills (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the past 12 months, I have found it difficult paying my mortgage, rent, rates, or insurance (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The level of debt is affecting my ability to save for retirement (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I always pay credit card bills in full and avoid finance charges (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the past year, I have reached the maximum limit on a credit card (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the past three months, I had to use a credit card because I ran out of money (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the past three months I have used emergency / payday / short-term loans (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Over the past five years, my personal loans and credit card debt has increased (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q79. To what extent do you agree or disagree with the following statements?

	Strongly Agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
I often follow financial matters in the news, on-line and/or in the media (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a weekly or monthly budget that I follow (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The level of debt has affected my ability to save for retirement (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is important to repay a mortgage before saving for retirement (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is important to put savings aside first before spending (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is important to save for any major purchase (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is important to just spend wage/salary, and save any income from other sources (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q80. To what extent do you agree or disagree with the following statements about investing?

	Strongly Agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
In terms of investing, safety is more important than returns (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I think of the word ‘risk’, the term ‘loss’ comes to mind immediately (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making money in shares is based on luck. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I think of the word ‘loss’, I tend to think about ‘total 100% loss’ (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Investing with an expectation of making a substantial gain comes with a significant risk of losing most or all my money (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q81 Please rate how ‘safe’ you feel the following investments are?

	Very Safe (1)	Safe (2)	Risky (3)	Very Risky (4)	Don't Know (5)
Commercial Property (1)	<input type="radio"/>				
Direct Shares (9)	<input type="radio"/>				
Finance Company Debentures (3)	<input type="radio"/>				
Fixed Interest Bonds (4)	<input type="radio"/>				
KiwiSaver funds - Balanced (5)	<input type="radio"/>				
KiwiSaver funds - Conservative (10)	<input type="radio"/>				
KiwiSaver funds - High Growth (11)	<input type="radio"/>				
Residential Rental Property (7)	<input type="radio"/>				
Term Deposit with a bank (8)	<input type="radio"/>				

Q82. On some occasions things do not go quite as planned. How frequently would you have made **alternative** arrangements or adjusted your financial affairs?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q83. In the case of a personal financial emergency, would you be able to access up to three months' worth of household expenditure, sufficient to cover your living costs?

- Yes (1)
- No (2)
- Don't know (3)

Q84. Were you affected financially by the collapse of NZ finance companies in 2006 - 2012?

- Yes (1)
- No (2)
- Don't know (3)

Q85. What impact did the collapse of NZ finance companies have on your retirement savings?

- No effect (1)
- Minor effect (2)
- Major effect (3)

Q86. Please indicate whether you have any of the following?

*(Please tick as many options as you need.)*

- Car Insurance (1)
- House & Contents Insurance (2)
- Life Insurance (3)
- Total & Permanent Disability (TPD) Insurance (4)
- Trauma or Serious Illness Insurance (5)
- Income Protection Insurance (6)
- Medical or Health Insurance (7)
- A Will (8)
- Enduring Power of Attorney - Health & Welfare (9)
- Enduring Power of Attorney - Property (10)
- A Trust that owns Assets or Property (11)
- Other (please specify) (12) \_\_\_\_\_

Q87. How likely or unlikely would your employer be to give you more than a month's paid leave if you were sick?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Very unlikely : Very likely (1)	<input type="radio"/>						

Q88. Financially, how confident or not confident do you feel about your retirement if:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	N/a (8)
Everything goes as you expect? (1)	<input type="radio"/>							
You or your partner are forced to retire early? (2)	<input type="radio"/>							
A loved one needs to go into extended long-term care? (3)	<input type="radio"/>							
Your partner dies before retirement? (4)	<input type="radio"/>							
An adult child moves back in and needs support? (5)	<input type="radio"/>							

Q89. What is your **main** source of financial advice?

- Partner / Spouse (1)
- Parents (2)
- Children (3)
- Friends or Work Colleagues (4)
- Professional Financial Advisers (5)
- Bank/s (6)
- My own reading and research (7)
- Other (please specify) (8) \_\_\_\_\_

Q90 & Q91. How often do you have in-depth discussions on the following topics with your (Q89. Choice or other financial advisers)?

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
Your Net Worth (Total assets owned less any money owed to bank or others) (1)	<input type="radio"/>				
How you would cope financially on a reduced family income (2)	<input type="radio"/>				
Where you would live in retirement (3)	<input type="radio"/>				
How you would pay for long-term care, if required (4)	<input type="radio"/>				
Your Will or inheritance plans (5)	<input type="radio"/>				

Q92. Have you sought **professional financial advice** in the past two years?

- Yes (1)
- No (2)

Q93. How likely or unlikely are you to seek **professional financial advice** in the next 12 months?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Highly Unlikely : Highly Likely (1)	<input type="radio"/>						

Q94 How comfortable or uncomfortable would you be discussing financial matters with a **professional financial adviser**?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Very uncomfortable : Very comfortable (1)	<input type="radio"/>						

Q95 How confident or not confident are you that you are well-prepared financially for retirement?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	8 (8)	9 (9)	10 (10)
Not at all confident : Very confident (1)	<input type="radio"/>									

Q96. How many hours per week do you regularly work in retirement?

- Less than 15 hours (1)
- Between 15 and 29 hours (2)
- 30 or more hours (3)

Q97. At what age do you plan to **fully** retire?

- |                                     |                               |                               |                                     |
|-------------------------------------|-------------------------------|-------------------------------|-------------------------------------|
| <input type="radio"/> Before 50 (1) | <input type="radio"/> 58 (58) | <input type="radio"/> 67 (67) | <input type="radio"/> 76 (76)       |
| <input type="radio"/> 50 (50)       | <input type="radio"/> 59 (59) | <input type="radio"/> 68 (68) | <input type="radio"/> 77 (77)       |
| <input type="radio"/> 51 (51)       | <input type="radio"/> 60 (60) | <input type="radio"/> 69 (69) | <input type="radio"/> 78 (78)       |
| <input type="radio"/> 52 (52)       | <input type="radio"/> 61 (61) | <input type="radio"/> 70 (70) | <input type="radio"/> 79 (79)       |
| <input type="radio"/> 53 (53)       | <input type="radio"/> 62 (62) | <input type="radio"/> 71 (71) | <input type="radio"/> 80 (80)       |
| <input type="radio"/> 54 (54)       | <input type="radio"/> 63 (63) | <input type="radio"/> 72 (72) | <input type="radio"/> After 80 (81) |
| <input type="radio"/> 55 (55)       | <input type="radio"/> 64 (64) | <input type="radio"/> 73 (73) |                                     |
| <input type="radio"/> 56 (56)       | <input type="radio"/> 65 (65) | <input type="radio"/> 74 (74) |                                     |
| <input type="radio"/> 57 (57)       | <input type="radio"/> 66 (66) | <input type="radio"/> 75 (75) |                                     |

Q98 In what year did you retire?

- |                                     |                                   |                                   |
|-------------------------------------|-----------------------------------|-----------------------------------|
| <input type="radio"/> < 1985 (1984) | <input type="radio"/> 1995 (1995) | <input type="radio"/> 2006 (2006) |
| <input type="radio"/> 1985 (1985)   | <input type="radio"/> 1996 (1996) | <input type="radio"/> 2007 (2007) |
| <input type="radio"/> 1986 (1986)   | <input type="radio"/> 1997 (1997) | <input type="radio"/> 2008 (2008) |
| <input type="radio"/> 1987 (1987)   | <input type="radio"/> 1998 (1998) | <input type="radio"/> 2009 (2009) |
| <input type="radio"/> 1988 (1988)   | <input type="radio"/> 1999 (1999) | <input type="radio"/> 2010 (2010) |
| <input type="radio"/> 1989 (1989)   | <input type="radio"/> 2000 (2000) | <input type="radio"/> 2011 (2011) |
| <input type="radio"/> 1990 (1990)   | <input type="radio"/> 2001 (2001) | <input type="radio"/> 2012 (2012) |
| <input type="radio"/> 1991 (1991)   | <input type="radio"/> 2002 (2002) | <input type="radio"/> 2013 (2013) |
| <input type="radio"/> 1992 (1992)   | <input type="radio"/> 2003 (2003) | <input type="radio"/> 2014 (2014) |
| <input type="radio"/> 1993 (1993)   | <input type="radio"/> 2004 (2004) | <input type="radio"/> 2015 (2015) |
| <input type="radio"/> 1994 (1994)   | <input type="radio"/> 2005 (2005) |                                   |

Q99. Did you work part-time for a while after you retired?

- Yes (1)
- No (2)

Q100. After you retired and you were working part-time, how many hours per week did you usually work?

- Less than 15 hours (1)
- Between 15 and 29 hours (2)
- 30 or more hours (3)

Q101. In what year did you **fully** retire?

- |                                     |                                   |                                   |
|-------------------------------------|-----------------------------------|-----------------------------------|
| <input type="radio"/> < 1985 (1984) | <input type="radio"/> 1995 (1995) | <input type="radio"/> 2006 (2006) |
| <input type="radio"/> 1985 (1985)   | <input type="radio"/> 1996 (1996) | <input type="radio"/> 2007 (2007) |
| <input type="radio"/> 1986 (1986)   | <input type="radio"/> 1997 (1997) | <input type="radio"/> 2008 (2008) |
| <input type="radio"/> 1987 (1987)   | <input type="radio"/> 1998 (1998) | <input type="radio"/> 2009 (2009) |
| <input type="radio"/> 1988 (1988)   | <input type="radio"/> 1999 (1999) | <input type="radio"/> 2010 (2010) |
| <input type="radio"/> 1989 (1989)   | <input type="radio"/> 2000 (2000) | <input type="radio"/> 2011 (2011) |
| <input type="radio"/> 1990 (1990)   | <input type="radio"/> 2001 (2001) | <input type="radio"/> 2012 (2012) |
| <input type="radio"/> 1991 (1991)   | <input type="radio"/> 2002 (2002) | <input type="radio"/> 2013 (2013) |
| <input type="radio"/> 1992 (1992)   | <input type="radio"/> 2003 (2003) | <input type="radio"/> 2014 (2014) |
| <input type="radio"/> 1993 (1993)   | <input type="radio"/> 2004 (2004) | <input type="radio"/> 2015 (2015) |
| <input type="radio"/> 1994 (1994)   | <input type="radio"/> 2005 (2005) |                                   |

Q102. To what extent do you agree or disagree with the following statements?

	Strongly agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
Before I retired, I believed that I was well-prepared financially for retirement. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Before I retired, I was aware of the need to plan financially for my retirement (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Before I retired, retirement was of concern to me (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have established long-term goals and am working to fulfill them. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel confident when it comes to understanding financial matters (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q103 **Before** you retired, how much thought did you give to the following?

	A lot (5)	Some (4)	Little (3)	Hardly any (2)	None (1)
Your quality of life in retirement (1)	<input type="radio"/>				
Funding your retirement (2)	<input type="radio"/>				
The length of your retirement (3)	<input type="radio"/>				

Q104 Thinking about your own personal retirement planning process, how well developed or undeveloped would you say your financial plans for retirement were **before** you retired?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
I did not have a financial retirement plan : My financial retirement plans were well developed (1)	<input type="radio"/>						

Q105. **Before** you retired, did you (and your partner) ever develop a formal financial plan for retirement?

- Yes, I / we did (1)
- No, I / we did not (2)
- Don't know (3)

Q106. **Before** you retired, did you (or your partner) try to figure out how much you need to save for your retirement? *(Please tick as many options as you need.)*

- No (1)
- Yes, as a weekly or monthly savings amount (2)
- Yes, as yearly amount required to be saved (3)
- Yes, based on the annual income required in retirement (4)
- Yes, as a total amount needed to accumulated before retirement (5)
- Don't know (6)

Q107. **Excluding** any equity in your home, how much did you think you needed to accumulate in total **before** you (and your partner) retired so that you can live comfortably in retirement?

- \$100,000 or less (1)
- \$100,000 - \$250,000 (2)
- \$250,001 - \$500,000 (3)
- \$500,001 - \$1 million (4)
- \$1.0 million - \$1.5 million (5)
- \$1.5 million - \$2.0 million (6)
- More than \$2 million (7)
- Don't know (8)

Q108. Was this financial plan for retirement written down?

- Yes (1)
- No (2)

Q109. Generally, were you (and your partner) able to stick to your financial plan?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- All of the time (5)

Q110. How adequate or inadequate is your current level of retirement income in funding your desired retirement lifestyle?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Very inadequate : Very adequate (1)	<input type="radio"/>						

Q111 **Including** NZ superannuation, what level of income (after tax) per week do you (and your partner) think you need to live comfortably in retirement?

- Less than \$350 per week (1)
- \$350 - \$600 per week (2)
- \$601 - \$1,000 per week (3)
- \$1,001 - \$1,500 per week (4)
- \$1,501 - \$2,000 per week (5)
- More than \$2,000 per week (6)

Q112. In your final year of earning **before** you retired, which of the following best describes your household's total yearly income from all sources before tax (including government allowances and NZ Superannuation)?

- |  |   |
|--|---|
| <input type="radio"/> \$10,000 or less (1)     | <input type="radio"/> \$100,001 - \$150,000 (6) |
| <input type="radio"/> \$10,001 - \$25,000 (2)  | <input type="radio"/> \$150,001 - \$200,000 (7) |
| <input type="radio"/> \$25,001 - \$35,000 (3)  | <input type="radio"/> More than \$200,000 (8)   |
| <input type="radio"/> \$35,001 - \$60,000 (4)  | <input type="radio"/> Don't know (9)            |
| <input type="radio"/> \$60,001 - \$100,000 (5) |   |

Q113. As a percentage of **household** income in the last year **before** you retired, what did you expect you would need in retirement?

*(Please move the slide to adjust your answer.)*

\_\_\_\_\_ Required annual retirement income (as a % of final year's earnings) (1)

Q114 In the first few years of your retirement was your household spending as you had anticipated?

- Yes, as expected (1)
- No, spent less than expected (2)
- No, spent more than expected (3)
- Don't know (4)

Q115. If NO, what do you think were the reasons that you spent more (or less) than you expected?

Q116. Are you **providing** financial support to any other family member (other than your spouse/partner) or organisation now that you are retired?

*(Please tick as many options as you need.)*

- Yes, one-off payment of \$(please state expected amount) (1)
- Yes, occasional payments of \$(please state expected amount per year) (2)
- Yes, regular on-going payments of \$(please state regular amount) (3)
- No (4)
- Don't know (5)

Q117. How often do you **provide** this regular financial support?

- Weekly (1)                    Every three (3) months (4)
- Fortnightly (2)                Every six (6) months (5)
- Monthly (3)                   Yearly (6)

Q118. Which person or organisation do you **provide** this financial support to?

*(Please tick as many options as you need.)*

- Children (1)
- Parents (2)
- Grandchildren (3)
- Other relations (4)
- Church (5)
- Charities (6)
- Other (please specify) (7) \_\_\_\_\_

Q119. Do you **receive** financial support from any other family member (other than your spouse/partner) or organisation now that you are retired? (Please tick as many options as you need.)

- Yes, one-off payment of \$(please state expected amount) (1)
- Yes, occasional payments of \$(please state expected amount per year) (2)
- Yes, regular on-going payments of \$(please state regular amount) (3)
- No (4)
- Don't know (5)

Q120. How often do you **receive** this regular financial support?

- Weekly (1)
- Fortnightly (2)
- Monthly (3)
- Every three (3) months (4)
- Every six (6) months (5)
- Yearly (6)

Q121. Which person or organisation do you receive this financial support from?

*(Please tick as many options as you need.)*

- Children (1)
- Parents (2)
- Grandchildren (3)
- Other relations (4)
- Church (5)
- Charities (6)
- Work and Income NZ (WiNZ) (7)
- Other (please specify) (8) \_\_\_\_\_

Q122. Thinking about how much you put aside to fund your retirement **before** you retired, to what extent do you agree or disagree with the following statements?

	Strongly Agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
I believed that NZ Superannuation would be sufficient for my retirement (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believed that I had saved enough to fund my desired lifestyle in retirement (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KiwiSaver should provide enough (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It was impossible to save for retirement (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I just knew that I would have sufficient financial resources (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intended to use the equity in my house to help fund my retirement (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q123. Apart from NZ Superannuation, from what other sources do you (and your partner) receive income in your retirement?

*(Please tick as many options as you need.)*

- Social welfare allowances and benefits (1)
- Employer pension or pension scheme (2)
- Part-time work or reduced hours (3)
- Regular withdrawals from KiwiSaver (4)
- Interest from savings account or term deposits (5)
- Interest from finance company debentures (6)
- Interest from fixed interest bonds (7)
- Dividends from shares (8)
  
- Profits from business/farm operations (9)
- Distributions from Trust/s (10)
- Rental income from residential property (11)
- Sell house to downgrade and invest the difference (12)
- Home equity release (13)
- Financial support from family (14)
- No other income sources in retirement (15)
- Other (please specify) (16) \_\_\_\_\_

Q124. When eligible to withdraw, what purposes did you (or do you intend to) use your KiwiSaver for?

*(Please tick as many options as you need.)*

- Only used to provide retirement income (1)
- Used some to provide retirement income (2)
- Travel (3)
- Repay mortgage (4)
- Repay loans and debt (5)
- Buy a house to live in (6)
- Buy a rental property (7)
- Refurnish home (8)
- Make a major purchase (car, boat, TV, etc.) (9)
- Provided financial assistance to children (10)
- Provided financial assistance to relatives (11)
- Gave to church (12)
- Gave to charity (13)
- Other (Please specify) (14) \_\_\_\_\_

Q125. What percentage of your KiwiSaver did you use for purposes **other than** for funding your retirement?

- 0% (1)
- Less than 10% (2)
- 10% - 25% (3)
- 26% - 50% (4)
- 51% - 75% (5)
- 76% -100% (6)
- Don't know (7)

Q126. Financially, how confident or not confident do you feel about your retirement if:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	N/a (8)
Everything goes as you expect? (1)	<input type="radio"/>							
A loved one needs to go into extended long-term care? (2)	<input type="radio"/>							
Your partner dies, reducing your NZ Superannuation? (3)	<input type="radio"/>							
An adult child moves back in and needs support? (4)	<input type="radio"/>							

Q127. How confident or not confident are you that your financial resources will be sufficient throughout your entire retirement?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	8 (8)	9 (9)	10 (10)
Not at all confident : Very confident (1)	<input type="radio"/>									

Q128. In order for people to take full advantage of the financial markets it is important that people understand financial terms and concepts. Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

- More than \$102 (1)
- Exactly \$102 (2)
- Less than \$102 (3)
- Don't know (4)

Q129. Suppose you had \$100 in a savings account and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have in this account in total?

- More than \$200 (1)
- Exactly \$200 (2)
- Less than \$200 (3)
- Don't know (4)

Q130. Suppose in the year 2016, your income has doubled and prices of all goods have doubled. In 2016, how much will you be able to buy with your income?

- More than today (1)
- Exactly the same (2)
- Less than today (3)
- Don't know (4)

Q131. Assume Sarah inherits \$10,000 today and James inherits \$10,000 in 3 years from now. Who is the richer because of the inheritance?

- Sarah (1)
- James (2)
- They are equally rich (3)
- Don't know (4)

Q132. Considering a long period of time (for example 10 or 20 years), which asset normally gives the highest return?

- Savings accounts (1)
- Fixed interest term deposits or bonds (2)
- Shares (3)
- Don't know (4)

Q133. When you are thinking about investing, what is your **first thought** when you consider investment risk?

- The risk that my returns may vary from year to year (1)
- The risk that I may lose some of my money (2)
- The risk that I may lose all of my money (3)
- The risk that the investment may be a scam (4)
- The risk that the adviser/organisation will take off with my money (5)
- Don't know (6)
- Other (please specify) (7) \_\_\_\_\_

Q134. When an investor spreads his money amongst different assets, does the investment risk of losing money...?

- Increase (1)
- Decrease (2)
- Stay the same (3)
- Don't know (4)

Q135. Which is the **best** example of ‘diversification’?

- Spreading your investment amongst five banks (1)
- Buying shares in ten NZ companies (2)
- Investing in a rental property and term deposits (3)
- Investing in cash, fixed interest, NZ shares, & international shares (4)
- Don't know (5)

Q137. What size city, town or place do you live in?

- Large city (100,000 or more people) (1)
- Medium city (50,000 - 99,999 people) (2)
- Small city (30,000 - 49,999 people) (3)
- Large town (10,000 - 29,999 people) (4)
- Small town (2,000 - 9,999 people) (5)
- Village (under 2,000 people) (6)
- Farm or rural property (7)

Q136. In what year were you born?

- |   |                                   |                                       |
|---|-----------------------------------|---------------------------------------|
| <input type="radio"/> Prior to 1935 (1) | <input type="radio"/> 1947 (1947) | <input type="radio"/> 1959 (1959)     |
| <input type="radio"/> 1936 (1936)       | <input type="radio"/> 1948 (1948) | <input type="radio"/> 1960 (1960)     |
| <input type="radio"/> 1937 (1937)       | <input type="radio"/> 1949 (1949) | <input type="radio"/> 1961 (1961)     |
| <input type="radio"/> 1938 (1938)       | <input type="radio"/> 1950 (1950) | <input type="radio"/> 1962 (1962)     |
| <input type="radio"/> 1939 (1939)       | <input type="radio"/> 1951 (1951) | <input type="radio"/> 1963 (1963)     |
| <input type="radio"/> 1940 (1940)       | <input type="radio"/> 1952 (1952) | <input type="radio"/> 1964 (1964)     |
| <input type="radio"/> 1941 (1941)       | <input type="radio"/> 1953 (1953) | <input type="radio"/> 1965 (1965)     |
| <input type="radio"/> 1942 (1942)       | <input type="radio"/> 1954 (1954) | <input type="radio"/> after 1965 (99) |
| <input type="radio"/> 1943 (1943)       | <input type="radio"/> 1955 (1955) |                                       |
| <input type="radio"/> 1944 (1944)       | <input type="radio"/> 1956 (1956) |                                       |
| <input type="radio"/> 1945 (1945)       | <input type="radio"/> 1957 (1957) |                                       |
| <input type="radio"/> 1946 (1946)       | <input type="radio"/> 1958 (1958) |                                       |

Q138. Which best describes your **highest** formal educational qualification?

- No formal qualification (1)
- School Qualification only (2)
- Trade Certificate or Diploma (3)
- Bachelor's Degree (4)
- Postgraduate Qualification (5)

Q139. Do you (or have you in the past) described yourself as the main income earner in your household?

- Yes (1)
- No (2)

Q140. When it comes to financial decision-making, what role would you play?

- I am the main financial decision-maker (1)
- I share the financial decision-making (2)
- I have limited input, someone else makes the financial decisions (3)

Q141. On average, how much income per week do you receive from your part-time work?

- \$0 (1)
- \$1 - \$100 (2)
- \$101 - \$250 (3)
- \$251 - \$500 (4)
- \$501 - \$750 (5)
- More than \$750 (6)
- Don't know (7)

Q142. Except for a basic cost of living or inflation-related adjustment, are you expecting a major change in your future household income?

- Yes, I expect my income to increase in the next two years (1)
- Yes, I expect my income to decrease in the next two years (2)
- No, I expect my income to stay much the same in the next two years (3)

Q143. Which of the following best describes your own **personal total yearly income** from all sources before tax (including government allowances and NZ Superannuation)?

- \$10,000 or less (1)
- \$10,001 - 25,000 (2)
- \$25,001 - \$35,000 (3)
- \$35,001 - \$60,000 (4)
- \$60,001 - \$100,000 (5)
- \$100,001 - \$150,000 (6)
- More than \$150,000 (7)
- Don't know (8)

Q144. Which of the following best describes your **household's total yearly income** from all sources before tax (including government allowances and NZ Superannuation)?

- \$10,000 or less (1)
- \$10,001 - \$25,000 (2)
- \$25,001 - \$35,000 (3)
- \$35,000 - \$60,000 (4)
- \$60,001 - \$100,000 (5)
- \$100,001 - \$150,000 (6)
- \$150,001 - \$200,000 (7)
- More than \$200,000 (8)
- Don't know (9)

Q145. How much on average would you are able to save each month?

- Nothing (1)
- \$1- \$100 per month (2)
- \$100 - \$250 per month (3)
- \$251 - \$500 per month (4)
- \$501 - \$1,000 per month (5)
- \$1,001 - \$2,000 per month (6)
- More than \$2,000 per month (7)

Q146. What is the most likely cause for this expected change in household income?

*(Please tick as many options as you need.)*

- One or more promotions (1)
- Change in careers (2)
- Re-training (3)
- Expecting and/or raising family (4)
- Expecting redundancy (5)
- Other (please specify) (6) \_\_\_\_\_

Q147. Which of the following best describes the value of your **home equity** (the value of the house that you live in **less** any outstanding mortgages or loans relating to that house)?

- \$25,000 or less (1)
- \$25,001 - \$50,000 (2)
- \$50,001 - \$100,000 (3)
- \$100,001 - \$250,000 (4)
- \$250,001 - \$500,000 (5)
- \$500,001 - \$1 million (6)
- \$1 million - \$1.5 million (7)
- \$1.5 million - \$2.5 million (8)
- Over \$2.5 million (9)
- Don't know (10)

Q148. How would you describe your health?

- Poor (1)
- Fair (2)
- Good (3)
- Excellent (4)

Q149. Have you ever had a period of three (3) months or more when you have been unable to work due to ill-health?

- Yes (1)
- No (2)

Q150. **In total**, how long was this period when you have been unable to work due to ill-health?

- Under 6 months (1)
- Between 6 months and a year (3)
- Between 1 and 2 years (4)
- Between 2 and 5 years (5)
- More than 5 years (6)
- Was unable to retire to work (7)

Q151. While you were unable to work due to ill-health, how long were you paid and/or receive disability insurance?

- Less than 3 months (1)
- Between 3 and 6 months (8)
- Between 6 months and a year (3)
- Between 1 and 2 years (4)
- Between 2 and 5 years (5)
- More than 5 years (6)
- Did not receive any payment (7)

Q152. Since beginning your working life, have you ever been out of paid employment for more than 3 months? *(Please tick as many options as you need.)*

- No, I have never been out of paid employment for more than 3 months (1)
- No, I never been in paid employment (2)
- Yes, to have and bring up children (3)
- Yes, on extended holiday (4)
- Yes, to retrain or gain qualification (5)
- Yes, unable to find paid employment (6)
- Yes, have been made redundant (7)
- Yes, doing voluntary work (8)
- Other (please specify) (9) \_\_\_\_\_

Q153. **In total**, how long a period were you out of paid employment?

- Under 6 months (1)
- Between 6 months and a year (3)
- Between 1 and 2 years (4)
- Between 2 and 5 years (5)
- Between 5 and 10years (6)
- More than 10 years (7)
- Was unable to find paid employment (8)

Q154. After raising your children, did you enter full-time or part-time employment?

- I only ever worked in part-time employment (1)
- Returned to part-time for a period, before gaining full-time employment (3)
- Returned to full-time employment (4)
- I never returned to part-time or full-time employment (5)

Q155. After returning to work after raising children, how many years did you work part-time before gaining full-time employment?

- |   |                                   |                                       |
|---|-----------------------------------|---------------------------------------|
| <input type="radio"/> Prior to 1935 (1) | <input type="radio"/> 1946 (1946) | <input type="radio"/> 1957 (1957)     |
| <input type="radio"/> 1936 (1936)       | <input type="radio"/> 1947 (1947) | <input type="radio"/> 1958 (1958)     |
| <input type="radio"/> 1937 (1937)       | <input type="radio"/> 1948 (1948) | <input type="radio"/> 1959 (1959)     |
| <input type="radio"/> 1938 (1938)       | <input type="radio"/> 1949 (1949) | <input type="radio"/> 1960 (1960)     |
| <input type="radio"/> 1939 (1939)       | <input type="radio"/> 1950 (1950) | <input type="radio"/> 1961 (1961)     |
| <input type="radio"/> 1940 (1940)       | <input type="radio"/> 1951 (1951) | <input type="radio"/> 1962 (1962)     |
| <input type="radio"/> 1941 (1941)       | <input type="radio"/> 1952 (1952) | <input type="radio"/> 1963 (1963)     |
| <input type="radio"/> 1942 (1942)       | <input type="radio"/> 1953 (1953) | <input type="radio"/> 1964 (1964)     |
| <input type="radio"/> 1943 (1943)       | <input type="radio"/> 1954 (1954) | <input type="radio"/> 1965 (1965)     |
| <input type="radio"/> 1944 (1944)       | <input type="radio"/> 1955 (1955) | <input type="radio"/> after 1965 (88) |
| <input type="radio"/> 1945 (1945)       | <input type="radio"/> 1956 (1956) |                                       |

Q156. In the past, have any members of your family reached the age of 90?

- Yes (1)
- No (2)

Q157. Have you ever smoked for a period of a year or more?

- Yes (1)
- No (2)

Q158. Do you still smoke?

- Yes (1)
- No (2)

Q159. Have you ever been separated or divorced before?

- Yes (1)
- No (2)

Q160. Did your separation and/or divorce have a substantial impact on your retirement savings or plans?

- Yes (1)
- No (2)

Finally, is there any answer, retirement related issues, or observations you wish to comment on. Your thoughts are most welcomed.

**Thank you for taking part in this survey, your time and effort in completing the questionnaire is greatly appreciated and your feedback is extremely valuable.**

Please click the NEXT arrow to submit your answers.

## Colmar Brunton Screening questions

Thanks for your willingness to take part in this survey. Before redirecting you to the university website, we have a few questions to check that you qualify, and to help make sure we've got the right mix of people.

S1 In which of the following regions do you live?

*Please select one only.*

Northland Region	1
Auckland Region (includes the area from the Bombay Hills up to Wellsford)	2
Waikato Region	3
Bay of Plenty Region	4
Gisborne Region	5
Hawke's Bay Region	6
Taranaki Region	7
Manawatu-Wanganui Region	8
Wellington Region (includes Kapiti and the Wairarapa)	9
Tasman Region	10
Nelson Region	11
Marlborough Region	12
West Coast Region	13
Canterbury Region	14
Otago Region	15
Southland Region	16
Area outside these regions	17
Don't know	18

S2 Are you...? *Please select one only.*

Male	1
Female	2

S3 Which of the following age groups are you in? *Please select one only.*

50 - 54 years	7
55 - 59 years	8
60 - 64 years	9
65 - 69 years	11
70 - 74 years	12
75 - 79 years	13
80 - 84 years	14

S4 Which of these groups do you fit into? You can be in more than one.

*Please select all that apply.*

New Zealand European	1
New Zealand Māori	2
Samoan	3
Cook Island Māori	4
Tongan	5
Niuean	6
Another Pacific Island group (please tell us)	7
Chinese	8
Indian	9
Another Asian group (please tell us)	10
Another European group (please tell us)	11
Another ethnic group (please tell us)	12
Don't know	13
Prefer not to say	14

S5 This question just helps to ensure we survey a wide range of people.

Which of the following **best describes** your annual household income, before tax?

Please consider all sources of income including any salary or wages, self-employed income, child support payments, money from the Government, and investments, etc.

If you're unsure, your best estimate is fine.

*Please select one only.*

\$20,000 or Less	1
\$20,001-\$30,000	2
\$30,001-\$50,000	3
\$50,001-\$70,000	4
\$70,001-\$100,000	5
\$100,001-\$150,000	6
\$150,001 or More	7

**IF QUOTA FULL CLOSE WITH:** I'm sorry. We have already surveyed a lot of people in a similar demographic group to you. Thank you very much for your interest.

**QUALIFIERS:** Thanks for answering those questions. You're just the person we're looking for.

Your participation in the survey is completely anonymous. The university does not have access to any personal information about you, such as your name and email address. All of those details remain confidential to Colmar Brunton.

## Appendix 4: Characteristics of Sample Population

	<b>Pre-Retired</b>	<b>Retired</b>	<b>Total</b>	<b>NZ<sup>129</sup></b>
<b>Gender (gender)</b>				
Female	n = 645	n = 399	n = 1044	n = 1.33M
Male	50.7%	54.2%	52.2%	51.7%
	49.3%	45.8%	47.8%	48.3%
<b>Marital Status (maritalstatus)</b>				
Single/Separated/Widowed	19.8%	21.8%	20.6%	30.9%
Married/Partnered	80.2%	78.2%	79.4%	69.1%
<b>Age (Age)</b>				
50-54	29.8%	2.0%	19.2%	22.6%
55-59	34.6%	3.8%	22.8%	19.6%
60-64	20.6%	10.8%	16.9%	17.6%
65-69	9.5%	23.3%	14.8%	14.8%
70-74	3.7%	32.1%	14.6%	11.3%
75-79	1.4%	18.0%	7.8%	8.0%
80+	0.5%	10.0%	4.1%	6.1%
<b>Region (region)</b>				
Auckland	35.3%	30.9%	34.8%	29.0%
Wellington	12.7%	9.5%	11.2%	10.5%
Canterbury	13.3%	13.0%	12.6%	13.6%
Other North Island	27%	35.3%	29.8%	34.6%
Other South Island	11.3%	11.3%	11.5%	12.3%
<b>Educational Qualifications (edqual)</b>				
No formal qualification	9.0%	13.6%	10.8%	29.6%
School Qualification	27.6%	32.6%	29.5%	31.0%
Trade Certificate or Diploma	29.8%	29.0%	29.5%	24.0%
Bachelor's Degree	16.8%	13.4%	15.5%	15.2% <sup>130</sup>
Postgraduate Qualification	16.8%	11.4%	14.7%	

<sup>129</sup> NZ figures are representative for 50 - 84 year age group as per NZ Census 2013.

<sup>130</sup> The NZ Census does not provide a separate figure for different levels of tertiary qualifications.

	<b>Pre-Retired</b>	<b>Retired</b>	<b>Total</b>	<b>NZ*</b>
<b>Ethnicity (ethnicity)</b>	<i>n = 645</i>	<i>n = 399</i>	<i>n = 1044</i>	<i>n = 1.33M</i>
Europeans	78.0%	88.5%	82.0%	82.6%
NZ Maori	7.0%	3.8%	5.7%	8.2%
Pacific	3.7%	1.3%	2.3%	3.4%
Asian	9.6%	5.8%	8.1%	7.0%
Other	1.4%	0.8%	1.1%	2.3%

**Household Income – Combined (incgroup)**

<\$30K	10.5%	36.8%	20.6%	21.0%
\$30k - \$50K	14.6%	28.3%	19.8%	20.2%
\$50K - \$100K	34.9%	24.6%	30.9%	30.9%
>\$100K	40.0%	10.3%	28.6%	27.9%

**Household - 50 - 64 years (incgroup)**

<\$30K	5.7%	1.8%	7.5%	7.6%
\$30k - \$50K	6.8%	0.7%	7.5%	7.7%
\$50K - \$100K	17.7%	1.8%	19.5%	20.0%
>\$100K	22.3%	2.0%	24.3%	22.4%

**Household - 65 & Over (incgroup)**

<\$30K	0.9%	12.3%	13.1%	13.4%
\$30k - \$50K	2.2%	10.2%	12.4%	12.5%
\$50K - \$100K	3.8%	7.6%	11.4%	10.9%
>\$100K	2.4%	1.9%	4.3%	5.5%

## Appendix 5: List of Variables Used in Statistical Analysis

This table shows in the first column the name of the variable used in the data analysis. In the second column, B = applies to both Retirees and Pre-retirees, P = Applies to Pre-retirees only, R = Applies to Retirees only. The fourth column is a full description of the named variable. Please refer to the coding used against appropriate survey questions in Appendix 3.

Variable Name	Question	Cohort	Full explanation of variable
<i>abilitysave</i>	Q76	B	Household's ability to save
<i>absence</i>	Q150/151	B	Respondent's absence from work due to ill health
<i>accomtype</i>	Q57	B	Accommodation type
<i>accamt<sup>P</sup></i>	Q22	P	Amount needed to be accumulated for retirement - Pre-retirees
<i>accamt<sup>R</sup></i>	Q107	R	Amount needed to be accumulated for retirement - Retirees
<i>achieve</i>	Q30	P	Likelihood of achieving required retirement income - Pre-retirees – Highly unlikely (1) – Highly likely (7)
<i>adequacy</i>	Calculated	B	Dichotomous dependent variable - Inadequate (0) Adequate (1)
<i>adequacy2</i>	Calculated	B	Continuous dependent variable - Adequacy differential (%)
<i>adequacy3</i>	Calculated	B	Ordered dependent variable - Inadequate (0), Marginal (2), Adequate (3)
<i>adequate</i>	Q110	R	Retirement lifestyle funded by retirement income -self-assessed – Very inadequate (1) – Very Adequate (7)
<i>age</i>	Q136	B	Respondent's age
<i>agegroup</i>	CB S3	B	Respondent's age - divided into 5-year age groups
<i>alternative</i>	Q82	B	Frequency of planning for alternatives
<i>aware<sup>P</sup></i>	Q15.2	P	Level of awareness for the need to plan for retirement - Pre-retirees –Strongly disagree (1) Strongly agree (5)
<i>aware<sup>R</sup></i>	Q102.2	R	Level of awareness for the need to plan for retirement – Retirees –Strongly disagree (1) - Strongly agree (5)
<i>bbills</i>	Q78.1	B	Level of difficulty in paying monthly bills –Strongly disagree (1) - Strongly agree (5)
<i>bbudget</i>	Q79.2	B	Ability to follow household budget –Strongly disagree (1) - Strongly agree (5)
<i>bcredit</i>	Q77.3	B	Rather use credit than to save –Strongly disagree (1) - Strongly agree (5)
<i>bdebtup</i>	Q78.7	B	Degree that household debt has increased over past 5 years – Strongly disagree (1) - Strongly agree (5)
<i>bdficc</i>	Q78.8	B	Degree of difficulty paying mortgage, rent, rates etc.
<i>bemerg</i>	Q78.6	B	Degree of use of emergency/pay day loans in past 3 months – Strongly disagree (1) - Strongly agree (5)
<i>bsfirst</i>	Q779.5	B	Degree of debt has affected ability to save for retirement – Strongly disagree (1) - Strongly agree (5)
<i>bhidebt</i>	Q78.2	B	Degree of importance to save before spending – Strongly disagree (1) - Strongly agree (5)
<i>bimpuls</i>	Q77.2	B	Degree of impulse buying - Strongly disagree (1) - Strongly agree (5)
<i>bknow</i>	Q77.8	B	Degree of personal knowledge to be able to select right financial product – Strongly disagree (1) - Strongly agree (5)
<i>bmaxcc</i>	Q78.4	B	Degree that Credit Card has been reached maximum level in past year – Strongly disagree (1) - Strongly agree (5)

Variable Name	Question	Cohort	Full explanation of variable
<i>bmedia</i>	Q79.1	B	Degree that financial matters are followed in the media – Strongly disagree (1) - Strongly agree (5)
<i>bpaycc</i>	Q78.3	B	Degree that credit cards are paid off in full to avoid interest charges – Strongly disagree (1) - Strongly agree (5)
<i>brainy</i>	Q77.7	B	Degree of saving for a 'rainy' day –Strongly disagree (1) - Strongly agree (5)
<i>brmortg</i>	Q79.4	B	Degree of importance of repaying mortgage before retirement saving –Strongly disagree (1)-Strongly agree (5)
<i>bsave</i>	Q77.4	B	Degree of being a saver, rather than a spender –Strongly disagree (1) - Strongly agree (5)
<i>boutcc</i>	Q79.4	B	Degree of Credit Card used after running out of money in past 3 months –Strongly disagree (1)-Strongly agree (5)
<i>bsother</i>	Q79.7	B	Degree that income, other than wage/salary, is saved rather than spent – Strongly disagree (1) - Strongly agree (5)
<i>bsmajor</i>	Q79.6	B	Degree that saving used for major purchases – Strongly disagree (1) - Strongly agree (5)
<i>bspend</i>	Q77.6	B	Degree spending provide greater satisfaction than saving – Strongly disagree (1) - Strongly agree (5)
<i>btoday</i>	Q77.5	B	Degree that living for today is favoured over saving for future – Strongly disagree (1) - Strongly agree (5)
<i>caexpect<sup>P</sup></i>	Q88.1	P	Degree of confidence that all will go as expected - Pre-retirees – Strongly disagree (1) - Strongly agree (5)
<i>caexpect<sup>R</sup></i>	Q126.1	P	Degree of confidence that all will go as expected - Pre-retirees – low confidence (1) – high confidence (7)
<i>calamount<sup>P</sup></i>	Q21	P	Method of calculating retirement accumulation amount-Pre-retirees
<i>cearly<sup>P</sup></i>	Q88.2	P	Degree of confidence if partner force to retire early - Pre-retirees – low confidence (1) – high confidence (7)
<i>ccreturns<sup>P</sup></i>	Q88.5	P	Degree of confidence should adult child return home - Pre-retirees – low confidence (1) – high confidence (7)
<i>ccreturns<sup>R</sup></i>	Q126.4	R	Degree of confidence should adult child return home – Retirees – low confidence (1) – high confidence (7)
<i>children</i>	Q10	B	The number of children the respondent has
<i>cltcare<sup>P</sup></i>	Q88.3	R	Degree of confidence about extended long-term care -Pre-retirees – low confidence (1) – high confidence (7)
<i>cltcare<sup>R</sup></i>	Q126.2	R	Degree of confidence about extended long-term care - Retirees–low confidence (1) – high confidence (7)
<i>community</i>	Q137	B	The size of community respondent lives in
<i>cpdies<sup>P</sup></i>	Q88.4	P	Degree of confidence should partner die before retirement - Pre-retirees – low confidence (1) – high confidence (7)
<i>cpdies<sup>R</sup></i>	Q126.3	R	Degree of confidence should partner die before retirement – Retirees – low confidence (1) – high confidence (7)
<i>cplcare</i>	Q90.4	B	Frequency of communication about long-term care-Never (1) – Always (5)
<i>cpnw</i>	Q90.1	B	Frequency of communication about net worth-Never (1) – Always (5)
<i>cpreduce</i>	Q90.2	B	Frequency of communication about reduced family income - Never (1) – Always (5)
<i>cpwhere</i>	Q90.3	B	Frequency of communication about where to live in retirement - Never (1) – Always (5)
<i>cpwill</i>	Q90.5	B	Frequency of communication about Wills or inheritance - Never (1) – Always (5)
<i>decmaker</i>	Q140	B	Respondent not (0) is main decision-maker (1)

Variable Name	Question	Cohort	Full explanation of variable
<i>divers</i>	Q135	B	Respondent knows the best example of 'diversification' (1), incorrect (0)
<i>edqual</i>	Q138	B	The highest education qualification the respondent has None (1) – Postgraduate (5)
<i>emerg</i>	Q83	B	Having access to 3-months expenditure funding – No (0), Yes (1)
<i>erspend</i>	Q114	R	Early retirement spending as anticipated – Retirees – Yes(1) – Spent more (3)
<i>ethnicgroup</i>	CBS4	B	Ethnicity groupings
<i>ethnicity</i>	CBS4	B	Ethnicity
<i>expchange</i>	Q145	B	Major change expected in future income - Worse (1), Same (2), better (3)
<i>expfuture</i>	Q74	B	Expectation about now compared to future - Worse (1), Same (2), better (3)
<i>exppast</i>	Q75	B	Expectation about now compared to past - Worse (1), Same (2), better (3)
<i>fincapability</i>	Q19, 77.1, 77.8, 78.8, 79.1, 79.2 & 104	B	Financial capability score ( 1 - 5)
<i>fincapgroup</i>	As above	B	Financial capability divided into groups
<i>findep</i>	Q11	B	The number of financial dependents respondent has
<i>finliteracy</i>	Q128-132, 134, 135	B	Financial literacy score (1 – 7)
<i>finliteracy2</i>	As above	B	Financial literacy groupings
<i>formalplan<sup>P</sup></i>	Q20	P	Formal planning - No (0) Yes (1) - Pre-retirees
<i>formalplan<sup>R</sup></i>	Q105	R	Formal planning - No (0) Yes (1) - Retirees
<i>gender</i>	CBS2	B	Gender - Male (1) Female (2)
<i>gfc</i>	Q85	B	The effect GFC had on financial position – None 91),Minor (2), major (3)
<i>goals<sup>P</sup></i>	Q15.9	P	The degree of long-term goals and working towards them - Pre-retirees – Strongly disagree (1) - Strongly agree (5)
<i>goals<sup>R</sup></i>	Q102.4	R	The degree of long-term goals and working towards them – Retirees – Strongly disagree (1) - Strongly agree (5)
<i>hasmortg</i>	Q57	B	Those without a mortgage (0) and with mortgage (1)
<i>health</i>	Q148	B	State of respondent's health – Poor (1) – Excellent (4)
<i>hequity</i>	Q147	B	level of home equity
<i>incgroup</i>	CBS5	B	Household income groupings
<i>investments<sup>P</sup></i>	Q38	B	Number of different types of investments - Pre-retirees
<i>investments<sup>R</sup></i>	Q123	B	Number of different types of investments - Retirees
<i>investsave</i>	Q81.1 - Q81.9	B	Score of correct safe investment questions ( Max =5)
<i>invrisk</i>	Q133	B	Score of correct investment risk questions ( Max =7)
<i>invtype</i>	Q38, Q57, Q123,	B	Four types of investment -None (0) - Investment & Home equity (4)
<i>iscouple</i>	Q3	B	Living alone (0) as couple (1)
<i>isretired</i>	Q5	B	Not retired (0) Retired - Fully (1) Retire - work part-time (2)

<b>Variable Name</b>	<b>Question</b>	<b>Cohort</b>	<b>Full explanation of variable</b>
<i>invtype</i>	Q38, Q57, Q123,	B	Four types of investment -None (0) - Investment & Home equity (4)
<i>iscouple</i>	Q3	B	Living alone (0) as couple (1)
<i>isretired</i>	Q5	B	Not retired (0) Retired - Fully (1) Retire - work part-time (2)
<i>ksall<sup>P</sup>p</i>	Q37.3	R	Degree that KiwiSaver is all retirement savings required - Pre-retirees -Strongly disagree (1) - Strongly agree (5)
<i>ksall<sup>R</sup></i>	Q122.3	P	Degree that KiwiSaver is all retirement savings required – Retirees –Strongly disagree (1) - Strongly agree (5)
<i>ksmember</i>	Q41	P	KiwiSaver membership No (0) – Yes (1)
<i>kslenght</i>	Q44	P	Length of KiwiSaver membership
<i>ksftype</i>	Q46	P	KiwiSaver Fund Type
<i>longevity</i>	Q156	B	Those without (0) with longevity in family
<i>lyearn</i>	Q112	R	Amount of last year's earnings -Retirees
<i>mainearn</i>	Q139	B	Respondent is not (0) is main income earner (1)
<i>majpurch</i>	Q18	B	Degree of thought into major purchases – none (1) – a lot (5)
<i>managefin</i>	Q73	B	Degree of managing financially today – Very difficult (1) – Living comfortably (5)
<i>maritalstatus</i>	Q3	B	Marital status of respondent
<i>mmoney</i>	Q3	B	Degree of money managements skills respondent has – Strongly disagree (1) - Strongly agree (5)
<i>mthsave</i>	Q144	B	Amount saved each month
<i>nzsuff<sup>P</sup></i>	Q37.1	P	Degree that NZ Superannuation is sufficient - Pre-retirees –Strongly disagree (1) - Strongly agree (5)
<i>nzsuff<sup>R</sup></i>	Q122.1	R	Degree that NZ Superannuation is sufficient – Retirees – Strongly disagree (1) - Strongly agree (5)
<i>nworth</i>	Q70	B	Household's Net Worth
<i>otherpen</i>	Q43	B	Expected to receive other pensions – No (0) Yes (1)
<i>ownhome</i>	Q57	B	No home (0) or own home (1)
<i>pa2yrs</i>	Q92	B	Have seen a professional financial advisers in the past 2 years -No (0) Yes (1)
<i>paadvice</i>	Q93	B	Expect to seek professional financial advice in next 12 months -No (0) Yes (1)
<i>pacomfort</i>	Q94	B	Degree of comfort talking to a professional financial advisers – very uncomfortable (1) – very comfortable (1)
<i>plandev<sup>P</sup></i>	Q19	P	Degree of development of retirement financial planning – Retirees –None(1) – Well developed (6)
<i>plandev<sup>R</sup></i>	Q104	R	Degree of development of retirement financial planning - Pre-retirees – None (1) – Well developed (6)
<i>prep<sup>P</sup></i>	Q15.1	P	First self-assessment of retirement preparedness -ranked 1-5 - Pre-retirees
<i>prep<sup>R</sup></i>	Q102	R	First self-assessment of retirement preparedness -ranked 1-5 – Retirees
<i>provsupport<sup>P</sup></i>	Q31	P	Those who provide financial support to others - Pre-retirees – No (0) – Yes (1)
<i>provsupport<sup>R</sup></i>	Q116	R	Those who provide financial support to others – Retirees – No (0) – Yes (1)
<i>pstick2<sup>P</sup></i>	Q25	P	Those who can stick to their financial plan - Pre-retirees - No (0) – Yes (1)

Variable Name	Question	Cohort	Full explanation of variable
<i>pwriting<sup>P</sup></i>	Q24	P	Those who financial plan is in writing - Pre-retirees - No (0) – Yes (1)
<i>rconc<sup>P</sup></i>	Q15.4	P	Degree that retirement is a concern - Pre-retirees –Strongly disagree (1) - Strongly agree (5)
<i>rconc<sup>R</sup></i>	Q102.3	R	Degree that retirement is a concern – Retirees –Strongly disagree (1) - Strongly agree (5)
<i>recode_prepd2<sup>P</sup></i>	Q95	B	Second self-assessment of retirement preparedness - Recoded 1-5
<i>recode_prepd2<sup>R</sup></i>	Q126.5	B	Second self-assessment of retirement preparedness - Recoded 1-5
<i>recsupport<sup>P</sup></i>	Q34	B	Those who receive financial support from others - Pre-retirees - No (0) – Yes (1)
<i>recsupport<sup>R</sup></i>	Q119	B	Those who receive financial support from others – Retirees - No (0) – Yes (1)
<i>region</i>	CB S1	B	Region within New Zealand
<i>responsib</i>	Q17_1	B	Degree retirement is individual's (1) or government's (7) responsibility
<i>retireearly</i>	Q5, Q136	B	Those who retired early (1), at 65 (2) or Later (3)
<i>reviewinv</i>	Q39	B	Frequency that investments are reviewed – None (1) – more than twice a year (5)
<i>rfund<sup>P</sup></i>	Q16.	P	Amount of thought given to retirement funding - Pre-retirees – None (1) – A lot (5)
<i>rfund<sup>R</sup></i>	Q103.2	R	Amount of thought given to retirement funding – Retirees – None (1) – A lot (5)
<i>rirequired<sup>P</sup></i>	Q28	B	Weekly dollar amount of retirement income required
<i>rirequired<sup>R</sup></i>	Q111	B	Weekly dollar amount of retirement income required
<i>riskmgnt</i>	Q86	B	Number of risk management strategies or policies in place
<i>rlenght<sup>P</sup></i>	Q16.3	P	Amount of thought given to the length of retirement - Pre-retirees – None (1) – A lot (5)
<i>rlenght<sup>R</sup></i>	Q103.3	R	Amount of thought given to the length of retirement – Retirees – None (1) – A lot (5)
<i>rlong<sup>P</sup></i>	Q15.5	P	Degree retirement is a long way off - Pre-retirees – Strongly disagree (1) - Strongly agree (5)
<i>rqual<sup>P</sup></i>	Q15.7	P	Amount of thought given to the quality of retirement lifestyle - Pre-retirees – None (1) – A lot (5)
<i>rqual<sup>R</sup></i>	Q103.1	R	Amount of thought given to the quality of retirement lifestyle – Retirees – None (1) – A lot (5)
<i>rror</i>	Calculated	B	Real rate of return - based on KiwiSaver type or calculated
<i>rrratio<sup>P</sup></i>	Q29	P	Household's required income replacement rate - Pre-retiree
<i>rrratio<sup>R</sup></i>	Q113	R	Household's required income replacement rate - Retiree
<i>rrgroup</i>	Q29, Q113	B	Required income replacement rate groupings
<i>rtolerance</i>	Q80.1 - 80.5, Q133	B	Score of correct risk tolerance questions ( Max =5)
<i>savings</i>	Q69	B	Current amount of savings/investments
<i>senoug<sup>P</sup></i>	Q37.2	P	Degree that respondent had saved enough for retirement – Retirees –Strongly disagree (1) - Strongly agree (5)
<i>senoug<sup>R</sup></i>	Q122.2	R	Degree that respondent had saved enough for retirement - Pre-retirees –Strongly disagree (1) - Strongly agree (5)
<i>separation</i>	Q159	B	Those not (1) experienced separation/divorce- little impact (2) Major (3)

Variable Name	Question	Cohort	Full explanation of variable
<i>shomeequ<sup>R</sup></i>	Q122.6	R	Degree of expected use of home equity – Retirees – Strongly disagree (1) - Strongly agree (5)
<i>simpos<sup>P</sup></i>	Q37.4	P	Degree that it is impossible to save for retirement - Pre-retirees –Strongly disagree (1) - Strongly agree (5)
<i>simpos<sup>R</sup></i>	Q122.4	R	Degree that it is impossible to save for retirement – Retirees –Strongly disagree (1) - Strongly agree (5)
<i>sresourc<sup>P</sup></i>	Q122.5	P	Degree they will have required resources for retirement - Pre-retirees –Strongly disagree (1) - Strongly agree (5)
<i>smoker</i>	Q157	B	Those never smoked (1) given up (2) still smoking (3)
<i>undst<sup>P</sup></i>	Q15.2	P	Degree of understanding of financial matters – Pre-retirees –Strongly disagree (1) - Strongly agree (5)
<i>undst<sup>R</sup></i>	Q102.5	R	Degree of understanding of financial matters - Retirees–Strongly disagree (1) - Strongly agree (5)
<i>unempty</i>	Q152.2	B	Respondent's absence from work due to unemployment, etc. No (1) – Yes (1)
<i>usecap</i>	Q71	B	Degree of expected use of investment capital in retirement –Strongly disagree (1) - Strongly agree (5)
<i>usehe</i>	Q72	B	Degree of expected use of home equity in retirement – Strongly disagree (1) - Strongly agree (5)
<i>workretired</i>	Q99	B	Those who never (0) had worked (1) still working (2) in retirement

## Appendix 6: Distribution by Characteristics CURRENT Retiree adequacy

		<i>Overall =</i>	60.4%	39.6%
		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Gender (gender)</b>				
Male	<i>n</i> = 246	45.8%	56.1%	43.9%
Female	<i>n</i> = 208	54.2%	65.4%	34.6%
<b>Retirement Status (isretired)</b>				
Retired - Fully	<i>n</i> = 319	70.3%	64.6%	35.4%
Retired - Working part-time	<i>n</i> = 135	29.7%	50.4%	49.6%
<b>Marital Status (maritalstatus)</b>				
<b>Living Alone</b>	<i>n</i> = 98	21.6%	48.0%	52.0%
Living Alone - Single	<i>n</i> = 14	3.1%	42.9%	57.1%
Living Alone - Divorced	<i>n</i> = 31	6.8%	48.4%	51.6%
Living Alone - Widowed	<i>n</i> = 53	11.7%	49.1%	50.9%
<b>Couple (iscouple)</b>	<i>n</i> = 356	78.4%	63.8%	36.2%
Couple - Married	<i>n</i> = 335	73.8%	63.9%	36.1%
Couple - Partnered	<i>n</i> = 21	4.6%	61.9%	38.1%
<b>Retiree Age (age)</b>				
Under 60	<i>n</i> = 24	5.3%	50.0%	50.0%
60-64	<i>n</i> = 45	9.9%	48.9%	51.1%
65-69	<i>n</i> = 121	26.7%	58.7%	41.3%
70-74	<i>n</i> = 142	31.3%	59.2%	40.8%
75-79	<i>n</i> = 79	17.4%	74.7%	25.3%
80 and over	<i>n</i> = 43	9.5%	60.5%	39.5%
<b>Educational Qualification (edqual)</b>				
No formal qualification	<i>n</i> = 60	13.3%	60.0%	40.0%
School Qualification	<i>n</i> = 142	31.6%	61.3%	38.7%
Trade Certificate or Diploma	<i>n</i> = 136	30.2%	60.3%	39.7%
Bachelor's Degree	<i>n</i> = 57	12.7%	61.4%	38.6%
Postgraduate Qualification	<i>n</i> = 55	12.2%	60.0%	40.0%
<b>Ethnicity (ethnicity)</b>				
Europeans	<i>n</i> = 401	88.3%	60.3%	39.7%
Other	<i>n</i> = 53	11.7%	60.4%	39.6%
<b>Children (children)</b>				
0	<i>n</i> = 34	7.5%	55.9%	44.1%
1	<i>n</i> = 31	6.8%	61.3%	38.7%
2	<i>n</i> = 160	35.2%	61.9%	38.1%
3	<i>n</i> = 141	31.1%	63.8%	36.2%
4 or more	<i>n</i> = 88	19.4%	53.4%	46.6%

*Distribution by characteristics of CURRENT Retiree Adequacy ... Continued*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Financial Dependents (finddep)</b>				
No Financial Dependents	<i>n</i> = 427	94.5%	60.0%	40.0%
Some Financial Dependents	<i>n</i> = 25	5.5%	64.0%	36.0%
<b>Accommodation Type (acomtype)</b>				
Own home with mortgage	<i>n</i> = 50	11.0%	46.0%	54.0%
Home held in Trust with mortgage	<i>n</i> = 17	3.8%	29.4%	70.6%
Own home no mortgage in own name	<i>n</i> = 243	53.6%	65.8%	34.2%
Home held in Trust with no mortgage	<i>n</i> = 95	21.0%	67.4%	32.6%
Flat/Rent/Board/Lease/Lifetime lease	<i>n</i> = 48	10.6%	45.8%	54.2%
<b>Community Size (community)</b>				
Large City (100,000 or more)	<i>n</i> = 207	46.0%	61.4%	38.6%
City (30,000 - 99,999)	<i>n</i> = 109	24.2%	60.6%	39.4%
Town or Rural (29,999 or less)	<i>n</i> = 134	29.8%	59.7%	40.3%
<b>Region (region)</b>				
Auckland	<i>n</i> = 147	32.4%	57.1%	42.9%
Wellington	<i>n</i> = 45	9.9%	64.4%	35.6%
Canterbury	<i>n</i> = 55	12.1%	61.8%	38.2%
Other North Island	<i>n</i> = 157	34.6%	61.8%	38.2%
Other South Island	<i>n</i> = 50	11.0%	60.0%	40.0%
<b>Retiree Household Income (incgroup)</b>				
\$30,000 or less	<i>n</i> = 153	33.7%	80.4%	19.6%
\$30,001 - \$50,000	<i>n</i> = 126	27.8%	52.4%	47.6%
\$50,001 - \$70,000	<i>n</i> = 67	14.8%	47.8%	52.2%
\$70,001 - \$100,000	<i>n</i> = 53	11.7%	58.5%	41.5%
More than \$100,000	<i>n</i> = 55	12.1%	40.0%	60.0%
<b>Retirement Income Required (rirequired<sup>R</sup>)</b>				
Less than \$350 / week	<i>n</i> = 38	8.4%	47.4%	52.6%
\$350 - \$600 / week	<i>n</i> = 194	42.9%	64.4%	35.6%
\$601 - \$1,000 / week	<i>n</i> = 160	35.4%	56.3%	43.8%
More than \$1,000 / week	<i>n</i> = 60	13.3%	68.3%	31.7%
<b>Retirement Replacement Rate (rrratio<sup>R</sup>)</b>				
0 - 25%	<i>n</i> = 19	4.2%	57.9%	42.1%
26% - 50%	<i>n</i> = 105	23.1%	57.1%	42.9%
51% - 75%	<i>n</i> = 132	29.1%	62.9%	37.1%
76% - 100%	<i>n</i> = 139	30.6%	63.3%	36.7%
More than 100%	<i>n</i> = 59	13.0%	54.2%	45.8%

*Distribution by characteristics of CURRENT Retiree Adequacy ... Continued*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Net Worth (nworth)</b>				
\$100,000 or less	n = 33	7.3%	33.3%	66.7%
\$100,001 - \$250,000	n = 31	6.9%	58.1%	41.9%
\$250,001 - \$500,000	n = 98	21.7%	45.9%	54.1%
\$500,001 - \$1.0 million	n = 126	27.9%	63.5%	36.5%
\$1.0 million - \$1.5 million	n = 56	12.4%	78.6%	21.4%
\$1.5 million - \$2.5 million	n = 45	10.0%	80.0%	20.0%
More than \$2.5 million	n = 36	8.5%	80.6%	19.4%
<b>Home Equity (hequity)</b>				
\$250,000 or less	n = 54	14.1%	46.3%	53.7%
\$250,001 - \$500,000	n = 139	36.3%	61.9%	38.1%
\$500,001 - \$1.0 million	n = 149	38.9%	68.5%	31.5%
More than \$1.0 million	n = 41	10.7%	70.7%	29.3%
<b>Savings/Investments (savings)</b>				
Nothing	n = 117	29.3%	34.2%	65.8%
\$10,000 or less	n = 25	6.3%	36.0%	64.0%
\$10,001 - \$50,000	n = 28	7.0%	32.1%	67.9%
\$50,001 - \$100,000	n = 41	10.3%	53.7%	46.3%
\$100,001 - \$250,000	n = 49	12.3%	67.3%	32.7%
\$250,001 - \$500,000	n = 66	16.5%	87.9%	12.1%
\$500,001 - \$1.0 million	n = 44	11.0%	93.2%	6.8%
More than \$1.0 million	n = 29	7.3%	89.7%	10.3%
<b>Utilisation of Investment Capital (usecap)</b>				
Expect to use all investment capital	n = 78	22.0%	62.8%	37.2%
Expect to use some investment capital	n = 209	59.0%	69.4%	30.6%
Want to preserve investment capital	n = 67	18.9%	49.3%	50.7%
<b>Utilisation of Home equity (usehe)</b>				
Expect to use all home equity	n = 274	76.5%	66.8%	33.2%
Expect to use some home equity	n = 70	19.6%	55.7%	44.3%
Want to preserve home equity	n = 14	3.9%	28.6%	71.4%
<b>Other Pension/s (otherpen)</b>				
Yes	n = 151	34.2%	62.9%	37.1%
No	n = 291	65.8%	60.1%	39.9%
<b>Health (health)</b>				
Poor	n = 16	3.5%	62.5%	37.5%
Fair	n = 83	18.4%	67.5%	32.5%
Good	n = 266	59.0%	59.4%	40.6%
Excellent	n = 86	19.1%	58.1%	41.9%

*Distribution by characteristics of CURRENT Retiree Adequacy ... Continued*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Absence due to sickness (absence)</b>				
Not off work sick for 3-months or more	<i>n</i> = 369	82.6%	60.7%	39.3%
Off work sick for 3-months or more	<i>n</i> = 78	17.4%	60.3%	39.7%
<b>Longevity (longevity)</b>				
Family member lived to age 90	<i>n</i> = 206	46.1%	54.9%	45.1%
No family member lived to age 90	<i>n</i> = 241	53.9%	65.6%	34.4%
<b>Absence from work - Unemployment, etc. (unemploy)</b>				
Yes	<i>n</i> = 221	49.2%	65.4%	34.6%
No	<i>n</i> = 228	50.8%	55.7%	44.3%
<b>Early Retirement (retireearly)</b>				
Retired earlier than 65	<i>n</i> = 188	41.4%	61.7%	38.3%
Retired at 65	<i>n</i> = 117	25.8%	59.0%	41.0%
Retired later than 65	<i>n</i> = 149	32.8%	64.4%	35.6%
<b>Working in Retirement (workretired)</b>				
No, never worked in retirement	<i>n</i> = 189	41.6%	61.4%	38.6%
Yes, worked part-time in retirement	<i>n</i> = 116	25.6%	56.9%	43.1%
Yes, working part-time in retirement	<i>n</i> = 149	32.8%	61.7%	38.3%
<b>Pre-retirement accumulation amount (accamt<sup>R</sup>)</b>				
\$100,000 or less	<i>n</i> = 53	16.0%	50.9%	49.1%
\$100,001 - \$250,000	<i>n</i> = 94	28.3%	66.0%	34.0%
\$250,001 - \$500,000	<i>n</i> = 86	25.9%	67.4%	32.6%
\$500,001 - \$1.0 million	<i>n</i> = 53	16.0%	83.0%	17.0%
More than \$1 million	<i>n</i> = 46	10.5%	73.9%	26.1%
<b>Have saved enough (senough)</b>				
Disagree	<i>n</i> = 71	16.0%	40.8%	59.2%
Neither Agree or Disagree	<i>n</i> = 107	24.2%	56.1%	43.9%
Agree	<i>n</i> = 265	59.8%	68.3%	31.7%
<b>Approach to saving (abilitysave)</b>				
Save regularly each pay	<i>n</i> = 140	31.3%	53.6%	46.4%
Save what is left over	<i>n</i> = 188	42.1%	67.0%	33.0%
Impossible to save	<i>n</i> = 69	15.4%	50.7%	49.3%
Haven't given savings any thought	<i>n</i> = 50	11.2%	72.0%	28.0%
<b>Saving each Month (mthsave)</b>				
Nothing	<i>n</i> = 132	30.2%	55.3%	44.7%
Less than \$100 per month	<i>n</i> = 112	25.6%	59.8%	40.2%
\$101 - \$250 per month	<i>n</i> = 90	20.6%	64.4%	35.6%
\$251 - \$500 per month	<i>n</i> = 56	12.8%	55.4%	44.6%
More than \$500 per month	<i>n</i> = 47	7.3%	65.6%	34.4%

*Distribution by characteristics of CURRENT Retiree Adequacy ... Continued*

<b>Provide Support to Others</b> ( <i>provsupport<sup>R</sup></i> )		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
Yes	<i>n</i> = 108	25.8%	68.5%	31.5%
No	<i>n</i> = 321	74.8%	57.9%	42.1%

**Receive Support from Others** (*recsupport<sup>R</sup>*)

Yes	<i>n</i> = 20	4.5%	97.6%	2.4%
No	<i>n</i> = 423	95.5%	61.2%	38.8%

**Number of investment types** (*investments*)

0	<i>n</i> = 31	7.1%	45.2%	54.8%
1	<i>n</i> = 172	39.4%	52.3%	47.7%
2	<i>n</i> = 122	27.9%	59.8%	40.2%
3	<i>n</i> = 77	17.6%	71.4%	28.6%
4	<i>n</i> = 28	6.4%	85.7%	14.3%
5 or more	<i>n</i> = 24	5.5%	75.0%	25.0%

**Financially Literacy** (*finlit*)

3 or fewer correct answers	<i>n</i> = 114	25.4%	54.4%	45.6%
4 or more correct answers	<i>n</i> = 334	74.6%	55.2%	44.8%

**Financial Capability** (*fincap*)

Scores 3.5 or less	<i>n</i> = 323	71.1%	55.7%	44.3%
Scores greater than 3.5	<i>n</i> = 131	28.9%	71.8%	28.2%

**Understand Diversification** (*divers*)

Incorrect answer	<i>n</i> = 199	44.2%	59.8%	40.2%
Correct answers	<i>n</i> = 251	55.8%	61.8%	38.2%

**Understand investment risk** (*invrisk*)

Incorrect answer	<i>n</i> = 301	66.4%	58.5%	41.5%
Correct answers	<i>n</i> = 152	33.6%	64.5%	35.5%

**Risk Management Strategies** (*riskmgnt*)

4 or less	<i>n</i> = 212	44.7%	56.6%	43.4%
5 or more	<i>n</i> = 242	55.3%	63.6%	36.4%

**More of a Saver than a Spender** (*bspeed*)

Disagree	<i>n</i> = 114	11.3%	49.0%	51.0%
Neither Agree or Disagree	<i>n</i> = 258	40.0%	54.7%	45.3%
Agree	<i>n</i> = 214	48.7%	68.2%	31.8%

**Save first before spending** (*bsfirst*)

Disagree	<i>n</i> = 16	3.5%	50.0%	50.0%
Neither Agree or Disagree	<i>n</i> = 82	18.1%	58.5%	41.5%
Agree	<i>n</i> = 354	78.3%	61.6%	38.4%

*Distribution by characteristics of CURRENT Retiree Adequacy ... Continued*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Save other income (bsother)</b>				
Disagree	n = 257	36.5%	56.4%	43.6%
Neither Agree or Disagree	n = 220	35.8%	66.7%	33.3%
Agree	n = 109	27.7%	58.4%	41.6%
<b>Pay credit card off in full (bpaycc)</b>				
Disagree	n = 55	12.2%	56.4%	43.6%
Neither Agree or Disagree	n = 29	6.4%	41.4%	58.6%
Agree	n = 366	81.3%	62.6%	37.4%
<b>Current - Managing Financially (managefin)</b>				
Finding it difficult	n = 40	8.8%	45.0%	55.0%
Just about getting by	n = 65	14.3%	47.7%	52.3%
Doing alright / living comfortably	n = 348	76.8%	64.7%	35.3%
<b>Difficulty paying outgoings (bdfc)</b>				
Disagree	n = 356	79.1%	61.8%	38.2%
Neither Agree or Disagree	n = 51	11.35	51.0%	49.0%
Agree	n = 43	9.6%	58.1%	41.9%
<b>Thought about quality of retirement (rqual<sup>R</sup>)</b>				
Hardly any / None	n = 26	3.6%	43.8%	56.3%
Little	n = 67	8.7%	46.2%	53.8%
Some / A lot	n = 493	87.7%	62.8%	37.2%
<b>Responsibility for retirement income (responsib)</b>				
Individual	n = 171	40.4%	64.8%	35.2%
Both	n = 229	37.0%	56.3%	43.7%
Government	n = 185	22.6%	59.8%	40.2%
<b>Awareness of need to plan for retirement (aware<sup>R</sup>)</b>				
Disagree	n = 14	3.1%	42.9%	57.1%
Neither Agree or Disagree	n = 34	7.6%	44.1%	55.9%
Agree	n = 399	89.3%	62.7%	37.3%
<b>Formal plan for retirement (formalplan<sup>R</sup>)</b>				
Yes	n = 189	43.2%	64.0%	36.0%
No	n = 249	56.8%	57.8%	42.2%

*Distribution by characteristics of CURRENT Retiree Adequacy ... Continued*

<b>Understand financial matters (<i>undst<sup>R</sup></i>)</b>		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
Disagree	<i>n</i> = 93	6.7%	46.7%	53.3%
Neither Agree or Disagree	<i>n</i> = 202	15.7%	65.7%	34.3%
Agree	<i>n</i> = 291	77.6%	60.8%	39.2%

**Self-assessed preparedness – First (*prep<sup>dR</sup>*)**

Poorly-prepared	<i>n</i> = 68	15.2%	45.6%	54.4%
Neither poorly or well-prepared	<i>n</i> = 83	18.6%	57.8%	42.2%
Well-prepared	<i>n</i> = 296	66.2%	64.9%	35.1%

**Self-assessed preparedness – Second (*prep<sup>d2R</sup>*)**

Poorly-prepared	<i>n</i> = 87	19.2%	43.7%	56.3%
Neither poorly or well-prepared	<i>n</i> = 107	23.6%	56.1%	43.9%
Well-prepared	<i>n</i> = 260	57.3%	68.8%	31.2%

## Calculated Information

<b>Financial Resources (<i>invtype</i>)</b>		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
None	<i>n</i> = 21	4.6%	9.5%	90.5%
Investments only	<i>n</i> = 28	6.2%	71.4%	28.6%
Home equity only	<i>n</i> = 119	26.2%	36.1%	63.9%
Home equity and investments	<i>n</i> = 286	63.0%	73.1%	26.9%

**Life Expectancy (*legroup*)**

Less than 86.5 years	<i>n</i> = 159	35.0%	59.1%	40.9%
86.5 - 87.5 years	<i>n</i> = 171	37.7%	58.5%	41.5%
87.5 - 90 years	<i>n</i> = 66	14.5%	69.7%	30.3%
More than 90 years	<i>n</i> = 58	12.8%	58.6%	41.4%

**Own their own home (*ownhome*)**

No	<i>n</i> = 48	10.6%	45.8%	54.2%
Yes	<i>n</i> = 406	89.4%	62.1%	37.9%

**Retired with Home Loan (*hasmortg*)**

No	<i>n</i> = 390	85.9%	63.3%	36.7%
Yes	<i>n</i> = 64	14.1%	42.2%	57.8%

## Appendix 7: Distribution by Characteristics of ACTIVE retiree adequacy

		<i>Overall =</i>	<b>60.4%</b>	<b>39.6%</b>
		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Gender (gender)</b>				
Male	<i>n</i> = 190	54.9%	43.7%	56.3%
Female	<i>n</i> = 156	45.1%	54.5%	45.5%
<b>Retirement Status (retired)</b>				
Retired - Fully	<i>n</i> = 206	59.5%	46.1%	53.9%
Retired - Working part-time	<i>n</i> = 140	40.5%	52.1%	47.9%
<b>Marital Status (maritalstatus)</b>				
Living Alone	<i>n</i> = 84	24.3%	39.3%	60.7%
Living Alone - Single	<i>n</i> = 12	3.5%	33.3%	66.7%
Living Alone - Divorced	<i>n</i> = 25	7.2%	36.0%	64.0%
Living Alone - Widowed	<i>n</i> = 47	13.6%	42.6%	57.4%
<b>Couple (iscouple)</b>	<i>n</i> = 262	75.7%	51.5%	48.5%
Couple - Married	<i>n</i> = 247	71.4%	51.8%	48.2%
Couple - Partnered	<i>n</i> = 15	4.3%	46.7%	53.3%
<b>Retiree Age (age)</b>				
Under 60	<i>n</i> = 30	10.8%	70.0%	30.0%
60-64	<i>n</i> = 49	17.6%	46.9%	53.1%
65-69	<i>n</i> = 120	43.2%	47.5%	52.5%
70-74	<i>n</i> = 29	10.4%	41.4%	58.6%
75-79	<i>n</i> = 26	9.4%	53.8%	46.2%
80 and over	<i>n</i> = 24	8.6%	45.8%	54.2%
<b>Educational Qualification (edqual)</b>				
No formal qualification	<i>n</i> = 42	12.2%	42.9%	57.1%
School Qualification	<i>n</i> = 98	28.6%	44.9%	55.1%
Trade Certificate or Diploma	<i>n</i> = 104	30.3%	49.0%	51.0%
Bachelor's Degree	<i>n</i> = 49	14.3%	55.1%	44.9%
Postgraduate Qualification	<i>n</i> = 50	14.6%	56.0%	44.0%
<b>Ethnicity (ethnicity)</b>				
Europeans	<i>n</i> = 307	88.7%	48.9%	51.1%
Other	<i>n</i> = 39	11.3%	46.2%	53.8%
<b>Children (children)</b>				
0	<i>n</i> = 28	8.1%	46.4%	53.6%
1	<i>n</i> = 21	6.1%	42.9%	57.1%
2	<i>n</i> = 130	37.6%	53.8%	46.2%
3	<i>n</i> = 105	30.3%	52.4%	47.6%
4 or more	<i>n</i> = 62	17.9%	33.9%	66.1%

*Contd: Distribution by characteristics of ACTIVE retiree adequacy*

**Financial Dependents (*finddep*)**

No Financial Dependents	<i>n</i> = 327
Some Financial Dependents	<i>n</i> = 18

Sample	Adequate	Inadequate
94.8%	48.3%	51.7%
5.2%	50.0%	50.0%

**Accommodation Type (*accomtype*)**

Own home with mortgage	<i>n</i> = 34
Home held in Trust with mortgage	<i>n</i> = 14
Own home no mortgage in own name	<i>n</i> = 177
Home held in Trust with no mortgage	<i>n</i> = 79
Flat/Rent/Board/Lease/Lifetime lease	<i>n</i> = 41

9.9%	26.5%	73.5%
4.1%	14.3%	85.7%
51.3%	53.1%	46.9%
22.9%	60.8%	39.2%
11.9%	36.6%	63.4%

**Community Size (*community*)**

Large City (100,000 or more)	<i>n</i> = 165
City (30,000 - 99,999)	<i>n</i> = 78
Town or Rural (29,999 or less)	<i>n</i> = 100

48.1%	51.5%	48.5%
22.7%	47.4%	52.6%
29.2%	46.0%	54.0%

**Region (*region*)**

Auckland	<i>n</i> = 115
Wellington	<i>n</i> = 35
Canterbury	<i>n</i> = 44
Other North Island	<i>n</i> = 116
Other South Island	<i>n</i> = 36

33.2%	45.2%	54.8%
10.1%	54.3%	45.7%
12.7%	52.3%	47.7%
33.5%	50.0%	50.0%
10.4%	44.4%	55.6%

**Retiree Household Income (*incgroup*)**

\$30,000 or less	<i>n</i> = 46
\$30,001 - \$50,000	<i>n</i> = 125
\$50,001 - \$70,000	<i>n</i> = 67
\$70,001 - \$100,000	<i>n</i> = 53
More than \$100,000	<i>n</i> = 55

13.3%	39.1%	60.9%
36.1%	52.0%	48.0%
19.4%	47.8%	52.2%
15.3%	58.5%	41.5%
15.9%	40.0%	60.0%

**Retirement Income Required (*rirrequired<sup>R</sup>*)**

Less than \$350 / week	<i>n</i> = 28
\$350 - \$600 / week	<i>n</i> = 129
\$601 - \$1,000 / week	<i>n</i> = 132
More than \$1,000 / week	<i>n</i> = 52

8.2%	28.6%	71.4%
37.8%	47.3%	52.7%
38.7%	47.7%	52.3%
15.2%	67.3%	32.7%

**Retirement Replacement Rate (*rrratio<sup>R</sup>*)**

0 - 25%	<i>n</i> = 11
26% - 50%	<i>n</i> = 81
51% - 75%	<i>n</i> = 98
76% - 100%	<i>n</i> = 111
More than 100%	<i>n</i> = 45

3.2%	27.3%	72.7%
23.4%	45.7%	54.3%
28.3%	51.0%	49.0%
32.1%	54.1%	45.9%
13.0%	40.0%	60.0%

*Contd: Distribution by characteristics of ACTIVE retiree adequacy*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Net Worth (nworth)</b>				
\$100,000 or less	n = 24	7.4%	8.3%	91.7%
\$100,001 - \$250,000	n = 18	5.5%	27.8%	72.2%
\$250,001 - \$500,000	n = 69	21.2%	26.1%	73.9%
\$500,001 - \$1.0 million	n = 95	29.1%	51.6%	48.4%
\$1.0 million - \$1.5 million	n = 45	13.8%	73.3%	26.7%
\$1.5 million - \$2.5 million	n = 40	12.3%	77.5%	22.5%
More than \$2.5 million	n = 35	10.7%	80.0%	20.0%
<b>Home Equity (hequity)</b>				
\$250,000 or less	n = 39	13.6%	25.6%	74.4%
\$250,001 - \$500,000	n = 95	33.2%	46.3%	53.7%
\$500,001 - \$1.0 million	n = 119	41.6%	60.5%	39.5%
More than \$1.0 million	n = 33	11.5%	63.6%	36.4%
<b>Savings/Investments (savinsg)</b>				
\$10,000 or less	n = 92	28.0%	1.1%	98.9%
\$10,001 - \$50,000	n = 22	6.7%	13.6%	86.4%
\$50,001 - \$100,000	n = 33	10.1%	42.4%	57.6%
\$100,001 - \$250,000	n = 38	11.6%	57.9%	42.1%
\$250,001 - \$500,000	n = 46	14.0%	82.6%	17.4%
\$500,001 - \$1.0 million	n = 38	11.6%	92.1%	7.9%
More than \$1.0 million	n = 59	18.0%	93.2%	6.8%
<b>Utilisation of Investment Capital (usecap)</b>				
Expect to use all investment capital	n = 65	23.1%	55.4%	44.6%
Expect to use some investment capital	n = 166	59.1%	61.4%	38.6%
Want to preserve investment capital	n = 50	17.8%	32.0%	68.0%
<b>Utilisation of Home equity (usehe)</b>				
Expect to use all home equity	n = 217	77.2%	58.5%	41.5%
Expect to use some home equity	n = 51	18.1%	41.2%	58.8%
Want to preserve home equity	n = 13	4.6%	23.1%	76.9%
<b>Other Pension/s (otherpen)</b>				
Yes	n = 117	34.8%	52.1%	47.9%
No	n = 219	65.2%	47.9%	52.1%
<b>Health (health)</b>				
Poor	n = 13	3.8%	53.8%	46.2%
Fair	n = 46	13.4%	41.3%	58.7%
Good	n = 210	61.2%	49.0%	51.0%
Excellent	n = 74	21.6%	52.7%	47.3%

*Contd: Distribution by characteristics of ACTIVE retiree adequacy*

<b>Absence due to sickness (<i>absense</i>)</b>		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
Not off work sick 3-months or more	<i>n</i> = 292	85.4%	50.7%	49.3%
Off work sick for 3- months or more	<i>n</i> = 50	14.6%	40.0%	60.0%

**Longevity (*longevity*)**

Had family member lived to age 90	<i>n</i> = 187	54.8%	56.7%	43.3%
Had no family member lived to age 90	<i>n</i> = 154	45.2%	39.6%	60.4%

**Absence from work - Unemployment, etc. (*unemploy*)**

Yes	<i>n</i> = 175	51.0%	55.4%	44.6%
No	<i>n</i> = 168	49.0%	42.3%	57.7%

**Early Retirement (*retireearly*)**

Retired earlier than 65	<i>n</i> = 147	42.5%	50.3%	49.7%
Retired at 65	<i>n</i> = 85	24.6%	42.4%	57.6%
Retired later than 65	<i>n</i> = 114	32.9%	50.9%	49.1%

**Working in Retirement (*workretired*)**

No, never worked in retirement	<i>n</i> = 140	40.5%	52.1%	47.9%
Yes, worked part-time in retirement	<i>n</i> = 85	24.6%	45.9%	54.1%
Yes, working part-time in retirement	<i>n</i> = 121	35.0%	46.3%	53.7%

**Pre-retirement accumulation amount (*accamt<sup>R</sup>*)**

\$100,000 or less	<i>n</i> = 37	14.9%	29.7%	70.3%
\$100,001 - \$250,000	<i>n</i> = 59	23.7%	45.8%	54.2%
\$250,001 - \$500,000	<i>n</i> = 61	24.5%	54.1%	45.9%
\$500,001 - \$1.0 million	<i>n</i> = 48	19.3%	81.3%	18.8%
More than \$1 million	<i>n</i> = 44	17.7%	72.7%	27.3%

**Have saved enough (*senough*)**

Disagree	<i>n</i> = 56	19.3%	23.2%	76.8%
Neither Agree or Disagree	<i>n</i> = 66	22.8%	40.9%	59.1%
Agree	<i>n</i> = 168	57.9%	64.3%	35.7%

**Approach to saving (*abilitysave*)**

Save regularly each pay	<i>n</i> = 118	34.7%	44.9%	55.1%
Save what is left over	<i>n</i> = 137	40.3%	54.7%	45.3%
Impossible to save	<i>n</i> = 45	13.2%	28.9%	71.1%
Haven't given savings any thought	<i>n</i> = 40	11.8%	65.0%	35.0%

**Saving each Month (*mthsave*)**

Nothing	<i>n</i> = 15	4.3%	80.0%	20.0%
Less than \$100 per month	<i>n</i> = 93	26.9%	38.7%	61.3%
\$101 - \$250 per month	<i>n</i> = 75	21.7%	40.0%	60.0%
\$251 - \$500 per month	<i>n</i> = 72	20.8%	55.6%	44.4%
More than \$500 per month	<i>n</i> = 91	26.3%	54.9%	45.1%

*Contd: Distribution by characteristics of ACTIVE retiree adequacy*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Provide Support to Others (<i>provsupport</i><sup>R</sup>)</b>		n = 91	27.8%	62.6%
Yes	No		72.2%	37.4%
<b>Receive Support from Others (<i>recsupport</i><sup>R</sup>)</b>		n = 20	4.7%	37.5%
Yes	No		95.3%	62.5%
<b>Number of investment types (<i>investments</i>)</b>		n = 19	21.1%	78.9%
0	1		35.5%	33.3%
2	3		26.6%	46.7%
3	4 or more		18.5%	53.3%
			13.9%	34.4%
<b>Financially Literacy (<i>finlit</i>)</b>		n = 72	29.2%	70.8%
3 or fewer correct answers	4 or more correct answers		78.9%	45.7%
<b>Financial Capability (<i>fincap</i>)</b>		n = 237	40.5%	59.5%
Scores 3.5 or less	Scores greater than 3.5		31.5%	66.1%
<b>Understand Diversification (<i>divers</i>)</b>		n = 131	40.5%	59.5%
Incorrect answer	Correct answers		61.7%	45.5%
<b>Understand investment risk (<i>invrisk</i>)</b>		n = 223	44.8%	55.2%
Incorrect answer	Correct answers		35.4%	55.7%
<b>Risk Management Strategies (<i>riskmgnt</i>)</b>		n = 155	41.3%	58.7%
4 or less	5 or more		55.2%	45.5%
<b>More of a Saver than a Spender (<i>bspend</i>)</b>		n = 242	51.2%	48.8%
Disagree	Neither Agree or Disagree		21.2%	54.8%
Agree			8.4%	62.1%
<b>Save first before spending (<i>bsfirst</i>)</b>		n = 35	25.7%	74.3%
Disagree	Neither Agree or Disagree		42.2%	55.9%
Agree			47.7%	42.1%

*Contd: Distribution by characteristics of ACTIVE retiree adequacy*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Save other income (bsother)</b>				
Disagree	<i>n = 126</i>	36.6%	43.7%	56.3%
Neither Agree or Disagree	<i>n = 125</i>	36.3%	56.8%	43.2%
Agree	<i>n = 93</i>	27.0%	45.2%	54.8%
<b>Pay credit card off in full (bpaycc)</b>				
Disagree	<i>n = 58</i>	11.0%	39.5%	60.5%
Neither Agree or Disagree	<i>n = 21</i>	6.1%	19.0%	81.0%
Agree	<i>n = 285</i>	82.8%	52.3%	47.7%
<b>Current - Managing Financially (managefin)</b>				
Finding it difficult	<i>n = 26</i>	7.5%	19.2%	80.8%
Just about getting by	<i>n = 41</i>	11.9%	19.5%	80.5%
Doing alright / living comfortably	<i>n = 278</i>	80.6%	55.8%	44.2%
<b>Difficulty paying outgoings (bdiffc)</b>				
Disagree	<i>n = 282</i>	82.0%	52.1%	47.9%
Neither Agree or Disagree	<i>n = 38</i>	11.0%	36.8%	63.2%
Agree	<i>n = 24</i>	7.0%	29.2%	70.8%
<b>Thought about quality of retirement (rqual<sup>R</sup>)</b>				
Hardly any / None	<i>n = 12</i>	3.5%	33.3%	66.7%
Little	<i>n = 26</i>	7.6%	19.2%	80.8%
Some / A lot	<i>n = 303</i>	88.9%	52.1%	47.9%
<b>Responsibility for retirement income (responsib)</b>				
Individual	<i>n = 152</i>	44.3%	57.9%	42.1%
Both	<i>n = 123</i>	35.9%	41.5%	58.5%
Government	<i>n = 68</i>	19.8%	41.2%	58.8%
<b>Awareness of need to plan for retirement (aware<sup>R</sup>)</b>				
Disagree	<i>n = 9</i>	2.6%	11.1%	88.9%
Neither Agree or Disagree	<i>n = 25</i>	7.3%	24.0%	76.0%
Agree	<i>n = 307</i>	90.0%	52.1%	47.9%
<b>Formal plan for retirement (formalplan<sup>R</sup>)</b>				
Yes	<i>n = 176</i>	52.5%	41.5%	58.5%
No	<i>n = 159</i>	47.5%	57.2%	42.8%

*Contd: Distribution by characteristics of ACTIVE retiree adequacy*

**State of retirement planning (*plandev<sup>R</sup>*)**

Poorly-developed plan	<i>n</i> = 67
Neither poorly or well-developed	<i>n</i> = 73
Well-developed plan	<i>n</i> = 200

Sample	Adequate	Inadequate
19.7%	23.9%	76.1%
21.5%	43.8%	56.2%
58.8%	59.5%	40.5%

**NZ Superannuation is sufficient (*nzsuff<sup>R</sup>*)**

Disagree	<i>n</i> = 216
Neither Agree or Disagree	<i>n</i> = 61
Agree	<i>n</i> = 60

64.1%	56.5%	43.5%
18.1%	47.5%	52.5%
17.8%	25.0%	75.0%

**KiwiSaver will provide enough (*ksall<sup>R</sup>*)**

Disagree	<i>n</i> = 171
Neither Agree or Disagree	<i>n</i> = 140
Agree	<i>n</i> = 31

50.0%	50.3%	49.7%
40.9%	50.0%	50.0%
9.1%	51.6%	48.4%

**Understand financial matters (*undst<sup>R</sup>*)**

Disagree	<i>n</i> = 21
Neither Agree or Disagree	<i>n</i> = 41
Agree	<i>n</i> = 279

6.2%	33.3%	66.7%
12.0%	41.5%	58.5%
81.8%	51.3%	48.7%

**Self-assessed preparedness – First (*prep<sup>d</sup><sup>R</sup>*)**

Poorly-prepared	<i>n</i> = 43
Neither poorly or well-prepared	<i>n</i> = 58
Well Prepared	<i>n</i> = 240

12.6%	18.6%	81.4%
17.0%	39.7%	60.3%
70.4%	56.7%	43.3%

**Self-assessed preparedness – Second (*prep<sup>d2</sup><sup>R</sup>*)**

Poorly-prepared	<i>n</i> = 57
Neither poorly or well-prepared	<i>n</i> = 70
Well-prepared	<i>n</i> = 219

16.5%	15.8%	84.2%
20.2%	30.0%	70.0%
63.3%	63.0%	37.0%

*Contd: Distribution by characteristics of ACTIVE retiree adequacy*

## Calculated Information

		<b>Sample I</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Financial Resources (invtype)</b>				
None	<i>n = 19</i>	5.5%	0.0%	100.0%
Investments only	<i>n = 23</i>	6.6%	65.2%	34.8%
Home equity only	<i>n = 76</i>	22.0%	1.3%	98.7%
Home equity and investments	<i>n = 228</i>	65.9%	66.7%	33.3%
<b>Life Expectancy (legroup)</b>				
Less than 86.5 years	<i>n = 125</i>	36.1%	48.8%	51.2%
86.5 - 87.5 years	<i>n = 131</i>	37.9%	45.8%	54.2%
87.5 - 90 years	<i>n = 47</i>	13.6%	57.4%	42.6%
More than 90 years	<i>n = 43</i>	12.4%	46.5%	53.5%
<b>Own their Own Home (ownhome)</b>				
No	<i>n = 41</i>	11.8%	36.6%	63.4%
Yes	<i>n = 305</i>	88.2%	50.2%	49.8%
<b>Retired with Home Loan (hasmortg)</b>				
No	<i>n = 300</i>	86.7%	52.3%	47.7%
Yes	<i>n = 46</i>	13.3%	23.9%	76.1%

Appendix 8: Distribution by Characteristics of PRE-retiree *adequacy*

		<i>Overall =</i>	<b>31.2%</b>	<b>68.8%</b>
		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Gender (gender)</b>				
Male	<i>n</i> = 291	49.3%	31.3%	68.7%
Female	<i>n</i> = 299	50.7%	31.1%	68.9%
<b>Marital Status (maritalstatus)</b>				
<b>Living Alone</b>	<i>n</i> = 117	19.8%	26.5%	73.5%
Living Alone - Single	<i>n</i> = 56	9.5%	25.0%	75.0%
Living Alone - Divorced	<i>n</i> = 51	8.6%	33.3%	66.7%
Living Alone - Widowed	<i>n</i> = 10	1.7%	0.0%	100.0%
<b>Couple (iscouple)</b>	<i>n</i> = 473	80.2%	32.3%	67.7%
Couple - Married	<i>n</i> = 403	68.3%	32.8%	67.2%
Couple - Partnered	<i>n</i> = 70	11.9%	30.0%	70.0%
<b>Pre-Retiree Age (age)</b>				
Under 60	<i>n</i> = 19	3.5%	78.9%	21.1%
60-64	<i>n</i> = 68	12.5%	41.2%	58.8%
65-69	<i>n</i> = 351	64.3%	27.4%	72.6%
70-74	<i>n</i> = 88	16.1%	27.3%	72.7%
75-79	<i>n</i> = 18	3.3%	22.2%	77.8%
80 and over	<i>n</i> = 2	0.4%	0.0%	100.0%
<b>Educational Qualification (edqual)</b>				
No formal qualification	<i>n</i> = 52	8.8%	26.9%	73.1%
School Qualification	<i>n</i> = 164	27.9%	26.8%	73.2%
Trade Certificate or Diploma	<i>n</i> = 170	28.9%	30.6%	69.4%
Bachelor's Degree	<i>n</i> = 104	17.7%	34.6%	65.4%
Postgraduate Qualification	<i>n</i> = 98	16.7%	38.8%	61.2%
<b>Ethnicity (ethnicity)</b>				
Europeans	<i>n</i> = 455	77.1%	29.5%	70.5%
Other	<i>n</i> = 135	22.9%	37.0%	63.0%
<b>Children (children)</b>				
0	<i>n</i> = 77	13.1%	36.4%	63.6%
1	<i>n</i> = 76	13.0%	19.7%	80.3%
2	<i>n</i> = 221	37.7%	34.4%	65.6%
3	<i>n</i> = 124	21.2%	34.7%	65.3%
4 or more	<i>n</i> = 88	15.0%	22.7%	77.3%

*Distribution by characteristics of PRE-retiree Adequacy ... Continued*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Financial Dependents (findep)</b>				
No Financial Dependents	n = 383	65.4%	34.2%	65.8%
Some Financial Dependents	n = 203	34.6%	25.1%	74.9%
<b>Accommodation Type (acomtype)</b>				
Own home with mortgage	n = 219	37.4%	29.2%	70.8%
Home held in Trust with mortgage	n = 51	8.7%	41.2%	58.8%
Own home no mortgage in own name	n = 167	28.5%	34.1%	65.9%
Home held in Trust with no mortgage	n = 53	9.0%	41.5%	58.5%
Flat/Rent/Board/Lease/Lifetime lease	n = 96	16.4%	18.8%	81.3%
<b>Community Size (community)</b>				
Large City (100,000 or more)	n = 312	53.2%	30.1%	69.9%
City (30,000 - 99,999)	n = 113	19.3%	30.1%	69.9%
Town or Rural (29,999 or less)	n = 162	27.6%	34.6%	65.4%
<b>Region (region)</b>				
Auckland	n = 216	36.6%	33.3%	66.7%
Wellington	n = 72	18.0%	25.0%	75.0%
Canterbury	n = 77	19.3%	22.1%	77.9%
Other North Island	n = 154	38.6%	35.7%	64.3%
Other South Island	n = 71	17.8%	31.0%	69.0%
<b>Retiree Household Income (incgroup)</b>				
\$30,000 or less	n = 62	10.5%	77.4%	22.6%
\$30,001 - \$50,000	n = 81	13.7%	50.6%	49.4%
\$50,001 - \$70,000	n = 93	15.8%	26.9%	73.1%
\$70,001 - \$100,000	n = 110	18.6%	17.3%	82.7%
More than \$100,000	n = 244	41.4%	20.9%	79.1%
<b>Retirement Income Required (irrequired<sup>P</sup>)</b>				
Less than \$350 / week	n = 27	4.6%	22.2%	77.8%
\$350 - \$600 / week	n = 189	32.3%	36.5%	63.5%
\$601 - \$1,000 / week	n = 206	35.2%	27.2%	72.8%
More than \$1,000 / week	n = 164	28.0%	31.1%	68.9%
<b>Retirement Replacement Rate (rrratio<sup>P</sup>)</b>				
0 - 25%	n = 27	4.6%	18.5%	81.5%
26% - 50%	n = 138	23.4%	31.2%	68.8%
51% - 75%	n = 202	34.2%	31.2%	68.8%
76% - 100%	n = 171	29.0%	28.7%	71.3%
More than 100%	n = 52	8.8%	46.2%	53.8%

*Distribution by characteristics of PRE-retiree Adequacy ... Continued*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Net Worth (nworth)</b>				
\$100,000 or less	n = 84	14.4%	32.1%	67.9%
\$100,001 - \$250,000	n = 49	8.4%	18.4%	81.6%
\$250,001 - \$500,000	n = 104	17.8%	26.0%	74.0%
\$500,001 - \$1.0 million	n = 140	24.0%	26.4%	73.6%
\$1.0 million - \$1.5 million	n = 81	13.9%	32.1%	67.9%
\$1.5 million - \$2.5 million	n = 52	8.9%	42.3%	57.7%
More than \$2.5 million	n = 73	12.5%	45.2%	54.8%
<b>Home Equity (nworth)</b>				
\$250,000 or less	n = 85	16.8%	35.3%	64.7%
\$250,001 - \$500,000	n = 167	32.9%	32.3%	67.7%
\$500,001 - \$1.0 million	n = 147	29.0%	30.6%	69.4%
More than \$1.0 million	n = 108	21.3%	36.1%	63.9%
<b>Savings/Investments (savings)</b>				
\$10,000 or less	n = 190	32.6%	25.3%	74.7%
\$10,001 - \$50,000	n = 71	12.2%	21.1%	78.9%
\$50,001 - \$100,000	n = 52	8.9%	15.4%	84.6%
\$100,001 - \$250,000	n = 59	10.1%	28.8%	71.2%
\$250,001 - \$500,000	n = 63	10.8%	25.4%	74.6%
\$500,001 - \$1.0 million	n = 54	9.3%	40.7%	59.3%
More than \$1.0 million	n = 94	16.1%	57.4%	42.6%
<b>Utilisation of Investment Capital (usecap)</b>				
Expect to use all investment capital	n = 41	10.6%	43.9%	56.1%
Expect to use some investment capital	n = 220	56.7%	36.4%	63.6%
Want to preserve investment capital	n = 127	32.7%	27.6%	72.4%
<b>Utilisation of Home Equity (usehe)</b>				
Expect to use all home equity	n = 233	58.1%	35.2%	64.8%
Expect to use some home equity	n = 128	31.9%	30.5%	69.5%
Want to preserve home equity	n = 40	10.0%	25.0%	75.0%
<b>Other Pension/s (otherpen)</b>				
Yes	n = 205	35.3%	32.2%	67.8%
No	n = 376	64.7%	30.9%	69.1%
<b>Health (health)</b>				
Poor	n = 21	3.6%	61.9%	38.1%
Fair	n = 98	16.8%	37.8%	62.2%
Good	n = 314	53.7%	29.6%	70.4%
Excellent	n = 152	26.0%	26.3%	73.7%

*Distribution by characteristics of PRE-retiree Adequacy ... Continued*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Longevity (longevity)</b>				
Had family member lived to age 90	n = 239	40.9%	32.2%	67.8%
Had no family member lived to age 90	n = 345	59.1%	30.7%	69.3%
<b>Absence due to sickness (absense)</b>				
Not off work sick for 3-months or more	n = 517	96.5%	28.4%	71.6%
Off work sick for 3- months or more	n = 19	3.5%	31.6%	68.4%
<b>Absence from work - Unemployment, etc. (unemploy)</b>				
Yes	n = 263	45.1%	30.4%	69.6%
No	n = 320	54.9%	31.9%	68.1%
<b>Early Retirement (retireearly)</b>				
Retire earlier than 65	n = 145	25.0%	26.9%	73.1%
Retire at 65	n = 32	5.5%	31.3%	68.8%
Retire later than 65	n = 100	17.2%	41.0%	59.0%
<b>Pre-retirement accumulation amount (accamt<sup>P</sup>)</b>				
\$100,000 or less	n = 47	8.0%	34.0%	66.0%
\$100,001 - \$250,000	n = 83	14.2%	32.5%	67.5%
\$250,001 - \$500,000	n = 131	22.4%	23.7%	76.3%
\$500,001 - \$1.0 million	n = 135	23.0%	28.1%	71.9%
More than \$1 million	n = 190	32.4%	36.8%	63.2%
<b>Have saved enough (senough)</b>				
Disagree	n = 217	37.0%	23.5%	76.5%
Neither Agree or Disagree	n = 190	32.4%	28.9%	71.1%
Agree	n = 179	30.5%	42.5%	57.5%
<b>Approach to saving (abilitysave)</b>				
Save regularly each pay	n = 289	49.4%	28.7%	71.3%
Save what is left over	n = 186	31.8%	31.2%	68.8%
Impossible to save	n = 99	16.9%	36.4%	63.6%
Haven't given savings any thought	n = 11	1.9%	45.5%	54.5%
<b>Saving each Month (mthsave)</b>				
Nothing	n = 108	18.3%	37.0%	63.0%
Less than \$100 per month	n = 100	16.9%	30.0%	70.0%
\$101 - \$250 per month	n = 96	16.3%	22.9%	77.1%
\$251 - \$500 per month	n = 95	16.1%	21.1%	78.9%
More than \$500 per month	n = 191	32.4%	37.7%	62.3%

Distribution by characteristics of PRE-retiree Adequacy ... Continued

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Provide Support to Others (<math>provsupport^P</math>)</b>		n = 74	15.1%	72.2%
Yes	No		84.9%	27.8%
<b>Receive Support from Others (<math>recsupport^P</math>)</b>		n = 417	62.8%	37.2%
Yes	No		86.9%	68.0%
<b>Number of investment types (<math>investments</math>)</b>				
0	n = 6	1.0%	50.0%	50.0%
1	n = 125	21.2%	31.2%	68.8%
2	n = 170	28.8%	22.4%	77.6%
3	n = 118	20.0%	33.1%	66.9%
4 or more	n = 171	29.0%	38.0%	62.0%
<b>Financial Literacy (<math>finlit</math>)</b>				
3 or fewer correct answers	n = 136	23.2%	30.1%	69.9%
4 or more correct answers	n = 450	76.8%	31.6%	68.4%
<b>Financial Capability (<math>fincap</math>)</b>				
Scores 3.5 or less	n = 484	82.0%	28.7%	71.3%
Scores greater than 3.5	n = 106	18.0%	42.5%	57.5%
<b>Understand Diversification (<math>divers</math>)</b>				
Incorrect answer	n = 193	32.8%	30.6%	69.4%
Correct answers	n = 395	67.2%	31.6%	68.4%
<b>Understand investment risk (<math>undst^P</math>)</b>				
Incorrect answer	n = 434	73.8%	30.9%	69.1%
Correct answers	n = 154	26.2%	32.5%	67.5%
<b>Risk Management Strategies (<math>riskmgnt</math>)</b>				
4 or less	n = 264	44.7%	36.0%	64.0%
5 or more	n = 326	55.3%	27.3%	72.7%
<b>More of a Saver than a Spender (<math>bspend</math>)</b>				
Disagree	n = 364	62.1%	33.0%	67.0%
Neither Agree or Disagree	n = 164	28.0%	28.0%	72.0%
Agree	n = 58	9.9%	27.6%	72.4%
<b>Save first before spending (<math>bspend</math>)</b>				
Disagree	n = 114	19.5%	24.6%	75.4%
Neither Agree or Disagree	n = 258	44.0%	28.7%	71.3%
Agree	n = 214	36.5%	37.4%	62.6%

Distribution by characteristics of PRE-retiree Adequacy ... Continued

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Save other income (<i>bsother</i>)</b>				
Disagree	<i>n</i> = 257	43.9%	31.1%	68.9%
Neither Agree or Disagree	<i>n</i> = 220	37.5%	30.0%	70.0%
Agree	<i>n</i> = 109	18.6%	33.0%	67.0%

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Pay credit card off in full (<i>bpaycc</i>)</b>				
Disagree	<i>n</i> = 395	50.0%	61.0%	39.0%
Neither Agree or Disagree	<i>n</i> = 29	3.7%	41.4%	73.3%
Agree	<i>n</i> = 366	43.3%	62.6%	66.6%

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Current - Managing Financially (<i>managefin</i>)</b>				
Finding it difficult	<i>n</i> = 91	15.6%	61.0%	70.3%
Just about getting by	<i>n</i> = 125	21.4%	30.4%	58.6%
Doing alright / living comfortably	<i>n</i> = 369	63.1%	31.7%	37.4%

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Difficulty paying outgoings (<i>bdiffc</i>)</b>				
Disagree	<i>n</i> = 445	75.9%	29.7%	70.3%
Neither Agree or Disagree	<i>n</i> = 82	14.0%	32.9%	67.1%
Agree	<i>n</i> = 59	10.1%	39.0%	61.0%

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Thought about quality of retirement (<i>rqual<sup>P</sup></i>)</b>				
Hardly any / None	<i>n</i> = 26	4.4%	30.8%	69.2%
Little	<i>n</i> = 67	11.4%	25.4%	74.6%
Some / A lot	<i>n</i> = 493	84.1%	31.8%	68.2%

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Responsibility for retirement income (<i>responsib</i>)</b>				
Individual	<i>n</i> = 171	29.2%	34.5%	65.5%
Both	<i>n</i> = 229	39.1%	30.1%	69.9%
Government	<i>n</i> = 185	31.6%	29.2%	70.8%

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Awareness of need to plan for retirement (<i>aware<sup>P</sup></i>)</b>				
Disagree	<i>n</i> = 7	1.2%	42.9%	57.1%
Neither Agree or Disagree	<i>n</i> = 21	3.6%	47.6%	52.4%
Agree	<i>n</i> = 558	95.2%	30.3%	69.7%

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Formal plan for retirement (<i>formalplan<sup>P</sup></i>)</b>				
Yes	<i>n</i> = 177	31.1%	36.7%	63.3%
No	<i>n</i> = 392	68.9%	28.3%	71.7%

*Distribution by characteristics of PRE-retiree Adequacy ... Continued*

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>State of retirement planning (<i>plandev</i><sup>P</sup>)</b>				
Poorly-developed plan	n = 210	35.8%	29.0%	71.0%
Neither poorly or well-developed	n = 119	20.3%	25.2%	74.8%
Well-developed plan	n = 257	43.9%	35.4%	64.6%
<b>NZ Superannuation is sufficient (<i>nzssuf</i><sup>P</sup>)</b>				
Disagree	n = 411	70.1%	26.8%	73.2%
Neither Agree or Disagree	n = 126	21.5%	37.3%	62.7%
Agree	n = 49	8.4%	51.0%	49.0%
<b>KiwiSaver will provide enough (<i>ksallt</i><sup>P</sup>)</b>				
Disagree	n = 360	61.5%	31.9%	68.1%
Neither Agree or Disagree	n = 177	30.3%	29.9%	70.1%
Agree	n = 48	8.2%	27.1%	72.9%
<b>Understand financial matters (<i>undst</i><sup>P</sup>)</b>				
Disagree	n = 52	8.9%	36.5%	63.5%
Neither Agree or Disagree	n = 130	22.2%	26.2%	73.8%
Agree	n = 404	68.9%	31.9%	68.1%
<b>Compared to the past 12 months (<i>expast</i><sup>P</sup>)</b>				
Worse off	n = 105	18.0%	32.4%	67.6%
No change	n = 329	56.3%	31.3%	68.7%
Better off	n = 150	25.7%	30.0%	70.0%
<b>Change in income expected in next 2 years (<i>expchange</i><sup>P</sup>)</b>				
Expect income to increase	n = 52	8.9%	42.3%	57.7%
Expect income to decrease	n = 361	61.8%	29.1%	70.9%
Expect no change	n = 171	29.3%	32.2%	67.8%
<b>Self-assessed preparedness – First (<i>prep<sub>d</sub></i><sup>P</sup>)</b>				
Poorly-prepared	n = 202	34.5%	24.3%	75.7%
Neither Poorly or Well-prepared	n = 150	25.6%	31.3%	68.7%
Well-prepared	n = 234	39.9%	36.8%	63.2%
<b>Self-assessed preparedness – Second (<i>prep<sub>d2</sub></i><sup>P</sup>)</b>				
Poorly-prepared	n = 205	34.7%	23.9%	76.1%
Neither Poorly or Well-prepared	n = 158	26.8%	32.3%	67.7%
Well-prepared	n = 227	38.5%	37.0%	63.0%

*Distribution by characteristics of PRE-retiree Adequacy ... Continued*

**KiwiSaver membership (*ksmember*)**

Current member, no withdrawals	<i>n</i> = 418
Current member, partial withdrawal	<i>n</i> = 14
Past member, full withdrawals	<i>n</i> = 10
Not a member, opted out	<i>n</i> = 11
Not a member, never joined	<i>n</i> = 132

Sample	Adequate	Inadequate
71.5%	34.0%	66.0%
2.4%	14.3%	85.7%
1.7%	60.0%	40.0%
1.9%	18.2%	81.8%
22.6%	42.4%	57.6%

**Length of KiwiSaver membership (*kslength*)**

Less than a year	<i>n</i> = 18
Between 1 and 3 years	<i>n</i> = 58
More than 3 year, less than 7 years	<i>n</i> = 189
From the start - 7 years	<i>n</i> = 176

4.1%	27.8%	72.2%
13.2%	39.7%	60.3%
42.9%	32.3%	67.7%
39.9%	34.7%	65.3%

**KiwiSaver contribution rate (*kscrata*)**

3%	<i>n</i> = 145
4%	<i>n</i> = 168
8% or more	<i>n</i> = 70

37.9%	31.7%	68.3%
43.9%	32.7%	67.3%
18.3%	34.3%	65.7%

**KiwiSaver fund types (*ksftype*)**

Default / Defensive	<i>n</i> = 42
Conservative	<i>n</i> = 114
Balanced	<i>n</i> = 145
Growth	<i>n</i> = 58
Aggressive / High Growth	<i>n</i> = 16

11.2%	31.0%	69.0%
30.4%	31.6%	68.4%
38.7%	34.5%	65.5%
15.5%	31.0%	69.0%
4.3%	18.8%	81.3%

**Current KiwiSaver account balance (*kscbal*)**

\$1 - \$5,000	<i>n</i> = 40
\$5,001 - \$10,000	<i>n</i> = 37
\$10,001 - \$25,000	<i>n</i> = 68
\$25,001 - \$50,000	<i>n</i> = 119
\$50,001 - \$100,000	<i>n</i> = 78
More than \$100,000	<i>n</i> = 36

10.6%	32.5%	67.5%
9.8%	24.3%	75.7%
18.0%	30.9%	69.1%
31.5%	32.8%	67.2%
20.6%	34.6%	65.4%
9.5%	22.2%	77.8%

**KiwiSaver - Intended spend on other purposes (*undst<sup>P</sup>*)**

0%	<i>n</i> = 166
<10%	<i>n</i> = 73
10% - 25%	<i>n</i> = 61
25%-50%	<i>n</i> = 30
50%-75%	<i>n</i> = 12
75%-100%	<i>n</i> = 17

46.2%	34.9%	65.1%
20.3%	27.4%	72.6%
17.0%	37.7%	62.3%
8.4%	36.7%	63.3%
3.3%	25.0%	75.0%
4.7%	17.6%	82.4%

## Calculated Information

		<b>Sample</b>	<b>Adequate</b>	<b>Inadequate</b>
<b>Financial Resources (<i>invtype</i>)</b>				
None	<i>n</i> = 50	8.5%	24.0%	76.0%
Investments only	<i>n</i> = 50	8.5%	16.0%	84.0%
Home equity only	<i>n</i> = 114	19.3%	26.3%	73.7%
Home equity and investments	<i>n</i> = 376	63.7%	35.6%	64.4%
<b>Life Expectancy (<i>legroup</i>)</b>				
Less than 86.5 years	<i>n</i> = 573	97.1%	31.2%	68.8%
86.5 - 87.5 years	<i>n</i> = 9	1.5%	22.2%	77.8%
87.5 - 90 years	<i>n</i> = 1	0.2%	100.0%	0.0%
More than 90 years	<i>n</i> = 7	1.2%	28.6%	71.4%
<b>Own their own home (<i>ownhome</i>)</b>				
No	<i>n</i> = 96	16.3%	18.8%	81.3%
Yes	<i>n</i> = 494	83.7%	33.6%	66.4%
<b>Retired with Home Loan (<i>hasmortg</i>)</b>				
No	<i>n</i> = 321	54.4%	30.8%	69.2%
Yes	<i>n</i> = 269	45.6%	31.6%	68.4%

## Appendix 9: Related Publications and Awards

Lissington, R.J., (2011). *The impact of past experiences, culture, values, attitudes and beliefs on intergenerational transfer of financial literacy*. A research project presented as part of the Postgraduate Diploma in Business Administration (Finance), Massey University, Palmerston North.

Lissington, R.J., (2012). *The impact of past experiences, culture, values, attitudes and beliefs on intergenerational transfer of financial literacy*. Presentation to the Central District Branch of the NZ Institute of Financial Advisers. February, 2012.

Lissington, R.J. and Matthews, C.D., (2012). *Intergenerational transfer of financial literacy*. Academy of Financial Services Conference, San Antonio, US. 1-2 October 2012.

Lissington, R.J., (2014). *Financial preparedness in NZ is low*. Massey University Pakistani Student's Association, 4<sup>th</sup> Annual Interdisciplinary Doctoral Students Research Symposium, Massey University, NZ.

- Awarded People's Choice Prize

Lissington, R.J. (2014). *Financial preparedness in NZ is low*. Massey University Business School PhD Symposium, Massey University, November, 2014.

Lissington, R.J., (2015). *Financial preparedness for retirement in NZ is low*. 19<sup>th</sup> Annual NZ Finance Colloquium, Waikato University, NZ.

Lissington, R.J., Matthews, C.D. and Naylor, M.J., (2016). *Self-assessment for retirement preparedness*. 29<sup>th</sup> Australian Finance and Banking Conference, Sydney, Australia.