Do Investor Beliefs About Asset Returns Produce

Rational Financial Behaviours?

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ABSTRACT

Introduction - Why do investors choose one investment over another? When comparisons are readily available the answer is assumed to be the one that provides the best expected return for the least risk, but when comparisons are difficult or non-existent due to inadequate or confusing data how do investors choose?

Purpose - This research considers the question of how Australian non-professional investors select between three common Australian investment options – Superannuation, Australian shares and Residential real estate to determine whether investors have a rational view, that is, that they sufficiently understand the risks and expected returns of specific investment characteristics, and then whether this view influences their investment actions in a rational or irrational manner.

Critical Literature Review and the Contribution - Utility maximisation, according to Von Neumann and Morgenstern (1964), is the basis of traditional finance and economics and Markowitz (1952) suggests that investors make investment decisions based on an optimal balance of risk and return. Behavioural finance and economics have questioned the rational man approach by identifying persistent anomalies in the decision-making process. Prospect theory (Kahneman & Tversky, 1979) was the basis of the concept of loss aversion and their further work built on an understanding of the impact of 'framing'. Simon's work on bounded rationality (Simon, 1955) suggested that people self-limited new information that did not accord with their already held beliefs.

Financial literacy has been considered as a solution for the irrationality of investment decision making as wealth and financial literacy has been found to be correlated (Hastings & Mitchell, 2011; van Rooij, Lusardi, & Alessie, 2012).

Methodology - An online, quantitative survey was conducted using a random selection of candidates sourced through social media and an Australian Financial Planning Association. The survey was administered using QUALTRICS software and usable responses were elicited from approximately 280 respondents. Descriptive statistics, correlation testing and logistic regression analysis was conducted to investigate the research questions.
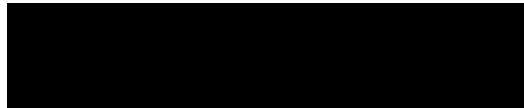
Results, Discussion and Implications - The sample was identified as being financially literate yet showed a poor understanding of the relationship between risk and return as measured by a mean-variance approach. Significant differences were identified when considering investing framed by past performance compared to framing by expected future performance

Respondent's perception of the best past performer of the three options was poor with more than 60% choosing a different option than the one which produced the actual best past performance. Notwithstanding this, the perception of past performance was a significant factor in respondents selecting their preferred investment. As respondents were not provided with information regarding actual past performance, this research has focussed on perceptions. The impact of the perception of past investment performance is the most important factor in investment choice decisions by Australian investors.

Conclusion - This research questions the efficacy of relying on a mean-variance approach to assessing an investor's tolerance for risk without considering their already held beliefs regarding the perception of risk and past performance of investments considered. The research suggests that participants were ignorant of the relative risks of the investment options considered, and indeed when combined with an inability to identify past performance accurately suggests the dangers of relying on naïve investors to provide for their financial future. The challenge of comparing investments that have unlike characteristics (fundamentally different risk and return profiles) has been highlighted and requires further investigation.

DECLARATION

I, Paul Anthony Moran, declare that this Doctoral thesis entitled, 'Do Investor Beliefs About Asset Returns Produce Rational Financial Behaviours?', is no more than 65,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my original work.

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Signature   Date

ACKNOWLEDGEMENTS

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List of Abbreviations

ABS	Australian Bureau of Statistics
APRA	Australian Prudential Regulatory Authority
ASIC	Australian Securities and Investment Commission
ASX	Australian Stock Exchange
AWOTE	Average Weekly Ordinary Times Earnings
CC	Concessional Contributions
CGT	Capital gains Tax
DCF	Discounted cash Flow
DFA	Dimensional Fund Advisers
EU	Expected Utility Theory
FHOG	First Home-Owners Grant
FSA	Financial Services Authority (UK)
GST	God and Services Tax
HILDA	Household Income and Labour Dynamics in Australia
MTAWE	Male Total Average Weekly Earnings
MTR	Marginal Tax Rate
OECD	Organisation of Economic Co-operation and Development
PAS	Productivity Award Scheme
P/B	Price to Book Ratio
P/E	Price to Earnings Ratio
PPR	Principle Place of Residence
NCC	Non-Concessional Contributions
NTA	Net Tangible Assets
RBL	Reasonable Benefit Limit
REIT	Real Estate Investment Trust
RV	Relative Value
SEC	Securities and Exchange Commission (USA)
SEU	Subjective Expected Utility Theory
SG	Superannuation Guarantee
SMSF	Self-Managed Superannuation Fund
SPSS	Statistical Package for Social Sciences

1. INTRODUCTION

1.1 Introduction and Background

The researcher has been a practising financial planner in Australia for more than 25 years and in that time has recognised a persistent theme amongst individuals seeking financial advice – that residential real estate is often perceived as a virtually risk-free, high return investment option. This realisation led to a preliminary investigation of research into investor beliefs and their influence on investment decision-making and in particular to their choice of investment vehicle and reasons for that decision.

Indeed, over the 20 years to 2016, property values in most capital cities of Australia have risen substantially (ABS, 2017b; Epley, 2012) perhaps adding to the belief that prices 'only ever go up'. Indeed, this perception was challenged in other countries where residential property prices fell dramatically during the financial crisis of 2007-2009, but after a very brief fall, in Australia property prices continued to climb. The more than 15-year bull-run on Australian property has, however, produced a conundrum; prices have become so high that a large amount of household financial resource is required to service and maintain a residential property. Consequently, new owner-occupiers of residential property have been forced to allocate more and more of their scarce financial resources to purchase such an asset, and this may be reducing their allocation to other financial and consumption needs such as retirement savings (Yuan, Liu, & Yang, 2011). Residential property investors have been forced to give up rental yields as prices have increased far in advance of rental return increases, and the levels of debt servicing is only supportable because of a favourable taxation environment which provides a tax deduction for net investment losses – known as negative gearing. Perhaps Shiller's property heuristic where the time frame between purchase and disposal of residential real estate leads to ignorance of volatility (Shiller, 2005) is alive and well – and lives in Australia?

In the example of residential real estate in Australia, the disbelief that property may fall in value may be explained under the framework of Tversky and Wacker's (1995) cumulative prospect theory. They describe that an (investment) event has more impact when a possibility is turned into a certainty. While the future value of any real estate investment is uncertain, the expectation of future value changes become less uncertain in the eye of the investor. A prolonged period of above-average returns without any significant volatility, as has been experienced in the Australian residential real estate

market over the past 15 or so years, may indeed have converted investor's expectations into a certain outcome.

With this as a backdrop, we consider three common vehicles available to Australian investors for elective, long-term wealth accumulation: voluntary additional contributions to superannuation, investing directly and indirectly in the stock market and residential real estate investment. Residential real estate is available both for personal residential purposes as well as for investment purposes. If the property heuristic is in play in Australia, perhaps other heuristics affect investor's attitudes to the other forms of investment identified above. Beliefs in levels of expected returns and levels of relative risk may determine investor choices as to where resources are allocated. But are these decisions effective and based on reasonable (rational) assumptions, or are they based on incorrect (irrational) beliefs and biases?

1.2   Context of the Study

This research will specifically investigate these three common forms of investment in Australia - voluntary contributions to superannuation savings, the Australian share-market and residential real estate – to identify if investors hold views on risk and return in broad accordance to financial markets expectations (rational). It will then determine if investor beliefs as to the characteristics of these investments efficiently influence their decisions.

Individuals must allocate capital and income in a manner that provides for their long-term financial needs. Neo-classical economists would describe this as utility maximisation (Bernoulli, 1954). However, behavioural finance has questioned whether these same individuals can make optimal investment decisions regarding this allocation (Kahneman, 2011). For example, over-spending on a residential property may incur the risk of having less available resources for long term retirement funding. This research investigates the decisions made by individual investors regarding the allocation of scarce financial resources to provide for their best long-term outcome. It will assess whether individuals' access and analyse available data rationally to reach a logical and justifiable position, or whether they use other more esoteric techniques such as the creation of heuristics to influence their decisions.

The study of an individual's financial decisions and actions falls within the fields of behavioural finance and neo-classical economics. Behavioural finance is often centred

around behaviours of groups of investors acting to impact on market pricing (Sewell, 2010), but has also included descriptions of individual's systematic deviations from rationality (Barber & Odean, 1999) and an understanding of the impact of human frailty and complications in decision-making (Mullainathan & Thaler, 2000). Neo-classical economics neatly assumes that individual investors act rationally, and has been described by Weintraub (1993) as involving three core assumptions:

1. Rational preferences are available as outcomes for individuals.
2. Individuals choose options that maximise their utility and profit maximisation is the motive for firms.
3. Decision-makers have full information availability.

In the neo-classical world, investor preferences are assumed to be unrelated to a specific market price. The efficient markets hypothesis is a widely accepted paradigm of neo-classical economics and one of its principal authors suggests that over-reactions to information are about as common as under-reactions (Fama, 1998). This argument is presented to refute the impact of behavioural finance proponents. Notwithstanding this position, there is a lot of empirical evidence of investor irrationality (Biswas, 2009; A. Tversky & Kahneman, 1986) and that this irrationality is consistent and persistent (Heath, 2000).

There have been several studies related to how individuals make financial and investment decisions without complete information (Brahmana, Hooy, & Ahmad, 2012; Hallahan, Faff, & McKenzie, 2004) and different theories have been developed in an attempt to explain, describe or predict this human behaviour. The 'decision under uncertainty' line of research (Kahneman & Tversky, 1979) linked psychology and economics and questioned the rational man approach by establishing, for example, that individuals assigned uneven weights to gains and losses (Kahneman & Tversky, 1979). Other researchers have been trying to capture individuals' investment decision-making behaviour under the concept of heuristics, or 'rules of thumb' principles (Golivich & Griffin, 2002).

There has also been significant literature associating rational personal financial decisions with financial literacy (Banks, O'Dea, & Oldfield, 2010; Lusardi & Mitchell, 2007a). A relationship has been identified in studies based on wealth, retirement outcomes and financial literacy (Commonwealth Bank Foundation, 2004; Hastings & Mitchell, 2011; Lusardi & Mitchell, 2007a; van Rooij et al., 2012). Importantly, financial literacy research has not produced significant causal links among these variables, but the

identified correlations between financial literacy and wealth warrant further investigation. The importance of understanding the link between financial literacy and investment decisions has emerged in response to a broadly held view that individuals are becoming more responsible for their retirement planning and less reliant on the government for their retirement income, or pension (van Rooij et al., 2012). This research takes the same view but approaches the issue from a different perspective – the beliefs an investor holds regarding the characteristics of the options they consider. Despite the suggested relationship between wealth and financial literacy, Willis (2008) suggests that individuals tend to see expenditure on financial literacy education as an inefficient use of resources. The high opportunity cost of financial literacy education has been described by Willis (p.202) as follows: "People are financially illiterate not because they are stupid, but because they have better things to do with their time".

In the Australian context, the 'three-pillar' approach specific to retirement adequacy sees investors taking significant responsibility for their long-term financial well-being (Ripoll, 2009). The first pillar involves a safety-net, means-tested age pension, the second is a compulsory employment-based retirement savings system (the superannuation guarantee), and the third is additional voluntary savings to superannuation (Henry, 2009). The second and third pillars mainly[1] involve a defined contribution (DC) system where individuals make decisions regarding investment options as well as the level of additional voluntary contributions. The first pillar (means-tested age pension) operates under a pay as you go system and is reliant on future taxation revenue to be sustainable. The widely described (Commonwealth of Australia, 2015) reduction in the ratio of working (and tax-paying) individuals to retired individuals (often called the dependency ratio) suggests that this self-reliance is becoming entrenched in western retirement systems (Davis, 2014) as more and more countries struggle with the sustainability of government funded retirement income. In Australia, the dependency ratio is expected to worsen from 4.5 in 2014-15 to 2.7 in 2054-55 (Commonwealth of Australia, 2015).

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[1] In absolute terms, there are a small number of legacy defined benefit (DB) retirement plans still operating in Australia but the vast majority of additional voluntary retirement savings must be made to a defined contribution (DC) option.

1.3 Research Question

There is little evidence in the literature that an individual, non-professional investor's *beliefs* regarding expected return and risk characteristics involved in their investment decisions have been considered in research to date. Inappropriate (irrational?) beliefs regarding long term expected outcomes from an investment decision could have a catastrophic impact on an individual's long-term financial health and the ability to support themselves in retirement. Further, overconfidence in, for example, expected future returns in residential real estate may explain continued growth in residential home prices despite valuations becoming stretched to record levels (Worthington, 2012). Little consideration has been given to irrational investor beliefs of future price growth as an explanation for reduced housing affordability. Typical explanations of house price growth include:

- Strong economic and population growth
- Cheaper and more accessible finance
- Tax incentives to investors and owner-occupiers
- Lack of land release for new home development creating scarcity (Worthington, 2012)

Irrational expectations of investment returns may bias the allocation of scarce resources towards inefficient assets in the belief that they are providing an unfounded long-term benefit.

The primary policy tool used to improve investor's levels of financial efficiency has been through the development of comprehensive financial literacy programs (OECD, 2005). An Australian government funded financial literacy foundation has been established with the following strategic priorities:

- Educate the next generation, mainly through the formal education system
- Increase the use of free, impartial information, tools and resources
- Provide quality targeted guidance and support
- Strengthen coordination and effective partnerships
- Improve research, measurement and evaluation (Australian_Government, 2013)

Financial literacy, however, has been primarily assessed based on numeracy skills as they apply to financial concepts such as inflation, diversification and compound interest (Lusardi, 2012). To date, research regarding financial literacy has ignored assessing an individual's ability to make choices about different types of investments with different risk and return characteristics. Further, there is no research investigating how an individual determines the expected return and relative risk of the investment choices that

they make. Rather, neo-classical economics suggests that there are universally accepted risk and return data available. This research seeks to reduce this gap by investigating, for the first time, individual investors preferences based on their naïve beliefs of the risks and expected return of three alternative investment options.

The irony of using past performance as a guide to determining expected future returns is perhaps no more obvious where Australian financial regulators require a warning on all material regarding investments to contain a warning that past performance does not relate to future performance. No such warning is required related to past risks. This research aims to establish the extent to which investors rely on past performance to determine their investment preferences. The research uses the term 'perception' purposefully when considering the research questions. In a professional investment setting, risks and return characteristics may be compared and rational choices made, but in a non-professional environment where naïve investors exist, choices are made based on a number of different assumptions and often without the advantage of accurate data. Notwithstanding this, choices are made every day to deploy capital.

The research considers the following:

1. What is the influence of perception of past performance on investment preference?
2. What is the influence of perception of expected future performance on investment preference?
3. What expectations do individuals' hold regarding asset returns and are they in line with generally accepted historical expected returns?
4. What expectations do individuals' hold regarding asset risks and are they in line with generally accepted long-run expected risks?
5. To what extent do individuals' investment actions (or propensity to act) match their stated perceptions? In other words, what is the probability of investors choosing the option that they believe will offer the best future risk and return for them.
6. Is there a relationship between the accuracy of these risk and return expectations and an individual's financial literacy?
7. Controlling for the above factors, do individuals who have a professional, on-going relationship with a financial planner have views that differ from those that have no such relationship?
8. Do demographic factors influence individuals' investment expectations on return and risk?

The primary thesis of this research is that the assumptions made in the mean-variance model of investment decision-making may be compromised by the risk and return beliefs of individual (non-professional) investors. Indeed, risk and return characteristics for at least two of the investment options researched (superannuation and

residential real estate) may not be accessible or even available to non-professional investors yet individual investors make decisions every day. If investors' beliefs regarding expected returns and risks of an investment option are incorrect, the traditional portfolio construction approach of generating a risk-adjusted portfolio is likely to be rejected by investors who may 'not believe' the outcome and this leads us to the two core research questions:

- **Research Question 1:** *Do individuals hold appropriate beliefs regarding the risks and expected returns of the investments they are considering?*
- **Research Question 2:** *Do individuals demonstrate a propensity to invest according to those beliefs in a rational manner?*

1.4 Purpose and Justification of the Study

To fund their financial needs in retirement, individuals' must make efficient decisions regarding finite financial resources over time. This research will determine whether investors have a rational view of specific investment characteristics, and then whether this view influences their investment actions in a rational or irrational manner.

A 'rational' view regarding investment expectations will be considered as being broadly consistent with academic, financial planning practitioner and financial markets evidence about long-run expected risks and returns. Literature has been reviewed to establish a consensus-based range of values for long-run expected return and risk for the three investment options analysed. 'Rational actions' are those decisions that accord with the individuals' assumption regarding long-run expected returns, irrespective of whether those return expectations were 'rational' in the first place.

The research will help to develop a better understanding of what individual's *think* about the *outcome* of their investment decisions. By relating this to their perceptions of risk and propensity to invest, we will be able to draw conclusions about the efficiency of their financial decision-making. By improving our understanding about what factors lead individuals to make significant investment decisions, we will be better able to promote rational decision making regarding three important financial investment decisions – residential property, superannuation and share-market investing.

The results of this study may influence government policy regarding financial education and financial capability, as well as provide financial planning and advice practitioners with additional insights to better understand investor behaviour at a household level.

1.5 Practical Context

The study will be conducted on Australian residents over the age of 18. The research will separately identify participants who have an on-going professional relationship with a financial planner and those who do not.

The study will focus on an individuals', willingness or desire to invest income, capital, or to employ debt towards the following investment options:

1. Making non-compulsory additional contributions to superannuation
2. Investing directly or indirectly in the Australian share market
3. Investing in residential real estate

This research will ascertain participants' expected future value for each of the above-mentioned investment options over a forward-looking,10-year period to calculate an expected annual return. This result will then be compared to expected and past return for these options (using current Australian financial markets data) to determine if participant's expectations are aligned (rational) or non-aligned (irrational) with market expectations.

Further, this research will identify the participant's perception of the risk for each of the options presented. This information will be related to an individual's actions or propensity to act on these views. It will be established that if participants' actions (or desire to act) accord with their view of expected return, this would be a rational action. However, the rational action may be based on an irrational expectation. If the study establishes that households are indeed influenced by these beliefs, the focus on financial education may need to set a new direction within teaching curriculum or superannuation member education programs. It will provide practitioners and educators with a better understanding of decision making under risk in finance.

1.6 Theoretical and Conceptual Framework

A conceptual framework has been developed to summarise the research. The study will look at the relationships between three influencing factors – financial literacy, financial advice and participant demographics – and investor beliefs about the characteristics of three different investment options (superannuation, Australian shares and residential real estate). These beliefs (expected returns, level of investment risk and confidence in participant predictions) will be measured against a series of benchmarks determined by long-run expectations of financial markets and academically supported benchmarks.

Expected returns will be measured by comparing a current value for each of the three investment choices to the expected value of the same option at a point in the future (ten years). The time interval has been selected to encourage a long-term view of the asset returns. Confidence in this prediction will be measured using a sliding scale of 1-100, and the participants' perspective regarding the risk of the option will also be measured using a sliding scale of 1-100. Risk measures of investment used by professional research organisations such as FE Analytics and Morningstar often use a scale in the range of 1-100 for describing risks. As a result of these beliefs, participants will be asked to identify their 'most favoured' investment of the provided choices. These outcomes will then be measured against the view of the return characteristics of their choices to determine the rationality of their preferred action.

Figure 1.1 - Conceptual Framework
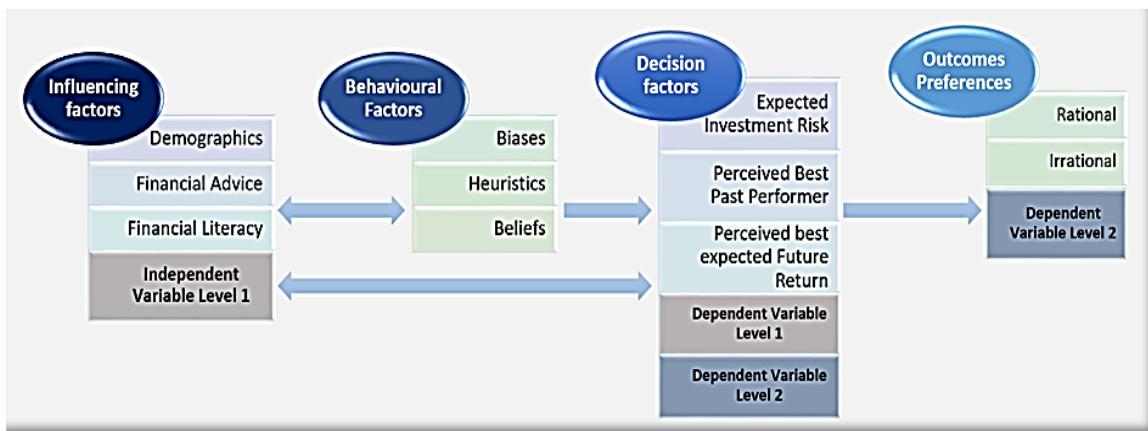
1.7   Methodology

The study was conducted using a quantitative, online survey to investigate the relationships between several variables involving human knowledge, beliefs and preferred actions regarding financial behaviour. The behavioural aspect of the study suggests a post-positivist perspective as the information gathered was 'real world' data. Surveys are frequently used to collect data regarding individual attitudes to investment and financial decisions (Agnew, Bateman, & Thorp, 2013; Dowling, Corney, & Hoiles, 2009; Seiler et al., 2008). It has become common to use on-line surveys as technology has become more pervasive in society and this has allowed more tailored surveys to be conducted (Agnew et al., 2013).

The data was collected over four months, with only one point of collection per participant and was, therefore, a cross-sectional study. The survey primarily consisted of

closed-ended questions and numerical data; additionally, questions of a qualitative nature such as perception of risk included a free text section that allowed participants to describe what they understand as risk.

The survey was conducted using the Qualtrics™ software program, which allows for sophisticated survey methodology enabling individualisation of the questions dependent on previous responses. This allowed, for example, values provided for household income, residence value and household superannuation balance to be used in establishing relative values in the questions regarding starting values for future investment performance estimations. The survey software also allowed for conditional questions.

Several approaches were undertaken to obtain participant responses. As there is no obvious panel of participants, a novel approach was applied to attracting participants. First, financial planning practitioner members of the 'Boutique Financial Planning Group' were asked to forward a request to their clients via email with a survey link attached. This was a method chosen as members of this group are independent financial planners who were supportive of the study. The study was looking for any differentiation in results between those who actively have a relationship with a financial Planner and those who do not. So it was a method of ensuring that a reasonable number of participants were in the first category. Second, social media was used to attract participants who did not have any particular relationship with a financial planner.

Finally, a short article was published in the media requesting participants (no reference was made to the outcome of the survey, but rather general comments regarding an interest in investor attitudes). Out of a total of 379 partially completed attempts, 260 surveys were produced with complete data, and these were used for analysis. The remaining surveys provided no useful information on important responses. Analysis was conducted using three methods:

- Descriptive statistics were used to identify simple measures of mean, median, mode and standard deviation and to establish that there were no fundamental flaws in the dataset.
- Correlation testing was conducted to test for relationships between variables. In particular, relationships between perceived risk and expected return
- Binary logistic regression was used to estimate the likelihood of responses as related to investment preference. Logistic regression calculates the 'odds' of one independent variable influencing the outcome of the dependent variable, after controlling for the other independent variables.

1.8   Structure of the Thesis

Chapter 1 presents the introduction to the research problem and its justification. The introductory chapter sets the tone for the research that is presented in underlying sections. This chapter also briefly discusses the research mythology and finally gives an outline and the structure of this thesis.

Chapter 2 presents reviews of current and historical literature to establish the academic basis of the thesis. Commencing with a discussion of the literature regarding traditional, or neo-classical, finance and economics and particularly the focus on the 'rational man' paradigm that is central to the area of study, we then move to a discussion of the literature on behavioural finance and economics. This challenges the 'rational man' approach and suggests that human decision-makers may be subject to biases that render their decision less than rational.

This is followed by a review of the literature regarding perceptions of risk and investment performance which informs the questions being posed in this research. The literature suggests that improving financial literacy may improve decision-making; however, the sample used for this study was found to exhibit very high levels of financial literacy, and so while potentially significant, there was little beneficial evidence of this from the study.

Finally, in this chapter, some typical approaches to risk and return measurement methodologies were discussed, and the variety of the same suggests that there is no one measure of either risk or return that is universally accepted.

Chapter 3 discusses the characteristics of the three investment options considered in the research: Australian superannuation, Australian shares and residential real estate. Each of these options is available to most Australian investors, and while they are accessible and commonly utilised, the complexities involved in each option demonstrates the complexity of the decision-making in choosing between each. At its core, this research aims to identify why an individual would choose one over another and so the historical context, historical returns, taxation rules and key risks have been discussed.

Chapter 4 introduces the theoretical and conceptual framework and hypotheses, and in this chapter, we contrast several decision-making models. The theoretical framework contrasts the decision-making process under a traditional, behavioural, financial literacy and a consumer choice model. Ultimately, however, the focus of the

research is the differences between a traditional model and a behavioural model. The theoretical framework is also influenced by previous research regarding perceptions of risk of an investment, perceptions of the past performance of an investment and perceptions of the expected future performance of an investment.

Chapter 5 is about research design and methodology chosen for the study. As this is the first study of its kind to compare three different investment choices for Australian investors, we have drawn on a number of methodologies to build and design this research. The study was conducted using a quantitative, online survey to investigate the relationships between a number of variables involving human knowledge, beliefs and preferred actions regarding financial behaviour. A quantitative study was an appropriate method given the overall purpose of the study as it provides for comparisons on results between multiple groups.

Data was collected using an on-line survey as it allowed for the ability to individualise some of the questions based on the data collected and volunteer participants were drawn from clients of a national association of boutique financial planners, social media call-outs and an article in the national print media. Statistical analysis was conducted on the sample using descriptive statistics, correlation testing and then binary logistic regression to identify 'the odds' of an independent variable influencing the dependent variable (propensity to invest). Two techniques were used to test the sensitivity of the results; however, both were found not to have affected the results and so the results are robust.

Chapter 6 provides data analysis and commentary on the results. The purpose of this chapter is to provide the analysis to test the hypotheses and assertions developed from the literature review, theoretical and conceptual frameworks. We start with a review of the descriptive statistics obtained from the survey that provides some insight into the characteristics of the sample and the rationale for the specific demographics used for analysis, results from the financial literacy questions and then a description of the results regarding perceptions of risk, past performance and expected future performance of the three investment alternatives considered. The chapter then moves to inferential statistical analysis, commencing with an exploration of the relationships between a number the key variables of risk and return – with return framed as past performance as well as expected future performance. The results in this section have been controlled for the independent demographic variables.

Finally, we use logistic regression to develop models that assess the contributions of each independent variable to the dependent variable of investment preference. Six models in total were developed to assess investment preference between the choices (3) framed as both past performance as well as expected future performance (2).

Chapter 7 discusses the results and draw conclusions. The primary thesis of this research is that the assumptions made in the mean-variance model of investment decision-making may be compromised by the risk and return beliefs of individual (non-professional) investors. If investors beliefs regarding the expected returns and risks of an investment option are incorrect, the traditional portfolio construction approach of generating a risk-adjusted portfolio is likely to be rejected by investors who may not 'believe' the outcome.

The mean-variance model of investment choice under a traditional finance model appears to be rejected by many non-professional investors. In all three options considered, scatterplots of risk and return were found to be slightly downward sloping rather than upward sloping which would have been expected if risk and return were positively related (the higher the risk, the higher the expected return).

Past performance was found to be the most significant independent variable in the investment decision-making process (see figure 7.1), yet more than 60% of respondents incorrectly identified which of the three options had performed best over the previous three years.

When considering expected future investment returns, a statistically significant result identified that only 48% of respondents who chose residential real estate as their preferred investment option felt that it would provide the best future returns. In other words, 52% of those who chose residential real estate believed that there were other, better options to invest in. Perception of risk was not identified as a significant variable.

Financially advised respondents were 2.75 times more likely to prefer residential real estate than non-financially advised respondents.

Older respondents (over 45) were 1.8 times more likely to prefer superannuation than younger respondents, although over 45's were less likely (0.29 times more likely) to prefer residential real estate. These results are as expected, given the age-based restriction on accessing superannuation (see chapter 3), and the potential issue of borrowing to purchase residential real estate for older respondents.

1.9   Limitations of Study and Key Assumptions

While a quantitative methodology was adopted along the lines of other studies in the areas of financial literacy and financial competence (Agnew et al., 2013; Lusardi, 2012) as well as behavioural studies such as Bovi (2009) and Brahmana et al. (2012), the anomalies identified that contradict traditional finance theories require further investigation. A qualitative approach could be used to investigate investor beliefs further to develop a deeper understanding of the reasons behind the beliefs. Moreover, experimental behavioural research could be conducted so as to target specific behaviours uncovered in this research.

Chapter 3 describes the complex nature of superannuation. However, technically, superannuation is a tax structure for holding investments rather than an investment such as residential real estate or shares (equities). There was a concern that this might confuse respondents however only three comments were received from respondents regarding this and the pilot testing, as well as the researcher's experience, have reinforced the view that investors do perceive superannuation as a stand-alone investment option. Superannuation as an 'asset class' was chosen as it reflects a significant component of retirement wealth for Australian investors.

It was assumed that respondents held views regarding the investment choices considered in the study. It is possible that the responses were 'guesses' rather than considered opinions of the respondents, and this could influence the results.

1.10   Significance of the Study and Contribution to Knowledge

The research conducted for this study has significant findings for policymakers and finance practitioners as it explored, for the first time, the impact of beliefs on investment decision making. Financial Advisers and Financial Planners are expected to assess an individual investor's preference for risk before making recommendations regarding investment choices. The mean-variance approach assumes that investors understand both the *mean* and the *variance;* however, this research brings that assumption into question. The research has shown that individual investors either do not understand this approach or ignore this approach in favour of a simple assessment of perceived past investment performance. While there are some minor differences between those who have an active relationship with a financial adviser and those who do not, perceived past performance is the single most important factor in investment decision-making by individual investors.

This is especially apparent in the case of residential real estate investing and seems not to be influenced by any of the control variables assessed.

Financial advisers and financial planners must be made aware of this anomaly to assist them in advising clients or else significant investment decisions will likely be sub-optimal. Additionally, there may need to be a revision of the risk measurement approach used as it appears that the traditional mean-variance approach is having little impact on investment decisions by non-professional investors. Policymakers, superannuation funds (who offer basic financial advice to their members) and regulators also need to be aware of the lack of adherence to traditional measures of risk by non-professional investors.

The research challenges the assumption in neo-classical economic theory that investors 'know' or are 'aware' of the rick and return characteristics of the investment choices they consider. The primary contribution to academia, of this research, is to add the dimension of investor beliefs to the existing research and hence to open a potentially new line of enquiry regarding how investors make decisions. Traditional financial models assume investors are rational and make investment decisions using all available information to provide an optimal outcome. In contrast, behavioural finance models search for persistent errors in judgment leading to biases that may result in sub-optimal investment decision-making. This research considers the 'real-world' situation where investor's beliefs influence their decision-making and has found that the perception of past performance, while mainly incorrect, provides the most significant influence on investment decisions. This incorrect assumption has not been considered in the research before and will provide further opportunity to develop both traditional finance theory as well as behavioural finance theory as this new consideration is neither irrational nor a persistent error.

1.11   Conclusion

Despite assumptions that investors adopt a risk-return framework regarding the selection of their investment preferences, Australian investors are strongly influenced by the past performance of investment options when considering which investment to choose. This appears to be significantly more important even than the respondent's perception of expected future best performer. Importantly, Australian investors perception of part performance of investments was incorrect more than 60% of the time. This is an

indication that the warnings regarding past performance required by Australian financial regulators are falling on deaf ears.

The consideration of the risk of an investment option did not follow the traditional finance model of higher risk – higher return, and for many respondents, the opposite was true. They felt that an expected high return investment came with low risk while an expected low return investment reflected high risk. Particularly noteworthy is that there is no central, agreed upon, measure of residential property returns available in Australia, Unlike the share market or even superannuation funds (although this is not optimal), this lack of accurate and available return data may be a cause behind the level of incorrect perception regarding past performance.

In the next chapter, we will review the literature as it relates to neo-classical finance theory, behavioural finance theory and financial literacy. This will lead us to identifying how investors may perceive investment risk and investment returns.

2. LITERATURE REVIEW

2.1 Introduction

In this Chapter, section 2.2 will commence by investigating the literature around the historical background to investment decision making under the neo-classical approach of rational and expected utility. This will lead us to modern portfolio theory and the concept of risk as it relates to investment portfolio decision-making in light of traditional models of decision-making.

Behavioural finance has challenged traditional economics, and so in section 2.3 we examine the literature regarding investment decision-making under uncertainty and over more extended periods. This adds complexity to the process, and so we look at the literature in this area. As behavioural finance and economics considers that investment decision-making may be less than optimal, we then look at what may influence these decisions, including framing, mental accounting, anchoring and adjustment. Furthermore, in section 2.4 we find that individual investors may be influenced by such factors as data format, rules of thumb, and non-professional social networks.

This study is particularly interested in the perceptions of non-professional investors and how they influence investment decision-making, and so section 2.5 considers the literature position regarding the perception of risk and investment performance. This is followed by a brief review, in section 2.6, of the retirement investment decision given previous comments regarding the purpose of investing.

We then look to the literature around financial literacy in section 2.7, to develop a better understanding of *what* individuals *know* about the factors surrounding the decisions they must make and relate this to how individuals think about financial decisions.

This leads to the gap in the literature – *what* individuals *think* about the outcomes of the investment choices they make, and this is discussed in section 2.8.

Finally, sections 2.9 and 2.10 leads us to consider how rational investors might determine both risk and expected return.

2.2 Neo-Classical Economics and Rationality

This section will discuss the relationship between neo-classical economics and it's underpinning with an expectation that investment decision-makers act rationally. We will start with the historical perspective of economic actors making decisions in their own best interest, as developed by both economists and philosophes between the 16th and 19th centuries. Then we will discuss different methods of rational investment decision-making and finally conclude with the relationship between rational choices and the efficient market hypothesis.

The concept of an individual making decisions that are in his best interest dates to Adam Smith's suggestion that 'self-love' is our key motivator to work to our best ability (A. Smith, 1805). This concept was further developed as classical economics by several philosophers and economists (Jevons, 1871; Veblen, 1899; Von Neumann & Morgenstern, 1964). Rational choice theory emerged from neo-classical economics (Hollis & Nell, 1975) and helped define the individual who wanted 'more', or who sought cost-efficient means of obtaining what they wanted. The rational man, whom Thaler (1980) later called 'Econs', thus became the pre-eminent player in economic and financial modelling. Thaler's discussion regarding 'Econs' affirms the paradigm in which rational investment decision making exists.

The concept of rational behaviour, though, is not unitary and Jones (2001) suggests two kinds of rational behaviour. Substantial rationality occurs when it is appropriate to goal achievement, and procedural rationality occurs when there has been explicit deliberation. Bounded rationality supports the notion that there are constraints on an individuals' ability to "gather and process information" (Jones, 2001). Bounded rationality suggests that choices are limited by the subset of behaviours that "the individual considers or perceives" (Simon, 1955, p. 102). This suggested that even rationality has a behavioural component that renders it subjective.

The 'rational choice theory' that also dominates the law-and-economics movement has significant limitations. Korobken and Ulen (2000) note that rational choice theory is flawed as they believe that people are boundedly rational and "often adopt decision strategies or employ heuristics that lead to decisions that fail to maximise utility" (Korobkin & Ulen, 2000, p. 1143). The flaw they identify is that the law assumes all actions are rational; however, humans do not always act rationally.

Furthermore, Lucas & Sargent (1981) suggests that asset prices in an exchange economy considers that markets are filled with investors who have rational expectations, and therefore, prices fully reflect all available information. This is provided as evidence for the Efficient Market Hypothesis (EMH) (Fama, 1970) that under these conditions, price changes are martingale and must be random.

While this section has focussed on return maximisation as a key component of utility, next, we will add an element to the investment decision-making process – risk.

2.2.1   Modern Portfolio Theory

While maximising utility is often considered in terms of maximising investment returns, another factor - risk – must be considered. In this chapter, we will discuss the relationship between risk and return through the lens of modern portfolio theory. The relationship between the risk and the return of an investment is considered to be the basis of portfolio theory and are fundamental concepts in finance (Peirson et a;., 2012). Modern Portfolio Theory, developed by Markowitz (1952), theorised that any portfolio should provide an 'optimal' balance between risk and return. Markowitz defines risk as 'variance of return' which he describes as undesirable. Thus, he provided a method of measuring investment efficiency by comparing expected return to historical variance of that return. A low-risk investor (risk-averse) must be satisfied with low expected returns, while a high-risk investor should be rewarded with the potential for higher returns.

Importantly, he also strongly argues that a diversified portfolio is always preferable to a non-diversified portfolio (Markowitz, 1952, p. 77) and empirically proves this to be the case. In this study, we are considered a combination of diversified portfolios (Superannuation and Australian Shares) as well as un-diversified investments (Residential Real Estate) to measure perceptions of risk as well as expected future returns. Risk, however, in this context, focuses on the somewhat limited definition of variability of returns over time, next, we will consider different aspects of risk.

2.2.2   Risk

In the neo-classical framework, investment risk involves probabilities of future returns where the outcome is calculable in the context of these probabilities. Where the probabilities are unknown, we have what is called uncertainty (Dhami, 2016).

While Markowitz (1952) considers investment risk in terms exclusively of the variance of returns, others consider other aspects of risk. Olsen (1997) suggests that there

are four attributes of investment risk – "the potential for a large loss, the potential for a below-target return, the feeling of control, and the perceived level of knowledge" (Olsen, 1997, p. 67). He found that the potential for a large loss was the most significant element of risk of these four alternatives. The measurement of risk, however, may not be uniform. Bernoulli developed the concept of utility in the 1700s and identified an element of relativity to risk (Bernoulli, 1954). The risk of a rich person losing $1000 is not the same as a poor person losing $1000 despite the quantum of the loss being equal. Lopes (1987) suggests that risk-seeking behaviour may be explained by a difference between the objective perception of the risk as opposed to a subjective measurement of risk. This may be displayed by someone who is not financially literate considering 'other' risk measures. Prospect theory (Kahneman & Tversky, 1979) focuses on the relative differences in the way we feel about losses (specifically as they relate to gains) and establishes that we feel losses more acutely than the same relative gain and this may exhibit itself as loss aversion or risk aversion. Guillemette and Nanigian (2014) suggest that, in addition to prospect theory, habit and investor sentiment may be significant factors in an investor's perception of risk. Several studies (Abel, 1990; Deusenberry, 1949) have identified that investor's perceptions of risk have an element of comparison with others as well as weighting their preferences to recent experience (habit preferences). Recent experiences may become 'habit forming' as expectations of the future and incorrectly produce a lower or higher risk perception regarding an investment outcome. This is similar to the influence of investor sentiment to recent returns. Some studies identified that investor sentiment increased when 'closed-end funds' (listed investment companies in the Australian context) traded above their Net Tangible Assets (NTA) despite evidence that mean reversions would impact the fund negatively (Baker & Wurgler, 2006; Lee, Shleifer, & Thaler, 1991). The fact that the price was higher than it should have been was taken as evidence of superiority of the investment by investors. This phenomenon has also been used to explain why risk aversion may decrease when investments have had a prolonged period of out-performance such as residential real estate in Australia.

2.2.3   Traditional Models of Decision-Making

Edwards (1954) describes the 'economic man' approach to decision-making as an armchair theorist – one who makes assumptions and then deduces theorems for later testing. His somewhat tongue-in-cheek description, although, assumes three conditions: Complete information, an ability to be sensitive to the different outcomes of his decisions and that he is rational. In other words, he must be able to identify different options and then choose which is the better option to choose.

Decision theory itself does not have a cohesive, unitary form as there are many theories regarding this field (Hansson, 1994). Normative decision theories establish how investment decisions should be made (such as in neo-classical economics) while descriptive decision theories are about how decisions are made (as in behavioural economics). Hansson (1994) suggests that the 'should' in 'should be made' intrinsically assumes rationality of decision-making. Hansson also suggests that a decision theory can be "weakly falsified as a normative theory" if a problem can arise whereby "an agent can perform in contradiction to the theory without being rational" (Hansson, 1994, p. 8).

The actual process of decision-making can be described as either sequential (Dewey, 1978; Simon, 1955) or non-sequential (Mintzberg, Raisinghani, & Theoret, 1976). Either way, there is a process of decision-making, whether it needs to be followed in order or not. Simon's (1960) modified three-step process provides a concise approach:

1. Intelligence (establishing what decision needs to be made)
2. Design (identifying the alternatives)
3. Choice (evaluation and selection of the best alternative)

The most obvious outcome of any decision is that it provides the highest utility for the decision-maker. Of course, utility is in the eye of the beholder, and this is where a degree of confusion arises – what does offer the highest utility?

Where the outcome of the decision is unknown, we move into the realm of 'decision making under uncertainty and move away from Bayesian decision theory towards choices based on decision weights rather than probabilities (Schoemaker, 1982). Next, we will discuss this in the context of behavioural finance and economics.

2.2.4 Expected Utility Theory (EU) and Subjective Expected Utility Theory (SEU)

Where objective probabilities of specific investment outcomes or events (E) cannot be determined, investors must assign subjective probabilities $\mu(E1)$, $\mu(E2)$,… to the event $(\sum_{i=1}^{n} \mu(Ei))$ and this is a form of uncertainty rather than risk. In a situation where the outcome is wealth (x), for example, and the outcome is determined by a specific event such that the value of, this is known as a 'Savage act' (Dhami, 2016, p. 90). This is also described as a contingent lottery where the individual investor acts to maximise the value of the outcome.

While expected utility theory assumes that that participants should linearly weight all probable outcomes, violations of this principle have been found. Both Allais Paradox and Prospect Theory are very suggestive that probabilities are not weighted linearly (Weber, 2007) however, in both of these examples the method of assessment is a simple lottery where the outcomes are known as they relate to wealth outcomes.

The use of lottery-style studies is convenient for researchers as it facilitates a calculable mathematical model but does not often relate to 'real world' examples. Dhami (2016, p. 116) discusses a game of Russian roulette[2] and uses it as an example of the flaws in expected utility theory where players should be willing to pay the same amount for a reduction in the number of bullets in the revolver from 1 to 0, as they would for a reduction from 4 to 3. He suggests that players would pay more for the removal of risk as compared to the reduction in risk.

Importantly, in this research, we are considering that investors may pay a premium for assets that they consider are risk-free (risk removed) as compared to other alternative investments. Specifically, for many investors, residential real estate may be seen to hold this characteristic, and this has certainly been the researcher's practical and anecdotal experience from professional practice.

The 'beliefs' being investigated in this study are likely seen by investors as known probabilities when, in fact, they are unknown. Specifically, we will identify if the participants' beliefs are an accurate reflection of either past performance or expected future performance.

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[2] Russian roulette is a fatal game often portrayed in movies where players take turns firing a partly loaded revolver at their own heads to see who is the 'unlucky one' with a live round in the chamber.

2.3　　　　Behavioural Finance

In the previous chapter, we discussed decision-making where rational choices based on known outcomes, is the norm. Herein, we will move to a field where outcomes are unknown or at least are unpredictable.

Prospect Theory

As mentioned above, Prospect theory by Kahneman and Tversky (1979) and challenged traditional finance and expected utility theory by establishing that there was a non-linear relationship between gains and losses. It provides some anomalies to expected utility theory, including loss aversion and the certainty effect. Loss aversion was found when the effect of losses was significantly greater than the effect of the same scaled gain. The certainty effect suggests that people underweight 'merely probable' events as compared to events that are perceived as certain. It has been interesting to consider, in this study, attitudes towards residential real estate in Australia, which has had a very long term and consistent positive performance. The more than 15-year bull run on residential real estate may have created a 'certainty effect' regards the future performance of that asset class.

Prospect theory is a seminal component in the development of behavioural finance, but importantly, it uses a probabilistic approach to prove the theory. Participants are typically offered an option between the probability of a loss or gain against a smaller certain gain, and this effectively converts the study to a gain or maybe gain option. In this study, we are offering a choice where the future wealth gain is unknown except that participants may have beliefs regarding the expected future return. Certainly, this is not probabilistic in a real work scenario.

Notwithstanding this, prospect theory has identified persistent evidence of people making choices based on "gains or losses, rather than as final states of wealth or welfare (Kahneman & Tversky, 1979, p. 274)" and further, that people' feel 'losses far more than they 'feel' gains of the same magnitude. This differentiation is represented in the figure below describing an 'S' shaped function (see figure 2) rather than a straight line as expected utility theory would suggest.

Figure 2.1 – Graphical Representation of Prospect Theory
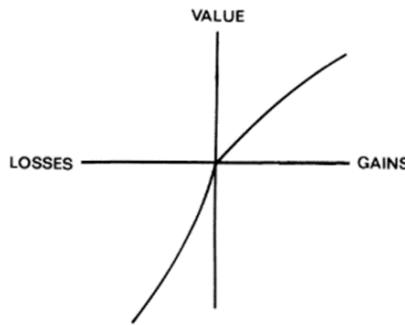
Prospect theory value function (Kahneman & Tversky, 1979, p. 279)

2.3.2 Investment Decision-Making Under Uncertainty

While almost all investment decisions have a degree of uncertainty, a commonly held view amongst neoclassical economists is that these decisions are made based on which choice provides the highest utility (Aleskerov, Bouyssou, & Monjardet, 2007). Expected Utility Theory (EUT) provides a mathematical model that can be applied to the decision-making process to help understand how decisions can provide for the maximum utility or benefit, to decision-maker (Wilkinson & Klaes, 2012). Further, EUT requires both a probabilistic differentiation between investment choices and information, concerning factor(s) that create utility maximisation for decision-maker (Wilkinson & Klaes, 2012).

In other words, the concept of maximising utility for investment decision-makers means that they should choose which option places them in a better *state* as compared to a different choice. In a financial sense, this would be the option that creates the highest wealth, or sense of wealth, relative to the risk involved in the choice (Lunt, 2005). Investors are assumed to be risk-averse and in "a state of complete information when making decisions" (Lashgari, 2015, p. 160) which is of course, not true in the real world and empirical exceptions to this forms the basis of behavioural finance and economics.

Decisions made where full information is not available (or used), and where outcomes that provide motives other than wealth maximisation is where this study sits. When comparing investment choices, the uncertainty may relate to errors of, or an inability to predict, future returns relative to risk (Lashgari, 2015).

2.3.3 Intertemporal Choices

Intertemporal choice describes a choice where decisions made today will impact on decisions that can be made in the future; in other words, the decision affects across time boundaries. Decisions around investment, and especially retirement planning decisions,

are intertemporal as the outcome of these decisions will necessarily produce future wealth outcomes that will impact on an individual's future lifestyle.

Regarding retirement savings decisions, the time frame between committing funds for retirement and gaining the benefit in the future could be decades, and many have identified that present consumption decisions (spending) tend to win out over future consumption decisions (saving) (Benartzi & Thaler, 2007; Rickwood & White, 2009; Tannahill, 2012; Thaler, 1980). Given the propensity to spend now rather than save for later, a number of tools have been used by policymakers to 'encourage' longer-term retirement savings. These include automatic enrolment initiatives in the USA and Save More Tomorrow (Thaler & Sunstein, 2008) program developed by Benartzi and Thaler (and the compulsory superannuation system in Australia. However, these systems seem to work because they encourage investors to avoid the need for intertemporal choices, or at best, to make a single choice.

In addition to the approaches outlined above, intertemporal choice has been analysed where choices between outcomes may be achieved in different periods (Ainslie, 1991; Lowenstein, 1988) which adds a comparison of present values in addition to the utility functions. Keren and Roelofsma (1995) discuss the immediacy effect and the certainty effect as an anomaly found in both the expected utility theory as well as the discount utility theory as they apply to intertemporal choice. The immediacy effect is identified where the decision-maker exaggerates the benefits of a choice, as compared to a future outcome (Keren & Roelofsma, 1995). The certainty effect observed by Kahneman and Tversky occurs when decision-makers overweight the benefits of outcomes that are perceived as certain, as compared to options 'where the outcomes are merely probable' (Kahneman & Tversky, 1979, p. 265).

2.3.4 Complexity and Risk

Allocating financial resources is a complex process. Rickwood and White (2009) developed models of consumer behaviour to investigate their applicability to complex financial purchases – especially retirement planning purchases. They confirmed that internal, external and risk factors influence decision making, and identified age as the main internal factor driving retirement savings over tax incentives and spare money.

Merton (1971) introduced a new line of literature into the discussion that takes into account 'other' influences than simply investment returns to an analysis of household

decision making. His introduction of real estate owned by a household as a part of the wealth decision-making process is relevant to the study as this research will explicitly consider decision making regarding residential real estate. Merton argued that decisions in the procurement of residential real estate should be part of the wealth decision making process. Even though Merton introduced this argument, decades ago, it is still rare for real estate decisions to be included in the contemporary literature around financial capability and literacy. This research will attempt to add to the literature on this count.

Diacon and Ennew (2001) found five dimensions of risk in decisions regarding financial services which provided some valuable insights into the actions of investors making actual decisions under uncertainty. Overall, they also found one common feature in that most investors considered characteristics of hazard rather than the more esoteric concept of risk. They found that the most significant influencing external factor was family and friends – carrying much heavier influence than professional advisers such as accountants and financial planners. However, this response may be biased because of the number of people who utilise the services of these professionals. Only around 20% of Australians have ever met with a financial adviser (Ripoll, 2009). Of relevance to this study, Daicon and Ennew (2001) found little literature on consumer decision-making of financial services. However, a weakness not accounted for in their research was the timing relationship between the financial crisis of 2008 and the participant's views regarding risk and investment.

The complexity of financial decisions faced by individuals may lead them to adopt simple heuristics as a means of coping. Benartzi and Thaler (2007) researched decisions relating to pension fund contributions in the US and the UK and found a number of heuristics at play regarding contribution rates, savings rates and asset allocation. Gilovich, Griffin and Kahneman (2002) also found that heuristics tend to lead to systematic biases and potential inefficiencies in investment decision making.

2.3.5 Framing and Mental Accounting

The study of mental accounting involves the situation where a decision must be reached between two or more financial outcomes and is interested in how the decision-makers perceive and evaluate the alternatives (Wilkinson & Klaes, 2012). These decisions are often complex, and so people categorise and evaluate the different outcomes by using recollections of past events to help assist with decisions relating to the future. Richard

Thaler is widely recognised as first describing mental accounting (Thaler, 1985) when he identified behaviours that violated economic principles because of the way that the outcome of the decision was 'accounted for'. Thaler (1985) suggested that individuals can derive utility from an outcome that is not economically based – such as the pleasure of the outcome – and not simply from the financial value of the outcome.

Closely related to mental accounting is 'framing', where often arbitrary reference information affects the decision-making process (Tversky & Kahneman, 1986). Because choices, or outcomes, can be described from both a positive (how much you could win) as well as a negative (how much you might lose) perspective, the same decision can be made to look more, or less, attractive. Prospect theory (Kahneman & Tversky, 1979) frames gambles in terms of losses or gains and has shown that outcomes framed as losses have a greater impact than those framed as gains. Further, Tversky and Kahneman identify that "the frame that the decision-maker adopts is controlled partly by the formulation of the problem and partly by the norms, habits and personal characteristics of the decision-maker" (Tversky & Kahneman, 1981, p. 453). Concerning this concept of framing, we can look to Gerhard et al. (2017) and their study related to past performance and the framing of investor beliefs who have identified that the framing methodology of past performance can have a material influence on investor behaviour. In Gerhard's study, the description of past performance in either a shorter term or a longer-term, frame was shown to influence investment decisions where longer-term descriptions reduced trading out of a default (producing a better outcome). In addition to past investment returns, others have shown how the presentation of risk can frame investor choices (H. Bateman et al., 2016) and portfolio preferences (Bateman et al.,2011).

2.3.6   Anchoring and Adjustment

The anchoring and adjustment heuristic describes events where a person uses a specific, but not necessarily relevant, number or piece of information as a starting point for a decision-making process. This heuristic, described by Tversky and Kahneman (1974), shows the susceptibility of decisions to the effect of outside forces or beliefs. They developed a, now classic, paradigm to demonstrate the effect of this heuristic by asking two groups of people, the age of Gandhi when he died. In the experiment, conducted many times over the years (Strack & Mussweiler, 1997), the first group were asked whether Gandhi was older or younger than 140 when he died, followed by the question

of how old he was when he died – providing an average age of 67 at death. When the initial question was asked as to whether Gandhi was older or younger than 39 years of age when he died, the average answer to the follow-up question was that Gandhi died at the age of 50. The repeatable differentiation between the answers demonstrates elegantly the impact of placing an irrelevant, or even nonsensical, number into the decision process. We may see this as it relates to the thesis at hand, where a commonly stated heuristic such as 'property doubles every seven years', or 'property never falls in value' may produce as significant an influencing anchor as 'the share market is risky'. The survey questions were careful not to apply an opportunity for anchoring to play a part in participant deliberations.

2.4   Behaviours and Assumptions – How Individuals Think

Individuals may be susceptible to miscalculating risks of investments. Bateman et al. (2011) conducted an Australian survey that investigated simple changes in the presentation of risk between three different investment options. They found that there was sensitivity to the style of presentation of risk (graphical versus textual), and that formats in data presentation (for example, frequencies versus probabilities) also influenced decisions. An online survey was conducted on 1200 participants who had been selected by a professional survey firm. By utilising many internationally recognised question formats, the results were able to be compared to other studies as the format of the data collection was similar.

Having some knowledge is important, but being able to apply the knowledge efficiently may be a different thing. Financial capability is "the ability to make informed judgements and to take effective decisions regarding the use and management of money" (Chardin, 2011 p.55). In the specific areas of superannuation and taxation, Chardin (2011) also found that multiple factors may share an inter-relationship in the financial decision-making process.

Rules of thumb appear to play a role in the investment decision of the individual such as that residential property 'doubles every seven years''. While this un-evidenced belief may be based on spurious information and little real analysis, it may be the basis why individuals feel comfortable borrowing large amounts to gear into residential property. Shiller (2005) contends that, rather than this 'expected return' heuristic, there has been a tendency for property prices to return to historical real levels over time. It is the time difference between purchase and sale allows for a heuristic to be created that

artificially implies a significant price growth, without taking into consideration holding costs, improvements or inflation (Shiller, 2005).

There is evidence that investor's use sub-optimal means to assist their property purchase decisions. A UK study (Gallimore & Gray, 2002) on property purchase decisions revealed that:

- The investor's *feel* for the market was more important than professional views
- Information from informal networks (such as friends or social meetings) plays a more significant role in purchase decisions than public sources.
- Discussions with agents, lunch and wine-bar conversations and discussions with other investors at site visits and auctions provided a significant source of informal information.

That study concluded that investor sentiment is perceived as an important source of information in the UK property market. Their findings that the lack of actual evidence on which to base rational decisions leads to sentiment-based decisions, provide some important links to discover what 'rules of thumb' investors may use in reaching their decisions (Gallimore & Gray, 2002).

2.5 Perceptions

Fundamental to this thesis is the concept of perception; insofar as the hypotheses and assertions made in this study specifically consider respondent's perceptions to factors such as risk, past investment performance and expected future investment performance rather than empirically determined scores. In this section, we will explore perceptions and the potential impact that they may have on investment decision-making.

2.5.1 Perceptions of Risk

Specifically, regarding the perception of risk, Wang (Wang, Keller, & Siegrist, 2011) found that the correlation between perceived risk and the traditionally measured risk was low. Further, that knowledge regarding an investment was inversely related to risk. In other words, the more 'familiar' an investor was with an investment, the lower the perceived risk. Traditional economic theory would expect that investors were risk-averse and would prefer diversification as a tool to lower risk. However, Wang's findings suggest that the availability heuristic (Tversky & Kahneman, 1973) has a more important influence as investors would prefer something that they 'know' over something that they are less 'familiar' with. Other studies (Bruno & Martin, 2009; Daicon & Ennew, 2001)

have suggested that familiarity may be related to lower perceived risk. Folkes (1988) suggests that the availability heuristic influences the perception of risk through the mechanism of familiarity or memory of previous failures and so in the Australian context, the 2007-2009 financial crisis significantly affected share-markets and superannuation. Yet, it did not have a significant impact on the residential real estate market[3]. While this event was six to eight years before the survey was completed, it is still regularly referred to in the press.

Perceived risk was divided into two components in an early study by Bettman (1973) where the components were distinguished as 'inherent risk' and 'handled risk'. He defines inherent risk as the "latent risk a product class holds for a consumer" (Bettman, p. 184) and suggests that 'handled risk' relates more to the particular brand that may be usually purchased by a consumer. In this study, handled risk is not being measured a there is no consideration of any particular 'brand' or specific 'product'. Bettman used a 10-point scale for his measurement of inherent risk (the higher the score, the higher the risk) and participants were asked to place an X on a paper-based form where they felt best described the relative the risk of the particular example. Here I use a 1-100 sliding scale available through the use of the Qualtrics software that allows for a more nuanced approach. When the Bettman study was completed in 1973 no such facility was available. Other studies have found risk preference to be related to perceptions of numerous risk factors and that the perception of risk, while broadly stable, can be affected by framing the risk questions by different investment time periods (Thaler, Tversky, Kahneman, & Schwartz, 1997; Vlaev, Chater, & Stewart, 2009).

2.5.2   Perception of Investment Performance

While there have been many studies investigating behavioural influences on the stock markets, there are few that consider the perception of performance as a determining factor in a broader investment decision-making framework. Cultural difference has been suggested as a reason for different perceptions of performance and the influence of behavioural biases especially in collectivist cultures such as some Asian cultures (Hofstede, 1984; Khan, 2014; Kim & Nofsinger, 2008) where herding behavioural biases have been identified and specific investment types are preferred. The presentation of returns can also have a material impact on investment preferences despite have little

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[3] See chapter 3 for historical returns of the three relevant investment options considered in this study.

predictive value (Carhart, 1997; Fama, 1970) regarding an investment's future performance. Presentation of the past performance of an investment has been shown to influence the decision-making of individual investors as related to mutual (managed) investment funds (Diacon & Hasseldine, 2007) and superannuation funds (Bateman at al., 2011). Diacon and Hasseldine studied the impact of framing of prior performance as regards to investors choices of preferred investment. They found little difference between the presentation of past performance time-frames, but did find that past performance influenced around 50% of participants in their study (Diacon & Hasseldine, 2007, p. 47). Behavioural biases have also been identified with preferred investment, including the home bias puzzle where investors tend to invest 'where they know' even in light of additional information that should influence their investment decision. Van Nieuwerburgh and Veldkamp (2009) suggest that part of the reason for home bias may be that investors choose to ignore available information regarding potential investment choices – effectively suggesting that confirmation bias (Brahmana et al., 2012; Golivich & Griffin, 2002) as a reason for home bias.

Surprisingly little has been published regarding misinterpretation of, or ignorance of investors of, actual investment returns. Because investment returns are readily obtainable, it is assumed that investors are aware of these returns and may utilise this information to assist in determining (along with an assumed understanding of the risk of any investment) their investment choice. It has been the anecdotal experience of the author that this is more common than many people think and warrants further investigation.

2.6   Retirement Investment Decisions

Investors must make decisions throughout their working life that ultimately impact on the quality of life they experience in retirement; however, their ability to effectively make these decisions has come under question. The transition in Australia (and other countries) from defined benefit retirement plans to defined contribution retirement plans (Poterba, Venti, & Wise, 2007; Poterba, Venti, & Wise, 2007 Jan) has been significant and places a significant decision-making burden on the pre-retiree. Economic theory on retirement such as the life-cycle approach exhibits three core rational assumptions: an explicit assumption that accumulation through savings precedes decumulation post-retirement in a manner that maximises utility; an implicit assumption that people have the cognitive ability to make appropriate choices throughout their lives; and an implicit assumption that

they are motivated to action this plan (Benartzi & Thaler, 2007). Both of the implicit assumptions have been questioned (Gilovich et al., 2002) and in particular by an unwillingness to participate in tax-effective retirement plans, even where benefits may be obtained just by joining with no actual contribution requirement by the beneficiary (Benartzi & Thaler, 2007).

Additionally, other factors that influence retirement investment decisions include gender (Sunden & Surette, 1998), peer choices (Duflo & Saez, 2002), financial literacy (Lusardi & Mitchell, 2007b), plan characteristics and psychological biases (Bailey, Nofsinger, & O'Neill, 2003).

Much of the research has focused on two aspects of the retirement choice puzzle: contribution rates (Duflo & Saez, 2002; Lusardi & Mitchell, 2007b) and plan portfolio choice (Bateman et al., 2016; Bateman at al, 2011) within a formal retirement system such as superannuation in Australia or 401K plans in the US. However, nothing has been found on explicit alternative investment strategies such as the use of real estate investments (rent) or share-based portfolios (dividends) as an alternative vehicle to fund retirement. This research starts to fill that gap in the literature.

2.7 Financial Literacy – What Individuals Know

Financial literacy is widely recognised in the literature as influencing the accumulation of wealth (Bateman at al.,2011; Commonwealth Bank Foundation, 2004; Lusardi, 2012; van Rooij et al., 2012). Van Rooj (2012) used an online survey to investigate the relationship between financial literacy and wealth accumulation in Holland. By isolating the effect of financial skills, the study attempted to identify if and how financial literacy impacted on household wealth and found a relationship between financial literacy and the increased wealth of households because of increased awareness of opportunities to invest (Lusardi & Mitchell, 2007a; van Rooij et al., 2012). A potential weakness in their study that this research will explore is that it maintains the positivist approach – if they know about it; they will do it – and still tends to ignore other pre-determinants that might influence financial decision making. Much of the current literature focuses on studying the decisions of investors who had already invested in a retirement plan or were members of a superannuation fund – versus the pre-retirement, or pre-investment, decision. This research will focus on the preliminary decision whether to invest into a retirement plan or another investment option.

Other researchers, on asset allocation based decisions have identified that 'pre-existing personal characteristics and opinions play at least as large a role in predicting allocations' (Bateman at al., 2011 p.4). The unanswered question is to identify the nexus between financial literacy and heuristics – that opinions influence asset allocation decisions.

While Bateman's research (2011) considered asset allocation decisions within a superannuation environment, the underlying research will look at asset allocation decisions around and including the superannuation environment.

Financial literacy might be seen as having two dimensions – a knowledge dimension and an application dimension (Huston, 2010). Huston suggests that the confidence and ability to use financial knowledge to make financial decisions is as much an integral component of financial literacy as specific knowledge about financial issues. The application dimension is missing in many studies that attempt to measure financial literacy. Further, she is critical of the lack of a common measure for financial literacy that renders academic interpretation of results deficient. There is little opportunity to draw concrete conclusions regarding policy approaches, for example, to justify the allocation of resources to a problem that may be deemed to be solved through improved financial literacy when a standardized measure is unavailable. Part of the problem of the lack of standardization for financial literacy measurement is that the definition of financial literacy is also widely defined (Hung, Parker, & Yoong, 2009; Huston, 2010). The Australian financial regulator, ASIC, simply defines financial literacy as "Financial literacy is about understanding money and finances and being able to confidently apply that knowledge to make effective decisions" (Australian Government, 2013). This is a similar definition to that used by the U.S. Financial Literacy and Education Commission – "Financial capability is an individual's capacity, based on knowledge, skills, and access, to manage financial resources effectively". (US Department of Treasury, 2016)).

In this research, participants will be asked to self-assess their knowledge, relative to an 'average person' about the three investment types (Superannuation, Australian Shares and Residential real estate) considered in this study. Specifically, the research takes a naïve view of investment choices as no information was provided to participants regarding actual risks and past performance of the investments in question. Croy, Gerrans & Speelman (2010) suggest that domain knowledge exerts a powerful influence over behavioural intentions and that those more self-confident in their knowledge in a

particular area might be more likely to act within that investment framework. This study will investigate in part whether this self-confidence is justified.

2.8 Knowledge Gap – What Individuals Think

While much current research is focused on financial literacy as the tool for making optimal investment decisions (Hastings & Mitchell, 2011; Tannahill, 2012; van Rooij et al., 2012), little is known of what individuals think about the risk and return characteristics of the three specific asset types discussed in the proposal and the impact of those beliefs on investment decisions. Knowing and understanding basic investment concepts may be a factor that influences levels of wealth (Hastings & Mitchell, 2011), but there is little that discusses what leads to decisions regarding the allocation of individual financial resources. This research proposes the collection of data regarding relationships between financial literacy and financial beliefs, financial advice relationships and financial beliefs, and financial beliefs and propensity to invest. In doing so, the current research gap of the impacts of pre-investment decision making based on heuristics will be addressed. The results from the survey will illuminate the impact of heuristics regarding asset performance characteristics on an individual's preferences regarding investing in any of the three investment options studied (superannuation, Australian shares and residential real estate,).

Where financial literacy seeks to understand better what individuals *know* about financial concepts and behavioural finance looks to how individuals *make decisions under uncertainty*, this research will investigate what individuals *think about the factors* that lead them to make their financial decisions.

2.9 Estimating Risk and Return

2.9.1 Valuation Methods for Investment Assets

Key to being able to identify an expected return on any investment assets is the ability first to produce an appropriate valuation of the asset and then to be able to identify how and if an economic benefit will be achieved in the future. In this chapter, we will review some investment valuation methodologies, particularly as they relate to shares, bonds and real estate. Furthermore, we will focus on investment valuation approaches used typically by non-professionals as we are looking at consumer investor behaviour. Superannuation investments typically consist of a portfolio of cash, shares, bonds and property (APRA,

2017) and so return expectations may be derived from the return expectations of the key asset classes discussed here. Notwithstanding our attempt to describe valuation methodologies, Damodaran clinically describes the core problem inherent with all valuation approaches by stating that "Valuation is neither the science that some of its proponents make it out to be nor the objective search for true value that idealists would like it to become" (Damodaran, 2012, p. 2).

2.9.2 Fundamental Analysis

Fundamental analysis aims to provide a valuation of an asset by considering a layered approach of looking at macroeconomic factors, industry-level factors and individual asset level factors (Hirt, Block, & Basu, 2006) and has been seen as a means of identifying investment opportunities to produce excess returns (Abarbanell & Bushee, 1998). Empirical proxies generally consisting of pieces of economic data are collated and purported to predict future changes in earnings or cash flows although investors come to realise these changes at different times and the subsequent mispricing that occurs creates opportunities for investors to benefit (Abarbanell & Bushee, 1998). While fundamental analysis appears to provide a 'neat' way of identifying valuations and investment opportunities, some have been concerned that it fails to truly factor in the economic impact of unexplained variables (Ball, 1992; Stober, 1992) or that the causes may vary from firm to firm or investment to investment (Dechow, Ge, & Schrand, 2010).

The pricing anomaly has been challenged by Fama and others (Fama, 1970; Fama & MacBeth, 1973; Malkiel, 2003) who suggests that markets are efficient, and sources of apparent mispricing's are exploited quickly through publicly as data used for fundamental analysis is publicly available information. Since the efficient market theory was introduced, there have been a number of challenges (Basu, 1977; DeBondt & Thaler, 1985) to it including Fama (Fama & French, 1993) himself who found that the price to book ratio of a company could provide information that could benefit investors.

Notwithstanding the above concerns about the effectiveness of fundamental analysis, some common methods of asset valuation include Discounted Cash Flow (DCF), Price to Earnings Ratio (P/E), Price to Book Ratio (P/B) and Relative Value (RV).

2.9.2.1 Discounted Cash Flow (DCF)

The basis of the DCF approach is in the present value rule, whereby the value of an asset equals the present value of its future free cash flows, after allowing for a discount rate to be applied to reflect the riskiness of the asset. The formula applied to calculate this value is described below:

$$DCF = [CF_1/(1+r)^1] + [CF_2/(1+r)^2] + ... + [CF_n/(1+r)^n]$$

While the DCF model for valuation is not perfect (Bradshaw, 2004; Lundholm & O'Keefe, 2001), it nevertheless provides a methodology of valuing assets. Naturally, estimates need to be made regarding future cashflows (perhaps other than for bond investments), and this is where the subjective nature of the model can be criticized (Bradshaw, 2004).

2.9.2.2 Price-earnings

The price-earnings approach to valuation is a simple calculation of the asset (typically share) price and dividing it by the asset's earnings. This creates a single number that may be used to compare the valuation of an asset as compared to another asset. Most commonly, analysts use previous years' earnings (Anderson & Brooks, 2006) to compare to current price although many now believe that a longer-term earnings average is more accurate (Anderson & Brooks, 2006).

Price-Earnings (PE) Ratio =   Price per share/Earnings per share

2.9.2.3 Price-book

The book value of a firm is the simple difference between the accounting value of the assets of the firm less the accounting value of the liabilities of the firm. The relationship between a firm's share price and the underlying book value has long been a simple measure of the relative value of a firm (Damodaran, 2012). It is seen as somewhat more stable than the DCF methodology (Damodaran, 2012, p. 511).

Price-Book (PB) Ratio =   Price per share/Book Value per share

2.9.2.4 Relative Value (RV)

The basis for a 'relative valuation' approach is to compare similar assets often standardized for variables such as earnings, cash flows or revenues. RV can be used

directly as in 'like' recent sales or as an approach using, for example, industry price-earnings ratios. Unlike DCF, which attempts to determine an intrinsic value for an asset, RV effectively assumes that the market is correct in the way it values assets in general.

2.9.2.5 Greater fool theory

Keynes (Keynes, 1936) suggests that asset prices do not require any formal valuation provided there is always a buyer willing to pay a higher price for the asset than the original purchaser. This approach is either known as the greater fool theory or the Keynesian beauty contest (Telser, 2010). While it seems logical that over time the supply of fools would diminish, Telser (2010) has used an algebraic manipulation of Keynes theory to show that prices can increase and decrease (collapse) further than most would think and that prices could increase just as likely as fall. Importantly, this approach suggests that each investment period is independent of the previous period and provided that a speculator buys with the expectation of a gain, the price increase may go on for longer that is expected – a true bubble description.

However, the greater fool approach assumes that investors are prepared to sell before the market for their asset crashes (Doblas-Madrid, 2012) and does not consider the *greatest* fool who perhaps considers that the asset may never fall in value.

2.9.2.6 Valuing residential real estate assets

Many suggest that real estate assets should be valued along the same lines as shares and other assets (Brueggeman & Fisher, 2006; Cerutti, Dagher, & Dell'Ariccia, 2017; Damodaran, 2012) while others consider other factors such as location, proximity to transit corridors and specific home features are at play in real estate valuation (Bond, Seiler, & Seiler, 2002; Kilpatrick, Throupe, Carruthers, & Krause, 2007; Sirmans, Macpherson, & Zietz, 2005). Key differences in valuations between, for example, share and real estate assets may exist because of the difference between the land component of property and the physical buildings on the property, as well as differences in expected cash flow growth between the two types of assets (Damodaran, 2012). Another significant difference in assessing valuations may be the impact of future inflation. Share and bond prices tend to drop when inflation increases but real estate assets often increase in value when inflation increases (Fama & Schwert, 1977)

2.10   Risk Measures

As we have discussed previously, financial markets generally consider risk to be volatility in prices (or variations in returns). Additionally, it is often assumed that all investors (persons) should be deemed to perceive risk identically (Bernoulli, 1954) and that individual circumstances should not be taken into account in the determination of risk estimation. Bernoulli (1954) does, however, state that risk cannot be measured without considering the utility of the person taking the risk although he focuses on the scale of the loss relative to the wealth if the risk-taker.

Risk as variability as opposed to simple loss

When risk is measured as a variation from expected return, we can get both positive and negative outcomes under a traditional financial risk approach, for example, the risk of a return 3% above an expected return is identical to the risk of a return 3% below the expected. Slovic (1987) suggests that the perception of outcome would be different for laypeople as compared to experts. Furthermore, he suggests that, while technological capability has enabled sophisticated risk assessments to be made

2.11   Conclusion

In this chapter, we have considered that traditional finance and economics aims to predict outcomes based on a 'rational man' approach who understands all choice options and can calculate the utility to the decision-maker. We then provided the challenge of behavioural finance and economics, which disputes the traditional approach by demonstrating, for example, that people weight decision-outcomes in a non-linear manner. The discussion of the literature regarding behavioural finance focussed on decision-making under uncertain outcomes, including choices made where the outcome is in the future. This was followed with a review of the literature regarding perceptions of risk and perceptions of investment performance, and this concluded the discussion which concerns 'how' people make decisions. Financial literacy is often associated with financial competence regarding decision-making and therefore is an important component in any study concerning investment decision-making. Finally, we discussed how individuals might calculate the return and risk of investments by reviewing several valuation methods and risk measures.

Next, we will consider the characteristics of the three investment options used in this study to enable a better understanding of the complexities, risks and historical and expected returns of these options.

3. CHARACTERISTICS OF INVESTMENT TYPES CONSIDERED IN THE STUDY

3.1 Introduction

In this chapter, we will investigate the three common investment options that have been chosen for this study. Each of these has different characteristics and so this chapter provides a comprehensive summary of the history, past returns, key risks and issues related to investment decisions. Section 3.2 discusses the complexity of the Australian superannuation system and how this complexity needs to be understood to be able to consider decision making by non-professional investors better. Section 3.3 reviews the Australian share-market and section 3.4 discusses the Australian residential real estate market.

3.2 Characteristics of the Australian Superannuation System

This chapter will discuss the history of the current retirement savings system, policy issues regarding the Australian superannuation system, the tax incentives available to superannuation, and then discuss some of the key risks and historical returns. We will also discuss the interaction with the overall retirement system in Australia. It is important to understand the complexities and structures of the Australian superannuation system to investigate issues around the choice of investment for Australian investors.

The historical basis of modern superannuation

This thesis will not be discussing the long-term historical basis of retirement policy, rather the specific area of superannuation development. The reason for this is that the focus on the study is investment choice made by individuals and households that includes additional voluntary contributions to superannuation as an option. This section will also establish that significant legislative change has occurred over a relatively short (35 years) period, perhaps leading to decreased confidence in the long-term benefits of voluntary superannuation contributions.

A non-means tested, tax-incentivised retirement savings system for Australians was first proposed by the Whitlam government in 1973 (Borowski & Oldsberg, 2007) although it was not enacted due to the government losing power. This was the first time in Australia that the concept of superannuation had been raised as a mechanism for delivering retirement benefits (other than the age pension) to those with higher means

(Hamilton, 2012). The pre-curser to modern superannuation was introduced in 1985 and known as the Productivity Award Scheme (PAS) and provided for compulsory employer contributions of 3% to individual member accounts within a superannuation fund established by an industrial award – now more generally known as Industry Super Funds. Importantly, this contribution was only made under industrial awards and employees not covered did not receive these benefits unless their employer volunteered to make them. The Keating Labor government introduced compulsory contributions for all workers in 1992 when it commenced the replacement of the PAS – the Superannuation Guarantee (Hamilton, 2012). While the contribution rate remained at 3% initially, it has been progressively raised and is currently 9.5% of an employee's income (as at 2016). Legislation progressively raising the amount to 12% has been slowed by the current government and is presently the source of some policy debate. During the period of the Howard government (1996 – 2007), the tax concessions that applied to superannuation were increased as government policy moved further towards superannuation as a retirement focused wealth creation system (Hamilton 2012). These changes culminated in the 2006 major overhaul of the tax concessions that applied to superannuation and the age pension simultaneously. The most significant reform that applied to the age pension was the doubling of the asset test[4] limit through the mechanism of halving the taper rate. The taper rate is the rate at which an increase in asset level reduces the amount of age pension entitlement, and this reform reduced the taper rate from $3.00 per $1000 over the lower threshold to just $1.50 per $1000. At the same time, the Howard government reduced all tax on withdrawals and pensions for those over 60 to nil. Before 2006, tax incentives were removed for benefits that exceeded 'reasonable benefits limits' (RBL's) which were set as a multiple based on average weekly incomes (Kalaboukas, 2013). The removal of these limits effectively allowed for unlimited tax-free benefits.

Shortly after these generous changes were made the financial crisis of 2007 - 2009 commenced, and financial pressures on the new Rudd Labour government that came to power in 2007 meant that some of these changes began to unwind. The amount that was available to be contributed in a tax-favoured manner (known as concessional contributions) was reduced from $100,000 per annum to $50,000 and then further to

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[4] Eligibility to the age pension in Australia is means tested with an assets test and an income test. The asset test excludes the primary residence but includes almost all other assets. Once a lower threshold, or asset value, is reached ($387,500 for couples and $$258,500 for singles as at 01/07/2018), the pension begins to taper until eligibility reaches zero. See more at https://www.humanservices.gov.au/individuals/enablers/assets/30621

$25,000 per annum. This has been increased progressively on an indexed basis to $30,000 with a higher limit of $35,000 for over 50's up to 30th June 2017 although, before the 2006 changes, these limits were age-based and grouped below in table 3.1 for the 2006/2007 financial year (ATO, 2016):

Table 3.1 – Historical maximum concessional contribution limits

Age group	Maximum concessional contribution
Under 35	$15,260
35 - 50	$42,385
Over 50	$105,113

As at 1st July 2017, these limits have been further reduced to $25,000 for all contributors regardless of their age thus removing a small benefit for those closer to retirement to be able to add to their retirement savings in this manner (ATO, 2017).

The Australian Retirement income system is often characterized as having three pillars (H. Bateman et al., 2012; Henry, 2009; Ripoll, 2009). The first pillar is a means-tested, age-based PAYG pension (age pension) provided by the federal government. The second pillar is a compulsory, occupationally based savings system known as the Superannuation Guarantee (SG) system. The third pillar consists of tax-advantaged voluntary savings to the superannuation system.

Under the first pillar, the means-tested age pension provides for a single pension currently set at 27.7% of Male Total Average Weekly Earnings (MTAWE). As at June 2015 MTAWE is $70,829pa (Australian_Government, 2014). The single rate is 60% of the couple rate, or describer another way, a couple's pension is 1.67 times the single pension. Primarily, eligibility for the age pension is based on reaching a specific age, and historically this has been 65 for men and 60 for women (Nielson, 2010). Current age-based eligibility is transitioning from 65 to 67 for eligible pensioners born after June 30, 1952 (Department_of_Social_Services, 2016) for both men and women as the differentiation of age eligibility had already equalized from 1995 (Power, 2018). In addition to the age requirement, two other means tests apply in the determination of both an actual entitlement and if entitled, the level of age pension that would apply. These means tests involve an assessment firstly of an applicant's income from most sources including investment income, earned income and some private pension income (the

incomes test), and secondly of an applicant's personal assets excluding their primary residence (the assets test).

Government policies involving changes and tightening of the income and assets means tests over the years now mean that the first pillar is becoming an actual safety net and not a supplementary source of income for retirees. For this reason, the second and third pillars, which both involve superannuation, are becoming even more critical in individual retirement planning.

The superannuation system in Australia, which is the focus on the second and third pillars above, is a tax-advantaged savings and investment system. It combines a compulsory, employer-sponsored contribution (9.5% of gross wages as at June 2015) known as the Superannuation Guarantee (SG) with additional restricted pre-tax (non-concessional) or post-tax (concessional) contributions to a superannuation investment pool. Depending on the specific superannuation product chosen by the investor, this investment pool generally offers an extensive range of investment options that members can choose from, as well as a 'default' investment choice if a member does not make a specific election. These choices can range from simple asset allocation models to detailed individual investment choices to be made by the investor.

The Australian system may be compared to other systems based on the level of taxation support provided to investors. Retirement savings systems are either taxed or not taxed, at the three main inflection points of the systems: contributions by investors, earnings on funds once invested, and withdrawal. The Australian system currently operates under a somewhat complicated taxation and regulatory structure (Henry, 2009; Ingles & Stewart, 2017; Knox, 2010) which will be outlined in the paragraphs below.

3.2.2 Contributions to Superannuation

Contributions to Australian superannuation are taxed at either 0%, 15%, 30% or 45% depending on the circumstances of the contribution (ATO, 2016). This tax may be increased by an additional Medicare levy of 2.0%. When post-tax funds (called Non-Concessional Contributions or NCC's) are invested there is no tax payable on the contribution subject to annual limits of $100,000 (as at 1st July 2017). The limits previously were significantly more generous at $180,000 per annum before 30th June 2017. The compulsory SG contribution paid by the employer, along with voluntary additional employee contributions paid with pre-tax income (both known as Concessional

Contributions or CC's) is taxed at the fund level (the fund pays the tax and not the individual directly) at the rate of 15% up to an annual limit of $25,000 from 1st July 2017 (ATO, 2017). Again, this is significantly lower than was previously allowed. Where an individual taxpayer has taxable income over $250,000 per annum, they pay an additional 15% on these contributions (making a total of 30%). If contribution caps identified above are breached, then penalty tax applies at up to 45% plus the applicable Medicare levy.

In general, employees and individual taxpayers have a high level of choice regarding where their funds are invested. The Australian Prudential Regulatory Authority (APRA) reports on 238 different large superannuation funds operating in Australia (APRA, 2014b) although this significantly underestimates the real choice offered. Many of the single entities measured by APRA may then offer up to 400 sub-choices of investments, although between 10 and 30 different offerings are more common (Smith & Koken, 2005).

Some industrial awards do not allow for fund choice (Watson, 2001), and while this is a topic of policy debate, currently it will not form a part of any discussion here.

There has been a significant increase in the number of private, or Self-Managed Super Funds (SMSF's) in Australia over the past ten years (Korporaal, 2017). These funds allow individual investors the ability to manage their retirement assets and, while operating within the same legislative framework as more traditional pooled superannuation funds, offer an almost unlimited ability to choose their investments and strategy. The growth in this sector now sees it managing more than 30% of the total retirement pool and making up 99% of the total *number* of superannuation funds (APRA, 2014a). Importantly, SMSF's allow for investments in residential real estate as well as direct shares and enable the investors to perhaps optimize their tax positions by selecting the optimal tax structure in which to hold assets that may be used for their retirement.

The range of taxes levied on the contribution point may act to confuse investors despite the majority of contributions being able to be made in a very tax-effective manner.

3.2.3 Earnings when invested in Superannuation

Other than specifically defined benefit superannuation funds operated for selected Commonwealth Government employees, all additional superannuation funds in Australia pay tax on earnings while in the accumulation phase. This tax is set at a flat 15% on income but may be reduced to 10% on income derived from certain capital gains (Ingles

& Stewart, 2017). There is no variability based on fund size or member balance. Tax on earnings may be reduced using imputed tax credits earned from the income of Australian shares or tax-deferred income from some property investments. Dividend imputation is used in the Australian company tax regime whereby tax paid by a corporation is attributed, or imputed, to the shareholders of the corporation resulting in a tax credit for the tax paid. Australian companies pay income tax at the flat rate of 30%, and this is the basis of the tax credit available. As this 30% tax credit exceeds the 15% tax rate on superannuation fund earnings, a tax refund is currently provided to the super funds.

The 15% tax rate on earnings is attractive to all taxpayers earning more than $18,200 per annum[5] as there is a tax differential between personal income tax and tax on superannuation earnings. While this is a specific design feature to encourage retirement savings, there has been recent criticism of this flat rate (Bateman & Kingston, 2010; Henry, 2009) as it favours higher-income earners over lower-income earners by providing a progressively higher relative tax benefit under the marginal tax rate system of Australia. Taxpayers earning more than $180,000 per annum would pay 15% on fund earnings held within a superannuation fund and obtain a tax benefit of 32% as compared to investment earnings in their own names (45% income tax, 2% Medicare levy). Taxpayers earning $30,000 would receive a tax benefit of 6% instead (19% income tax and 2% Medicare levy). While this apparent inequity has been identified (Bateman & Kingston, 2010), governments have avoided making marginal tax bracket adjustments thus far, except for what is known as the Division 293 tax where an additional 15% tax is levied on contributions if the taxpayer has a taxable income above $250,000[6] per annum.

3.2.4 Withdrawing from Superannuation

At the point of retirement or qualified semi-retirement[7] and an application made by a retiree to access some or all their superannuation benefit, a tax determination is made that crystallises the benefits into one of two categories – taxable or tax-free. All concessional contributions that have been received on a pre-tax basis, as well as all fund earnings over the life of the fund, are converted into the taxable element. The fund balance that existed pre- 1/7/1983, as well as post-tax contributions made by the fund member and several

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[5] As at 1/7/17
[6] Between 2012-2016 this threshold was $300,000 but it was reduced from the 2017 financial year to $250,000
[7] Individuals may elect to commence a Transition to Retirement (TTR) income stream once they have met certain age limits criteria without necessarily actually retiring.

other historical components convert to the tax-free element.[8] The tax-free element is paid to superannuants, and dependent beneficiaries as the name implies – tax-free, provided they meet eligibility criteria.

Superannuation in Australia offers a number of options at retirement including lump-sum withdrawal, conversion to an account-based pension, annuitisation or any combination of the above. The tax at this point depends upon the age of the retiree. Superannuation benefits are payable to retirees from age 55 for those born before 1/7/1960, and this access, or *preservation*, age is progressively increasing to 60 for those born after 1/7/1965. For those who meet the criteria to retire before age 60, a low rate threshold applies (currently $200,000[9]), and the following table 3.2 explains the different tax rates that will apply.

Table 3.2 – Taxation on benefits from superannuation

Type of Taxable Component	Type of payment	Tax rate up to low rate threshold including Medicare	Tax rate above the low rate threshold including Medicare
Under age 60	Lump-Sum	Nil	17%
Under age 60	Income Stream	Marginal tax rate less 15% tax offset	Marginal tax rate less 15% tax offset
60 and over	Lump-Sum	Nil	Nil
60 and over	Income Stream	Nil	Nil

Source: Australian Taxation Office

Importantly, most of those who access superannuation benefits which are over age 60 receive those benefits tax-free. The exception is those who receive benefits from a non-taxed superannuation source. As discussed above, defined benefit superannuation funds operated for selected Commonwealth Government employees who have not had a contributions tax levied on their funds must pay some tax on their benefits when received at retirement. If taken as a lump sum this tax is typically up to 15%, or if taken as a pension then the pension amount is taxed at marginal tax rates less a 10% tax offset.

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[8] For the purposes of this paper, we will ignore the special treatment of Commonwealth government defined benefit funds that may also have a third component – the untaxed element.

[9] This is the amount of lump sum withdrawals (2017/2018) from the taxable component that are available tax free to the beneficiary. See https://www.ato.gov.au/Individuals/Super/In-detail/Withdrawing-and-paying-tax/Withdrawing-your-super-and-paying-tax/?anchor=Howtaxappliestoyoursuper#Lowratecapamount for more details.

3.2.5　Historical returns of Australian superannuation

Calculating past performance of superannuation funds is difficult due to the vast number of both superannuation funds and the underlying investment choices offered within many funds. As an example, the largest superannuation fund in Australia as at 30/06/15 (APRA, 2018) – Australian Super – provided more than 50 discrete investment choices. Large commercial super funds can offer more than 500 separate investment choices, all of which produce different returns over time.

Because of the difficulty in calculating actual investor returns, this research will adopt a methodology using APRA data. It will provide an average performance of the top 25 Australian superannuation funds by size as at 30th June each year. The funds move places each year, and so this is not a comparison of a discrete set of funds, but rather the top 25 as measured each distinct year on 30th June.

Annual returns were gathered for each of the funds for the 2005 – 2014 financial years inclusively and the result averaged to produce a single figure. These yearly returns reflect the most popular (largest) investment choice within each fund. The results are seen below in table 3.3.

3.2.6　Key risks and potential future return expectations

As identified through this chapter, the rules and regulations regarding superannuation have changed regularly over the past 35 years (Agnew et al., 2013; H. Bateman, 2006; Paskin, Turner, & Konstantopoulos, 2015).

Table 3.3 – Annual returns and 10-year return for largest 25 Australian Superannuation Funds 2005 - 2014

Annual Returns 2005 - 2014	
2005	12.4%
2006	13.7%
2007	14.8%
2008	-7.9%
2009	-11.6%
2010	9.1%
2011	7.8%
2012	0.3%
2013	14.0%
2014	11.5%
10 Year average	**6.4%**
Last 3 Year average	**8.6%**

Source: APRA Quarterly Superannuation Statistics (APRA, 2017)

Given the very long-term nature of superannuation savings (potentially an opportunity cost through losing access to these funds for up to 45 years as a twenty-year-old), confidence in, and certainty of, the rules regarding access, taxation and security of the superannuation system should be paramount in legislator's minds. Having detailed the nature, history and characteristics of the Australian superannuation system, we will now look to an alternative investment option used by investors.

3.3 Characteristics of the Australian Share Market

This chapter will discuss the physical characteristics, tax rules, historical performance and how investing in the Australian share market might form a component of investors retirement plans. It should be noted that investing in the share market may be undertaken through the superannuation system, but for this study, we have separated 'pure' investments in the Australian share market from those made indirectly through the superannuation system.

Relative size and participation

The Australian share market is operated primarily by the Australian Securities Exchange (ASX). While several smaller exchanges work on a specialty basis, by far the dominant exchange is the ASX. The ASX has an estimated $1.5 trillion market capitalization across almost 2200 listed companies with 6.7 million investors (ASX, 2016). The ASX conducts regular surveys on share ownership, and a recently published study (ASX, 2016) identifies the following key statistics:

- 36% of Australian adults own shares directly or indirectly through unlisted managed funds (13% in international stocks)
- 26% of Australian adults own shares directly only
- 13% of Australian adults own global shares either directly or indirectly
- The gender breakdown of direct share ownership is 57% Australian male and 43% Australian female

The above, however, does not consider investors indirect holding through superannuation funds which would have the effect of raising the ownership percentages. One of the most commonly used benchmarks for share market performance in Australia is the S&P/ASX 200 index (ASX, 2015). This index covers approximately 80% of the market capitalization of all eligible companies as listed on the ASX but is highly concentrated towards the top 10 stocks. As at 31/12/2016, the top 10 stocks made up 39.48% of the total value by market capitalization. From a sector perspective, the top two

industry sectors – Financials (ex-REIT's) and Materials constitute 54.39% of the top 200 by market capitalization. In contrast, the S&P 500 index, which represents the most common index in the US market, is much less concentrated. The top 10 stocks in this index account for only 18.24% of the index by market capitalization and financials and the top two industry sectors (Information Technology and Financials) constitute only 35.60%.

3.3.2 Tax structure, dividend imputation and CGT system

Returns made from share market investments in Australia are taxed in either or both of two ways. Income received by investors in the form of dividends is taxed but may include a tax credit known as an Imputation Credit (see below), and profits made on the disposal of an asset for a gain are taxed under a Capital Gains Tax regime. Importantly, both forms of returns are taxed under an individual's marginal tax rate system.

The Australian share market and taxation system operates under what is known as a dividend imputation system, where franked dividends paid to resident shareowners are

deemed to be tax paid at the company rate and a tax credit is raised for this tax paid, thus avoiding double taxation on dividend payments. Treasurer Paul Keating introduced this dividend imputation system in 1987 as a part of a significant free-market initiative designed to encourage share ownership and investment into companies (Abraham, Dempsey, & Marsden, 2015).

The tax rate on net earnings made by Australian companies including those listed on the ASX is a flat rate of 30% (as at 1/1/18) and distributions made to shareholders in the form of dividends are typically paid from post-tax income and are known as franked dividends[10]. In some circumstances, dividends are paid to shareholders where tax has not been paid (for example, in a financial year where the net income is negative, or the company has significant depreciation of assets). These dividends are known as unfranked dividends. Companies can pay a combination of franked and un-franked dividends (partially franked) where a percentage is applied to determine the proportion of the dividends that the franking credit applies to.

The tax-advantaged nature of dividends (especially when considering that some other jurisdictions tax dis-advantage dividends) has led to a relatively high payout ratio of profits by Australian companies. This stream of dividends has become an attractive source of passive income for Australian investors and especially appealing to low tax rate investors such as retirees as any imputed tax credit earned more than an individual's tax liability are refunded as cash to the investor (Abraham et al., 2015). In effect, tax on the income derived from Australian shares may be calculated as:

Marginal Tax Rate (MTR) – 30% = tax rate payable

Dividend imputation can, in effect, increase the dividend by up to 30% if the taxpayer is exempt as superannuation pensions are.

3.3.2.2   Capital gains tax

Tax on realised capital gains are calculated differently across different tax jurisdictions, however, in Australia realised capital gains are taxed as ordinary income after the allowance of a 50% discount on the gain for assets held for at least one year (Cooper, Evans, & Wilson, 2011). The capital gain on assets held for less than one year is taxed at full marginal tax rates. When we consider the differentiation between franked dividends

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[10] Shareholders must own the shares continuously for 45 days to be eligible for the franking credit.

and realised capital gains, we find that that the tax rate differential can be between 30% and 6.5% (Cooper et al., 2011).

The following table 3.4 identifies the tax payable on franked Australian dividends across the marginal tax rates and compares them to the tax payable on realized capital gains (as at 1/1/17).

Table 3.3 – Effective tax rates on Australian share income and capital gains

	Taxable income	Less Imputed tax credit	Effective tax payable (Dividend income)	Effective tax payable (Capital gain)
Nil	Up to $18,200	30%	-30%*	Nil
19%	$18,201 - $37,000	30%	-11%*	9.5%
32.5%	$37,001 - $80,000	30%	2.5%	16.25%
37%	$80,001 - $180,000	30%	7%	18.5%
47%	$180,001 and over	30%	17%	23.5%

* Available as refund or to offset other taxable income.

Source: Australian Taxation Office

3.3.3 Historical performance of the Australian share market

There is a common adage used with investing, and that is that it is the **time in** the market rather than <u>timing</u> the market that produces the best long-term returns however there are apparent differences on long-term outcomes for investors dependent upon when they commenced their investment. The tables below (3.5 & 3.6) identifies differences of between 9.20% and 6.10% in the 10-year returns on Australian shares based on whether you invested in 2002 or 2004 and shows that an investor would have received a little over 50% higher return if they invested in 2004 and not 2002. The 20-year return also shows a difference (8.70% - 11.00%) although this difference is only a little over 2%. Dimensional Fund Advisers (DFA) use a total return methodology to determine discrete year returns and provide a slightly different set of results by measuring the performance of the ASX-300 index with dividends re-invested. In contrast, the Russell figures use rolling 10-year returns.

Table 3.4 – Historical returns of the Australian share market

Year	10-year Return	20-year Return
2010	8.40%	11.00%
2011	6.10%	8.70%
2012	8.90%	9.80%
2013	9.20%	8.70%
2014	7.10%	9.50%

Average	7.94%	9.54%

(Investments, 2011, 2012, 2013, 2014, 2015)

Table 3.5 – Annual total returns and 10-year return for Australian share-market (ASX-200) 2005 - 2014

Annual Returns 2005 - 2014	
2005	22.5%
2006	24.5%
2007	16.2%
2008	-38.9%
2009	37.6%
2010	1.9%
2011	-11.0%
2012	19.7%
2013	19.7%
2014	5.3%
10 Year average	**9.8%**
Last 3 Year average	**14.9%**

Source: Dimensional Fund Advisers (Returns Matrix Book)

3.3.4   Key risks and potential future return expectations

There has been much written regarding the Australian dividend imputation system, and there is some debate as to its efficacy (Kevin Davis, 2016). Those who support its continuation suggest that the change will prove highly disruptive and that the overall benefit of the system outweighs its costs (Kevin Davis, 2016) despite the distortions it produces.

3.4   Characteristics of the Australian Residential Real Estate Market

In this chapter, we will commence by investigating residential property ownership in Australia, then consider government policies that impact on the residential property market. We will then discuss issues of affordability of residential property considering the rapid rates of property price growth over the past 15 years and low interest rates. We will then look at recent returns on residential real estate in Australia. Finally, we will look at behavioural factors surrounding different methodologies for assessing price changes for residential property.

Australia has a relatively high level of homeownership as compared to several OECD countries, although this has declined since the 1990s (Andrews & Sánchez, 2011). The description of home-ownership as the 'Great Australian Dream' (Moran, 2006), has

led to increased scrutiny by political leaders concerned with the impact on the decline of home-ownership. The focus has rightly been on housing affordability as house prices have increased at rates higher than inflation since the 1970s and more particularly rapidly since the 1990s at approximately 6% per annum in real terms (Stapledon, 2010); however, there may be other demographic factors such as increased migration of younger workers not yet ready to purchase (Andrews & Sánchez, 2011).

Home-ownership has been linked to a number of positive outcomes for individuals and society including better educational outcomes for children (Blau & Haurin, 2013; Donald, Toby, & Haurin, 2002) and improved an ability to meet basic household needs (DiPasquale & Glaesner, 1999). Mainly related to retirement security, home-ownership has been described as a significant factor in retirement policy where renters fare significantly worse in retirement than homeowners (Morris, 2016; Stebbing & Spies-Butcher, 2016). This retirement impact of reducing home-ownership rates is not unique to Australia (Brown, Hou, & Lafrance, 2010) and has been recognized as a source of poverty amongst other nations also.

3.4.1 Tax and support for the Australian residential real estate market

The Australian government provides a significant tax incentive that supports home-ownership in the form of a capital gains tax exemption for the taxpayer's principal place of residence (PPR). This incentive is an uncapped exemption and has no time-based ownership requirements; however, no tax deduction is provided for interest payments or other costs of ownership. Alternatively, if an investor owns a property that is not their PPR, all interest payments and costs of ownership (including depreciation to 1/7/2018) are tax-deductible against any taxable rental income earned. Further, any net losses as incurred under the conditions described above are fully deductible against the taxpayer's 'other' income under what is known as negative gearing. There is significant concern that negative gearing distorts the housing market as it provides for increased affordability as compared to owner-occupiers and has been reported as a reason for the considerable increase in housing prices over recent years (Blunden, 2016; Galloway, 2016; Krunic, 2016). Capital gains made on the sale of investment properties are taxable as income in the year the benefit is crystalised. However, a 50% discount on the benefit is allowed if the property has been held for longer than one calendar year. The most recent and significant tax review conducted in Australia called for both a reduction in the capital

gains tax discount and an end to negative gearing (Henry, 2009); however, both suggestions have so far been ignored by the government.

The federal government introduced the First Home Owners Grant (FHOG) in July 2000 to counter the effect of a newly introduced consumption tax known as the Goods and Services Tax (GST) on homeownership. This grant was administered by each state or territory and provided a lump sum payment to new homeowners who satisfied all criteria regarding the grant and continued a long tradition of government support to encourage homeownership (Dungey, Wells, & Thompson, 2011). While notionally, the introduction was to counter public discontent regarding the additional costs of purchasing a new home, the grant (which has changed several times over the following years) has been used since then, for example, to counter the effects of the global financial crisis, so that home building was less impacted by the overall economic downturn (Dungey et al., 2011; Randolph, Pinnegar, & Tice, 2013). There have been conflicting levels of support for schemes such as this with the backing of the housing industry groups and others (HIA, 2008; Lee, Lin. & Reed, 2014) but concerns from economists, social service organisations and academics regarding the lack of targeting for needy groups of beneficiaries and access to the schemes from high-income earners to purchase expensive properties (Brotherhood of St Laurence, 2003; Randolph et al., 2013; Wood, Watson, & Flatau, 2006).

Problematic with the discussion regarding house price growth and affordability is the lack of a transparent and accurate price measurement process. The long periods between sales of the same property, lack of frequency of sales and heterogeneity amongst the houses for sale (Prasad & Richards, 2006) can lead to inaccuracies for both policy-makers as well as property purchasers. Further, the most common method of property price measurement in Australia – the change in the median-price – takes no account of compositional changes in the stock sold[11] (Abelson & Chung, 2005; Ryder, 2003).

3.4.2   Housing Affordability

Housing affordability in Australia has declined as prices have increased significantly faster than wages growth (Yates, 2008). Despite dramatic falls in house prices across many nations during the financial crisis of 2008, Australian house prices continued to climb, albeit after a minimal fall during the peak of the crisis (Murphy, 2011). The

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[11] Any capital improvements are ignored in the median price analysis. Indeed, a total new-build is included in the prices used for much analysis.

reduction in affordability may be a reason that many households are facing housing stress as the ratio of household income to median house price has steadily increased over the past 25 years (Worthington, 2012), but this seems to have little effect on home-buyers' desire to pay higher and higher prices to access the housing market as owners or investors. While housing purchase decisions may be seen under a neo-classical, or rational approach where data is analysed, and optimal decisions are reached, it seems that the persistent reduction in affordability may indicate a behavioural factor (Gallimore & Gray, 2002; Rath, Mahapatra, & De, 2014).

As real estate prices have increased at a faster rate than wages growth over recent years (Stapledon, 2010), levels of personal indebtedness has also risen (ABS, 2014). This increase in debt is likely to be due to many factors, including behavioural factors (Stone & Maury, 2006). Therefore, real estate purchase (and pricing) decisions may not be made under an efficient market model because of the abovementioned lack of price transparency. The increasing proportion of household income being allocated towards a mortgage and household costs must logically have an impact on 'other' expenditures such as saving for retirement. Conversely, the persistent increases in house prices may lead to a wealth effect on consumption as property owners 'feel' wealthier because of asset price growth. This Australian phenomena of house price increases over many years, could be described as a 'trend' and may account for increases in consumption spending but decreases in savings (Lettau & Ludvigson, 2000).

Real estate investors have also been affected by the rapid real estate price growth in one of two ways. Those investors who purchased before or early in the latest up-trend of prices have benefitted from a significantly higher asset value; however, those who purchased later in the cycle have experienced considerably lower relative rental returns. Shi et al. (Shi, Valadkhani, Smyth, & Vahid, 2016) identified in the twenty years 1995 – 2016 that prices grew almost 1.5 times as fast as rents in Australia's capital cities, and nearly two times as fast in Sydney over this period.

While the impact of this price increase, as far as holding costs for investors are concerned, there has been somewhat offset by the previously discussed tax incentives, it nevertheless reflects that investors must make a more significant contribution to their investment and that real estate investments are less likely to produce a positive cash flow when borrowings are taken into account. One factor that may have offset the reduction in real rental income have been changes in interest rates. The Reserve Bank of Australia sets the cash rate, or overnight money market rate, which in turn establishes benchmark rates

for overall lending and deposit rates in Australia. Rates have been in a downward trend since 1990 and now sits at record lows.

3.4.3 Historical performance of the Australian residential real estate market

Historical returns have varied significantly over time, mainly dependent upon the period being considered and the methodology applied. Russell Investments and the Australian Stock Exchange (ASX) has been producing a longitudinal report on asset returns since 2010 and will be the primary source of data for this component of the study. Each year they produce 10-year and 20-year historical returns for several asset classes including Australian residential real estate. The report provides long term returns to the end of each calendar year, and the results are summarized in the table below. Importantly, the methodology uses data from the Australian Bureau of Statistics to make some adjustments for capital improvements as well as adjusting net rental income to allow for vacancy rates, maintenance expenses, and several other costs of ownership. The report set, however, does not specify what component of the return for residential real estate was made up by rent, as opposed to capital value increases. The table below (figure 3.8) summarises the rolling 10-year returns for residential real estate in Australia for the calendar years described. The average number represents the average of the rolling 10-year and 20-year returns for the six years 2010 – 2015. This incorporates the period that the survey was completed for this research.

Figure 3.1 – House prices to rent ratio, 1995 - 2016

(Shi et al., 2016, p. 597)

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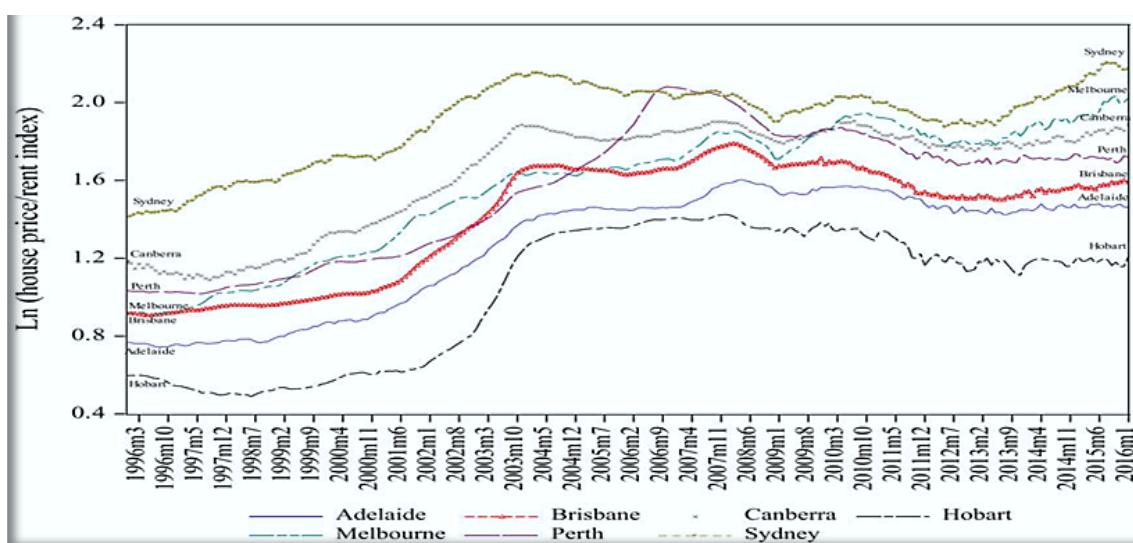
Figure 3.2 – RBA cash rates 1990 - 2016

(RBA, 2017)

By contrast, the ten years from 1990 – 2000, there had been total house price growth of only 1.7% (Abelson & Chung, 2005) although this ignores net rental income. The Abelson and Chung methodology for determining property price growth uses composite data from more than 40 sources (Abelson & Chung, 2005, p. 268) to conduct their analysis which provides a more robust outcome compared to other methodologies. Unfortunately, no data is available after 2003 using this methodology.

The Australian Bureau of Statistics also provides residential property price data and the growth in prices between the ten years described in the ASX/Russell report above as at December 2014 was 6.95% in total (ABS, 2017b). Note that this is the price only return and ignores net rental income and is slightly less than the ASX/Russell returns which does include net rental income.

Table 3.6 – 10-year residential real estate returns and inflation

Year	10-year Return	10-year Inflation
2010	10.1%	2.9%
2011	8.0%	2.9%
2012	6.5%	2.8%
2013	6.1%	2.8%
2014	7.0%	2.7%
Average	**7.5%**	**2.8%**

(Investments, 2011, 2012, 2013, 2014, 2015)

ABS data uses a stratified median house price measure of all dwelling sold during the period considered to determine price growth. As previously discussed, this methodology ignores improvements to dwellings.

As a demonstration of the ambiguity in the recording of house price growth, tables 3.9 and 3.10 below outline the returns over the ten years to 2015, also from the ABS, of index price growth over that period. You will see a material difference between that 10-year return and the one identified above (6.95% – 4.90%), which could be explained by excluding net rent in the lower figure. Excluding rent is more appropriate for this study as the respondents were asked about price growth only, and so this is the figure that will more accurately reflect the outcome. The 3-year average return in this case was 4.60%. Additionally, if we separate the two most populous capital cities (Sydney and Melbourne) and consider real estate returns over the same period we see a higher average 10-year return of 5.80% and a materially higher 3-year return of 7.90%

Table 3.7 – Annual total returns and 3- and 10-year average returns for Australian residential real estate (Weighted average of 8 capital cities - Price only) 2005 - 2014

Annual Returns 2005 - 2014	
2005	2.4%
2006	8.6%
2007	13.3%
2008	-4.0%
2009	14.3%
2010	4.4%
2011	-4.1%
2012	-3.0%
2013	10.0%
2014	6.7%
10 Year average	**4.9%**
Last 3 Year average	**4.6%**

Source: ABS Residential Property Price Indexes: Eight Capital Cities

Table 3.8 - Annual total returns and 3- and 10-year average returns for Australian residential real estate (average of Melbourne and Sydney only - Price only) 2005 - 2014

Annual Returns 2005 - 2014	
2005	-0.5%
2006	4.9%
2007	14.9%
2008	-4.1%

2009	16.7%
2010	6.4%
2011	-4.2%
2012	2.9%
2013	12.1%
2014	8.6%
10 Year average	**5.8%**
Last 3 Year average	**7.9%**

Source: ABS Residential Property Price Indexes: Eight Capital Cities

From the above tables, we can see that house prices in Australia have increased significantly over the past 10 - 15 years as compared to inflation (including wage inflation) and, by extension, affordability has been compromised. Tax advantages provided to homeowners and investors may play a part in this over-valuation, as may the lack of transparency around price discovery. Recent price growth experienced within the Australian residential property market will have created an expectation that future prices may continue to rise as many new entrants to the residential property market will not have experienced a significant market downturn in their lifetimes. There is, however, little consistency in predictions of future price rises or falls as a recent newspaper report reflected that amongst five senior economists surveyed about price growth the ranges of expectations in the short term ranged from 0% - 10% (Duke, 2017).

3.5   Conclusion

The purpose of this chapter was to identify the complexities in making comparisons between the three different investment options considered. As this is the first study of its type to consider the factors involved in investment decision-making by non-professional investors, it is essential to gain an understanding of the risks, historical performance and particular attributes that each of the three options hold. We can see that superannuation operates under a complex regulatory framework with restrictive rules regarding investing and withdrawing, but that provides a generally highly tax-effective investing environment. Australian shares are familiar to Australian investors but are typically highly volatile. Notwithstanding this, there are specific tax advantages to investing in Australian shares as compared to international shares. Residential real estate has many tax advantages also – specifically negative gearing allowances as well as capital gains discounts. However, it is an illiquid asset that is frequently geared by investors.

In the next chapter, we will discuss the both the theoretical and conceptual frameworks that have been adopted and developed for this thesis.

4. THEORETICAL FRAMEWORK, CONCEPTUAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Introduction

This research will specifically investigate individual investors propensity to invest, or not to invest, in three common forms of investment in Australia - voluntary contributions to superannuation savings, the Australian share-market and residential real estate – to identify if investors hold views on risk and return in broad accordance to financial markets expectations (rational). It will then determine if investor beliefs as to the characteristics of these investments efficiently influence their decisions. A thorough literature search has failed to find evidence that this comparative investment choice has been studied before.

Following the order of the literature review, we see that there is a conflict between the traditional finance model of decision making and the behavioural model of investment decision making. We will also consider the impact of financial literacy on investment decision making, as there is a large body of literature that suggests that poor financial literacy may lead to inefficient financial outcomes for individuals. However, very few studies have determined the causality of this inefficiency.

The chapter structure is as follows: sections 4.2 – 4.5 discuss decision making under four different theoretical models and section 4.6 expands on the key factors as they relate to this specific study. Section 4.7 discusses the research questions.

4.2 Investment Decision Making Under A Neo-Classical Model

Because individuals must allocate capital and income in a manner that provides for their long-term financial needs, neo-classical economists describe utility maximisation (Bernoulli, 1954) as the driving force in investment decision making.

If we consider the theoretical framework of investor choice under utility theory as per Von Neumann and Morgenstern (1964), we see that four conditions are assumed:

- The investor is entirely rational
- The investor can manage complex decisions
- The investor is risk-averse, and
- The investor aims to maximise wealth

Figure 4.1 - Describes the Investment Decision Making process under a Neo-Classical framework.
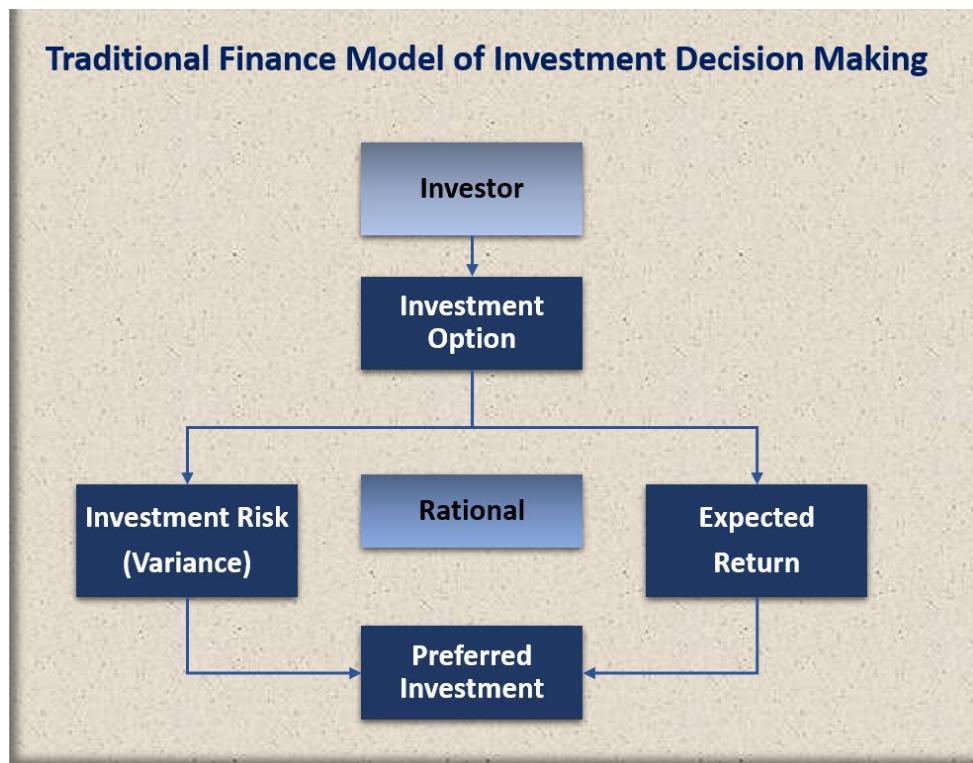
This study will be adopting this assumptive model by assessing an individual's choices between three specific options available to Australian investors:

- **Rationality:** We assess rationality by evaluating whether the 'preferred' investment of respondents matches their perception of optimal risk and return.
- **Complexity:** We manage this component by offering only three choices without the need to optimise the decision on an intertemporal basis or with any 'alternative consumption'. Notwithstanding this, the decision making is complex, given the informational needs of the investor as discussed in the descriptions of the characteristics of the investment choices.
- **Risk-aversion:** Respondents 'preferred' investment choices will be controlled for risk to establish if risk is a significant factor in decision making.
- **Wealth Maximisation:** Respondents should select their 'preferred' investment choice based on the highest expected future return, after consideration for risk.

One weakness of utility theory is that it generally applies to aggregate investor. behaviour rather than individual investor behaviour (Nagy & Obenberger, 1994), and most empirical studies have only considered the investment decision within a specific asset class such as common stock decisions (Baker, Hargrove, & Haslem, 1977; Baker & Wurgler, 2006) (Clark-Murphy & Soutar, 2004). This study will be the first to consider

the investment decision across asset classes or investment types to identify if efficient decision making is undertaken at the level of choice of investment type.

4.3 Investment Decision Making Under A Behavioural Model

Notwithstanding the above, the study of an individual's financial actions and investment decisions falls within the fields of both behavioural finance and neo-classical economics. Behavioural finance is often centred around behaviours of groups of investors acting to impact on market pricing (Sewell, 2010), but has also included descriptions of individual's systematic deviations from rationality (Barber & Odean, 1999) and an understanding of the impact of human frailty and complications in decision-making (Mullainathan & Thaler, 2000). There is a lot of empirical evidence of investor irrationality (Biswas, 2009; Tversky & Kahneman, 1986) and that this irrationality is consistent and persistent (Heath, 2000).

There have been several studies related to how individuals make financial and investment decisions without complete information (Brahmana et al., 2012; Hallahan et al., 2004) and different theories have been developed in an attempt to explain, describe or predict this human behaviour. The 'decision under uncertainty' line of research (Kahneman & Tversky, 1979) linked psychology and economics and questioned the rational man approach by establishing, for example, that individuals assigned uneven weights to gains and losses (Kahneman & Tversky, 1979). Other researchers have been trying to capture individuals decision-making behaviour under the concept of heuristics, or 'rules of thumb' principles (Golivich & Griffin, 2002). Figure 4.2 describes the investment decision-making process under a behavioural finance conceptual framework.

Behavioural economists would argue that many biases cannot be un-learned (Fischoff, 2002; Kahneman, 2011) and this is perhaps supported by Simon's 'bounded rationality' where individuals are likely to discount information that does not support their already determined views (Simon, 1955). Additionally, those same investors may feel 'cognitive dissonance' or uncomfortable being challenged by information that does not accord with already held views (Gilovich et al., 2002). This research will consider if differences exist between investment preferences when the choice is framed with past performance compared with the same choice framed with expected future performance to identify if investors tend to become anchored by past performance.

But what are these 'views' on investment and what influence do they hold over investment decision-making. We refer to these views as 'beliefs' or 'perceptions.' Risk and return can be empirically determined under traditional economic modelling, yet investors may still invest in sub-optimal investments if considered using the risk/return framework. Perhaps this is because the traditional methods for determining both risk and expected return are based on the past performance and characteristics of investments and the actual investment decision must be made based on future expected risks and expected returns.

Figure 4.2 -Describes the Investment Decision Making process under a Behavioural framework
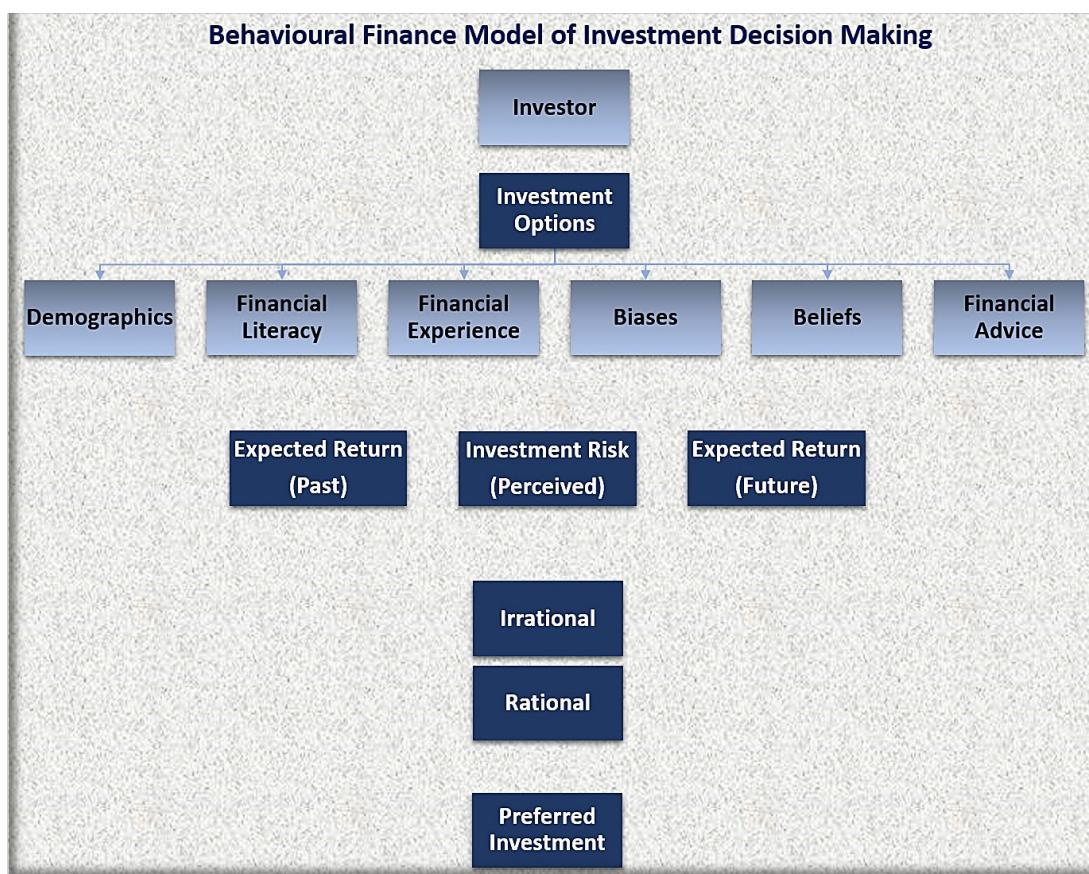
4.4 Investment Decision Making under a Financial Literacy Model

There has also been significant literature associating rational personal financial decisions with financial literacy (Banks et al., 2010; Lusardi & Mitchell, 2007a). A relationship has been identified in studies based on wealth, retirement outcomes and financial literacy (Commonwealth Bank Foundation, 2004; Hastings & Mitchell, 2011; Lusardi &

Mitchell, 2007a; van Rooij et al., 2012). Importantly, financial literacy research has not produced significant causal links among these variables, but the identified correlations between financial literacy and wealth warrant further investigation.

Understanding the link between financial literacy and investment decisions has become more critical in response to a broadly held view that individuals are becoming more responsible for their retirement planning and less reliant on the government for their retirement income, or pension (van Rooij et al., 2012). This research takes the same view but approaches the issue from a different perspective – the beliefs an investor holds regarding the characteristics of the options they consider.

4.5   Investment Decision Making Under A Consumer Choice Model

The decision to invest in one of three presented options that all may be used to fulfil the third pillar of retirement planning[12], and are common options for Australian investors, may be considered under consumer choice theory. Sheth, Newman & Gross (1991). proposed a model for predicting consumer choice based on five values, all of which may make different contributions to the decision (see figure 4.3). The five values are:

- *Functional Value*
- *Social Value*
- *Emotional Value*
- *Epistemic Value*
- *Conditional Value*

Functional value is perhaps best aligned with traditional utility theory and is considered to be the primary influencer in the purchase decision (Sheth et al., 1991). In the case of investment decisions, it would be the expected return of the investment. *Social value* pertains to specific social groups where the purchaser is seen more positively or negatively as a result of the purchase (Sheth et al., 1991). Typically, purchases of this type are highly visible items such as clothing or motor vehicles but in the case of this study may include residential real estate – perhaps the most visible of all purchases. *Emotional value* is where "the perceived utility acquired from an alternative's capacity to arouse feelings or affective states" (Sheth et al., 1991, p. 161). While this may be a specific influencer in property decisions, particularly where the purchase is for a home, it

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[12] Pillar 1 – Government funded means tested pension, Pillar 2 – compulsory superannuation savings, Pillar 3 – additional voluntary savings or investment.

is less likely to be an influential factor in an investment decision. *Epistemic value* relates to a purchasers sense of "arousing curiosity, providing novelty, or satisfy a desire for knowledge" (Sheth et al., 1991, p. 162). Finally, Sheth et al suggest that *conditional value* is a utility function that occurs only in specific circumstances where the purchase decision is consequential to another situation. An example of this would be the choice of an airline for a 'once in a lifetime' world trip involving a long-haul flight, which might be a very different choice for a regular work-related short-haul flight.

Figure 4.3 - Describes the Investment Decision Making process under Consumer choice framework.
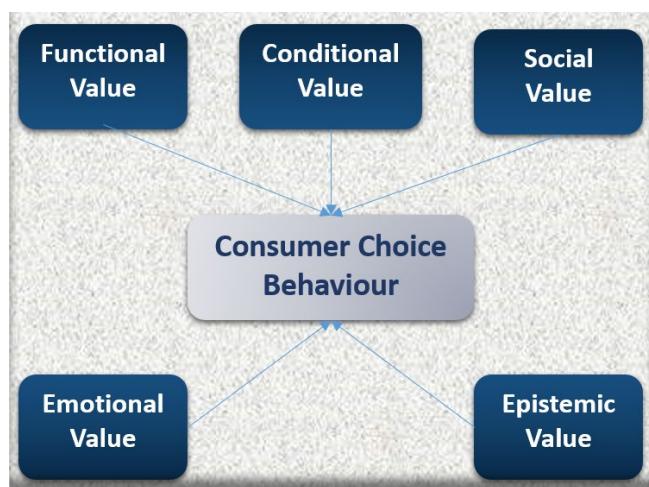
Source: (Sheth et al., 1991, p. 160)

Importantly, this model is based on a decision to purchase or not to purchase and so aligns with this research insofar as we are looking at a decision to purchase (preference to invest) in superannuation or not superannuation, Australian shares or not Australian shares and residential real estate or not residential real estate. We need to modify Sheth, Newman and Gross's model (1991) by focusing on the risk and return characteristics involved in investment choice as these are functional values. Not tested in this study, but certainly an area of extension of this research would be an investigation into the social and emotional values inherent in the investment choice.

4.6   Key Factors in This Study

The key investigation undertaken in this study involves the perception (as opposed to the reality) of three investment factors – the perception of risk, perception of past performance and expected future performance.

4.6.1   Perceived risk of an investment

Perceived risk theory suggests that investors consider the probability of the risk event occurring multiplied by the negative consequences from that event (Mitchell, 1992). Mitchell also defines perceived financial risk as "the risk that the service purchased will not attain the best possible monetary gain for the consumer" (Mitchell, 1992, p. 27). The consideration of 'not attaining the best…' is entirely at odds with the traditional measure of investment risk being the variability or volatility of returns, which of course can involve both gains and losses.

Indeed, a study of Dutch investment club member found that perceived risk lowered as investment returns increased (Antonides & Van Der Sar, 1990) which is surprising as price (investment return) increases of investments typically lead to a lower 'value' perception. This consideration will be tested in this research by matching perceptions of relative recent past performance with the perception of risk to identify if such a relationship exists when considering three separate investment choices. This is further supported by the research conducted by Wang et al. (2011) which contradicts traditional finance theory as regards perceived risk.

Accurately measuring differences in perceived risk is challenging as risk is typically not uniform across different decision domains where the same individual does not show consistency of risk-averse (or risk-seeking) behaviour (Weber, Blais, & Betz, 2002). They believe that this is because of the structure of the expected utility framework, where "risk attitude is nothing more than a descriptive label for the shape of the utility function presumed to underlie an individual's choice" (p. 264), and effectively refers to the curvature of the representative utility graph.

Weber also provides a risk-return model that differs from the traditional finance model of risk and return in that it assigns differences between individuals and allows for different levels of risk tolerance across different decision domains (financial, social, physical for example) (Weber, 1988).

$$\text{Preference }(X) = a(\text{Expected Benefit }(X)) + b(\text{Perceived Risk }(X)) + c$$

Thus, in the context of this study where we are looking at the investment preference of choice between three alternatives, we find that:

$$\text{Preference }(X) \text{ must be} \geq \text{Preference (Other)}$$

The framing of outcomes has been shown to result in differences in perceptions of risk (Biswas, 2009; Diacon & Hasseldine, 2007; Tversky & Kahneman, 1981) and so this study will identify investment preferences when the returns are framed as both past and future-orientated to establish if any differences occur.

4.6.2 Past performance

Numerous studies have demonstrated the inefficiency of relying on past performance as a predictor of expected future investment returns (Carhart, 1997; Fama, 1970), although there may be some relationship between past and future relative performance when considering mutual funds (Grinblatt & Titman, 1992). Indeed, many financial regulators (including ASIC in Australia, The FSA in the United Kingdom and the SEC in the US) require that investment advertisements and marketing material explicitly provide a warning that past performance is not an indication of future performance (Nagy & Obenberger, 1994).

Also, De Bondt (1998) considers how investors detect patterns of returns as a method of identifying optimal investment choices. While he questions the efficacy of pattern identification, he also posits that extrapolation bias, the "expected continuation of past price changes" (De Bondt, 1998, p. 833) as one of the most established investment biases. We have identified that residential real estate investment in Australia has experienced a more than 15-year bull-run which is likely to support the assertion that it is a 'pattern' of reliable positive performance when seen from the benefit of hindsight.

The use of past performance is likely due to both representativeness bias and the availability heuristic (Kahneman, 2011; Tversky & Kahneman, 1973) as investors tend to anchor on the concrete past performance rather than a more abstract future expectation.

4.6.3 Expected future investment return

When making a decision to invest, or at least citing an individual's investment preference, the expected future return from the investment, along with the perception of risk associated with that investment should be the key determining factor (Clark-Murphy & Soutar, 2004). Baker and Haslem studied individual stock market investors and found that "investors are primarily concerned with expectations about the future" (Baker & Haslem, 1973, p. 66).

There appears to be a significant difference between the expected return of an investment and the expectation of returns from the same investment. Greenwood and Shleifer (Greenwood & Shleifer, 2014) found that while individual investors held views regarding the expected return in line with actual market returns, their expectations of returns were negatively correlated to actual returns.

Shefrin (2001) also questions the validity of the relationship between risk and return as embodied under the capital market line of traditional finance theory. His longitudinal study suggests that higher return expectations are related to the 'safety' of the investment rather than to the investment's inherent 'riskiness'.

4.7 Research Question

A key practical research question has led to the development of this thesis – how do investor beliefs regarding risk and return manifest in their decision making. This has been supported by the literature review conducted in Chapter 2; however, it was identified during the literature review that this specific area had not been well researched. The review identified that the behavioural aspects of decision making have been studied empirically and found to violate the expectations of neo-classical economic theory frequently. Yet, neo-classical theory remains the foundation of appropriate decision making, particularly as decisions related to financial outcomes. In other words, it is generally assumed that individual investors behave 'rationally' and to do this, they must hold 'rational' beliefs regarding the expected return of their investment choices, as well as the relative risk of those choices. This study will identify if these beliefs compromise the neo-classical view.

Thus, the thesis aims to answer the following linked question.

- Research Question 1: **Do individuals hold appropriate beliefs regarding the risks and expected returns of the investments they are considering?**
- Research Question 2: **Do individuals then demonstrate a propensity to invest according to those beliefs in a rational manner?**

The answer to these questions may help to explain why, for example, Australian investors have continued to invest into residential real estate after many years of booming prices – either because they see the expected return will compensate for the risk, or they have ignored the risk altogether.

4.8   Conclusion

If we assume utility maximisation as an outcome and risk aversion as a given, then a rational investor should choose an investment that provides the highest return for the least risk willing to be accepted by the investor, or vice versa. This research will test this assumption. So, while neoclassical economists assume that investors are rational and behavioural economists assume that investors are not rational, both make the normative assumption that investors should be rational. This is supported by evidence that financially literate individuals make better financial decisions and are wealthier, although the evidence is less convincing that financial literacy causes wealth enhancement. Consumer choice theory suggests that there are a number of values, or other factors in the investment (purchase) decision that may influence the decision-maker in a manner that may conflict with the neo-classical model, but which are supported if the utility is extended to include social and emotional outcomes.

In the next chapter we will discuss the research design and methodology adopted for the study.

5. RESEARCH DESIGN AND METHODOLOGY

Introduction

In this chapter, we will discuss the methodology used in the study. As this is the first study of its kind to compare three different investment choices for Australian investors, we have drawn on a number of methodologies to build and design this research.

The chapter structure is as follows: section 5.2 and 5.3 justify the research methodology and explore the research paradigm. Sections 5.4 – 5.9 discuss the process and application of the survey development and data collection and section 5.10 and 5.11 discuss the statistical techniques used and their limitations. Section 5.12 briefly considers the ethical considerations for this study.

5.2 Justification of the Research Method

The study was conducted using a quantitative, online survey to investigate the relationships between a number of variables involving human knowledge, beliefs and preferred actions regarding financial behaviour. The behavioural aspect of the study suggests a post-positivist perspective as the information gathered was 'real world' data. Surveys are frequently used to collect data regarding individual attitudes to investment and financial decisions (Agnew et al., 2013; Dowling et al., 2009; Seiler et al., 2008). It has become common to use online surveys as technology has become more pervasive in society and this has allowed more tailored surveys to be conducted (Agnew et al., 2013).

A quantitative study was an appropriate method given the overall purpose of the study as it provides for comparisons on results between multiple groups. Quantitative methodology yields candid results, and while there is generally a need to carefully sample to protect external validity (Bates & Cozby, 2012), the broad-based nature of the project required participants from across the demographic divide. Research has been conducted in this field using discrete samples (Australian University staff for example) (Ntalianis & Wise, 2011) however, results for this study would be too heavily influenced by the very generous and non-normal nature of university superannuation funding. A well-formed research problem is active, has an impact, and does not have adequate solutions available (Ellis & Levy, 2009). The project must be feasible, and feasibility can be improved by narrowing the population of the group studied geographically, again, this would have compromised and limited the scope of the survey, and so an alternative sample

methodology was developed. The researcher recognizes that this may be a weakness for external validity.

The data was collected over four months, with only one point of collection per participant and was, therefore, a cross-sectional study. Surveys are appropriate tools for drawing conclusions from a sample and for making inferences about the population as a whole (Fowler, 2009). Creswell (2014) suggests that a quantitative method is suitable for data collection regarding the participant's attitudes.

The survey primarily consisted of closed-ended questions and numerical data. Measurements of attitude or belief were based on both a 5-point Likert scale approach or a 1-100 scale dependent on the question. This approach has been adopted in several financial literacy studies (H. Bateman et al., 2011; Hastings & Mitchell, 2011; van Rooij et al., 2012) as it allows for the benchmarking of the findings to other research findings on the relationships between financial literacy and investment attitudes. Also, questions of a qualitative nature such as perception of risk included a free text section that allowed participants to describe what they understand as risk.

Participants were asked to self-assess their knowledge, relative to an 'average person' about the three investment types (Superannuation, Australian Shares and Residential real estate) considered in this study.

5.3 Research Paradigm

The research paradigm selected influences the adoption of the research methodology (Creswell, 2014). This thesis applied a positivist approach and used quantitative methods to establish participant views, or beliefs, regarding factors that influence their investment choices. While some have chosen to study this field using a qualitative approach (Agyemang & Ansong, 2016; Jaiyeoba & Haron, 2016; Rickwood & White, 2009), it was decided to use a quantitative methodology due to the specific hypotheses being tested. Primarily these related to participant estimates of investment risk, investment return (both past and future), preference of investment option and the demographic factors that may have influenced these decisions.

5.4   Data Collection Technique

The technical population of the study consisted of Australians over the age of 18 and was the basis for sampling. It is impossible to survey everyone, and so a sampling technique was used. Sampling is an appropriate technique (Babbie, 2007) to use when the population is large. While using an online survey to reach a large number of participants, there was also scope for a degree of interactivity within the survey design. An essential characteristic of the survey was the ability to individualise some of the questions based on the data collected (Ahern, 2005; de Vaus, 2014). For example, the participant's estimate of the *value* of their residence was able to be related to the scale used to establish the *value* of the question regarding house price growth.

Similarly, the value of the participant's superannuation and salary was used to create the scaling of the questions regarding future values of superannuation and share investing. This novel approach allowed the participants to answer the questions based more on their own experiences and perceptions rather than an arbitrary scale that may be outside their experience. This may also overcome a potential bias if a standardized set of values were used in the survey. For example, if a standardized value of a residential property of, say, $500,000 was used as a scale to assess potential price growth, a participant who considered this to be an inferior property might underestimate the potential for price growth in the future. The technique is available when using e-survey, computer-based questionnaires or face to face interviews but is not available for paper-based self-conducted surveys (Bethlehem & Biffignandi, 2012; de Vaus, 2014). The sponsor University of this project has a relationship with a commercial survey provider, Qualtrics. They offer services that allow for a sophisticated survey methodology to enable the individualization described above.

It would be possible to produce the interactivity described above with direct interviews; however, the sample size suggested would make this time consuming and laborious, and it was discounted for use.

5.5   Survey Development

There are three core constructs or themes to the questions – participant details and demographics, financial literacy and investment attitudes and beliefs.

5.5.1 Participant details and demographics

- Gender
- Age
- Relationship Status
- Education level
- Relationship status with a financial adviser
- Employment or specific training in finance
- Residential status (i.e. home-owner or tenant)
- Property value estimate of participant's residence
- Outstanding mortgage balance (if applicable)
- Superannuation balance
- Household Income

5.5.2 Financial literacy

Standardised questions as per Lusardi and Mitchell (2007a) were used. While the questions and methodology used as per above do not provide a measurable outcome (except for correct or incorrect), what have become known as the 'big three' questions were adopted in this survey. These questions relate to compound interest, the impact of inflation and diversification

5.5.3 Investment attitudes and beliefs

The development of the survey was designed to capture investor beliefs and preferences regarding three alternative wealth creation approaches used by Australian investors for, amongst other things, saving for retirement. These three are: Superannuation, the Australian share market, and residential real estate. Regarding beliefs, the survey aimed to elicit responses that allow for the identification of expected future returns, relative risks and perceptions of past performance. Preferences were elicited by identifying the most preferred choice of the three.

5.6 Pilot Testing of the Online Survey

Pilot testing of the online survey was undertaken to improve the reliability and validity of the data collected, evaluate individual questions and the entire online survey (Roberts, 1999). The process was undertaken to ascertain the value of the questions and ensured that the questions elicited the right information to answer the research question. Furthermore, the pilot test ensured an appropriate length of the survey and that the respondents remained focused throughout the process (Bethlehem & Biffignandi, 2012).

The pilot testing process involved three steps during the online survey development stage, as outlined by (Sue & Ritter, 2012).

Step One: Discussions with academic supervisors to receive feedback on the development of an online survey were conducted. These discussions focused on the instructions on how to complete the online survey, survey format, order of questions, wording of questions, response selections, completion time frame and survey layout and design (Roberts 1999). The feedback was reviewed and where applicable, the online survey was rectified.

- It was decided to focus on naïve perceptions of the past performance of each of three specific investment choices and that no information was to be provided regarding actual past performance.
- Estimation of the future value of each of three specific asset type in 10 years provided a longer-term perspective on future performance and matched the researcher's anecdotal evidence of many investors using 10 years as their investment time frame.
- Perception of the degree of risk associated with the options provided
- Identification of investment preferences, of the options offered, by the participant

Step Two: Ten financial planning clients were selected from the researcher's client base were personally requested by the researcher to test the online pilot survey. Additionally, ten personal contacts who are known not to have financial planning relationships were asked to complete the survey.

Step Three: Each participant was then contacted by telephone or face to face to provide feedback on the pilot survey. This process ensured that the final survey would elicit the right information to answer the research question.

Based on the pilot survey, several areas of weakness and conflict within the original survey design were identified and some survey elements were modified. In the pilot survey, a standard value ($500,000) was applied to all questions regarding expectations of future returns. These questions asked participants to estimate the future value (in ten years) of each of the three choices surveyed, but feedback obtained suggested that some participants had difficulty conceptualising a return for an amount outside their 'experience zone'. Some suggested the amount was too high ("I can't even imagine what $500,000 in super would look like" and "I would never invest $500,000 in the share market") to too low ("A $500,000 property would be a pretty poor property and probably wouldn't grow much at all"). Based on this feedback, a series of conditional questions were inserted that allowed for participants demographic and participant-specific

information gathered as a part of the survey to tailor the scale of questions that related to investment returns so that they might be more meaningful to participants. Five separate investible amounts were selected and applied to each of the question sets. These amounts were $90,000, $180,000, $270,000, $360,000 and $450,000 although for property-based questions, gearing was applied that allowed for 'real' property values to be considered. The $90,000 unit of differentiation was chosen as it most accurately reflects a 'round number' amount equal to the average weekly ordinary times earnings (AWOTE) (Statistics, 2014) and the average household superannuation balance sat at approximately $250,000 at the time of the survey (Ryan & Stone, 2016), which approximates the mid-point of the range.

The participant-specific information used for conditionally formatted questions and to differentiate investment amounts were:

a) **Combined household superannuation balance:**
"Thinking about how much you and your partner currently have in superannuation, what do you think is the approximate total of all of your accounts? In other words, how much in total do you currently have in superannuation?"

b) **Total household income:**
"Now we'd like you to think about your current financial situation. Remember that we are not looking for exact answers - close enough is just fine.   Considering all of your sources of income (wages, bonuses, rent, interest, dividends, etc.), what is your best estimate of your combined household income last year before tax? You might remember what your tax assessment stated."

c) **Value of property at which you reside:**
"Thinking about the property that you currently live in. What, in your opinion, is the best price it would achieve if it were sold today?"

The researcher considered using one of the above as a single demographic piece of information (for example; household income) to select a uniform value for all questions, however, significant variations in the three were identified even within the participants during the pilot, and so an alternative approach was developed.

The selection of the amount used for each participant was based on relational information (from points 1, 2 or 3 above) and was potentially different for each investment option, that is, a single participant could have been asked to estimate future values for a $90,000 superannuation fund, a $180,000 share portfolio and $360,000 invested in a residential real estate property. The researcher decided to separate these amounts based on the three separate individual data points identified above, and to separate responses based on one of the five dollar-based values listed above ($90,000,

$180,000, $270,000, $360,000 and $450,000). A thorough review of the literature suggested that this is the first time this approach has been taken when identifying future value estimates across several different investment choices. However, based on the feedback from the pilot survey discussed, this original approach was chosen.

Once data was collected, it was consolidated into a new data set that combined all answers for each investment choice.

Superannuation: The data collected for conditional questioning expected returns for superannuation was combined household superannuation balance. The answer to the question shown below on the left in the table provided the value to be inserted into the conditional question on the right of the table.

Australian share market: The data collected for conditional questioning expected returns for Australian shares was combined household income. The answer to the question shown below on the left in the table provided the value to be inserted into the conditional question on the right of the table.

Table 5.1 – Conditional survey question to determine superannuation base value

Q 22 (singles) & Q23 (couples)	Q25 (a-e)
Thinking about how much you (and your partner) currently have in superannuation, what do you think is the approximate total of all of your accounts? In other words, how much **in total** do you currently have in superannuation?	If you inherited <$ Insert> today but could only invest it into a superannuation fund of your choice, what would you predict the approximate value might grow to in 10 years? Please ignore any future contributions
Less than $75,000 or "I don't know"	$90,000
$75,000 - $150,000	$180,000
$150,001 - $300,000	$270,000
$300,001 - $500,000	$360,000
More than $500,001	$450,000

Table 5.2 – Conditional survey question to determine Australian shares base value

Q16	Q28 (a-e)
Considering all of your sources of income (wages, bonuses, rent, interest, dividends, etc.), what is your best estimate of your combined household income last year before tax? You might remember what your tax assessment stated.	If you inherited a good quality, blue-chip portfolio of Australian shares worth <Insert> today, what would you predict the approximate value would grow to in 10 years? Please consider all dividends will be reinvested into more shares.
Less than $60,000 or "I don't know"	$90,000
$60,001 - $120,000	$180,000
$120,001 - $180,000	$270,000
$180,001 - $240,000	$360,000
More than $240,001	$450,000

Residential real estate: The data collected for conditional questioning expected returns for superannuation was the value of the property that the participant currently lived in. The answer to the question shown below on the left in the table provided the value to be inserted into the conditional question on the right of the table.

5.7 Administration of Online Survey

De Vaus (2014) suggests that there are four main methods of survey administration – face to face interviews, telephone interviews, postal self-administration surveys and internet surveys.

Table 5.3 – Conditional survey question to determine residential real estate base value

Q18	Q31 (a-e)
Thinking about the property that you currently live in. What, in your opinion, is the best price it would achieve if it were sold today?	If you purchased an investment property with a value of <Insert> today with the help of a mortgage (<Insert> of your own money as a deposit), what would you expect the approximate value to grow to in 10 years? Please ignore any rent that might be earned.
Less than $500,000 or "I don't know"	$400,000 ($310,000 mortgage and $90,000 deposit)
$500,001 - $750,000	$600,000 ($420,000 mortgage and $180,000 deposit)
$750,001 - $1,000,000	$800,000 ($530,000 mortgage and $270,000 deposit)
$1,000,001 - $1,500,000	$1,200,000 (840,000 mortgage and $360,000 deposit)
More than $1,500,001	$1,600,000 ($1,150,000 mortgage and $450,000 deposit)

While face to face interviews provide for reputable, good-quality data, they are expensive to undertake and may limit the number of respondents (de Vaus, 2014). Similarly, telephone interviews and postal self-administered surveys can be appropriate, especially if there is a discrete, identifiable and contactable sample to be surveyed (Dillman, Smyth, & Christiam, 2008).

Online surveys ensure that geography is not a barrier to completion, all respondents answer the identical question set and that respondents can answer in their own time. Additionally, contemporary survey software such as Qualtrics allows easily for conditional questions so that the survey can be manipulated to suit each respondent. This conditional questioning technique was utilised in this survey to provide for the individualisation of the questions on future investment return where answers to questions regarding household income, household superannuation balance and estimated value of residence were used to 'scale' the questions regarding future expected return.

Individualisation was identified as an issue in the pilot testing (as previously described) and was able to be rectified in the main survey.

In the broad field of financial decision-making and financial literacy in Australia, it has been typical to collect survey data from discrete populations such as University Staff or students for studies such as this (Beal & Delpachitra, 2003; Ntalianis, 2011) or through publicly funded mass access studies such as the HILDA survey (Ryan & Stone, 2016) or studies that require substantial financial resources with customised surveys (Agnew et al., 2013; Bateman et al., 2012). It was deemed that none of these approaches would answer the research questions adequately (Universities have a high proportion of superannuation members in defined benefit funds, the HILDA survey does not cater for questions as asked in this survey, and the financial resources were not available for mass-access customised surveys) and so a novel approach was developed.

As this was the first survey conducted to consider and analyse responses concerning investment risk in the context of investment returns (as perceived by investors), the research required responses from a broad cross-section of the community. Additionally, the research was investigating any relationships between respondents who used the services of a professional financial adviser/planner and those who did not. Because of this, surveys were distributed by a group of financial advisers/planners to their clients to allow the capture of data from this subgroup. The distribution method was a group email to their clients with a hyperlink to the Qualtrics survey site. The financial advisers/planners chosen were members of a professional group of boutique financial planners of which the author is a member. Other respondents were invited to participate through a combination of social media posts, short supportive articles on a significant blog site and a short article in the press about the need for participants for the survey. There was no explicit survey population due to the method of collection and so no 'rate of survey return' data will be provided.

5.8 Final Sample Responses

As has previously been discussed, response rates were not able to be determined due to the wide public distribution of the survey links. However, data was at least partially collected from 379 participants who clicked to accept the terms of the survey. On analysis of the collected responses, a large number of respondents had a significant number of questions unanswered, and of these, if meaningful questions were missing regarding

investment choices and expected return, the responses were excluded. Of those who answered at least the majority of questions, including investment choice and expected return and ad hoc missing data was dealt with, by the use of pair-wise analysis in SPSS software. The completed questions ranged from 260-280 respondents; however, we are unable to determine an absolute response rate.

5.9 Data File Development

The data file was developed as a means of conducting statistical analysis and was influenced by the type of data collected, how the research questions were posed and the testing requirements of the hypotheses. The survey was conducted through the online software 'Qualtrics™' (www.qualtrics.com) as provided by the sponsoring University which coded and stored the data as collected and provided a basic analysis of the data collection process (such as date and time collected). This software has limited analytical capabilities and so the data, once collected, was exported into Statistical Package for Social Sciences (SPSS) version 23 for a more detailed analysis. Before transferring to SPSS, the data was exported to MS Excel for visual assessment. MS Excel provides an easier preliminary view of the results so that obvious issues can be identified and then rectified later in SPSS. MS Excel is useful to perform some preliminary analysis but is not suitable for detailed statistical analysis (Goldwater, 2007). Once exporting to SPSS had been completed, the data was viewed again and screened for significant missing data and non-responses so that cases which had limited or no value to the results were excluded. For example, if the survey was started by a respondent, but no answers were provided to the meaningful questions regarding investment decision-making or expected returns, the respondent was excluded from the sample used for analysis (Pallant, 2013). While 379 respondents clicked to commence the survey, the number of respondents with meaningful answers was in the range from 260 - 280 depending on the question. Survey data was collected between 23rd January 2015 and 30th April 2015.

Missing Data

As discussed above, missing data has the potential to bias results and so needs to be identified (de Vaus, 2014). In some cases, missing data is incidental to the overall results if respondents fail to answer a small number of questions or if the questions they failed to answer are small in number. Missing data ranged from nil to 19 across different questions but maintained in the order of 250 – 260 completed responses in each question

of the survey. Missing data was applied as 'pairwise' throughout the analyses conducted in SPSS. Pallant (2013) suggests that 'pairwise' mode in SPSS allows for responses to be excluded as it relates to the data specifically being analysed.

5.10   Statistical Techniques

To answer the various hypotheses and the core research question, several statistical techniques were utilised. First, the responses were assessed using descriptive statistics so that a broad view could be developed and to ensure that any apparent anomalies could be identified. Frequencies were collated to assess the sample for matching to the population statistics, and cross-tabs were performed on a number of the responses to establish relationships. Means were compared, and t-tests were conducted to identify the relationship between two groups (for example investment choice framed with past performance versus investment choice framed with an expected future return. The results were regressed across a number of independent variables to establish the relationship between these variables.

Descriptive Statistics

Survey responses were counted to determine the most basic statistic of the sample, described as n (number) and then, as appropriate, the mean, median and mode were calculated. These basic statistics are used to confirm that there are no fundamental errors in the dataset, but descriptive statistics are also used to describe the sample for data analysis, check for violations of assumptions that may be applied to further statistical techniques and to address research questions (Pallant, 2013) specifically.

Standard deviation was calculated to assess how well the means summarised the range of answers. Histograms, including a line of best fit, were produced to identify whether the data followed a normal distribution of whether the results were skewed, whether the data followed a normal distribution, and to identify outliers within the dataset (Knapp, 2014). While descriptive statistics provide an overview of the dataset, they do not test hypotheses but rather ensure that the dataset is sound, and help form the process of analysis (Knapp, 2014).

5.10.2   Correlation Testing

Correlation testing allows for the identification of a relationship between variables. This relationship can be assessed based on both the strength of the relationship as well as the direction of the relationship (Pallant, 2013). Correlations range from -1 to +1, where a positive correlation suggests that one variable moves in scale in the same direction as another and vice-versa for the negative correlation. A correlation closer to 1 (either negative or positive) indicates a strong correlation, whereas a correlation closer to zero indicates a weak, or no, correlation.

5.10.3   Binary Logistic Regression

Logistic regression is often used when the dependent variable is categorical and is typically used to determine the strength of the predictiveness of a set of variables and further to identify the relevance of each specific variable (Pallant, 2013). The 'odds' of one independent variable influencing the outcome of the dependent variable is compared to it not influencing the same dependent variable, and the 'logs' of these odds are known as 'logits'(Hair, Black, Babin, & Anderson, 2014). This multi-variate methodology was used to determine the impact of independent variables on the investment preference of respondents after controlling for other factors.

All independent variables tested in this manner were re-coded as dummy variables as this is required for logistic regression as a basis for comparing categories against a reference outcome. For example, what is the impact on investment preference of respondents who have a relationship with a financial adviser as opposed to those who do not have a relationship with a financial adviser, or what is the impact on the same decision based on the gender of the respondent?

To ensure that the logit models are suitable for robust statistical testing, the number of cases per parameter should be between 10-20 as a minimum (Hair et al., 2014, p. 353).

5.10.4   Sensitivity testing and Robustness

Two techniques were utilised to test for sensitivity and robustness. The first was to identify the positive and negative predictive value of the logistic models developed where the values derived from the statistical analysis indicated the percentage of respondents who were accurately identified as representing the dependent variable. Pallant suggests

that this is an appropriate tool to test the robustness of the results from logistic regression (Pallant, 2013, p. 183) and has been used in other quantitative studies when assessing the impact of dependent variables on, for example, financial literacy (Hung et al., 2009). This technique, recommended by Hosmer et al. (2013), was performed for each of the six models developed and is undertaken by dividing the number of observed 'yes' responses into the total number of predicted 'yes' responses. The negative predictive value uses the reverse outputs in the same manner.

The second technique to test sensitivity was to enhance the levels of contrast within independent variables where data was available to do so (as in the case of age, household income and education level).

5.11   Limitations of Quantitative Research Methodology

A quantitative methodology allows for conclusions to be drawn from a random sample study of a population (Jerrim & De Vries, 2015); however, there are limitations to this methodology. The dataset obtained from this survey was small relative to the population. While the sample size does allow for analysis, a larger sample size would lead to more robust results. More generally, quantitative analysis can be effective at simplifying data to allow for conclusions to be drawn, but the simplification process can also lead to errors of interpretation (Atieno, 2009). Further criticism of the quantitative method is that it can produce 'sterile or unimaginative' information that is nevertheless factual and descriptive (de Vaus, 2014, p. 6).

5.12   Ethical Considerations

The primary focus of this thesis is the collection of personal data reflecting both demographic a well as personal opinions, because of this, there were ethical considerations regarding the collection and storage of data collected during the survey. There was no need to identify any respondent from the survey personally hence the survey was not formally distributed to a specific list of respondents and no identifying information was collected. In particular, the opening question requested that only participants over the age of 18 should complete the survey and there was no focus on the Australian Indigenous community. It is not a pilot study, nor does it form a part of a more extensive survey.

Identification and contact details of the researcher and supervisors were available at the beginning of the survey, as was the rationale of the study, the title of the thesis, confirmation of ethics approval and confirmation of anonymity was provided in the opening page of the survey and needed to be accepted before the survey could be accessed.

Notwithstanding the above, ethics approval was sought from the Human Research Ethics Committee at Victoria University, and the project was rated as low risk. Approval for the project was provided on 20th December 2014.

Access to the data was only available to the researcher, principal supervisor and co-supervisor and no external individuals or groups have or have had access to the data.

5.13   Conclusion

There is always a challenge when introducing a new direction in research, and the evolving use of technology, especially social media, within the community has allowed for novel approaches to respondent access. In this study, the focus is on identifying the extent that respondent beliefs influence their investment decision making by understanding the relationships between perceptions of risk and return and how framing the responses by past performance and expected future performance affected those choices. As an early-stage research in this area, a quantitative approach was taken. After a pilot survey was conducted, enhancements were made to the survey questions that were made possible by use of sophisticated survey software. Descriptive statistics, correlation testing and logistic regression techniques were applied to the resulting data to allow for conclusions to be reached.

In the next chapter we will discuss the data analysis and report on the results found.

6.   DATA ANALYSIS AND REPORTING

Introduction

The purpose of this chapter is to provide the analysis to investigate the research questions developed from the literature review, theoretical and conceptual frameworks. Section 6.2 starts with a review of the descriptive statistics obtained from the survey that provides some insight into the characteristics of the sample and the rationale for the specific demographics used for analysis, results from the financial literacy questions. Section 6.3 follows with a description of the results regarding perceptions of risk, past performance and expected future performance of the three investment alternatives considered. It will then move to inferential statistical analysis, commencing with an exploration of the relationships between a number of key variables of risk and return – with return framed as past performance as well as expected future performance. The results in this section have been controlled for the independent demographic variables.

Finally, section 6.4 discusses the logistic regression used to develop models that assess the contributions of each independent variable to the dependent variable of investment preference. Six models in total were developed to assess the probability of three (3) investment choices when framed as both past performance as well as expected future performance (2). The key results are:

- No relationship was found between the perception of risk and expected return
- Judgment of best past performing investment was <u>incorrect</u> in 61.5% of responses
- Perceived best past performance was found to influence the decision to invest by up to 5.8 times
- Expected future return was less influential than the perception of past performance
- Respondents were more accurately able to predict that expected future return was in line with past performance

6.2   Descriptive Statistics

Reviewing the descriptive statistics is an essential step before completing inferential statistics. So that we could develop an understanding of the sample of survey responses, descriptive statistics were analysed along the lines of the three question groupings: (1) Demographics, (2) Financial Literacy and (3) Investor Preferences and Beliefs.

Demographics

While several demographic variables were measured in the survey, six key demographic areas used for analysis in this research. These variables were:

a) Gender
b) Age
c) Education Level
d) Financially Advised
e) Financial Experience (employment or training)
f) Household Income

Of the six variables, three of the variables were naturally dichotomous (Gender: male/female; Financially Advised – yes/no; financial Experience – yes/no), although the other three were re-coded to enable dichotomous analysis. The three variables that were re-coded were based on raw data, as follows:

a) **Age:** Recoding was performed to create the bi-variate data '45 and under' and 'over 45'. In this way, the split between the groups reflected a ratio of 35:65

b) **Education Level:** Recoding was performed to create the bi-variate data 'Sub-University educated' and 'University educated'. The 'Sub-University category included high school, trade or diploma education levels, and the University category included bachelor's degrees and higher education degrees. In this way, the split between the groups reflected a ratio of 42:58

c) **Household Income:** Recoding was performed to create the bi-variate data 'less than or equal to $120,000' and 'more than $120,000'. In this way, the split between the groups reflected a ratio of 51:49

Table 6.1 provides frequency information regarding the key demographic details observed in the sample.

Table 6.1 – Summary table of demographic variables

		Number	Percentage
Gender	Male	140	53.2%
	Female	123	46.8%
	n=	263	
Age	45 and under	93	35.2%
	Over 45	171	64.8%
	n=	264	
Education	Sub-University educated	110	41.7%
	University educated	154	58.3%
	n=	264	
Financially Advised	Yes	123	46.9%
	No	139	53.1%
	n=	262	
Financial Experience	Yes	182	68.4%
	No	84	31.6%
	n=	266	
Household Income	Less than or equal to $120,000	135	50.8%
	More than $120,000	131	49.2%
	n=	266	

Country of birth and familial country of origin details were also collected; however, the responses were overwhelmingly skewed towards Australian born or Australian/UK Familial origins, and so these variables were not used for comparison groups or as controls. It was also identified that little meaningful information would be derived by analysing relationship status also and so this data was disregarded for the analysis.

6.2.2   Financial Literacy

Financial literacy of the respondents was assessed using survey questions developed in several studies conducted previously (Agnew et al., 2013; Lusardi, 2012; van Rooij et al., 2012) and include the 'big 3' questions used across studies to identify levels of financial literacy. The 'Big 3' questions include those about interest, inflation and diversification and a common question related to mortgage knowledge was also included as this was an element tested within the survey. The 'mortgage knowledge' question has been found in several financial literacy studies also (Agnew et al., 2013; OECD-INFE, 2011). Additionally, the researcher developed a single additional question to evaluate the influence of recent past performance on decision-making which is in-line with other researchers (see above) who have added specific questions to surveys of financial literacy.

More than 90% answered the questions related to interest and inflation correctly (see tables 6.2 and 6.3), and 75.2% answered the diversification question correctly (see table 6.4). The question regarding mortgage interest (table 6.5) was answered correctly by more than 82%. Regarding the additional question relating to the influence of past performance (table 6.6) of an investment, only 5.3% of participants answered that they would be less likely to invest in an investment that had performed 'much better than expected over the past two years. Based on mean reversion (Balvers & Wu, 2006; Becker, Lee, & Gup, 2012), the answer should have been 'less likely to invest' although slightly more than 50% answered that it would make them neither more or less likely to invest indicating some ambivalence to recent past performance. However, taking the level of correct responses to the 'big 3' questions as a guide, we can conclude that the sample group would be considered as a financially literate group. Because of the very high percentage of respondents who answered the questions correctly, financial literacy was not included as a dichotomous (or dummy) variable in further analysis due to the lack of a number of respondents who were 'not financially literate', and the results were likely to have been not meaningful.

Table 6.2 - Financial literacy - interest question

		Frequency	Per cent	Valid Percent	Cumulative Percent
	More than $102	240	90.2	91.3	91.3
	Exactly $102	4	1.5	1.5	92.8
Valid	Less than $102	15	5.6	5.7	98.5
	Don't know	4	1.5	1.5	100.0
	Total	263	98.9	100.0	
	Missing	3	1.1		
Total		266	100.0		

Source: SPSS Output

Table 6.3 - Financial literacy - inflation question

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	More than today	8	3.0	3.1	3.1
	Exactly the same as today	7	2.6	2.7	5.7
	Less than today	239	89.8	91.2	96.9
	Don't know	8	3.0	3.1	100.0
	Total	262	98.5	100.0	
	Missing	4	1.5		
Total		266	100.0		

Source: SPSS Output

Table 6.4 - Financial literacy - diversification question

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	True	11	4.1	4.2	4.2
	False	200	75.2	76.0	80.2
	Don't know	52	19.5	19.8	100.0
	Total	263	98.9	100.0	
	Missing	3	1.1		
Total		266	100.0		

Source: SPSS Output

Table 6.5 - Financial literacy - mortgage question

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	True	220	82.7	84.3	84.3
	False	26	9.8	10.0	94.3
	Don't know	15	5.6	5.7	100.0
	Total	261	98.1	100.0	
	Missing	5	1.9		
Total		266	266	100.0	

Source: SPSS Output

Table 6.6 - Influence of past performance

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	More likely to invest	111	41.7	42.0	42.0
	Less likely to invest	14	5.3	5.3	47.3
	Neither more likely or less likely to invest	139	52.3	52.7	100.0
	Total	264	99.2	100.0	
	Missing	2	.8		
Total		266	100.0		

Source: SPSS Output

6.2.3 Investor Preferences and Beliefs

When looking at investor preferences, it is important to remember that we are considering what respondents 'think' so that we can compare to actual. In this way, we will be able to identify if the respondent's beliefs are 'rational' insofar as they agree with either actual outcomes (past) or expected outcomes (future). In this section, we will consider five aspects of respondent beliefs as they apply to the three investment vehicles (Superannuation, Australian shares and residential real estate) used in this study:

- Perceptions of risk
- Perceptions of relative past performance (3 years)
- Preferred investment choice (framed by past performance)
- Expectations of future performance (10 years)
- Preferred investment performance (framed by future performance)

6.2.3.1 Perceptions of Risk

The relationship between risk and return of an investment is considered to be the basis of portfolio theory and are fundamental concepts in finance (Peirson et al., 2012). Modern Portfolio Theory, developed by Markowitz (Markowitz, 1952), theorised that any portfolio should provide an 'optimal' balance between risk and return. Markowitz defines risk as 'variance of return' which he describes as undesirable. Thus, he provided a method of measuring investment efficiency by comparing expected return to historical variance of that return. A low-risk investor (risk-averse) must be satisfied with low expected returns, while a high-risk investor should be rewarded with the potential for higher returns.

The research tested this approach in the context of an investor's 'perception' of risk to identify if the assumption that a lower risk investment is perceived as producing a lower return and vice-versa. Importantly, Markowitz also strongly argues that a diversified portfolio is always preferable to a non-diversified portfolio (Markowitz, 1952, p. 77) and empirically proves this to be the case. As previously described in earlier chapters and if this was the case, then an Australian Superannuation fund offering multi-asset class choices would offer the most diversified investment, Australian share portfolio (diversified within a single asset class) the second most diversified and residential real estate investment (a single asset or very small number of assets within a single asset class) the least diversified. The findings, as perceived by the participants, did not fully support that argument. Participants were asked to simply score their perception of the risk of the investment choice offered on a sliding scale of 1-100 with the results shown in table 6.7 below.

While the more diversified superannuation achieved the lowest mean risk score, there was no discernible difference between shares and residential real estate.

Table 6.7 – Perception of risk (1-100 scale)

		Perception of risk - super	Perception of risk - shares	Perception of risk - property
N	Valid	259	257	253
	Missing	7	9	13
Mean		43.49	49.41	49.58
Median		45.00	50.00	50.00
Std. Deviation		23.082	23.229	24.142

Source: SPPS output

90

6.2.3.2   Qualitative perspective on risk

Markowitz's theory (1952) is inherently a 'traditional' financial theory, and it is therefore important that we consider the 'behavioural' implications of risk ,in particular, the perception of risk by an individual as it applies to a specific investment choice.

To further investigate this result, respondents were asked to describe what they thought was the most significant risk for each of the investment options, and the text-based results were then divided into themes based on the responses. While the literature provides some guidance regarding the perception of risk (Bruno & Martin, 2009; Lippi, Barbieri, Piva, & De Bondt, 2018; Weber, Weber, & Nosić, 2013), this mainly relates to risk attitudes to choices regarding specific trading patterns or choices within a specific investment option. It is silent regarding perceptions of risk regarding the choices between the three options studied in this research and so the themes identified were based on the responses received by the survey respondents. These risk themes were:

a) Governance and management risk
b) Regulatory risk
c) Market risk
d) Understanding and knowledge risk

For the residential real estate investment option only, two more were added based on notable responses received:

a) Little or no risk perceived
b) Tenant related risk

Where multiple themes were identified within a single response, the first factor listed was recorded for statistical purposes, and these themes have been summarised below in table 6.8.

Governance and management risk were identified as significant factors where the respondents felt that the investment sector was poorly managed as a whole, where bad decisions could be made by managers and advisers or where the specific investment choice made could be poor. Typical of the responses included:

"Lack of trustworthy advice", "Getting the timing wrong and overpaying, then being locked in for years while the market recovers.", "Not understanding or having control over when specific assets within the managed fund are being sold, CGT being realised within the portfolio.", "Bad management within the organisation.", "Knowing the real facts about company finances".

Regulatory risk was identified as a significant factor where the respondents felt that a government or regulator could have a material impact on the outcome of the investment. Changes to existing laws or regulations would impact negatively for the investor. Typical of the responses included:

"Legislation Change and all the risks associated with the asset classes invested in.", "Government changing the rules", "Change of Government", "laws regarding such investments and tax benefits", "Government meddling".

Market risk was identified as a significant factor where the concern was more typically asset price-related, especially regarding price falls. This is a more 'traditional economic' concern as it relates to the overall return expected from the investment. Typical of the responses included:

"Market volatility", "Commodity prices", "World economy", "oversupply of apartments and influence of major infrastructure on the location", "Property slump", "World money instability due to political instability".

Understanding and knowledge risk was identified as a significant factor where respondents felt that they did not have what they perceived as the expert knowledge required to invest in this option successfully. Typical of the responses included:

"Inadequate knowledge of the market and general economic development", " Lack of knowledge", "Lack of understanding of how to make the investment work for tax purposes", "Inadequate knowledge of the market and general economic development".

Little or no risk perceived was identified amongst some respondents but only in the responses related to residential real estate. While the number of respondents who answered in this way was relatively small, it seemed interesting to at least record these specific responses. Typical of the responses included:

"Not a huge risk if you are not highly in debt. Provided you can ride out a downturn in the market and don't need to sell, you should be ok.", "Whilst it may go up and down it seems more solid", "Real Estate always grows but can change with dips and rises in a country's economy", "Reasonably safe over the long term", "guaranteed rental returns", "I think it has the least risk as far as any investment is concerned" "Property always increases, albeit slow, you are likely not to lose", "None".

Tenant related risks were explicitly identified as a risk factor for residential real estate investment, and many respondents identified this as their primary risk involved in this type of investment. Typical of the responses included:

"problems with tenants wrecking place or not paying rent", "damage to property", "Unable to rent out - no rental income", "Bad tenants - the destruction of your property by others", "lack of tenants, abuse by tenants, damage to property, changes to the area for the worst".

Of the six identified risks above, only market risk relates to the neo-classical concept of risk yet even within responses from this section were more likely to be 'risk of losing money' than volatility related. Table 6.8 below identifies the percentage of respondents who identified the primary risk of each of the investment choices. We can see that participants suggest that 'market risk' is the main risk considered in each investment choice, but there are significant numbers who felt other risks were more important.

Table 6.8 - Summary of Responses – Qualitative perspective of 'risk'.

Response Category	Superannuation	Australian Shares	Residential Real Estate
Governance	33.5%	13.7%	14.5%
Regulatory	11.7%	2.1%	3.8%
Market	50.9%	77.3%	59.6%
Understanding	3.9%	6.9%	2.6%
Little or No Risk	0.0%	0.0%	8.1%
Tenant	n/a	n/a	11.5%
Total	**100.0%**	**100.0%**	**100.0%**

Source: Survey Results

6.2.3.3 Perceptions of relative past performance (3 years)

While the past performance of an investment is not indicative of future performance (indeed Australian corporate regulators make it mandatory to provide a statement to that effect whenever past performance is discussed in any advertising material), this research is investigating the potential impact that perception of past performance has on investment decision-making.

When looking at investor preferences, it is essential to remember that we are considering what respondents 'think' was the best performance. We will then be able to draw a comparison between what 'was' the best-performed investment and what was 'thought to be' the best-performed investment.

There is no standard measure of 'short-term' versus 'long-term' with regards to investment time frames. The survey questions reflected both a 'shorter-term' (3 year) time frame as well as a 'longer-term' (20 year) time frame to identify if there was a difference

in the perception of 'best-performed' investment. To test perceptions over a 'shorter' (past three years) period versus a longer (past twenty years) period, both periods were evaluated in the survey to identify in a difference was found. Indeed, there was a correlation between the two time periods regarding the perception of the best performer. Table 6.9 identifies these results.

Table 6.9 - 3 year past performance perception vs 20 year past performance perception

Best 3 Year Past Performance * Best 20 Year Past Performance Crosstabulation

			Best 20 Year Past Performance			
			Superannuation	Australian Shares	Residential Real Estate	Total
Best 3 Year Past Performance	Superannuation	Count	19	15	27	61
		% within Best 20 Year Past Performance	50.0%	17.2%	23.5%	25.4%
	Australian Shares	Count	8	49	34	91
		% within Best 20 Year Past Performance	21.1%	56.3%	29.6%	37.9%
	Residential Real Estate	Count	11	23	54	88
		% within Best 20 Year Past Performance	28.9%	26.4%	47.0%	36.7%
Total		Count	38	87	115	240
		% within Best 20 Year Past Performance	100.0%	100.0%	100.0%	100.0%

Symmetric Measures

		Value	Asymptotic Standardized Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.357			.000
	Cramer's V	.253			.000
Interval by Interval	Pearson's R	.192	.069	3.026	.003[c]
Ordinal by Ordinal	Spearman Correlation	.187	.067	2.934	.004[c]
N of Valid Cases		240			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Table 6.10 provides a summary of the results, which shows that 61.5% of the respondents incorrectly estimated the best past performing investment from the choices offered.

Given that there was a very material difference between the past performance of the best (Australian shares = 14.9%) and the others (Superannuation = 8.6% and Residential real estate = 4.6%/7.9%) this is a surprising result. This provides some early evidence that respondents exhibited a bias towards their already preferred investment option by assuming that the returns for this option were superior to the other choices.

Table 6.10 – Summary of past three-year performance (belief versus actual)

Investment Option	Believed this was the best past three-year performer	Actual return for past three-years	Rank
Superannuation	25.1%	8.6%	2
Australian shares	38.5%	14.9%	1
Residential real estate	36.4%	4.6% (all capital cities)	3
		7.9% (Sydney/Melbourne)	3

(ABS, 2017b; APRA, 2017; Investments, 2013, 2014, 2015)

6.2.3.4   Choice of investment framed by past performance

Immediately after asking respondents to select what they believed to be the best performing investment from the three choices offered, they were asked to select their preferred investment (see Table 6.11). No direction was provided to the respondents regarding this selection as the research aimed to identify their investment preference when framed by past performance. The results closely matched the proportion of respondent's perception regarding past performance. This relationship supports the answer to the additional financial literacy question regarding propensity to invest in investments that have performed 'better than expected' over the past few years.

6.2.3.5   Expectations of future performance (10 years)

The survey asked participants to estimate the future value of a specific opening value of each of the three investment choices (Superannuation, Australian Shares and Residential Real Estate) in ten years. As has been previously discussed, the pilot survey identified an unwillingness to make a simple dollar-based estimation, and so seven options were provided from which participants could choose. Additionally, to avoid creating the impression that there was a specific 'correct' answer, modest ranges either side of results that represent 0% -12% returns (0%, 2%, 4%, 6%, 8%, 10% & 12%) were offered. An example of the survey question is provided below in Table 6.12, but please note that the percentage figures were not included in the question. The researcher considered including a negative return as an option, however, a thorough review of historical returns (DFA_Australia, 2019) since the mid-1970s found no negative 10-year periods and so it was decided that a zero return over ten years would act as an effective proxy.

Table 6.11 - Preferred investment choice (framed by past performance)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Superannuation	70	26.3	26.9	26.9
	Australian shares	102	38.3	39.2	66.2
	Residential real estate	88	33.1	33.8	100.0
	Total	260	97.7	100.0	
Missing	Missing	6	2.3		
Total		266	100.0		

Source: SPSS Output

Furthermore, and as has also been previously described in chapter 4, the value chosen as the initial value of the investment was based individually on total estimated household superannuation balance (Superannuation basis), total estimated household income (Australian Share basis) and estimated current residential property value (Residential Real Estate basis). The Qualtrics survey software used in this research allowed for conditional formatting so that the amounts chosen in the survey question (as presented in Tables 5.1 – 5.3) could be customised to reflect the respondents' current financial circumstances. This was done based on pilot testing that suggested a single investment value for all participants added an unexpected qualitative component that could skew the results. This element was, as an example, if a residential property value were significantly lower or higher than the value of the respondent's residence, they would see the 'quality' of the property as inferior or superior, and this would affect their view on future performance. By aligning the values used more towards the respondents' personal experience, this potential bias would be overcome. The range of values were grouped in $90,000 increments and so the questions provided for opening values of $90,000, $180,000, $270,000, $360,000 and $450,000. These amounts were increased to reflect residential property prices in Australia and so were increased to reflect a 70% gearing ratio through the suggested additions of a mortgage.

The results were the basis for estimating the expected return (10 years) for the three investment choices (see Table 6.12).

Importantly, the survey instructions identified that Superannuation option should ignore any future additional contributions, Australian Shares option should regard that all dividends would be re-invested as consistent with the ASX 300 Total Return Index and that Residential Real Estate option should ignore rent and consider only the property value

in determining the future value of the investment choice. The results of the respondent estimates for the next ten years are presented in Table 6.13:

Table 6.12 – Example expected future return question

"If you inherited $180,000 today but could only invest it into a superannuation fund of your choice, what would you predict the approximate value would grow to in 10 years' time? Please ignore any future contributions."

Response	Answer	Midpoint $ value	Approximate Midpoint return %
1	Between $160,000 - $200,000	$180,000	0%
2	Between $200,000 - $245,000	$222,500	2%
3	Between $245,000 - $290,000	$267,500	4%
4	Between $290,000 - $355,000	$322,500	6%
5	Between $355,000 - $425,000	$390,000	8%
6	Between $425,000 - $505,000	$465,000	10%
7	Between $505,000 - $610,000	$557,500	12%

Table 6.13 – Summary of expected 10-year future returns

Investment Option	n	Mean	Mode	Standard Deviation
Superannuation	262	5.39%	8.00%	2.85%
Australian Shares	262	6.30%	8.00%	2.87%
Residential Real Estate	262	4.73%	4.00%	2.46%

Source: SPSS Output

Data was sourced from the ASX/Russell investments annual survey of asset class returns (ASX/Russell_Investments, 2011, 2012, 2013, 2014, 2015, 2016)and the results were averaged over the five years to 2015. Table 6.14 below summarises the similarities and differences between perceptions of past performance held by respondents and the actual figures as described in the ASX/Russell results. The historical time frame used reflects the period, including the global financial crisis of 2007-2009.

Table 6.14 – Comparison of past performance to expected future return

Investment Choice	ASX/Russell	Survey (Mean)	Survey (Mode)
Superannuation	6.04%	5.39%	8.00%
Australian Shares	7.94%	6.30%	8.00%
Residential Real Estate	7.54%	4.73%	4.00%

Source: SPSS Output

The results suggest that survey participants predicted the future 10-year returns within one standard deviation of the historical returns for both Superannuation and Australian Shares but were materially different regarding Residential Real Estate. We know that Residential Real Estate investments must carry an element of affordability in

their returns as a rise in property values above wages growth reduces the ability of investors (and owner-occupiers) to afford the purchase and so an actual 10-year return for Residential Real Estate of 7.54% is high. Inflation over the same 10-year time period as measured above (and using the same approach of averaging the 10-year results) yields an inflation average of 2.82%. The ASX/Russell results do not measure wages growth, and so the inflation figures only tell a part of the story. However, even wages growth as measured by Average Weekly Ordinary Times Earnings (AWOTE) was only 3.2% for the same period (ABS, 2017a) which suggests that participants recognise a period of higher than expected performance and may have adapted their expectations of future returns. This is an area that would require further research.

To help identify the dispersion of the results, histograms of the distribution of returns are provided below in Figure 6.1.

Figure 6.1 – Histogram description of expected future returns
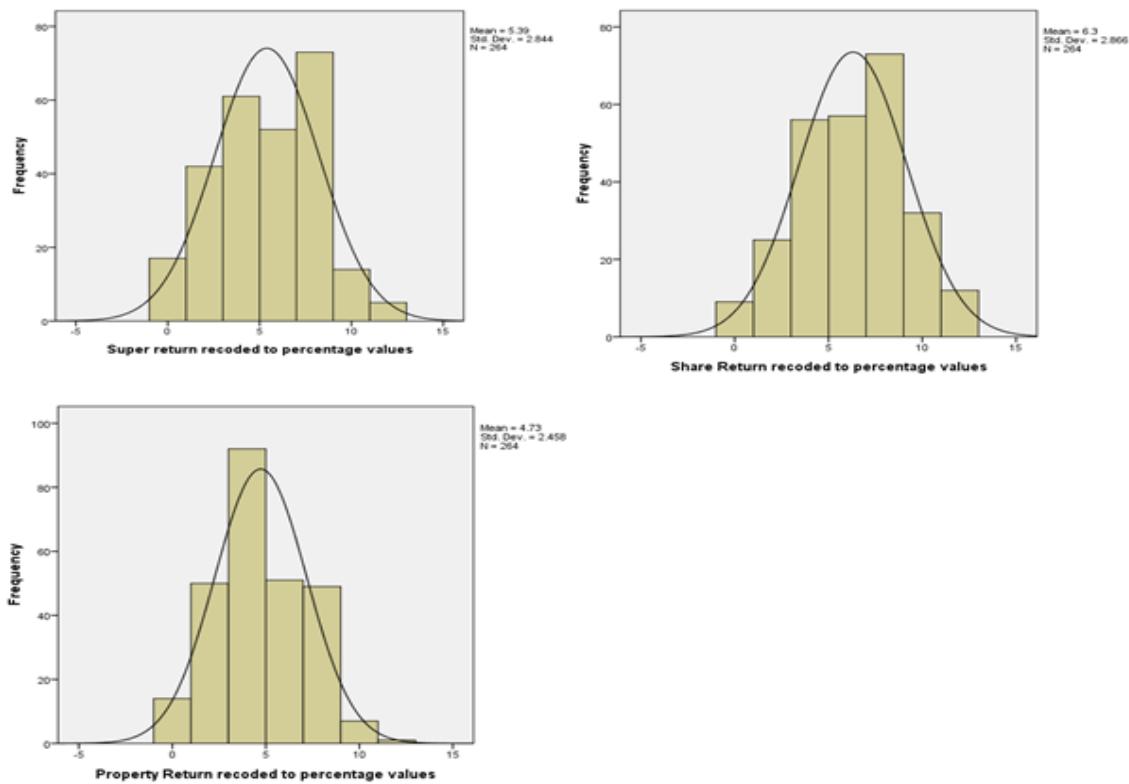
6.2.3.6   Choice of investment framed by future performance

Immediately after asking respondents to select what they believed to be the expected future investment returns of the three choices offered, they were asked to select their preferred investment again (see table 6.15).

No direction was provided to the respondents regarding this selection as the research aimed to identify their investment preference when framed by future performance. The results closely matched the proportion of respondents' perception regarding expected future performance.

Table 6.15 - Preferred investment choice (framed by future performance)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Super fund of your choice	88	33.1	33.5	33.5
	Blue-chip share portfolio	127	47.7	48.3	81.7
	Residential investment property	48	18.0	18.3	100.0
	Total	263	98.9	100.0	
Missing	System	3	1.1		
Total		266	100.0		

Source SPSS data

6.3   Crosstabulations and Inferential Statistics

In the previous section, we considered the descriptive statistics of the data obtained from the online survey. This provided an overview of the results obtained except for comparing expectations around 3-year and 20-year returns and comparative risks of investment types. In this section, we will conduct a statistical analysis of the results to investigate relationships between perceptions of risk and perceptions of investment returns with investment preferences to test the research assertions.

Relationship between Perceived Risk and Expected Return

Testing the relationship between the expected return of the three investment choices, with participants' perception of risk was performed by comparing responses in two ways.

Initially, a scatterplot was developed to identify the general shape of the relationship. Scatterplot was chosen as the variables were both scale (interval) variables, and the number of options was high (expected return = 7, risk = 100). In these circumstances, a scatterplot is a recommended manner to analyse data (de Vaus, 2014). This is not the expected result as investment return, and investment risk is considered to be related in a positively correlated manner. The figures describe the results where the

line of best fit is slightly downward sloping; however, the scatterplots in Figure 6.2 show no linear relationship between risk and expected return for any of the three investment choices. choices.

The survey asked respondents to estimate the future value of each of the three investment choices ten years in the future. As has been previously discussed, the pilot survey identified an unwillingness to make a simple estimation, and so seven options were provided from which participants could choose. Additionally, to avoid creating the impression that there was a specific 'correct' answer, modest ranges either side of results that represent 0% -12% returns (0%, 2%, 4%, 6%, 8%, 10% & 12%) were offered. The results were the basis for estimating the expected return (10 years) for the three investment choices. The sliding scale (1-100) was used to prepare a scatterplot to visually identify any relationship between expected return and perception of risk and in particular to compare to the expected upward sloping curve expected under modern portfolio theory.

Figure 6.2 below identifies that there is a lack of the traditional 'cigar' shaped scatterplot expected in a traditional risk and return graph. Indeed, the expected upward sloping curve does not exist at all for any of the three investment options considered. All three options display a slightly downward sloping line of best fit, showing that the expected relationship between risk and return was not found.

Importantly, the traditional measure of risk is the volatility of an investment, but here we are examining actual investors' beliefs regarding risk and not a mathematical measure and so, for the first time, we are considering the impact of what investors think of the risk of investing in different investment options.

To confirm the results, the data was then consolidated into smaller sub-groups (expected return = 3, risk = 5) and cross-tabulation was conducted (see Tables 6.16 (a),(b) & (c)). Expected return was recoded so that expectations of 0%, 2% and 4% were re-classified as 'low', expected returns of 6% and 8% were re-classified as medium and expected returns of 10% and 12% were re-classified as high. Risk scores were re-coded to quintiles.

Figure 6.2 – Scatterplots of perceived risk and expected return (incorporating line of best fit)
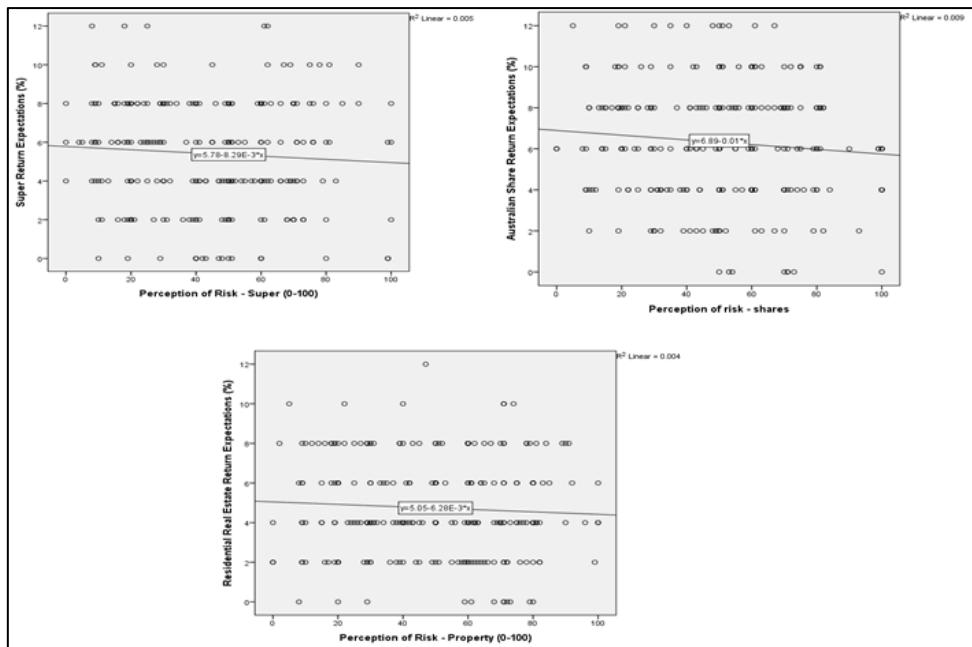
Table 6.16 (a) – Crosstabulation: Super 3 categories return and 5 categories risk

Super expected return 3 categories * Perception of risk Super Quintiles Crosstabulation

			Perception of risk Super Quintiles					Total
			Very Low	Low	Average	High	Very High	
Super expected return 3 categories	Low	Count	12	13	19	10	3	57
		% of Total	4.7%	5.1%	7.4%	3.9%	1.2%	22.3%
	Medium	Count	40	42	59	32	7	180
		% of Total	15.6%	16.4%	23.0%	12.5%	2.7%	70.3%
	High	Count	6	3	1	7	2	19
		% of Total	2.3%	1.2%	0.4%	2.7%	0.8%	7.4%
Total		Count	58	58	79	49	12	256
		% of Total	22.7%	22.7%	30.9%	19.1%	4.7%	100.0%

Symmetric Measures

		Value	Asymptotic Standardized Error[a]	Approximate T[b]	Approximate Significance
Interval by Interval	Pearson's R	.013	.069	.205	.838[c]
Ordinal by Ordinal	Spearman Correlation	.009	.067	.141	.888[c]
N of Valid Cases		256			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Table 6.16 (b) – Crosstabulation: Shares 3 categories return and 5 categories risk

Shares expected return 3 categories * Perception of risk Shares Quintiles Crosstabulation

| | | | Perception of risk Shares Quintiles | | | | | |
			1	2	3	4	5	Total
Shares expected return 3 categories	Low	Count	2	6	13	9	3	33
		% of Total	0.8%	2.3%	5.1%	3.5%	1.2%	12.8%
	Medium	Count	29	36	61	38	17	181
		% of Total	11.3%	14.0%	23.7%	14.8%	6.6%	70.4%
	High	Count	7	8	15	11	2	43
		% of Total	2.7%	3.1%	5.8%	4.3%	0.8%	16.7%
Total		Count	38	50	89	58	22	257
		% of Total	14.8%	19.5%	34.6%	22.6%	8.6%	100.0%

Symmetric Measures

		Value	Asymptotic Standardized Error[a]	Approximate T[b]	Approximate Significance
Interval by Interval	Pearson's R	-.068	.058	-1.095	.274[c]
Ordinal by Ordinal	Spearman Correlation	-.062	.059	-.997	.320[c]
N of Valid Cases		257			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Table 6.16 (c) – Crosstabulation: Property 3 categories return and 5 categories risk

Property expected return 3 categories * Perception of risk Property Quintiles Crosstabulation

| | | | Perception of risk Property Quintiles | | | | | |
			1	2	3	4	5	Total
Property expected return 3 categories	Low	Count	13	10	13	22	3	61
		% of Total	5.1%	4.0%	5.1%	8.7%	1.2%	24.1%
	Medium	Count	28	46	42	52	17	185
		% of Total	11.1%	18.2%	16.6%	20.6%	6.7%	73.1%
	High	Count	1	2	1	3	0	7
		% of Total	0.4%	0.8%	0.4%	1.2%	0.0%	2.8%
Total		Count	42	58	56	77	20	253
		% of Total	16.6%	22.9%	22.1%	30.4%	7.9%	100.0%

Symmetric Measures

		Value	Asymptotic Standardized Error[a]	Approximate T[b]	Approximate Significance
Interval by Interval	Pearson's R	.011	.063	.180	.857[c]
Ordinal by Ordinal	Spearman Correlation	.006	.063	.102	.919[c]
N of Valid Cases		253			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

These results identify a behavioural influence on perceptions of risk and return where respondents in this survey appear to believe that there is no direct relationship between risk and return and therefore that high investment returns can exist with low risk and also that low investment returns may come with high risk. Remembering that risk in this survey is not measured in a traditional manner rather as a simple perception from the participant, it seems that the expectation of return may be influential in how respondents perceive the risk of the particular investment choice. This is certainly an effect that may benefit from further investigation and supports findings by Antonides and Van Der Sar (1990). As a final test, Pearson's R correlations show no relationship between return and risk (see Table 6.17).

Table 6.17 – Correlation testing for risk and return

Investment Choice	Pearson's r	Spearman's Correlation
Superannuation	.013	.009
Australian Shares	-.068	-.062
Residential Real Estate	.011	.006

6.3.2   Relationship between perceived risk and preferred investment (framed by past performance)

The previous section considered the relationship between perceived risk and the expected return of each of the three investment choices. In this section, we will investigate the relationship between perceived risk and preferred investment of each investment choice. In other words, do those who prefer one investment option have a different perception of risk than those who prefer another investment option.

We perform the first part of this analysis by comparing the perception of risk by those who preferred each investment option in turn with the perception of risk who preferred 'other' when framed by past performance. Table 6.18 shows the mean scores for each option are persistently lower for respondents who chose that option; however, we cannot establish from the data whether, or which way, causality occurs.

Table 6.18 – Mean risk scores raw data preferred versus prefer other

Investment Type	Choice of investment	Mean risk score
Superannuation	Prefer superannuation	40.54
	Prefer other than superannuation	44.73
Australian Shares	Prefer Australian shares	45.17
	Prefer other than Australian shares	52.52
Residential real estate	Prefer residential real estate	46.09
	Prefer other than residential real estate	52.07

So that significant difference can be identified, further analysis was conducted using a Mann-Whitney U test which is suitable when the research is comparing two groups (preferred investment vs preferred other) and when using a continuous measure (Pallant, 2013, p. 235).

Superannuation: The Mann-Whitney U test revealed no significant difference in perceived risk score for respondents who preferred superannuation (Md = 47.0, n = 67) and those who preferred other than superannuation (Md = 41.0, n = 186), U = 5602, z = -1.225, sig = .221, r = 0.08. The effect is small (0.1 = small) according to Cohen's (1988) methodology.

Australian shares: The Mann-Whitney U test revealed that there was statistical significance in perceived risk score for respondents who preferred Australian shares (Md = 48.0, n = 96) and those who preferred other than Australian shares (Md = 50.0, n = 155), U = 6265, z = -2.104, sig = .03, r = 0.08. The effect is small (0.13 = small).

Residential real estate: The Mann-Whitney U test approaches statistical significance in perceived risk score for respondents who preferred residential real estate (Md = 45.0, n = 86) and those who preferred other than residential real estate (Md = 57.0, n = 161), U = 6028, z = -1.674, sig = .09, r = 0.08. The effect is small (0.11 = small).

6.3.3 Relationships between investment preference framed with perceived best past performance

Having now considered the impact of preferred investment on the perception of risk, we now look at the relationship between past performance and an individual's preferred investment. Remembering that Australian government regulators (ASIC) insist on warnings that past performance should not be relied upon in investment selection, the research was interested in whether these warnings were effective and if not, whether there were any groups (described by the independent variables below) who were particularly affected. Key factors were examined to identify if there was a direct relationship between demographic and background characteristics and preferred investment. Crosstabulations were conducted to identify any demographic factors that may have influenced investment preference and results were controlled for six independent variables as shown below in Table 6.19:

Table 6.19 – independent variables

Variables		
Gender	Male	Female
Age	45 and Under	Over 45
Education	Sub-University Education	University Education
Financially Advised	Current Relationship with Financial Adviser	No Current Relationship with Financial Adviser
Financial Experience	Employed or Formal Training in Finance	Not Employed or Formal Training in Finance
Household Income	Less than or equal to $120,000	Greater than $120,000

Table 6.20 shows that for both male and female groups separately, there was a moderate, statistically significant, relationship between the judgment of best previous 3-year return and most preferred investment for all three investment choices (Male: Phi = 0.45; p = 0.001; Female: Phi = 0.38; p = 0.002)

For the male group (n = 131):

- 53% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.

- 54% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 56% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

For the Female group (n = 112):

- Only 37% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 58% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 57% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

The congruence between the judgment of best past return and propensity to invest was stronger for the male group regarding superannuation, but no gender difference regarding the other two. Regarding the Superannuation choice, there was a much lower level of support for past performance amongst female participants.

Table 6.20 – Preferred investment, past performance (Gender Controlled)

Preferred Investment Choice Past Performance * Best 3 Year Past Performance Recoded * Gender Crosstabulation

| Gender | | | | Best 3 Year Past Performance Recoded | | | Total |
				Superannuation	Australian Shares	Residential Real Estate	
Male	Preferred Investment Choice Past Performance	Superannuation	Count	18	15	7	40
			% within Best 3 Year Past Performance Recoded	52.9%	26.8%	17.1%	30.5%
		Australian shares	Count	10	30	11	51
			% within Best 3 Year Past Performance Recoded	29.4%	53.6%	26.8%	38.9%
		Residential real estate	Count	6	11	23	40
			% within Best 3 Year Past Performance Recoded	17.6%	19.6%	56.1%	30.5%
	Total		Count	34	56	41	131
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Female	Preferred Investment Choice Past Performance	Superannuation	Count	10	6	8	24
			% within Best 3 Year Past Performance Recoded	37.0%	15.8%	17.0%	21.4%
		Australian shares	Count	10	22	12	44
			% within Best 3 Year Past Performance Recoded	37.0%	57.9%	25.5%	39.3%
		Residential real estate	Count	7	10	27	44
			% within Best 3 Year Past Performance Recoded	25.9%	26.3%	57.4%	39.3%
	Total		Count	27	38	47	112
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Total	Preferred Investment Choice Past Performance	Superannuation	Count	28	21	15	64
			% within Best 3 Year Past Performance Recoded	45.9%	22.3%	17.0%	26.3%
		Australian shares	Count	20	52	23	95
			% within Best 3 Year Past Performance Recoded	32.8%	55.3%	26.1%	39.1%
		Residential real estate	Count	13	21	50	84
			% within Best 3 Year Past Performance Recoded	21.3%	22.3%	56.8%	34.6%
	Total		Count	61	94	88	243
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%

Preferred Investment Choice Past Performance * Best 3 Year Past Performance Recoded * Gender Crosstabulation

Gender				Best 3 Year Past Performance Recoded			Total
				Superannuation	Australian Shares	Residential Real Estate	
Male	Preferred Investment Choice Past Performance	Superannuation	Count	18	15	7	40
			% within Best 3 Year Past Performance Recoded	52.9%	26.8%	17.1%	30.5%
		Australian shares	Count	10	30	11	51
			% within Best 3 Year Past Performance Recoded	29.4%	53.6%	26.8%	38.9%
		Residential real estate	Count	6	11	23	40
			% within Best 3 Year Past Performance Recoded	17.6%	19.6%	56.1%	30.5%
	Total		Count	34	56	41	131
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Female	Preferred Investment Choice Past Performance	Superannuation	Count	10	6	8	24
			% within Best 3 Year Past Performance Recoded	37.0%	15.8%	17.0%	21.4%
		Australian shares	Count	10	22	12	44
			% within Best 3 Year Past Performance Recoded	37.0%	57.9%	25.5%	39.3%
		Residential real estate	Count	7	10	27	44
			% within Best 3 Year Past Performance Recoded	25.9%	26.3%	57.4%	39.3%
	Total		Count	27	38	47	112
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Total	Preferred Investment Choice Past Performance	Superannuation	Count	28	21	15	64
			% within Best 3 Year Past Performance Recoded	45.9%	22.3%	17.0%	26.3%
		Australian shares	Count	20	52	23	95
			% within Best 3 Year Past Performance Recoded	32.8%	55.3%	26.1%	39.1%
		Residential real estate	Count	13	21	50	84
			% within Best 3 Year Past Performance Recoded	21.3%	22.3%	56.8%	34.6%
	Total		Count	61	94	88	243
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%

Symmetric Measures

Gender			Value	Approximate Significance
Male	Nominal by Nominal	Phi	.450	.000
		Cramer's V	.318	.000
	N of Valid Cases		131	
Female	Nominal by Nominal	Phi	.384	.002
		Cramer's V	.271	.002
	N of Valid Cases		112	
Total	Nominal by Nominal	Phi	.420	.000
		Cramer's V	.297	.000
	N of Valid Cases		243	

6.3.3.2 Controlled for age (45 and under/over 45)

Table 6.21 shows that for the 45 and under group, there was a moderate, statistically significant, relationship between the judgment of best previous 3-year return and most preferred investment for all three investment choices (45 and under: Phi = 0.33; p = 0.04).

The over 45 group showed a stronger, statistically significant relationship (Over 45: Phi = 0.49; p = 0.001)

For the 45 and under group (n = 90):

- 37% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 47% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 60% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

For the over-45 group (n = 154):

- 50% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 60% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 56% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

The congruence between the judgment of best past return and propensity to invest appeared to be noticeably different between the two groups regarding superannuation and Australian shares but was quite similar for residential real estate. Younger participants could likely perceive the time until being able to access superannuation (preservation age of 60) could have acted as a deterrent to their preference. Conversely, a geared residential investment property may have a similar disincentive for those over 45, yet there was a high level of congruence in this category.

Table 6.21 – Preferred investment, past performance (Age Controlled)

Preferred Investment Choice Past Performance * Best 3 Year Past Performance Recoded * Age two categories Crosstabulation

Age two categories				Superannuation	Australian Shares	Residential Real Estate	Total
				Best 3 Year Past Performance Recoded			
Under 45	Preferred Investment Choice Past Performance	Superannuation	Count	7	6	3	16
			% within Best 3 Year Past Performance Recoded	36.8%	16.7%	8.6%	17.8%
		Australian shares	Count	6	17	11	34
			% within Best 3 Year Past Performance Recoded	31.6%	47.2%	31.4%	37.8%
		Residential real estate	Count	6	13	21	40
			% within Best 3 Year Past Performance Recoded	31.6%	36.1%	60.0%	44.4%
	Total		Count	19	36	35	90
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Over 45	Preferred Investment Choice Past Performance	Superannuation	Count	21	15	12	48
			% within Best 3 Year Past Performance Recoded	50.0%	25.9%	22.2%	31.2%
		Australian shares	Count	14	35	12	61
			% within Best 3 Year Past Performance Recoded	33.3%	60.3%	22.2%	39.6%
		Residential real estate	Count	7	8	30	45
			% within Best 3 Year Past Performance Recoded	16.7%	13.8%	55.6%	29.2%
	Total		Count	42	58	54	154
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Total	Preferred Investment Choice Past Performance	Superannuation	Count	28	21	15	64
			% within Best 3 Year Past Performance Recoded	45.9%	22.3%	16.9%	26.2%
		Australian shares	Count	20	52	23	95
			% within Best 3 Year Past Performance Recoded	32.8%	55.3%	25.8%	38.9%
		Residential real estate	Count	13	21	51	85
			% within Best 3 Year Past Performance Recoded	21.3%	22.3%	57.3%	34.8%
	Total		Count	61	94	89	244
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%

Symmetric Measures

Age two categories			Value	Approximate Significance
Under 45	Nominal by Nominal	Phi	.336	.038
		Cramer's V	.238	.038
	N of Valid Cases		90	
Over 45	Nominal by Nominal	Phi	.492	.000
		Cramer's V	.348	.000
	N of Valid Cases		154	
Total	Nominal by Nominal	Phi	.424	.000
		Cramer's V	.300	.000
	N of Valid Cases		244	

6.3.3.3   Controlled for Education

Table 6.22 shows that for both the Sub-university education group and the University education group, there was a moderately strong, statistically significant, relationship between the judgment of best previous 3-year return and most preferred investment for

all three investment choices (Sub-university education group: Phi = 0.50; p = 0.001, University education group: Phi = 0.41; p = 0.001).

For the Sub-university group (n = 101):

- 42% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 52% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 68% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

For the University group (n = 143):

- 49% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 58% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 52% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

The congruence between the judgment of best past return and propensity to invest appeared to be similar between the two groups regarding superannuation and Australian shares but was quite different for residential real estate (68% Sub University vs 52% for University group). There is nothing in the literature that would suggest why this is the case and indeed when comparing, within this survey, differences in education level and the 'influence of past performance' question there was no discernible difference between the groups.

Table 6.22– Preferred investment, past performance (Education Controlled)

Preferred Investment Choice Past Performance * Best 3 Year Past Performance Recoded * Education recoded 2 level Crosstabulation

Education recoded 2 level				Superannuation	Australian Shares	Residential Real Estate	Total
Sub University Education	Preferred Investment Choice Past Performance	Superannuation	Count	11	13	4	28
			% within Best 3 Year Past Performance Recoded	42.3%	29.5%	12.9%	27.7%
		Australian shares	Count	10	23	6	39
			% within Best 3 Year Past Performance Recoded	38.5%	52.3%	19.4%	38.6%
		Residential real estate	Count	5	8	21	34
			% within Best 3 Year Past Performance Recoded	19.2%	18.2%	67.7%	33.7%
	Total		Count	26	44	31	101
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Univesity Education	Preferred Investment Choice Past Performance	Superannuation	Count	17	8	11	36
			% within Best 3 Year Past Performance Recoded	48.6%	16.0%	19.0%	25.2%
		Australian shares	Count	10	29	17	56
			% within Best 3 Year Past Performance Recoded	28.6%	58.0%	29.3%	39.2%
		Residential real estate	Count	8	13	30	51
			% within Best 3 Year Past Performance Recoded	22.9%	26.0%	51.7%	35.7%
	Total		Count	35	50	58	143
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Total	Preferred Investment Choice Past Performance	Superannuation	Count	28	21	15	64
			% within Best 3 Year Past Performance Recoded	45.9%	22.3%	16.9%	26.2%
		Australian shares	Count	20	52	23	95
			% within Best 3 Year Past Performance Recoded	32.8%	55.3%	25.8%	38.9%
		Residential real estate	Count	13	21	51	85
			% within Best 3 Year Past Performance Recoded	21.3%	22.3%	57.3%	34.8%
	Total		Count	61	94	89	244
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%

Symmetric Measures

Education recoded 2 level			Value	Approximate Significance
Sub University Education	Nominal by Nominal	Phi	.498	.000
		Cramer's V	.352	.000
	N of Valid Cases		101	
Univesity Education	Nominal by Nominal	Phi	.412	.000
		Cramer's V	.291	.000
	N of Valid Cases		143	
Total	Nominal by Nominal	Phi	.424	.000
		Cramer's V	.300	.000
	N of Valid Cases		244	

6.3.3.4   Controlled for Financially Advised

Table 6.23 shows that for both the advised and the un-advised groups, there was a moderately strong, statistically significant, relationship between the judgment of best

previous 3-year return and most preferred investment for all three investment choices (Advised: Phi = 0.48; p = 0.01, Non-advised: Phi = 0.42; p = 0.01).

For the advised group (n = 110):

- 52% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 64% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 47% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

For the un-advised group (n = 131):

- 41% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 47% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 66% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

The congruence between the judgment of best past return and propensity to invest appeared to be noticeably different between all three groups regarding all three investment choices. This was not surprising to the researcher as there was an expectation that advised participants would be more likely to have chosen superannuation than the unadvised participants (Superannuation: Advised 51.9% - Unadvised 41.2%) given the tax benefits available and the expected better understanding of advised clients of superannuation. There were also apparent differences between the groups regarding the Australian share and residential real estate choices with the advised group significantly more commonly choosing shares over property (Australian Shares: Advised 64.4% - Unadvised 46.8%, Residential Real Estate: Advised 47.4% - Unadvised 66.0%).

Table 6.23 – Preferred investment, past performance (Financial Advice Controlled)

Preferred Investment Choice Past Performance * Best 3 Year Past Performance Recoded * Professionally financially advised Crosstabulation

Professionally financially advised				Best 3 Year Past Performance Recoded			Total
				Superannuation	Australian Shares	Residential Real Estate	
Yes	Preferred Investment Choice Past Performance	Superannuation	Count	14	12	10	36
			% within Best 3 Year Past Performance Recoded	51.9%	26.7%	26.3%	32.7%
		Australian shares	Count	9	29	10	48
			% within Best 3 Year Past Performance Recoded	33.3%	64.4%	26.3%	43.6%
		Residential real estate	Count	4	4	18	26
			% within Best 3 Year Past Performance Recoded	14.8%	8.9%	47.4%	23.6%
	Total		Count	27	45	38	110
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
No	Preferred Investment Choice Past Performance	Superannuation	Count	14	9	4	27
			% within Best 3 Year Past Performance Recoded	41.2%	19.1%	8.0%	20.6%
		Australian shares	Count	11	22	13	46
			% within Best 3 Year Past Performance Recoded	32.4%	46.8%	26.0%	35.1%
		Residential real estate	Count	9	16	33	58
			% within Best 3 Year Past Performance Recoded	26.5%	34.0%	66.0%	44.3%
	Total		Count	34	47	50	131
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Total	Preferred Investment Choice Past Performance	Superannuation	Count	28	21	14	63
			% within Best 3 Year Past Performance Recoded	45.9%	22.8%	15.9%	26.1%
		Australian shares	Count	20	51	23	94
			% within Best 3 Year Past Performance Recoded	32.8%	55.4%	26.1%	39.0%
		Residential real estate	Count	13	20	51	84
			% within Best 3 Year Past Performance Recoded	21.3%	21.7%	58.0%	34.9%
	Total		Count	61	92	88	241
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%

Symmetric Measures

Professionally financially advised			Value	Approximate Significance
Yes	Nominal by Nominal	Phi	.484	.000
		Cramer's V	.343	.000
	N of Valid Cases		110	
No	Nominal by Nominal	Phi	.418	.000
		Cramer's V	.295	.000
	N of Valid Cases		131	
Total	Nominal by Nominal	Phi	.432	.000
		Cramer's V	.305	.000
	N of Valid Cases		241	

6.3.3.5 Controlled for Financial Experience

Table 6.24 shows that for both the 'not financially trained or employed' group and the 'financially trained or employed' group, there was a moderately strong, statistically significant, relationship between the judgment of best previous 3-year return and most

preferred investment for all three investment choices (Not financially trained or employed group: Phi = 0.48; p = 0.001, financially trained or employed group: Phi = 0.38; p = 0.025)

For the not financially trained or employed (n = 168):

- 45% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 61% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 59% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

For the financially trained or employed group (n = 76):

- 47% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 44% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 52% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

The congruence between the judgment of best past return and propensity to invest appeared to be similar between the two groups regarding superannuation and residential real estate but was quite different for Australian Shares (61% not financially trained or employed vs 44% for financially trained or employed group). There is nothing in the literature that would suggest why this is the case and indeed when comparing, within this survey, differences in specific training or employment level and the 'influence of past performance' question there was no discernible difference between the groups.

Table 6.24 – Preferred investment, past performance (Financial Experience Controlled)

Preferred Investment Choice Past Performance * Best 3 Year Past Performance Recoded * Financial Training or employment Crosstabulation

Financial Training or employment				Best 3 Year Past Performance Recoded			Total
				Superannuation	Australian Shares	Residential Real Estate	
No	Preferred Investment Choice Past Performance	Superannuation	Count	20	10	11	41
			% within Best 3 Year Past Performance Recoded	45.5%	16.1%	17.7%	24.4%
		Australian shares	Count	13	38	14	65
			% within Best 3 Year Past Performance Recoded	29.5%	61.3%	22.6%	38.7%
		Residential real estate	Count	11	14	37	62
			% within Best 3 Year Past Performance Recoded	25.0%	22.6%	59.7%	36.9%
	Total		Count	44	62	62	168
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Yes	Preferred Investment Choice Past Performance	Superannuation	Count	8	11	4	23
			% within Best 3 Year Past Performance Recoded	47.1%	34.4%	14.8%	30.3%
		Australian shares	Count	7	14	9	30
			% within Best 3 Year Past Performance Recoded	41.2%	43.8%	33.3%	39.5%
		Residential real estate	Count	2	7	14	23
			% within Best 3 Year Past Performance Recoded	11.8%	21.9%	51.9%	30.3%
	Total		Count	17	32	27	76
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Total	Preferred Investment Choice Past Performance	Superannuation	Count	28	21	15	64
			% within Best 3 Year Past Performance Recoded	45.9%	22.3%	16.9%	26.2%
		Australian shares	Count	20	52	23	95
			% within Best 3 Year Past Performance Recoded	32.8%	55.3%	25.8%	38.9%
		Residential real estate	Count	13	21	51	85
			% within Best 3 Year Past Performance Recoded	21.3%	22.3%	57.3%	34.8%
	Total		Count	61	94	89	244
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%

Symmetric Measures

Financial Training or employment			Value	Approximate Significance
No	Nominal by Nominal	Phi	.476	.000
		Cramer's V	.336	.000
	N of Valid Cases		168	
Yes	Nominal by Nominal	Phi	.383	.025
		Cramer's V	.271	.025
	N of Valid Cases		76	
Total	Nominal by Nominal	Phi	.424	.000
		Cramer's V	.300	.000
	N of Valid Cases		244	

6.3.3.6   Controlled for Household Income

Table 6.25 shows that for both the low household income group and the high household income group, there was a moderately strong, statistically significant, relationship between the judgment of best previous 3-year return and most preferred investment for

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all three investment choices (low household income group: Phi = 0.37; p = 0.002, high household income group: Phi = 0.51; p = 0.001)

For the low household income group (n = 124):

- 41% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 51% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 53% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

For the high household income group (n = 120):

- 52% of those who considered that superannuation had performed the best over the previous three years also indicated a propensity to invest in superannuation over the other two choices.
- 59% of those who considered that Australian shares had performed the best over the previous three years also indicated a propensity to invest in Australian shares over the other two choices.
- 62% of those who considered that residential real estate had performed the best over the previous three years also indicated a propensity to invest in residential real estate over the other two choices.

The congruence between the judgment of best past return and propensity to invest appeared to be somewhat different between the two groups regarding all choices superannuation (41% low household income vs 52% high household income), Australian shares (51% low household income vs 59% high household income) and residential real estate (53% low household income vs 62% for high household income group). The literature has not identified this relationship before and there is nothing in the literature that would suggest why this is the case. Indeed, when comparing within this survey, differences in household income level and the 'influence of past performance', there was a significant difference between the groups whereby the higher income group was more likely to prefer based on perceived best past performance.

Table 6.25 – Preferred investment, past performance (Household income Controlled)

Preferred Investment Choice Past Performance * Best 3 Year Past Performance Recoded * Household Income of <$120k vs >$120k Crosstabulation

Household Income of <$120k vs >$120k				Best 3 Year Past Performance Recoded			
				Superannuation	Australian Shares	Residential Real Estate	Total
<=$120k	Preferred Investment Choice Past Performance	Superannuation	Count	14	12	8	34
			% within Best 3 Year Past Performance Recoded	41.2%	27.9%	17.0%	27.4%
		Australian shares	Count	14	22	14	50
			% within Best 3 Year Past Performance Recoded	41.2%	51.2%	29.8%	40.3%
		Residential real estate	Count	6	9	25	40
			% within Best 3 Year Past Performance Recoded	17.6%	20.9%	53.2%	32.3%
	Total		Count	34	43	47	124
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
>$120k	Preferred Investment Choice Past Performance	Superannuation	Count	14	9	7	30
			% within Best 3 Year Past Performance Recoded	51.9%	17.6%	16.7%	25.0%
		Australian shares	Count	6	30	9	45
			% within Best 3 Year Past Performance Recoded	22.2%	58.8%	21.4%	37.5%
		Residential real estate	Count	7	12	26	45
			% within Best 3 Year Past Performance Recoded	25.9%	23.5%	61.9%	37.5%
	Total		Count	27	51	42	120
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%
Total	Preferred Investment Choice Past Performance	Superannuation	Count	28	21	15	64
			% within Best 3 Year Past Performance Recoded	45.9%	22.3%	16.9%	26.2%
		Australian shares	Count	20	52	23	95
			% within Best 3 Year Past Performance Recoded	32.8%	55.3%	25.8%	38.9%
		Residential real estate	Count	13	21	51	85
			% within Best 3 Year Past Performance Recoded	21.3%	22.3%	57.3%	34.8%
	Total		Count	61	94	89	244
			% within Best 3 Year Past Performance Recoded	100.0%	100.0%	100.0%	100.0%

Symmetric Measures

Household Income of <$120k vs >$120k			Value	Approximate Significance
<=$120k	Nominal by Nominal	Phi	.371	.002
		Cramer's V	.263	.002
	N of Valid Cases		124	
>$120k	Nominal by Nominal	Phi	.509	.000
		Cramer's V	.360	.000
	N of Valid Cases		120	
Total	Nominal by Nominal	Phi	.424	.000
		Cramer's V	.300	.000
	N of Valid Cases		244	

6.3.3.7 Summary of results – the influence of perception of past performance over preferred investment

Comparisons were made between the perception of 'best' past return and preferred investment. Six demographic factors were used as control variables to establish if differences could be identified. Table 6.26 provides a tabular summary of these results.

Gender was a factor insofar as females were less likely to prefer superannuation (M=53%: F=38%). However, in the female group, there were as many respondents who chose Australian shares as who chose superannuation despite selecting superannuation as the best past performance.

Age is a significant factor where younger investors are less likely to prefer superannuation (<45=37% : >45=50%) and are less likely to prefer Australian shares (<45=47% : >45=60%). There was surprisingly little difference regarding residential real estate.

Education was a factor where a significant difference emerged between those with a sub-university education preferring residential real estate (Sub-Uni=68%: Uni=52%) as compared to those with a university education.

Financially advised respondents were more likely to invest in superannuation (Adv=52%: UnAdv=41%) and shares (Adv=64%: UnAdv=47%) but were less likely to invest in residential real estate (Adv=47%: UnAdv=66%) than those who were not receiving or received financial advice.

Respondents with **financial experience** were less likely to select Australian shares as their preferred investment (No exp=61%: With exp=44%) than those without financial experience, despite identifying that as the best past performing investment.

After controlling for **household income**, we identified, in all cases, that there was a difference between preferring an investment that they perceived as performing best in the past. However, in the less than $120,000 group, there were as many respondents who chose Australian shares as who chose superannuation despite selecting superannuation as the best past performance.

In this section, we have considered the relationship between a participant's investment choices and that participant's preferred investment when framed in the context of recent past performance, controlled for six independent variables (gender, age, education, financially advised, financial experience and household income). Next, we will consider the same question framed in the context of expected future performance.

Table 6.26 - Summary of results: influence of perception of past performance over preferred investment

Gender	Congruence	Male	Female
Superannuation	Low[13]	53%	38%
Australian Shares	High	54%	58%
Residential Real Estate	High	56%	57%
Significance	Male: Phi = 0.45; p = 0.001; Female: Phi = 0.38; p = 0.002		
Age	**Congruence**	**45 and under**	**Over 45**
Superannuation	Low	37%	50%
Australian Shares	Low	47%	60%
Residential Real Estate	High	60%	56%
Significance	45 and under: Phi = 0.33; p = 0.04; Over 45: Phi = 0.49; p = 0.001 Not found		
Education Level	**Congruence**	**Sub-University**	**University**
Superannuation	Mod	42%	49%
Australian Shares	Mod	52%	58%
Residential Real Estate	Mod	68%	52%
Significance	Sub-university education group: Phi = 0.50; p = 0.001, University education group: Phi = 0.41; p = 0.001		
Financial Advice	**Congruence**	**Advised**	**Unadvised**
Superannuation	Low	52%	41%
Australian Shares	Low	64%	47%
Residential Real Estate	Low	47%	66%
Significance	Advised: Phi = 0.48; p = 0.01, Non-advised: Phi = 0.42; p = 0.01Phi = 018;		
Financial Experience	**Congruence**	**Inexperienced**	**Experienced**
Superannuation	High	45%	47%
Australian Shares	Low	61%	44%
Residential Real Estate	Mod	59%	52%
Significance	Not financially trained or employed group: Phi = 0.48; p = 0.001, financially trained or employed group: Phi = 0.38; p = 0.025		
Household Income	**Congruence**	**<$120,000**	**>$120,000**
Superannuation	Mod	41%	52%
Australian Shares	Mod	51%	59%
Residential Real Estate	Mod	53%	62%
Significance	low household income group: Phi = 0.37; p = 0.002, high household income group: Phi = 0.51; p = 0.001		

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[13] Note that congruence between groups is identified as follows:

Difference <8% = High, Difference 8% - 18% = Moderate, Difference >18% = Low (Authors suggestion)

6.3.4 Relationship between expected future performance and preferred investment

In the last section, we identified that there are relationships between preferred investment choices and the perception of the past performance of those investment choices. In this section, we will investigate the relationship between preferred investment choices and the perception of expected future performance of those investment choices.

Participants were asked to identify their investment preferences at two points of the survey. First immediately after, and therefore framed by, questions related to past performance. Later in the survey, participants were asked again about their preferred investment choice, but this time the question was asked immediately after, and therefore framed by, obtaining the participant's expectations of future performance of these investment choices. In other words, the investment preference question was at this point 'framed' in the context of future expected performance. We have previously discussed that framing a question by relating it to other issues has been shown to influence decision-making (Kahneman, 2011; Kahneman & Tversky, 1979) and in this context, we would expect a relationship to be found between future expected performance framing and participants preferred investment.

In this analysis, participant responses were isolated for each investment choice to establish the responses for those whose belief was such that their investment choice was expected to produce a return higher than, or equal to, the other choices. Ideally, this would have been conducted on an *exclusive* basis with participants who selected an investment option where the participant's expected future performance was 'higher' than the other options; however, the number of respondents who answered this way was too small to produce meaningful results. Because of that, the use of *inclusive* 'higher than or equal to' results were chosen. In this manner, we were still able to analyse those who selected an investment preference that was 'at least' as good as any other choice and hence that did not compromise the validity of the results. Notwithstanding this, the researcher recognises that the responses would be more meaningful if the sample size yielded a significantly higher number of cases where the expected investment return produced a singular 'best' outcome.

6.3.5 Preferred Investment – Future (Superannuation)

The number of participants who selected superannuation as the highest expected future return (exclusive) was low (n = 26), which compromises any ability to infer statistical significance from the sample. The number of participants who chose superannuation as the highest or equal highest (inclusive) was higher (n = 226), and because of this, the 'inclusive' sample has been analysed.

Table 6.27 shows that for those respondents who preferred superannuation framed within the expected future performance, there was a weak, statistically significant relationship between those who preferred super and those who expected superannuation to produce returns in the future at least equal to the other options. (Phi = 0.13; p = 0.043). Even though the relationship was statistically weak, 92% of respondents who preferred superannuation also ranked the expected future return from superannuation to be at least as high as any other option. The weakness of the relationship (83% preferred 'other') is likely because of the inclusivity of the measures.

Table 6.27 – Preferred superannuation, superannuation equal highest expected return

| | | | Super Expected Return Highest or equal highest | | Total |
			Not Highest	Highest or equal highest	
Most preferred super future performance	Prefer Other	Count	30	145	175
		% within Most preferred super future performance	17.1%	82.9%	100.0%
	Prefer Super	Count	7	81	88
		% within Most preferred super future performance	8.0%	92.0%	100.0%
Total		Count	37	226	263
		% within Most preferred super future performance	14.1%	85.9%	100.0%

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.125	.043
	Cramer's V	.125	.043
N of Valid Cases		263	

6.3.5.1 Controlled for gender

Table 6.28 shows that for both male and female groups separately, there was not a statistically significant relationship between judgment of best expected return and most preferred investment (Male: Phi = 0.13; p = 0.113; Female: Phi = 0.11; p = 0.216)

For the Male group who preferred superannuation (n = 51):

- 94% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

For the Female group (n = 37):

- 89% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

There was a high degree of congruence between both male and female regarding investment preference and higher expected return. Respondents of both genders whose preferred investment choice was superannuation also expected superannuation to provide at least as high an expected return as any other choice.

Table 6.28 – Preferred superannuation, superannuation equal highest expected return (gender controlled)

Gender				Not Highest	Highest or equal highest	Total
				Super Expected Return Highest or equal highest		
Male	Most preferred super future performance	Prefer Other	Count	13	75	88
			% within Most preferred super future performance	14.8%	85.2%	100.0%
		Prefer Super	Count	3	48	51
			% within Most preferred super future performance	5.9%	94.1%	100.0%
	Total		Count	16	123	139
			% within Most preferred super future performance	11.5%	88.5%	100.0%
Female	Most preferred super future performance	Prefer Other	Count	17	68	85
			% within Most preferred super future performance	20.0%	80.0%	100.0%
		Prefer Super	Count	4	33	37
			% within Most preferred super future performance	10.8%	89.2%	100.0%
	Total		Count	21	101	122
			% within Most preferred super future performance	17.2%	82.8%	100.0%
Total	Most preferred super future performance	Prefer Other	Count	30	143	173
			% within Most preferred super future performance	17.3%	82.7%	100.0%
		Prefer Super	Count	7	81	88
			% within Most preferred super future performance	8.0%	92.0%	100.0%
	Total		Count	37	224	261
			% within Most preferred super future performance	14.2%	85.8%	100.0%

Symmetric Measures

Gender			Value	Approximate Significance
Male	Nominal by Nominal	Phi	.134	.113
		Cramer's V	.134	.113
	N of Valid Cases		139	
Female	Nominal by Nominal	Phi	.112	.216
		Cramer's V	.112	.216
	N of Valid Cases		122	
Total	Nominal by Nominal	Phi	.127	.040
		Cramer's V	.127	.040
	N of Valid Cases		261	

Table 6.29 shows that for the 45 and under, there was a moderate, statistically significant relationship between the judgment of best-expected return and most preferred investment for the 45 and under group but no significant statistical relationship for over 45 group. (45 and Under: Phi = 0.20; p = 0.058; Over 45: Phi = 0.11; p = 0.141).

For the 45 and under group who preferred superannuation (n = 22):

- 100% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

For the over 45 group (n = 171):

- 89% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

Even though the number of participants 45 and under preferring super was low, all those who preferred superannuation in this group also believed that future investment returns would be at least as high as the other options. This indicates that future expected returns being high(er) than other choices may overcome the naturally long period before superannuation investments can be accessed and that this might justify the loss of accessibility to any funds invested. The result is somewhat surprising given the opportunity cost and time frames related to superannuation investing.

Both age groups showed a high level of congruence between preferred investment option and expected future return.

Table 6.29 – Preferred superannuation, superannuation equal highest expected return (age controlled)

Age two categories				Super Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
45 and Under	Most preferred super future performance	Prefer Other	Count	10	59	69
			% within Most preferred super future performance	14.5%	85.5%	100.0%
		Prefer Super	Count	0	22	22
			% within Most preferred super future performance	0.0%	100.0%	100.0%
	Total		Count	10	81	91
			% within Most preferred super future performance	11.0%	89.0%	100.0%
Over 45	Most preferred super future performance	Prefer Other	Count	20	85	105
			% within Most preferred super future performance	19.0%	81.0%	100.0%
		Prefer Super	Count	7	59	66
			% within Most preferred super future performance	10.6%	89.4%	100.0%
	Total		Count	27	144	171
			% within Most preferred super future performance	15.8%	84.2%	100.0%
Total	Most preferred super future performance	Prefer Other	Count	30	144	174
			% within Most preferred super future performance	17.2%	82.8%	100.0%
		Prefer Super	Count	7	81	88
			% within Most preferred super future performance	8.0%	92.0%	100.0%
	Total		Count	37	225	262
			% within Most preferred super future performance	14.1%	85.9%	100.0%

Symmetric Measures

Age two categories			Value	Approximate Significance
45 and Under	Nominal by Nominal	Phi	.198	.058
		Cramer's V	.198	.058
	N of Valid Cases		91	
Over 45	Nominal by Nominal	Phi	.113	.141
		Cramer's V	.113	.141
	N of Valid Cases		171	
Total	Nominal by Nominal	Phi	.126	.041
		Cramer's V	.126	.041
	N of Valid Cases		262	

6.3.5.3   Controlled for Education

Table 6.30 shows that there was no statistically significant relationship between the judgment of best-expected return and most preferred investment for the Sub-University group. Still, there was a weak, but marginally statistical relationship for University Education group. (Sub-University: Phi = 0.09; p = 0.337; University Education: Phi = 0.15; p = 0.059).

For the Sub-University group who preferred superannuation (n = 37):

- 89% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

For the University Education group (n = 51):

- 94% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

Superannuation, as discussed in the previous literature review, is a complicated but very tax-efficient method of saving for retirement. This complexity has been seen as one reason for investors to prefer other investment options and may explain the difference in significance between the two groups. A higher education level may improve the ability of investors to identify the benefits over the complexity and encourage this as a preferred investment choice.

In both the groups, there was a high level of congruence between preferred investment choice and future expected return.

Table 6.30 – Preferred superannuation, superannuation equal highest expected return (education controlled)

Education recoded 2 level				Super Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
Sub University Education	Most preferred super future performance	Prefer Other	Count	13	60	73
			% within Most preferred super future performance	17.8%	82.2%	100.0%
		Prefer Super	Count	4	33	37
			% within Most preferred super future performance	10.8%	89.2%	100.0%
	Total		Count	17	93	110
			% within Most preferred super future performance	15.5%	84.5%	100.0%
University Education	Most preferred super future performance	Prefer Other	Count	17	84	101
			% within Most preferred super future performance	16.8%	83.2%	100.0%
		Prefer Super	Count	3	48	51
			% within Most preferred super future performance	5.9%	94.1%	100.0%
	Total		Count	20	132	152
			% within Most preferred super future performance	13.2%	86.8%	100.0%
Total	Most preferred super future performance	Prefer Other	Count	30	144	174
			% within Most preferred super future performance	17.2%	82.8%	100.0%
		Prefer Super	Count	7	81	88
			% within Most preferred super future performance	8.0%	92.0%	100.0%
	Total		Count	37	225	262
			% within Most preferred super future performance	14.1%	85.9%	100.0%

Symmetric Measures

Education recoded 2 level			Value	Approximate Significance
Sub University Education	Nominal by Nominal	Phi	.091	.337
		Cramer's V	.091	.337
	N of Valid Cases		110	
University Education	Nominal by Nominal	Phi	.153	.059
		Cramer's V	.153	.059
	N of Valid Cases		152	
Total	Nominal by Nominal	Phi	.126	.041
		Cramer's V	.126	.041
	N of Valid Cases		262	

6.3.5.4   Controlled for Financially Advised

Table 6.31 shows that for the financially advised group there was no statistically significant relationship found, however, for the not financially advised groups, there was a weak, statistically significant relationship between the judgment of best-expected return

and most preferred investment. (financially advised: Phi = 0.10; p = 0.281; not financially advised: Phi = 0.17; p = 0.043).

For the financially advised group who preferred superannuation (n = 48):

- 87% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

For the not financially advised group (n = 38):

- 97% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

In both the groups, there was a high level of congruence between preferred investment choice and future expected return. Perhaps surprisingly, the percentage of participants selecting superannuation who have a financial adviser was slightly lower than those with no financial adviser, although this could indicate that the adviser influence had taken into account other factors. Discussions with financial advisers regarding this issue has identified that timeframe between investing a lumpsum into superannuation and preservation age (the age at which superannuation may be accessed) is a common factor in discussions with their clients.

Table 6.31 – Preferred superannuation, superannuation equal highest expected return (financial advice controlled)

Professionally financially advised				Super Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
Yes	Most preferred super future performance	Prefer Other	Count	15	60	75
			% within Most preferred super future performance	20.0%	80.0%	100.0%
		Prefer Super	Count	6	42	48
			% within Most preferred super future performance	12.5%	87.5%	100.0%
	Total		Count	21	102	123
			% within Most preferred super future performance	17.1%	82.9%	100.0%
No	Most preferred super future performance	Prefer Other	Count	15	85	100
			% within Most preferred super future performance	15.0%	85.0%	100.0%
		Prefer Super	Count	1	37	38
			% within Most preferred super future performance	2.6%	97.4%	100.0%
	Total		Count	16	122	138
			% within Most preferred super future performance	11.6%	88.4%	100.0%
Total	Most preferred super future performance	Prefer Other	Count	30	145	175
			% within Most preferred super future performance	17.1%	82.9%	100.0%
		Prefer Super	Count	7	79	86
			% within Most preferred super future performance	8.1%	91.9%	100.0%
	Total		Count	37	224	261
			% within Most preferred super future performance	14.2%	85.8%	100.0%

Symmetric Measures

Professionally financially advised			Value	Approximate Significance
Yes	Nominal by Nominal	Phi	.097	.281
		Cramer's V	.097	.281
	N of Valid Cases		123	
No	Nominal by Nominal	Phi	.173	.043
		Cramer's V	.173	.043
	N of Valid Cases		138	
Total	Nominal by Nominal	Phi	.121	.050
		Cramer's V	.121	.050
	N of Valid Cases		261	

6.3.5.5 Controlled for Financial Experience

Table 6.32 shows that for both the groups (those with financial training or employment in the field and those without financial training or employment) there was no statistically significant relationship found. (financial training or employment: Phi = 0.11; p = 0.300; without financial training or employment: Phi = 0.11; p = 0.143)

For the group without financial training or employment who preferred superannuation (n = 53):

- 89% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

For the group with financial training or employment, who preferred superannuation (n = 35):

- 97% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

In both the groups, there was a high level of congruence between those with financial training or employment, and those without financial training or employment and future expected return.

Table 6.32 – Preferred superannuation, superannuation equal highest expected return (financial experience controlled)

Financial Training or employment				Super Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
No	Most preferred super future performance	Prefer Other	Count	26	101	127
			% within Most preferred super future performance	20.5%	79.5%	100.0%
		Prefer Super	Count	6	47	53
			% within Most preferred super future performance	11.3%	88.7%	100.0%
	Total		Count	32	148	180
			% within Most preferred super future performance	17.8%	82.2%	100.0%
Yes	Most preferred super future performance	Prefer Other	Count	4	44	48
			% within Most preferred super future performance	8.3%	91.7%	100.0%
		Prefer Super	Count	1	34	35
			% within Most preferred super future performance	2.9%	97.1%	100.0%
	Total		Count	5	78	83
			% within Most preferred super future performance	6.0%	94.0%	100.0%
Total	Most preferred super future performance	Prefer Other	Count	30	145	175
			% within Most preferred super future performance	17.1%	82.9%	100.0%
		Prefer Super	Count	7	81	88
			% within Most preferred super future performance	8.0%	92.0%	100.0%
	Total		Count	37	226	263
			% within Most preferred super future performance	14.1%	85.9%	100.0%

Symmetric Measures

Financial Training or employment			Value	Approximate Significance
No	Nominal by Nominal	Phi	.109	.143
		Cramer's V	.109	.143
	N of Valid Cases		180	
Yes	Nominal by Nominal	Phi	.114	.300
		Cramer's V	.114	.300
	N of Valid Cases		83	
Total	Nominal by Nominal	Phi	.125	.043
		Cramer's V	.125	.043
	N of Valid Cases		263	

6.3.5.6   Controlled for Household Income

Table 6.33 shows that for both the groups (those with household income < \$120,000 and those > \$120,000) there was no statistically significant relationship found. (< \$120,000: Phi = 0.13; p = 0.145; >\$120,000: Phi = 0.11; p = 0.143)

For the < \$120,000 group who preferred superannuation (n = 40):

- 90% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

For the > \$120,000 group (n = 48):

- 94% of those who considered that superannuation was expected to perform best or equal best over the next ten years also indicated a propensity to invest in superannuation over the other two choices.

In both the groups, there was a high level of congruence between preferred investment and future expected return.

Table 6.33 – Preferred superannuation, superannuation equal highest expected return (household income controlled)

Household Income of <$120k vs >$120k				Super Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
<=$120k	Most preferred super future performance	Prefer Other	Count	19	74	93
			% within Most preferred super future performance	20.4%	79.6%	100.0%
		Prefer Super	Count	4	36	40
			% within Most preferred super future performance	10.0%	90.0%	100.0%
	Total		Count	23	110	133
			% within Most preferred super future performance	17.3%	82.7%	100.0%
>$120k	Most preferred super future performance	Prefer Other	Count	11	71	82
			% within Most preferred super future performance	13.4%	86.6%	100.0%
		Prefer Super	Count	3	45	48
			% within Most preferred super future performance	6.3%	93.8%	100.0%
	Total		Count	14	116	130
			% within Most preferred super future performance	10.8%	89.2%	100.0%
Total	Most preferred super future performance	Prefer Other	Count	30	145	175
			% within Most preferred super future performance	17.1%	82.9%	100.0%
		Prefer Super	Count	7	81	88
			% within Most preferred super future performance	8.0%	92.0%	100.0%
	Total		Count	37	226	263
			% within Most preferred super future performance	14.1%	85.9%	100.0%

Symmetric Measures

Household Income of <$120k vs >$120k			Value	Approximate Significance
<=$120k	Nominal by Nominal	Phi	.126	.145
		Cramer's V	.126	.145
	N of Valid Cases		133	
>$120k	Nominal by Nominal	Phi	.112	.203
		Cramer's V	.112	.203
	N of Valid Cases		130	
Total	Nominal by Nominal	Phi	.125	.043
		Cramer's V	.125	.043
	N of Valid Cases		263	

6.3.6 Preferred Investment – Future (Australian shares)

The number of participants who selected Australian shares as the highest expected future return (exclusive) was adequate to conduct cross-tab analysis (n = 86), however, the number on the comparative alternatives (superannuation and residential real estate) was very low which compromises any ability to infer statistical significance from the sample. The number of participants who chose Australian shares as the highest or equal highest (inclusive) was higher (n = 189), and because of this, the 'inclusive' measure has been analysed.

Table 6.34 shows that for those respondents who preferred Australian shares framed within an expected future performance, no significant relationship was found between those who preferred Australian shares and those who expected Australian shares to produce returns in the future at least equal to the other options. Only 74% of those who preferred Australian shares believed that the expected future return was at least as high as the other options compared with 70% who preferred 'other'.

Table 6.34 – Preferred Australian shares, Australian shares equal highest expected return

| | | | Share Expected Return Highest or equal highest | | |
			Not Highest	Highest or equal highest	Total
Most preferred shares future performance	Prefer Other	Count	41	95	136
		% within Most preferred shares future performance	30.1%	69.9%	100.0%
	Prefer Shares	Count	33	94	127
		% within Most preferred shares future performance	26.0%	74.0%	100.0%
Total		Count	74	189	263
		% within Most preferred shares future performance	28.1%	71.9%	100.0%

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.046	.453
	Cramer's V	.046	.453
N of Valid Cases		263	

6.3.6.1 Controlled for Gender

Table 6.35 shows that for both male and female groups separately, there was not a statistically significant relationship between judgment of best expected return and most preferred investment (Male: Phi = 0.15; p = 0.087; Female: Phi = -0.53; p = 0.560)

For the Male group, who preferred Australian shares (n = 65):

- 81% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 69% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

For the Female group, who preferred Australian shares (n = 61):

- 65% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 70% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

There was a material difference in the congruence between both male and female regarding the investment preference for Australian shares and a higher expected return.

The literature has identified that female investors are more risk-averse than male investors (Bannier & Neubert, 2016; Fisher & Yao, 2017) and this could be explained in this instance. Data collected in this survey identified quite comparable estimates of risk associated with Australian share investing between male and females which contradicts the literature, however, in the case of this research, we did not ask the same questions as literature specifically focussed on gender-based risk differences. Studies, such as those above, that have shown evidence of gender-based differences in risk appetite have been conducted using trading rates rather than perceptions of risk or expected return and this could be a new line of investigation for gender-based differences in investment choices.

Table 6.35 – Preferred Australian shares, Australian shares equal highest expected return (Gender controlled)

| Gender | | | | Share Expected Return Highest or equal highest | | Total |
				Not Highest	Highest or equal highest	
Male	Most preferred shares future performance	Prefer Other	Count	23	51	74
			% within Most preferred shares future performance	31.1%	68.9%	100.0%
		Prefer Shares	Count	12	53	65
			% within Most preferred shares future performance	18.5%	81.5%	100.0%
	Total		Count	35	104	139
			% within Most preferred shares future performance	25.2%	74.8%	100.0%
Female	Most preferred shares future performance	Prefer Other	Count	18	43	61
			% within Most preferred shares future performance	29.5%	70.5%	100.0%
		Prefer Shares	Count	21	40	61
			% within Most preferred shares future performance	34.4%	65.6%	100.0%
	Total		Count	39	83	122
			% within Most preferred shares future performance	32.0%	68.0%	100.0%
Total	Most preferred shares future performance	Prefer Other	Count	41	94	135
			% within Most preferred shares future performance	30.4%	69.6%	100.0%
		Prefer Shares	Count	33	93	126
			% within Most preferred shares future performance	26.2%	73.8%	100.0%
	Total		Count	74	187	261
			% within Most preferred shares future performance	28.4%	71.6%	100.0%

Symmetric Measures

Gender			Value	Approximate Significance
Male	Nominal by Nominal	Phi	.145	.087
		Cramer's V	.145	.087
	N of Valid Cases		139	
Female	Nominal by Nominal	Phi	-.053	.560
		Cramer's V	.053	.560
	N of Valid Cases		122	
Total	Nominal by Nominal	Phi	.046	.454
		Cramer's V	.046	.454
	N of Valid Cases		261	

6.3.6.2   Controlled for Age

Table 6.36 shows that for both 45 and under and over 45 groups separately, there no statistically significant relationship between the judgment of best-expected return and most preferred investment for either group. (45 and Under: Phi = -0.07; p = 0.508; Over 45: Phi = 0.10; p = 0.180).

For the 45 and under group who preferred Australian shares (n = 91):

- 67% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 73% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

For the over 45 group who preferred Australian shares (n = 171):

- 77% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 70% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

Therefore, in the case of shares, age made no difference to the congruence of beliefs about expected returns and investment preference.

Table 6.36 – Preferred Australian shares, Australian shares equal highest expected return (age controlled)

Age two categories				Share Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
45 and Under	Most preferred shares future performance	Prefer Other	Count	14	38	52
			% within Most preferred shares future performance	26.9%	73.1%	100.0%
		Prefer Shares	Count	13	26	39
			% within Most preferred shares future performance	33.3%	66.7%	100.0%
	Total		Count	27	64	91
			% within Most preferred shares future performance	29.7%	70.3%	100.0%
Over 45	Most preferred shares future performance	Prefer Other	Count	27	57	84
			% within Most preferred shares future performance	32.1%	67.9%	100.0%
		Prefer Shares	Count	20	67	87
			% within Most preferred shares future performance	23.0%	77.0%	100.0%
	Total		Count	47	124	171
			% within Most preferred shares future performance	27.5%	72.5%	100.0%
Total	Most preferred shares future performance	Prefer Other	Count	41	95	136
			% within Most preferred shares future performance	30.1%	69.9%	100.0%
		Prefer Shares	Count	33	93	126
			% within Most preferred shares future performance	26.2%	73.8%	100.0%
	Total		Count	74	188	262
			% within Most preferred shares future performance	28.2%	71.8%	100.0%

Symmetric Measures

Age two categories			Value	Approximate Significance
45 and Under	Nominal by Nominal	Phi	-.069	.508
		Cramer's V	.069	.508
	N of Valid Cases		91	
Over 45	Nominal by Nominal	Phi	.103	.180
		Cramer's V	.103	.180
	N of Valid Cases		171	
Total	Nominal by Nominal	Phi	.044	.477
		Cramer's V	.044	.477
	N of Valid Cases		262	

6.3.6.3 Controlled for Education

Table 6.37 shows that for both Sub-University Educated and University Educated groups separately, there was no statistically significant relationship between the judgment of best-expected return and most preferred investment. (Sub-University: Phi = 0.13; p = 0.183; University Education: Phi = -0.02; p = 0.832)

For the Sub-University group who preferred Australian shares (n = 54):

- 76% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 64% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

For the University Education group who preferred Australian shares (n = 72):

- 72% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 74% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

In both the groups, there was a high level of congruence between preferred investment choice and future expected return. Level of education did not influence investment preference in this case.

Table 6.37 – Preferred Australian shares, Australian shares equal highest expected return (education controlled)

Education recoded 2 level				Share Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
Sub University Education	Most preferred shares future performance	Prefer Other	Count	20	36	56
			% within Most preferred shares future performance	35.7%	64.3%	100.0%
		Prefer Shares	Count	13	41	54
			% within Most preferred shares future performance	24.1%	75.9%	100.0%
	Total		Count	33	77	110
			% within Most preferred shares future performance	30.0%	70.0%	100.0%
University Education	Most preferred shares future performance	Prefer Other	Count	21	59	80
			% within Most preferred shares future performance	26.3%	73.8%	100.0%
		Prefer Shares	Count	20	52	72
			% within Most preferred shares future performance	27.8%	72.2%	100.0%
	Total		Count	41	111	152
			% within Most preferred shares future performance	27.0%	73.0%	100.0%
Total	Most preferred shares future performance	Prefer Other	Count	41	95	136
			% within Most preferred shares future performance	30.1%	69.9%	100.0%
		Prefer Shares	Count	33	93	126
			% within Most preferred shares future performance	26.2%	73.8%	100.0%
	Total		Count	74	188	262
			% within Most preferred shares future performance	28.2%	71.8%	100.0%

Symmetric Measures

Education recoded 2 level			Value	Approximate Significance
Sub University Education	Nominal by Nominal	Phi	.127	.183
		Cramer's V	.127	.183
	N of Valid Cases		110	
University Education	Nominal by Nominal	Phi	-.017	.832
		Cramer's V	.017	.832
	N of Valid Cases		152	
Total	Nominal by Nominal	Phi	.044	.477
		Cramer's V	.044	.477
	N of Valid Cases		262	

6.3.6.4 Controlled for Financially Advised

Table 6.38 shows that for both the financially advised group and the non-financially advised group; there was no statistically significant relationship found. (financially advised: Phi = 0.07; p = 0.441; not financially advised: Phi = 0.01; p = 0.951)

For the financially advised group who preferred Australian shares (n = 63):

- 75% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 68% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

For the not financially advised group who preferred Australian shares (n = 64):

- 73% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 73% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

In both the groups, there was a high level of congruence between responses regarding preferred investment choice and future expected return. Financial advice did not influence investment preference in this case.

Table 6.38 – Preferred Australian shares, Australian shares equal highest expected return (financial advice controlled)

Professionally financially advised				Share Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
Yes	Most preferred shares future performance	Prefer Other	Count	19	41	60
			% within Most preferred shares future performance	31.7%	68.3%	100.0%
		Prefer Shares	Count	16	47	63
			% within Most preferred shares future performance	25.4%	74.6%	100.0%
	Total		Count	35	88	123
			% within Most preferred shares future performance	28.5%	71.5%	100.0%
No	Most preferred shares future performance	Prefer Other	Count	20	54	74
			% within Most preferred shares future performance	27.0%	73.0%	100.0%
		Prefer Shares	Count	17	47	64
			% within Most preferred shares future performance	26.6%	73.4%	100.0%
	Total		Count	37	101	138
			% within Most preferred shares future performance	26.8%	73.2%	100.0%
Total	Most preferred shares future performance	Prefer Other	Count	39	95	134
			% within Most preferred shares future performance	29.1%	70.9%	100.0%
		Prefer Shares	Count	33	94	127
			% within Most preferred shares future performance	26.0%	74.0%	100.0%
	Total		Count	72	189	261
			% within Most preferred shares future performance	27.6%	72.4%	100.0%

Symmetric Measures

Professionally financially advised			Value	Approximate Significance
Yes	Nominal by Nominal	Phi	.069	.441
		Cramer's V	.069	.441
	N of Valid Cases		123	
No	Nominal by Nominal	Phi	.005	.951
		Cramer's V	.005	.951
	N of Valid Cases		138	
Total	Nominal by Nominal	Phi	.035	.573
		Cramer's V	.035	.573
	N of Valid Cases		261	

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6.3.6.5   Controlled for Financial Experience

Table 6.39 shows that for both the groups (those with financial training or employment in the field and those without financial training or employment) there was no statistically significant relationship found. (financial training or employment: Phi = 0.09; p = 0.215; without financial training or employment: Phi = -0.31; p = 0.779)

For the without financial training or employment group who preferred Australian shares (n = 96):

- 74% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 65% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

For the financial training or employment group who preferred Australian shares (n = 31):

- 74% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 77% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

In both the groups, there was a high level of congruence between those with financial training or employment, and those without financial training or employment and future expected return. Financial experience did not influence investment preference in this case.

Table 6.39 – Preferred Australian shares, Australian shares equal highest expected return (financial experience controlled)

Financial Training or employment				Share Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
No	Most preferred shares future performance	Prefer Other	Count	29	55	84
			% within Most preferred shares future performance	34.5%	65.5%	100.0%
		Prefer Shares	Count	25	71	96
			% within Most preferred shares future performance	26.0%	74.0%	100.0%
	Total		Count	54	126	180
			% within Most preferred shares future performance	30.0%	70.0%	100.0%
Yes	Most preferred shares future performance	Prefer Other	Count	12	40	52
			% within Most preferred shares future performance	23.1%	76.9%	100.0%
		Prefer Shares	Count	8	23	31
			% within Most preferred shares future performance	25.8%	74.2%	100.0%
	Total		Count	20	63	83
			% within Most preferred shares future performance	24.1%	75.9%	100.0%
Total	Most preferred shares future performance	Prefer Other	Count	41	95	136
			% within Most preferred shares future performance	30.1%	69.9%	100.0%
		Prefer Shares	Count	33	94	127
			% within Most preferred shares future performance	26.0%	74.0%	100.0%
	Total		Count	74	189	263
			% within Most preferred shares future performance	28.1%	71.9%	100.0%

Symmetric Measures

Financial Training or employment			Value	Approximate Significance
No	Nominal by Nominal	Phi	.092	.215
		Cramer's V	.092	.215
	N of Valid Cases		180	
Yes	Nominal by Nominal	Phi	-.031	.779
		Cramer's V	.031	.779
	N of Valid Cases		83	
Total	Nominal by Nominal	Phi	.046	.453
		Cramer's V	.046	.453
	N of Valid Cases		263	

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6.3.6.6　Controlled for Household Income

Table 6.40 shows that for both the groups (those with household income < $120,000 and those > $120,000) there was no statistically significant relationship found. (< $120,000: Phi = 0.10; p = 0.244; >$120,000: Phi = 0.11; p = 0.903)

For the < $120,000 group who preferred Australian shares (n = 65):

- 75% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 66% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

For the > $120,000 group (n = 62):

- 73% of those who considered that Australian shares were expected to perform best or equal best over the next ten years (compared to 73% who preferred 'other'), also indicated a propensity to invest in Australian shares over the other two choices.

In both the groups, there was a high level of congruence between preferred investment and future expected return. Household income did not influence investment preference in this case.

Table 6.40 – Preferred Australian shares, Australian shares equal highest expected return

(household income controlled)

Household Income of <$120k vs >$120k				Share Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
<=$120k	Most preferred shares future performance	Prefer Other	Count	23	45	68
			% within Most preferred shares future performance	33.8%	66.2%	100.0%
		Prefer Shares	Count	16	49	65
			% within Most preferred shares future performance	24.6%	75.4%	100.0%
	Total		Count	39	94	133
			% within Most preferred shares future performance	29.3%	70.7%	100.0%
>$120k	Most preferred shares future performance	Prefer Other	Count	18	50	68
			% within Most preferred shares future performance	26.5%	73.5%	100.0%
		Prefer Shares	Count	17	45	62
			% within Most preferred shares future performance	27.4%	72.6%	100.0%
	Total		Count	35	95	130
			% within Most preferred shares future performance	26.9%	73.1%	100.0%
Total	Most preferred shares future performance	Prefer Other	Count	41	95	136
			% within Most preferred shares future performance	30.1%	69.9%	100.0%
		Prefer Shares	Count	33	94	127
			% within Most preferred shares future performance	26.0%	74.0%	100.0%
	Total		Count	74	189	263
			% within Most preferred shares future performance	28.1%	71.9%	100.0%

Symmetric Measures

Household Income of <$120k vs >$120k			Value	Approximate Significance
<=$120k	Nominal by Nominal	Phi	.101	.244
		Cramer's V	.101	.244
	N of Valid Cases		133	
>$120k	Nominal by Nominal	Phi	-.011	.903
		Cramer's V	.011	.903
	N of Valid Cases		130	
Total	Nominal by Nominal	Phi	.046	.453
		Cramer's V	.046	.453
	N of Valid Cases		263	

6.3.7 Preferred Investment – Future (Residential Real Estate)

The number of participants who selected residential real estate as the highest expected future return (exclusive) was low (n = 35), which compromises any ability to infer statistical significance from the sample. The number of participants who chose residential

real estate as the highest or equal highest (inclusive) was higher (n = 92), and because of this, the 'inclusive' measure has again been used.

Table 6.41 shows that for those respondents who preferred residential real estate framed within the expected future performance, there was a statistically significant relationship between those who preferred residential real estate and those who expected residential real estate to produce returns in the future at least equal to the other options. Less than 50% of those who preferred residential real estate believed that the expected future return was at least as high as the other options. Even so, for real estate, we see a clear difference between those preferring property and those preferring other investments.

Table 6.41 – Preferred residential real estate, residential real estate equal highest expected return

Most preferred property future performance * Property Expected Return Highest or equal highest Crosstabulation

| | | | Property Expected Return Highest or equal highest | | |
			Not Highest	Highest or equal highest	Total
Most preferred property future performance	Prefer Other	Count	146	69	215
		% within Most preferred property future performance	67.9%	32.1%	100.0%
	Prefer Property	Count	25	23	48
		% within Most preferred property future performance	52.1%	47.9%	100.0%
Total		Count	171	92	263
		% within Most preferred property future performance	65.0%	35.0%	100.0%

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.128	.038
	Cramer's V	.128	.038
N of Valid Cases		263	

6.3.7.1 Controlled for Gender

Table 6.42 shows that for both male and female groups separately, no statistically significant relationship was found between perception of best expected return and most preferred investment (Male: Phi = 0.14; p = 0.100; Female: Phi = 0.13; p = 0.166) .

For the male group who preferred residential real estate (n = 23):

- 48% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

For the female group who preferred residential real estate (n = 24):

- 50% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

There was a high degree of congruence between both male and female regarding the preference for investing in residential real estate and a higher expected return. Of interest regarding this factor, is the lack of conviction between the selection of residential real estate as the highest or equal to highest expected return yet only around half of the respondents chose this as their investment preference. However, overall, gender did not change the picture.

Table 6.42 – Preferred residential real estate, residential real estate equal highest expected return (Gender Controlled)

Most preferred property future performance * Property Expected Return Highest or equal highest * Gender Crosstabulation

Gender				Property Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
Male	Most preferred property future performance	Prefer Other	Count	81	35	116
			% within Most preferred property future performance	69.8%	30.2%	100.0%
		Prefer Property	Count	12	11	23
			% within Most preferred property future performance	52.2%	47.8%	100.0%
	Total		Count	93	46	139
			% within Most preferred property future performance	66.9%	33.1%	100.0%
Female	Most preferred property future performance	Prefer Other	Count	64	34	98
			% within Most preferred property future performance	65.3%	34.7%	100.0%
		Prefer Property	Count	12	12	24
			% within Most preferred property future performance	50.0%	50.0%	100.0%
	Total		Count	76	46	122
			% within Most preferred property future performance	62.3%	37.7%	100.0%
Total	Most preferred property future performance	Prefer Other	Count	145	69	214
			% within Most preferred property future performance	67.8%	32.2%	100.0%
		Prefer Property	Count	24	23	47
			% within Most preferred property future performance	51.1%	48.9%	100.0%
	Total		Count	169	92	261
			% within Most preferred property future performance	64.8%	35.2%	100.0%

Symmetric Measures

Gender			Value	Approximate Significance
Male	Nominal by Nominal	Phi	.139	.100
		Cramer's V	.139	.100
	N of Valid Cases		139	
Female	Nominal by Nominal	Phi	.126	.166
		Cramer's V	.126	.166
	N of Valid Cases		122	
Total	Nominal by Nominal	Phi	.134	.030
		Cramer's V	.134	.030
	N of Valid Cases		261	

6.3.7.2 Controlled for Age

Table 6.43 shows that for the over 45 group only, there was a moderate statistically significant relationship between the judgment of the best-expected return and most preferred investment. (45 and Under: Phi = 0.09; p = 0.402; Over 45: Phi = 0.18; p = 0.017)

For the 45 and under group who preferred residential real estate (n = 91):

- 40% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

For the over 45 group who preferred residential real estate (n = 171):

- 61% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

While the relationship between age, expected return on investment and investment preference was statistically significant for the over 45 group, there was a notable difference between the two groups regarding preferred investment selection. In the 45 and under group the number of respondents who believed that residential real estate would produce the highest or equal highest future returns, the number who selected that as their investment preference was lower than expected. So this time, age made a real difference, with much more congruence displayed by the over 45's.

Table 6.43 – Preferred residential real estate, residential real estate equal highest expected return (Age Controlled)

Most preferred property future performance * Property Expected Return Highest or equal highest * Age two categories Crosstabulation

Age two categories				Property Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
45 and Under	Most preferred property future performance	Prefer Other	Count	42	19	61
			% within Most preferred property future performance	68.9%	31.1%	100.0%
		Prefer Property	Count	18	12	30
			% within Most preferred property future performance	60.0%	40.0%	100.0%
	Total		Count	60	31	91
			% within Most preferred property future performance	65.9%	34.1%	100.0%
Over 45	Most preferred property future performance	Prefer Other	Count	103	50	153
			% within Most preferred property future performance	67.3%	32.7%	100.0%
		Prefer Property	Count	7	11	18
			% within Most preferred property future performance	38.9%	61.1%	100.0%
	Total		Count	110	61	171
			% within Most preferred property future performance	64.3%	35.7%	100.0%
Total	Most preferred property future performance	Prefer Other	Count	145	69	214
			% within Most preferred property future performance	67.8%	32.2%	100.0%
		Prefer Property	Count	25	23	48
			% within Most preferred property future performance	52.1%	47.9%	100.0%
	Total		Count	170	92	262
			% within Most preferred property future performance	64.9%	35.1%	100.0%

Symmetric Measures

Age two categories			Value	Approximate Significance
45 and Under	Nominal by Nominal	Phi	.088	.402
		Cramer's V	.088	.402
	N of Valid Cases		91	
Over 45	Nominal by Nominal	Phi	.182	.017
		Cramer's V	.182	.017
	N of Valid Cases		171	
Total	Nominal by Nominal	Phi	.127	.040
		Cramer's V	.127	.040
	N of Valid Cases		262	

6.3.7.3   Controlled for Education

Table 6.44 shows that for the Sub-University Educated group, there was a statistically significant relationship between the judgment of best-expected return and most preferred investment. This level of significance was not found in the University Educated group (Sub-University: Phi = 0.26; p = 0.008; University Education: Phi = 0.04; p = 0.639)

For the Sub-University group who preferred residential real estate (n = 19):

- 63% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

For the University Education group who preferred residential real estate (n = 29):

- 37% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

The difference in statistical significance between the two groups was also highlighted in the difference between the proportion of those who believed that residential real estate would produce the highest or equal highest future returns and the respondents who preferred investment choice. A little under half the percentage of university-educated respondents selected residential real estate as their preferred investment. Education level made a statistical difference.

Table 6.44 – Preferred residential real estate, residential real estate equal highest expected return (Education Controlled)

Most preferred property future performance * Property Expected Return Highest or equal highest * Education recoded 2 level Crosstabulation

Education recoded 2 level					Property Expected Return Highest or equal highest		Total
					Not Highest	Highest or equal highest	
Sub University Education	Most preferred property future performance	Prefer Other	Count		63	28	91
			% within Most preferred property future performance		69.2%	30.8%	100.0%
		Prefer Property	Count		7	12	19
			% within Most preferred property future performance		36.8%	63.2%	100.0%
	Total		Count		70	40	110
			% within Most preferred property future performance		63.6%	36.4%	100.0%
University Education	Most preferred property future performance	Prefer Other	Count		82	41	123
			% within Most preferred property future performance		66.7%	33.3%	100.0%
		Prefer Property	Count		18	11	29
			% within Most preferred property future performance		62.1%	37.9%	100.0%
	Total		Count		100	52	152
			% within Most preferred property future performance		65.8%	34.2%	100.0%
Total	Most preferred property future performance	Prefer Other	Count		145	69	214
			% within Most preferred property future performance		67.8%	32.2%	100.0%
		Prefer Property	Count		25	23	48
			% within Most preferred property future performance		52.1%	47.9%	100.0%
	Total		Count		170	92	262
			% within Most preferred property future performance		64.9%	35.1%	100.0%

Symmetric Measures

Education recoded 2 level			Value	Approximate Significance
Sub University Education	Nominal by Nominal	Phi	.255	.008
		Cramer's V	.255	.008
	N of Valid Cases		110	
University Education	Nominal by Nominal	Phi	.038	.639
		Cramer's V	.038	.639
	N of Valid Cases		152	
Total	Nominal by Nominal	Phi	.127	.040
		Cramer's V	.127	.040
	N of Valid Cases		262	

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6.3.7.4 Controlled for Financially Advised

Table 6.45 shows that for the financially advised group, there was no statistically significant relationship found; however, for the non-financially advised group, a moderate statistical significance was found. (financially advised: Phi = 0.05; p = 0.608; not financially advised: Phi = 0.18; p = 0.035). We should caution against reading too much into this as the number of financially advised clients who preferred residential real estate was low.

For the financially advised group who preferred residential real estate (n = 5):

- 42% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

For the not financially advised group who preferred residential real estate (n = 18):

- 50% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

In both the groups, there was a high level of congruence between responses regarding preferred investment choice and future expected return. However, the number of cases is very low to draw any conclusion.

Table 6.45 – Preferred residential real estate, residential real estate equal highest expected return (Financial Advice Controlled)

Most preferred property future performance * Property Expected Return Highest or equal highest * Professionally financially advised Crosstabulation

Professionally financially advised				Property Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
Yes	Most preferred property future performance	Prefer Other	Count	73	38	111
			% within Most preferred property future performance	65.8%	34.2%	100.0%
		Prefer Property	Count	7	5	12
			% within Most preferred property future performance	58.3%	41.7%	100.0%
	Total		Count	80	43	123
			% within Most preferred property future performance	65.0%	35.0%	100.0%
No	Most preferred property future performance	Prefer Other	Count	71	31	102
			% within Most preferred property future performance	69.6%	30.4%	100.0%
		Prefer Property	Count	18	18	36
			% within Most preferred property future performance	50.0%	50.0%	100.0%
	Total		Count	89	49	138
			% within Most preferred property future performance	64.5%	35.5%	100.0%
Total	Most preferred property future performance	Prefer Other	Count	144	69	213
			% within Most preferred property future performance	67.6%	32.4%	100.0%
		Prefer Property	Count	25	23	48
			% within Most preferred property future performance	52.1%	47.9%	100.0%
	Total		Count	169	92	261
			% within Most preferred property future performance	64.8%	35.2%	100.0%

Symmetric Measures

Professionally financially advised			Value	Approximate Significance
Yes	Nominal by Nominal	Phi	.046	.608
		Cramer's V	.046	.608
	N of Valid Cases		123	
No	Nominal by Nominal	Phi	.180	.035
		Cramer's V	.180	.035
	N of Valid Cases		138	
Total	Nominal by Nominal	Phi	.126	.042
		Cramer's V	.126	.042
	N of Valid Cases		261	

6.3.7.5 Controlled for Financial Experience

Table 6.46 shows that for both the groups (those with financial training or employment in the field and those without financial training or employment) there was no statistically significant relationship found. (financial training or employment: Phi = 0.11; p = 0.128; without financial training or employment: Phi = 0.19; p = 0.091)

For the without financial training or employment group who preferred residential real estate (n = 31):

- 52% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

For the financial training or employment group who preferred residential real estate (n = 17):

- 41% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

In both the groups, there was a moderate level of congruence between those with financial training or employment and those without financial training or employment and future expected return.

Table 6.46 – Preferred residential real estate, residential real estate equal highest expected return (Financial Experience Controlled)

Most preferred property future performance * Property Expected Return Highest or equal highest * Financial Training or employment Crosstabulation

Financial Training or employment				Property Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
No	Most preferred property future performance	Prefer Other	Count	94	55	149
			% within Most preferred property future performance	63.1%	36.9%	100.0%
		Prefer Property	Count	15	16	31
			% within Most preferred property future performance	48.4%	51.6%	100.0%
	Total		Count	109	71	180
			% within Most preferred property future performance	60.6%	39.4%	100.0%
Yes	Most preferred property future performance	Prefer Other	Count	52	14	66
			% within Most preferred property future performance	78.8%	21.2%	100.0%
		Prefer Property	Count	10	7	17
			% within Most preferred property future performance	58.8%	41.2%	100.0%
	Total		Count	62	21	83
			% within Most preferred property future performance	74.7%	25.3%	100.0%
Total	Most preferred property future performance	Prefer Other	Count	146	69	215
			% within Most preferred property future performance	67.9%	32.1%	100.0%
		Prefer Property	Count	25	23	48
			% within Most preferred property future performance	52.1%	47.9%	100.0%
	Total		Count	171	92	263
			% within Most preferred property future performance	65.0%	35.0%	100.0%

Symmetric Measures

Financial Training or employment			Value	Approximate Significance
No	Nominal by Nominal	Phi	.114	.128
		Cramer's V	.114	.128
	N of Valid Cases		180	
Yes	Nominal by Nominal	Phi	.185	.091
		Cramer's V	.185	.091
	N of Valid Cases		83	
Total	Nominal by Nominal	Phi	.128	.038
		Cramer's V	.128	.038
	N of Valid Cases		263	

6.3.7.6 Controlled for Household Income

Table 6.47 shows that for the group household income < $120,000 there was a statistically significant relationship found and for those household income > $120,000) there was no statistically significant relationship found. (household income < $120,000: Phi = 0.17; p = 0.045; household income > $120,000: Phi = 0.05; p = 0.537)

For the < $120,000 group who preferred residential real estate (n = 28):

- 57% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

For the > $120,000 group who preferred residential real estate (n = 20):

- 35% of those who considered that residential real estate was expected to perform best or equal best over the next ten years also indicated a propensity to invest in residential real estate over the other two choices.

Between the groups, there was a low level of congruence between preferred investment and future expected return but there was less congruence for the high-income group, so household income **did** make a difference here.

Table 6.47 – Preferred residential real estate, residential real estate equal highest expected return (Household Income Controlled)

Most preferred property future performance * Property Expected Return Highest or equal highest * Household Income of <$120k vs >$120k Crosstabulation

Household Income of <$120k vs >$120k				Property Expected Return Highest or equal highest		Total
				Not Highest	Highest or equal highest	
<=$120k	Most preferred property future performance	Prefer Other	Count	67	38	105
			% within Most preferred property future performance	63.8%	36.2%	100.0%
		Prefer Property	Count	12	16	28
			% within Most preferred property future performance	42.9%	57.1%	100.0%
	Total		Count	79	54	133
			% within Most preferred property future performance	59.4%	40.6%	100.0%
>$120k	Most preferred property future performance	Prefer Other	Count	79	31	110
			% within Most preferred property future performance	71.8%	28.2%	100.0%
		Prefer Property	Count	13	7	20
			% within Most preferred property future performance	65.0%	35.0%	100.0%
	Total		Count	92	38	130
			% within Most preferred property future performance	70.8%	29.2%	100.0%
Total	Most preferred property future performance	Prefer Other	Count	146	69	215
			% within Most preferred property future performance	67.9%	32.1%	100.0%
		Prefer Property	Count	25	23	48
			% within Most preferred property future performance	52.1%	47.9%	100.0%
	Total		Count	171	92	263
			% within Most preferred property future performance	65.0%	35.0%	100.0%

Symmetric Measures

Household Income of <$120k vs >$120k			Value	Approximate Significance
<=$120k	Nominal by Nominal	Phi	.174	.045
		Cramer's V	.174	.045
	N of Valid Cases		133	
>$120k	Nominal by Nominal	Phi	.054	.537
		Cramer's V	.054	.537
	N of Valid Cases		130	
Total	Nominal by Nominal	Phi	.128	.038
		Cramer's V	.128	.038
	N of Valid Cases		263	

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6.3.7.7 Summary of control groups – preferred investment and expected performance

We would expect to find statistically significant correlations between respondents who preferred a particular investment and that respondent's belief regarding expected future returns from that investment under a neo-classical model. That is, they prefer an investment because they expect an investment return at least as high as any alternatives provided.

Regarding superannuation, more than 90% of respondents who preferred superannuation also expected the future returns from superannuation to be at least as high as any other option. Of the six dichotomous control variables, all exhibited a high level of congruence; that is, there was little variation within the two control groups. No strong statistical significance was found across the control groups.

Regarding Australian shares, more than 25% of respondents chose Australian shares as their preferred investment despite selecting other options expecting to produce higher investment returns. There was a difference observed between male and female respondents insofar as males were significantly more likely to select Australian shares as compared to females. Only 65% of females who preferred Australian shares believed that they would produce an investment return at least as high as other investment options. Age also appears to be a factor where almost one-third of those respondents 45 and under who preferred Australian shares selected another option as providing better-expected returns.

Residential real estate provided the most interesting result where more than 50% of those respondents who preferred residential real estate as an investment believed that other options would produce better future returns. Again, age provided a significant difference amongst the control variables where, of those 45 and under, 60% of those who preferred residential real estate believed that the other options would produce better returns. Additionally, education was a factor where a large difference was observed between the two education groups (although the numbers were small). Interestingly, within the university-educated group, two-thirds of those who preferred residential real estate believed that other options would produce better investment returns. Similar observations were found for the household income group where almost two-thirds of the over $120,000 group preferred residential real estate, despite believing that other options would produce better investment returns.

Table 6.48 – Summary of Control Groups – Correlations

Gender			Male	Female
Superannuation	Congruence	High [14]	94%	89%
	Significance		Not found	Not found
Australian Shares	Congruence	Low	81%	65%
	Significance		Not found	Not found
Residential Real Estate	Congruence	High	48%	50%
	Significance		Not found	Not found
Age			**45 and under**	**Over 45**
Superannuation	Congruence	Mod	100%	89%
	Significance		Phi = 0.20;	Not found
Australian Shares	Congruence	Mod	67%	77%
	Significance		Not found	Not found
Residential Real Estate	Congruence	Low	40%	61%
	Significance		Not found	Phi = 0.18;
Education Level			**Sub-University**	**University**
Superannuation	Congruence	High	89%	94%
	Significance		Not found	Phi = 0.15;
Australian Shares	Congruence	High	76%	72%
	Significance		Not found	Not found
Residential Real Estate	Congruence	Low	63%	37%
	Significance		Phi = 0.26;	Not found
Financial Advice			**Advised**	**Unadvised**
Superannuation	Congruence	Mod	89%	97%
	Significance		Not found	Phi = 017;
Australian Shares	Congruence	High	75%	73%
	Significance		Not found	Not found
Residential Real Estate	Congruence	Mod	42%	50%
	Significance		Not found	Phi = 018;
Financial Experience			**Experienced**	**Inexperienced**
Superannuation	Congruence	Mod	89%	97%
	Significance		Not found	Not found
Australian Shares	Congruence	High	74%	74%
	Significance		Not found	Not found
Residential Real Estate	Congruence	Mod	52%	41%
	Significance		Not found	Not found
Household Income			**<$120,000**	**>$120,000**
Superannuation	Congruence	High	90%	94%
	Significance		Not found	Not found
Australian Shares	Congruence	High	75%	73%
	Significance		Not found	Not found
Residential Real Estate	Congruence	Low	57%	35%
	Significance		Phi = 017;	Not found

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[14] Note that congruence between groups* is identified as follows:

Difference <8% = High, Difference 8% - 18% = Moderate, Difference >18% = Low (Authors suggestion)

6.4   Logistic Regression Analysis and Model Development

In the previous section, we considered the relationships between dependent and independent variables based on the data obtained from the online survey and this established several relationships between variables. In this section, we will conduct a logistic regression analysis of the obtained results to develop several models that represent the important relationships found.

Logistic Regression

Models were developed to identify how a number of independent or predictive variables combine to estimate the probability of choosing a particular investment. As has been the format of previous sections, these models were based on the framing of choice in both past-performance and expected future performance.

Logistic regression is used where a dependent variable is categorical (Pallant, 2013) and is useful when assessing the contribution of each independent variable and their predictive power. SPSS software uses a 'Forced Entry Method' as a default to perform these tests where all independent variables are tested in one single block and this technique combines and controls for the effects of other predictors (Pallant, 2013, p. 175).

Dummy variables were used as predictors for this analysis as follows (see table 6.49). Three of the predictor variables (Gender, Age and Household Income) were chosen based on several studies that have investigated either investment choices (Bannier & Neubert, 2016) (Hallahan et al., 2004; Weber et al., 2013), financial literacy (Lusardi & Mitchell, 2007b; van Rooij et al., 2012) or decision-making (Merkle & Weber, 2014).

Table 6.49 – Predictor Variables recoded

Gender	Male	Female
Age	45 and Under	Over 45
Education	Sub-University Education	University Education
Financial Experience	No	Yes
Household Income	Less than or equal to $120,000	Greater than $120,000
Financially Advised	Yes	No
Best 3 Year Past Performance*	Yes	No
Highest Expected Future Return	Yes	No

In each category of choice – Superannuation, Australian shares and residential real estate.

Given the previous discussion regarding access to superannuation, dichotomising age as under 45 and over 45 is appropriate as this categorisation provides a differentiation between 'younger' and 'older' adults. Education levels have been studied regarding superannuation, specifically (Ntalianis & Wise, 2011), where university staff have been

the basis of the dataset, and financial literacy studies have also identified higher education levels relating to improved financial decision making (Cole & Shastry, 2009; Lusardi, 2012; Lusardi & Mitchell, 2007b) and so differentiating along these lines was chosen. One of the critical research questions in the study was specifically looking at the impact of financial advice on the outcomes of the analysis, and so this was included although there is no evidence in the literature that this has been considered before. Similarly, to the impact of financial advice, the researcher was interested in the impact of experience in the field of finance, which included those with either specific education within the field of finance, or those who worked in the field of finance. This variable, while not been found in the literature, was included in the survey to identify if this was significant.

6.4.1.1   Multi-collinearity was evaluated

Multi-collinearity of independent variables occurs when these variables are highly correlated to each other with an R-value of 0.9 or above (Pallant, 2013). Regression models can be detrimentally affected when this condition exists, and so Pallant (2013) suggests that testing for these (ensuring that tolerances of greater than 0.1 are found) should be performed before developing the models. This was completed using SPSS collinearity diagnostics before each model was developed and showed no issues with multi-collinearity amongst the independent variables.

6.4.1.2   Why two sets of models?

For the development of model 1 (a, b & c) of this logistic regression analysis the preferred investment decision was framed in the context of past performance and the perception of past three years performance of each of the investment choices were included. For the development of model 2 (a, b & c) the preferred investment decision was framed in the context of expected future (10 years) performance; therefore, the perception of expected future return was included in this model.

Perception of risk as a continuous variable was also included. Traditional finance suggests that choosing between investments should be based on optimising the relationship between risk and return (Markowitz, 1952) as investors are typically risk-averse and would choose an investment that provides the best return for the lowest risk.

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As the perception of risk has been identified as a key element in the investment decision-making process, this variable was included in the logistic regression analysis. It was generally found to improve the model as contrasted with this variable being ignored.

6.4.1.3 Sensitivity testing including contrast categories

To test the relative influence on the results from within a number of variables (in this case, age, education level and household income), a sensitivity analysis was also conducted. Sensitivity analysis can help to identify whether variations within variables can affect the overall output of the results (Merz, Small, & Fischbeck, 1992)

Sensitivity analysis was conducted on the results above by recoding three categorical variables (Age, Education level and Household income) by recoding into sets of binary contrasts to test for the effects of particular categories. This created four new independent variables for each category, as there were five initial categories in each variable (n-1 'dummy variables' - See table 6.50).

Table 6.50 - Contrast categories recoded

Variable Types	Age	Education	Household Income
Binary Variable	45 and Under / Over 45	Sub-university level / University Level	<=$120,000 / >$120,000
Contrast variable	AgeRV1 = 18 - 35yrs	EducRV1 = Secondary	IncomeRV1 = < $60,000
Contrast variable	AgeRV2 = 36 – 45yrs	EducRV2 = Trade Qualification	IncomeRV2 = $60,000 - $120,000
Contrast variable	AgeRV3 = 46 – 55yrs	EducRV3 = Diploma	IncomeRV3 = $120,001 - $180,000
Contrast variable	AgeRV4 = 56 – 65yrs	EducRV4 = University Degree	IncomeRV4 - $180,001 - $240,000
Omitted Reference Category	Over 65yrs	University Post-Graduate	More than $240,000

6.4.2 Model Development – Framed Past Performance

This section will present model development for each of the three preferred investment options predicting each of them framed as past performance.

Model 1A Predicting preferred superannuation choice framed as past performance

Research Question: *What factors predict the likelihood that respondents would choose superannuation as their preferred investment?*

This model aims to identify what factors influence the decision to choose superannuation as a preferred investment when the decision has been framed by a consideration of investment returns in the recent past. Logistic regression was used as the research is trying to determine 'what are the odds' of selecting superannuation and what factors influence that decision.

Model 1A has a good statistical fit (Chi-Square 25.276; p = .001) and explains 15.1% of the variance in outcome of the dependent variable (investment preference = Superannuation) (Nagelkerke R Sq = 0.151). This is a moderate level of prediction from the set of variables described below. The Hosmer and Lemeshow test is **not** significant, and this shows that the sample and the model parameters do not violate the assumptions of logistic regression

The relative impact of the independent variables (predictors) in this model shows that the only significant and robust predictor of the dependent variable (investment preference = Superannuation) is 'best3yrpastsuper' (Log Odds = Exp(B) = 3.990; Sig (Wald)=0.001). This means that controlling for the combined effects of the other predictive factors, people who judged Superannuation as the best past 3-year performance were 3.99 times more likely also to prefer Superannuation as their investment choice than were people who did not judge super as the best past 3-year performer.

Table 6.51 – Model 1A Variables

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	gender	-.447	.340	1.727	1	.189	.640
	age_hi_lo	.343	.380	.815	1	.367	1.409
	Education2catR	.031	.339	.008	1	.928	1.031
	Financialexperience	.339	.349	.943	1	.331	1.403
	Householdinc_2group	.117	.330	.125	1	.724	1.124
	financiallyadvised	-.426	.345	1.521	1	.218	.653
	best3yrpastsuper	1.384	.337	16.896	1	.000	3.990
	superrisk	-.006	.007	.787	1	.375	.994
	Constant	-.822	1.289	.406	1	.524	.440

a. Variable(s) entered on step 1: gender, age_hi_lo, Education2catR, Financialexperience, Householdinc_2group, financiallyadvised, best3yrpastsuper, superrisk.

Model 1A – Sensitivity testing superannuation past performance

Please refer to Table 6.50 for the contrast categories that were tested within each variable.

- *Age:* No new significant independent variables were identified, and the categorical contrasts made no material change to the outcome. The only significant independent variable (best3yrpastsuper) saw a small increase in exp(B) from 3.99 to 4.01
- *Education Level:* No new significant independent variables were identified; however, the additional variables improved the predictability of the outcome. The only significant independent variable (best3yrpastsuper) saw an increase in exp(B) from 3.99 to 4.64
- *Household Income:* No new significant independent variables were identified; however, the additional variables improved the predictability of the outcome. The only significant independent variable (best3yrpastsuper) saw an increase in exp(B) from 3.99 to 4.58

There was no material change to the model outcome except for a slight increase in the impact of bestpast3yr following the more nuanced sub-category contrasts within these 3 control variables.

6.4.2.1 Model 1B predicting preferred Australian shares choice framed as past performance

Research Question: *What factors predict the likelihood that respondents would choose Australian shares as their preferred investment?*

This model aims to identify what factors influence the decision to choose Australian shares as a preferred investment when the decision has been framed by a consideration of investment returns in the recent past.

Model 1B has a good statistical fit (Chi-Square 27.925; p = .001) and explains 15% of the variance in outcome of the dependent variable (investment preference = Australian shares) (Nagelkerke RSq = 0.154). This is a moderate level of prediction from the set of variables described below. The Hosmer and Lemeshow test is **not** significant, and this shows that the sample and the model parameters do not violate the assumptions of logistic regression.

The relative impact of the independent variables (predictors) in this model shows that there are two significant predictors ('best3yrpastshares' and 'sharerisk'), but only

one strong predictor of a dependent variable (investment preference = Australian shares). The strong predictor was found to be 'best3yrpastshares' (Log Odds = Exp(B) = 3.235; Sig (Wald)=0.001). This means that controlling for the combined effects of the other predictive factors, people who judged Australian shares as the best past 3-year performance were <u>3.24 times more likely also to prefer Australian shares as their investment choice</u> than were people who did not judge Australian shares as the best past 3-year performer.

Table 6.52 – Model 1B Variables

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	gender	.070	.304	.053	1	.818	1.072
	age_hi_lo	-.279	.342	.665	1	.415	.757
	Education2catR	.018	.307	.003	1	.953	1.018
	Financialexperience	.189	.327	.336	1	.562	1.208
	Householdinc_2group	-.090	.300	.091	1	.763	.914
	financiallyadvised	-.405	.316	1.642	1	.200	.667
	best3yrpastshares	1.174	.294	15.990	1	.000	3.235
	sharerisk	-.017	.007	6.081	1	.014	.983
	Constant	.886	1.199	.547	1	.460	2.426

a. Variable(s) entered on step 1: gender, age_hi_lo, Education2catR, Financialexperience, Householdinc_2group, financiallyadvised, best3yrpastshares, sharerisk.

Model 1B – Sensitivity testing Australian shares past performance

- *Age:* No new significant independent variables were identified, and a previously significant independent variable – financially advised – lost its significance. This may have been because the reference category of over 65 is likely to have been the highest group who were financially advised. The only significant independent variable (best3yrpastshares) saw a small decrease in exp(B) from 3.24 to 3.22.
- *Education Level:* No new significant independent variables were identified; however, the additional variables improved the predictability of the outcome. The only significant independent variable (best3yrpastshares) saw a small increase in exp(B) from 3.24 to 3.44
- *Household Income:* No new significant independent variables were identified; however, the additional variables improved the predictability of the outcome. The only significant independent variable (best3yrpastshares) saw an increase in exp(B) from 3.24 to 3.60.

There was no material change to the model outcome as a result of the sensitivity analysis.

6.4.2.2   **Model 1C predicting preferred** residential real estate **choice framed as past performance**

<u>Research Question</u>: *What factors predict the likelihood that respondents would choose residential real estate as their preferred investment?*

This model aims to identify what factors influence the decision to choose residential real estate as a preferred investment when the decision has been framed by a consideration of investment returns in the recent past.

Model 1C has a good statistical fit (Chi-Square 52.438; p = .001) and explains 28% of the variance in outcome of the dependent variable (investment preference = Residential real estate) (Nagelkerke RSq = 0.283). While still a moderate level of prediction, this model to predict Residential real estate choice was by far the strongest of the three so far. The Hosmer and Lemeshow test is **not** significant, and this shows that the sample and the model parameters do not violate the assumptions of logistic regression.

The relative impact of the independent variables (predictors) in this model shows that there are two significant and strong predictors of the dependent variable (investment preference = Residential real estate) - being 'best3yrpastproperty' (Log Odds = Exp(B) = 5.846; Sig (Wald) = 0.001) and 'financiallyadvised' (Log Odds = Exp(B) = 2.753; Sig (Wald) = 0.004).   This means that controlling for the combined effects of the other predictive factors, people who judged Residential real estate as the best past 3-year performance were <u>5.8 times more likely to also prefer residential real estate as an investment choice</u> than were people who did not judge residential real estate as the best past 3-year performer. Additionally, those who have a relationship with a financial adviser were <u>2.75 times more likely to also prefer residential real estate as an investment choice</u> than were people who did not have a relationship with a financial adviser. This demonstrates the relative strength of Model 1C compared with Models 1A and 1B.

Table 6.53 – Model 1C Variables

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1ᵃ	gender	.201	.327	.378	1	.539	1.223
	age_hi_lo	-.300	.348	.745	1	.388	.741
	Education2catR	-.029	.337	.007	1	.931	.971
	Financialexperience	-.481	.357	1.814	1	.178	.618
	Householdinc_2group	.042	.325	.017	1	.897	1.043
	financiallyadvised	1.013	.350	8.382	1	.004	2.753
	best3yrpastproperty	1.766	.323	29.873	1	.000	5.846
	propertyrisk	-.012	.007	3.113	1	.078	.988
	Constant	-2.064	1.215	2.884	1	.089	.127

a. Variable(s) entered on step 1: gender, age_hi_lo, Education2catR, Financialexperience, Householdinc_2group, financiallyadvised, best3yrpastproperty, propertyrisk.

Model 1C – Sensitivity testing Residential real estate past performance

- *Age:* Contrast variable AgeRV2 (36 – 45 yrs) approached significance and indicated exp(B) of 2.64. Of the other significant independent variables, 'best3yrpastproperty' saw a small decrease in exp(B) from 5.85 to 5.82 and 'financiallyadvised' fell slightly from 2.75 to 2.57.
- *Education Level:* No new significant independent variables were identified; however, the additional variables improved the predictability of the outcome. Of the two significant independent variables (best3yrpastproperty and financiallyadvised), there was a small increase in exp(B) from 5.85 to 5.90 and 2.75 to 2.81, respectively.
- *Household Income:* No new significant independent variables were identified; however, the additional variables improved the predictability of the outcome. Of the two significant independent variables (best3yrpastproperty and financiallyadvised), there was a small increase in exp(B) from 5.85 to 5.91 for 'best3yrproperty' but a small decrease in 'financiallyadvised' from 2.75 to 2.57.

There was no material change to the model outcome as a result of the sensitivity analysis.

6.4.3 Model Development – Framed Future Performance

This section will present model development for each of the three preferred investment options predicting each of them framed in terms of future performance.

6.4.3.1   Model 2A predicting preferred superannuation choice framed as future expected performance

Research Question: *What factors predict the likelihood that respondents would choose superannuation as their preferred investment?*

This model aims to identify what factors influence the decision to choose superannuation as a preferred investment when the decision has been framed by a consideration of investment returns in the future (next ten years).

Model 2A has a statistical fit (Chi-Square 16.557; p = .035) but explains less than 10% of the variance in outcome of the dependent variable (Investment preference = Superannuation) (Nagelkerke RSq = 0.092). This is a lower level of prediction than was found in Models 1A, 1B and 1C above. The Hosmer and Lemeshow test is **not** significant, and this shows that the sample and the model parameters do not violate the assumptions of logistic regression.

The relative impact of the independent variables (predictors) in this model shows that there are no strong predictors of the dependent variable (Investment preference = Superannuation). Age_hi_lo (Log Odds = Exp(B) = 1.780; Sig (Wald) = 0.082) and 'financialexperience' (Log Odds = Exp(B) = 1.798; Sig (Wald) = 0.051) is significant at p = .05. Controlling for the combined effects of the other predictive factors, people who were over 45 were <u>1.8 times more likely also to prefer superannuation as an investment choice</u> than were people who were under 45. Additionally, those who had financial experience were <u>1.8 times more likely also to prefer superannuation as an investment choice</u> than were people who did not have financial experience.

Table 6.54 – Model 2A Variables

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1ª	gender	-.110	.289	.146	1	.703	.896
	age_hi_lo	.577	.332	3.027	1	.082	1.780
	Education2catR	-.099	.292	.115	1	.735	.906
	Financialexperience	.587	.301	3.793	1	.051	1.798
	Householdinc_2group	.395	.287	1.891	1	.169	1.485
	financiallyadvised	-.451	.299	2.276	1	.131	.637
	HiExSup	.664	.464	2.052	1	.152	1.943
	superrisk	-.002	.006	.082	1	.775	.998
	Constant	-2.050	1.184	2.996	1	.083	.129

a. Variable(s) entered on step 1: gender, age_hi_lo, Education2catR, Financialexperience, Householdinc_2group, financiallyadvised, HiExSup, superrisk.

Model 2A – Sensitivity testing superannuation expected future return

- *Age:* No new significant independent variables were identified, and the categorical contrasts made no material change to the outcome. Age over 45 lost its significance; however, the use of over 65 as an omitted control is likely to be the reason for this. The only significant independent variable (financialexperience) saw a small increase in exp(B) from 1.80 – 1.81
- *Education Level:* When education was used as a contrast variable set, no independent variable achieved significance. 'financialexperience' only approached significance.
- *Household Income:* Similarly to the above, the use of household income as a contract variable caused the loss of any significant independent variable.

There was no material change to the model outcome as a result of the sensitivity analysis.

6.4.3.2 **Model 2B predicting preferred** Australian shares **choice framed as future expected performance**

<u>Research Question</u>: *What factors predict the likelihood that respondents would choose Australian shares as their preferred investment?*

This model aims to identify what factors influence the decision to choose Australian shares as a preferred investment when the decision has been framed by a consideration of investment returns in the future (next ten years).

Model 2B has a statistical fit (Chi-Square 15.646; p = .048); however, it explains less than 10% of the variance in the outcome of the dependent variable (Investment preference = Australian shares) (Nagelkerke RSq = 0.081). This is a low level of prediction from the set of variables described above. The Hosmer and Lemeshow test is **not** significant, and this shows that the sample and the model parameters do not violate the assumptions of logistic regression.

The relative impact of the independent variables (predictors) in this model shows that there is one predictor of the dependent variable (Investment preference = Australian shares). While perception of risk (sharerisk) was significant, it provided predictive value of less than 1 (Log Odds = Exp(B) = 0.983; Sig (Wald) = 0.006). As perception of share risk was a continuous variable, this means that controlling for the combined effects of the other predictive factors, people who perceived Australian shares to carry a higher risk

were <u>slightly less likely also to prefer Australian shares as an investment choice</u> than were people who perceived Australian shares to have a lower risk.

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Table 6.55– Model 2B Variables

Variables in the Equation

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		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1ᵃ	gender	.079	.274	.083	1	.773	1.082
	age_hi_lo	.158	.310	.262	1	.609	1.172
	Education2catR	-.134	.278	.233	1	.629	.874
	Financialexperience	-.442	.295	2.245	1	.134	.643
	Householdinc_2group	.057	.272	.044	1	.833	1.059
	financiallyadvised	-.080	.287	.078	1	.780	.923
	HiExShare	.063	.297	.046	1	.831	1.066
	sharerisk	-.017	.006	7.681	1	.006	.983
	Constant	.597	1.088	.301	1	.583	1.817

a. Variable(s) entered on step 1: gender, age_hi_lo, Education2catR, Financialexperience, Householdinc_2group, financiallyadvised, HiExShare, sharerisk.

Model 2B – Sensitivity testing Australian shares expected future return

- *Age:* No new significant variable emerged, and there was no change to the only significant variable 'sharerisk'. The contrast variables AgeRV1, AgeRV3 and AgeRV4 approached significance only.
- *Education Level:* Using these contrast variables caused the model to lose significance (Chi-Square 16.70; p = .117). There was no change to the outcome of the original model
- *Household Income:* Using these contrast variables caused the model to lose significance (Chi-Square 16.27; p = .131). There was no change to the outcome of the original model. There was no material change to the model outcome as a result of the sensitivity analysis.

6.4.3.3 Model 2C predicting preferred residential real estate choice framed as future expected performance

Research Question: *What factors predict the likelihood that respondents would choose residential real estate as their preferred investment?*

This model aims to identify what factors influence the decision to choose residential real estate as the preferred investment when the decision has been framed by a consideration of investment returns in the future (next ten years).

Model 2C has a good statistical fit (Chi-Square 31.318; p = .001) and explains almost 20% of the variance in outcome of the dependent variable (Investment preference = Residential real estate) (Nagelkerke RSq = 0.195). Again, this model to predict Residential real estate choice was by far the strongest of the three models being framed within future expected performance. The Hosmer and Lemeshow test is **not** significant, and this shows that the sample and the model parameters do not violate the assumptions of logistic regression.

The relative impact of the independent variables (predictors) in this model shows that there are several predictors of the dependent variable (Investment preference = Residential real estate). This means that controlling for the combined effects of the other predictive factors, Age_hi_lo (Log Odds = Exp(B) = 0.293; Sig (Wald) = 0.002) provides good predictability indicates that investors over 45 are a little less than 30% as likely to prefer residential real estate. Additionally, 'HiExProperty' (Log Odds = Exp(B) = 2.302; Sig (Wald) = 0.023) also provides good predictability and indicates that investors who believed that residential real estate offered the highest expected return were 2.3 times more likely to prefer residential real estate. Further, 'Financiallyadvised' provides predictability (Log Odds = Exp(B) = 2.358; Sig (Wald) = 0.037) identifies that those investors with financial advisers were almost 2.4 times for more likely to invest in residential real estate.

Table 6.56 - Model 2C Variables

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	gender	.066	.376	.031	1	.861	1.068
	age_hi_lo	-1.227	.392	9.821	1	.002	.293
	Education2catR	.272	.382	.505	1	.477	1.312
	Financialexperience	.243	.394	.381	1	.537	1.275
	Householdinc_2group	-.723	.375	3.706	1	.054	.486
	financiallyadvised	.858	.412	4.334	1	.037	2.358
	HiExProperty	.834	.366	5.181	1	.023	2.302
	propertyrisk	-.008	.008	1.201	1	.273	.992
	Constant	-.173	1.425	.015	1	.903	.841

a. Variable(s) entered on step 1: gender, age_hi_lo, Education2catR, Financialexperience, Householdinc_2group, financiallyadvised, HiExProperty, propertyrisk.

Model 2C – Sensitivity testing Residential real estate expected future return

- *Age:* Significant differences emerged when applying all four age-based contrast variables. Nagelkerke RSquared increased from 19.5% to 25.1%, and all four contrast variables became highly significant.
  - AgeRV1 (p = .005; Exp(B) = 22.93

- AgeRV2 (p = .002; Exp(B) = 30.60
- AgeRV3 (p = .032; Exp(B) = 11.24
- AgeRV4 (p = .025; Exp(B) = 11.53
- Householdinc_2Group (p = .017; Exp(B) = 0.39
- HiExProperty (p = .021; Exp(B) = 2.38

While not changing the overall outcome, this confirms that age group is a critical variable when trying to predict real estate investment framed within future expected returns.

- *Education Level:* Two new significant independent variables were identified; however, the additional contrast variables slightly improved predictability of the outcome. Of the two significant independent variables (HiExproperty and financiallyadvised), there was a small increase in exp(B) from 2.30 to 2.33 and 2.36 to 2.65, respectively. The two new significant variables were age and household income and as expected suggested that older respondents were less likely to prefer property and lower-income households were also less likely to prefer property.

- *Household Income:* No new significant independent variables were identified; however, the additional variables improved the predictability of the outcome. Of the three significant independent variables (age_hi_lo, HiExProperty and financiallyadvised), there were small changes in exp(B) from 0.29 – 0.28 (age_hi_lo) 2.30 – 2.40 (HiExProperty) and2.36 – 2.46 (financiallyadvised).

6.4.4   Summarised Table of Results

There was no material change to the model outcome as a result of the sensitivity analysis.

Table 6.57 – Summary of model results

Model 1 – Past Framed						
No.	Type	Statistical Fit	Significant Variable	% Explained by Variable	Exp(B) Log Odds	Level of Predictability
A	Superannuation	Yes (Chi Square 25.276; p = .001)	Best Past Performance	15.1%	3.99	High
B	Australian Shares	Yes (Chi Square 27.925; p = .001)	Best Past Performance	15.4%	3.24	High
C	Residential Real Estate	Yes (Chi Square 52.438; p = .001)	Best Past Performance Financial Advised	28.3%	5.85 2.75	High
Model 2 – Future Framed						
No.	Type	Statistical Fit	Significant Variable	% Explained by Variable	Exp(B) Log Odds	Level of Predictability
A	Superannuation	Yes (Chi Square 16.557; p = .035)	Age Over 45 Financial Experience	8.8%	1.78 1.80	Low
B	Australian Shares	Yes (Chi Square 15.646; p = .048)	Perception of risk	8.1%	0.98	Low
C	Residential Real Estate	Yes (Chi Square 31.318; p = .001)	Age Over 45 High Expected Return Financially Advised	19.5%	0.29 2.30 2.36	High

6.5   Summary of findings and conclusion

This study is concerned with the relationship between the perception of the risks and returns of three common forms of investment for Australian investors, and the preference to invest in one or another of those three options. This is important because the comparison of these three options is challenging under the traditional finance paradigm that the higher the expected return, the higher the risk. This paradigm is efficient when investments are comparable in their characteristics but become less efficient when the comparison is less valid as in the comparison of each of the three options in this study.

We found that respondents had a poor understanding of the relationship between risk and return, as mentioned above, and demonstrated that they felt their preferred

investment offered a lower risk than other options in all cases. In other words, investment option with the highest expected return was associated with a lower risk.

In addition to the descriptive statistics, relationships were identified using bivariate analysis and logistic regression was used to develop models to anticipate investment preference.

6.5.1 Superannuation

Specifically, regarding Superannuation, there was a high proportion of respondents who felt the primary risk was not market-related at all, but instead was governance and regulatory. Hence there was a mismatch between the perception of risk as measured under mean-variance and respondent perspective. No statistical relationship was found between perceived risk and preferred investment (when framed by past performance) which implies that risk perception held a less than expected level of importance. Notwithstanding this, respondents who preferred superannuation believed it held a lower level of risk than those who preferred other than superannuation. Gender and Age were factors (male and over 45 more likely) where superannuation was the preferred investment framed by past performance as expected due to preservation (access) rules, as was financial advice (more likely for those with financial advisers) and those with a household income above $120,000.

When considering superannuation as a preferred investment when framed by expected future performance, a weak, statistically significant relationship exists between those who believe superannuation will perform best over the next ten years and those who preferred superannuation. Regarding the control groups, the only factor providing significance was the over 45's, who were more likely to prefer superannuation,

The regression models for superannuation (1A and 2A) both showed good statistical fit and explained 15.1% and less than 10%, respectively, of the variance in outcome. Significantly, the past performance framed results were superior predictors to the future framed results. Respondents who judged superannuation as the best past performer were almost four times more likely to prefer superannuation as compared to those who judged another option as the best performer. When framed by future performance, the over 45 group and the financial experience group were both 1.8 times more likely to prefer superannuation.

6.5.2 Australian Shares

Specifically, regarding Australian Shares, more than 75% of respondents related risk to market-related, suggesting mean-variance risk assessment may apply. A relationship was found between perceived risk and preferred investment framed by past performance, although the effect is small. Of the three investment options, the difference between the mean perception of risk score of those who preferred Australian shares was highest as compared to those who preferred another option. Age was a factor (over 45 more likely) where Australian shares were the preferred investment framed by past performance (which was a little surprising as we would expect that older respondents to be more risk-averse), as was financial advice (more likely for those with financial advisers).

When considering Australian shares as a preferred investment when framed by expected future performance, no relationship was found between those who believe Australian shares will perform best over the next ten years and those who preferred Australian shares. Regarding the control groups, Gender was a factor with males more likely to prefer Australian shares.

The regression models for Australian shares (model's 1B and 2B) both showed good statistical fit and explained 15% and less than 10%, respectively, of the variance in outcome. Significantly, the past performance framed results were superior predictors to the future framed results. Respondents who judged superannuation as the best past performer were 3.2 times more likely to prefer superannuation as compared to those who judge another option as the best performer, and this was the only material factor. When framed by future performance, the only factor that provided any significance was the perception of risk; however, this was negligible with those who perceived higher risk only very slightly less likely to prefer Australian shares.

6.5.3 Residential Real Estate

Specifically, regarding residential real estate, more than 25% of respondents related risk to governance or tenancy related risk and more than 8% suggested that there was no risk associated with this form of investing. A weak relationship was found between perceived risk and preferred investment framed by past performance, although the effect is small. Financial Advice was a factor (Unadvised more likely) where residential real estate was the preferred investment framed by past performance.

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When considering residential real estate as a preferred investment when framed by expected future performance, a relationship was found between those who believe residential real estate will perform best over the next ten years and those who preferred residential real estate. However, less than 50% of those who preferred this option also believed that it would produce the highest return.

Regarding the control groups, education was a factor with the Sub-University group more likely to prefer residential real estate compared to the University education group. The lower household income group (<$120,000) also preferred residential real estate compared to the higher income group.

The regression models for residential real estate (model's 1C and 2C) both showed good statistical fit and explained 28% and almost than 20%, respectively, of the variance in outcome making them the strongest predictive models of all. Significantly, the past performance framed results were superior predictors to the future framed results. Respondents who judged residential real estate as the best past performer were 5.8 times more likely to prefer superannuation as compared to those who judge another option as the best performer and those who received financial advice were 2.7 times more likely. When framed by future performance, three factors demonstrated significance. Age, financial advice and high expected return all appear to influence residential real estate as a preference. Over 45's are only less than one third as likely to prefer this option, while financially advised and high expected return are both a little over 2.3 times more likely to prefer this choice.

In the next chapter we provide an overall summary of the chapters, update the literature review for recent relevant literature, and discuss the practical and academic implications from our findings.

7. DISCUSSION AND CONCLUSIONS

Introduction

While there is a large amount of excellent research and literature available that considers investment decision-making under traditional finance, behavioural finance and financial literacy paradigms, little has considered the practical decision-making of non-professional investors when their choices are across asset class options. The purpose of this study was to investigate what influences Australian investor decision-making by offering three choices of fundamentally different, but highly recognisable and available, investments. The decision to invest in superannuation, Australian shares or residential real estate all have different characteristics as outlined in chapter three, but all options are available to Australian investors for long term wealth creation.

This study considered the impact of investor beliefs regarding investment characteristics – specifically risk, past performance and expected return, whether these beliefs are 'correct' or not, and whether the beliefs support the investor's propensity to invest in one of three options provided.

The primary thesis of this research is that the assumptions made in the mean-variance model of investment decision-making may be compromised by the risk and return beliefs of individual (non-professional) investors. If investors beliefs regarding the expected returns and risks of an investment option are incorrect, the traditional portfolio construction approach of generating a risk-adjusted portfolio is likely to be rejected by investors who may not 'believe' the outcome. The researcher's long experience in dealing with individual investors has led to this view; however, this appears not to have been academically tested until now.

Of particular interest to the researcher were the reasons for investing in residential real estate despite the price of this asset class being at record levels and investors (as well as owner-occupiers) being prepared to borrow heavily to purchase this asset class as an investment vehicle. A specific motivation for the researcher (a financial planning practitioner for more than 25 years) was to investigate the commonly heard refrain from investors that residential real estate provides a high return for little or no risk.

Furthermore, the researcher was interested in the influence of framing the investment questions related to propensity to invest. This led to the decision to 'frame' the investment decision based on both investor beliefs regarding past performance as well as investor expected future performance to identify if differences exist in investment propensity.

In this concluding chapter, section 7.2 summarises the chapters, section 7.3 discusses the results and interprets them as they relate to the research questions and section 7.4 reviews relevant recent literature. Section 7.5 presents the practical and academic implications of the research, section 7.6 considers the limitations of the research and then section 7.7 explores areas of potential future research.

7.2   Summary of Chapters

Chapter 1 provides an overview of the research area and outlines the background to the research problem, a summary of the literature, and a summary of the findings. Chapter 2 provides a detailed review of the literature as it applies to the research project, while chapter 3 describes in detail the three investment options chosen for the study. Chapter 4 outlines the theoretical and conceptual framework that informs the research, and chapter 5 describes the research methodology. Chapter 6 provides a detailed description of the results, including a summary of the descriptive statistics, crosstabs and inferential statistics and model development using logistic regression.

7.3   Discussion and Research Questions

Two key research questions were posed by, and informed, this research:

1. Do individuals hold appropriate beliefs regarding the risks and expected returns of the investments they are considering?
2. Do individuals then demonstrate a propensity to invest according to those beliefs in a rational manner?

The results from this study indicate that the answer to the first question is in the negative as respondents of the survey demonstrated a poor understanding of the risks associated with the investment choices – certainly if compared to a mean reversion approach. Additionally, when comparing mean risk scores across preferred investment, each investment preference group scored risk lower on their preferred investment as compared to those preferring other. In other words, investment preference led to a lower perception of risk.

Perceptions of best past performance were also largely incorrect, with more than 60% choosing incorrectly. When predicting expected future performance, the survey found that respondents chose returns closer to historical performance figures. This anomaly was surprising as the predictions of future performance imply an understanding

of past performance, but the survey group were unable to identify and rank from best to worst performers in the past. The implication is that investors may have 'made up their minds' regarding their investment choices without considering actual past or future returns.

Regarding a propensity, or preference, to invest, respondents of the survey were overwhelming influenced by their perception of past performance, and this appears to be the most significant factor in their investment choice. The results from the single additional financial literacy question regarding influence of past performance supports this view where only 7% of respondents indicated that they would be less likely to invest in an investment that had performed 'much better than expected'. Expectations of the best future performer were less influential that the perception of past performance, which should be of interest to Australian regulators who insist on a 'past performance warning' on all regulated investments. Notwithstanding this, the implication is that survey respondents acted 'rationally' if their perception of best past performance was the most influential, but 'irrationally' when considering expected future investment returns.

7.4   Relevant Literature Review Post 2015

Included here are some relevant findings in the literature produced between the conclusion of the data collection and analysis and the final writing of this thesis. At the time the data was collected for this study, there had been no research that considered perception of risk as it related to future returns and investment choice. Between the collection of the data and the completion of the research, studies were identified that had considered these relationships and the following is presented to reflect that research insofar as it relates to this thesis.

Huber and Huber (2019) have studied risk perception, return expectations, and propensity to invest and found that risk and return presentation influenced propensity to invest. Their study focussed on the variability in the scale used on graphs that demonstrated past performance and price changes and suggests that a high scale graph is suggestive to investors of higher risks and more squat graphical representations suggest lower risk. While the proportions of both styles of graphs are the same, the perception of the user changes.

As a part of their laboratory experiment, they also confirmed that participant perception of past performance "almost perfectly" (Huber & Huber, 2019, p. 78) predicted future return expectations which supports the findings in this research.

A study on risk perception (Huber, Palan, & Zeisberger, 2019), as opposed to mean-variance measured risk, found that when risk is measured subjectively, investors were willing to pay higher prices for assets that they perceived as being low-risk. Huber et al. (2019) also find that risk perception by the individual investor can influence prices in the overall market.

7.5 Practical Implications and Academic Contributions

7.5.1 Practical Implications

Financial Advisers and Financial Planners are expected to assess an individual investor's preference for risk before making recommendations regarding investment choices. This assessment assumes a mean-variance approach to investment risk using a traditional variance approach to risk measurement – the higher the past variability of returns of the investment, the higher the risk attributed to the investment. This research has shown that individual investors either do not understand this approach or ignore this approach in favour of a simple assessment of perceived past investment performance. While there are some minor differences between those who have an ongoing relationship with a financial adviser and those who do not, perceived past performance is the single most important factor in investment decision-making by individual investors. This is especially apparent in the case of residential real estate investing and seems not to be influenced by any of the control variables assessed.

Financial advisers and financial planners must be made aware of this anomaly to assist them in advising clients or else significant investment decisions will likely be sub-optimal. Additionally, there may need to be a revision of the risk measurement approach used as it appears that the traditional mean-variance approach is having little impact on investment decisions by non-professional investors.

7.5.2 Academic Contributions

The primary contribution to academia is to add the dimension of investor beliefs to the existing research. Traditional financial models assume investors are rational and make

investment decisions using all available information to provide an optimal outcome. In contrast, behavioural finance models search for persistent errors in judgment leading to biases that may result in sub-optimal investment decision-making. This research considers the 'real-world' situation where investor's *beliefs* influence their decision-making and has found that the perception of past performance, while mainly incorrect, provides the most significant influence on investment decisions. This incorrect assumption has not been considered in the research before and will provide further opportunity to develop both traditional finance theory as well as behavioural finance theory as this new consideration is neither irrational nor a persistent error.

7.6 Limitations

The research conducted for this study will provide valuable findings for policymakers and finance practitioners as it explores, for the first time, the impact of beliefs on investment decision making. The study was conducted on a cross-sectional basis using only Australian respondents and as such has certain limitations. Additionally, the time and resources available for the completion of a Doctor of Business Administration degree only allowed for a limited study.

This research was conducted primarily using a quantitative methodology which was deemed appropriate given resource constraints and the widespread use of quantitative methods used in numerous financial literacy and financial competence studies (Agnew, Bateman & Thorp 2013; Bateman 2011; Lusardi 2012), as well as many behavioural finance studies (Bovi 2009; Brahmana, Hooy & Ahmad 2012). This methodology has identified several anomalies that contradict traditional finance assumptions and require further investigation. Specifically, there are two areas of the research which are limited by this methodology. The first is that the beliefs demonstrated by the respondents could be further investigated through the use of a more detailed qualitative approach to understand the reasons behind the respondent decisions better. The second would be further testing of the research questions through the use of laboratory experiments. Laboratory experiments have been a particularly popular method of analysis for behavioural scientists as they provide for precise targeting of specific behaviours and indeed behavioural laboratories are now available in many Australian Universities.

Furthermore, sampling of the population through a variety of mass media access points cannot guarantee a truly random sample of the population, and along with the

limited number of respondents, the results must be taken as requiring further study. Notwithstanding this, the research has provided a unique insight into the factor's investors use to assist with their investment decision-making.

7.7   Future Research

This study was the first of its kind to investigate investment decision-making across different types of accessible and common investments for Australian investors. For this reason, it has provided a fruitful source of additional research questions.

We considered the propensity to invest in three alternative forms of investment, but in the case of residential real estate, we were forced to apply gearing to the investment. Future research could consider the relationship between the perceived expected return of the same investment framed as a geared investment (with borrowings to complete the purchase) as opposed to framing as an un-geared investment. This would identify if there were any influence of the carrying of debt on a property on the expected return or perceived risk.

The research identified the significance of perception of past performance on the investment decision-making process, yet most respondent's perceptions were incorrect in fact. Further research is required to determine two aspects of this anomaly:

a) What led to the misperception of past performance?
b) Would the outcome have been different if evidence was provided to respondents regarding actual past performance?

Risk was considered as a single elemental score (1-100), and while traditional finance measures risk as the variability of return and support the tenet that higher returns require higher risk, there is little evidence that this is considered by retail (non-professional) investors as their primary determination of the risk of an investment. Indeed, the findings of this research suggest that risk is very poorly understood, and the risk-return upward sloping line is often ignored by retail investors. This research found that there were as many respondents who thought a high return investment offered low risk as those who considered a low return investment was indicative of a high risk. Perception of risk has been considered in the research but has yet to be studied in the context of choice between fundamentally different investment choices (as in the three options considered in this research). Further research would develop an understanding of investor's risk perception and how that influences their investment choices.

It became very apparent during both the literature review and the survey analysis that there is very poor information on the risk and return characteristics of residential real estate in Australia and that this is a significant area of future research. Using listed property as a proxy for residential real estate, or using blunt instruments such as median house prices, offer little useful information to investors and therefore it becomes a nonsense to try to add this asset class to a traditional mean-variance based portfolio. Yet in the Australian context, that is precisely what many financial advisers and financial planners must do - with little success.

7.8   Conclusions

Australian Investors are strongly influenced by the past performance of investment options when considering which investment to choose. This is even more influential than the investor's expectation of future returns or their perception of the risk of the investment.

Australian Investors knowledge of actual past performance is poor and was incorrect for more than 60% of respondents to this survey. Given the level of influence of past performance, this is likely to lead to sub-optimal investment choices.

The consideration of the risk of an investment option did not follow the traditional finance model of higher risk – higher return, and for many respondents, the opposite was true. They felt that an expected high return investment came with low risk while an expected low return investment reflected high risk. Perception of risk has been identified as having other characteristics than mean-reversion.

Australian regulator enforced statutory warnings that past performance bears no relationship to future returns are likely to have little or no impact on investor behaviour unless actual past performance figures are readily available for comparable investments.

7.9   Recommendations

The key recommendations from this research are as follows:

A.   *Perception of risk is different from the traditional finance (mean-variance) view of risk*

Financial advisers typically use a risk profile questionnaire to assist them in determining what investment matches the level of risk willing to be accepted by their clients. These questionnaires attempt to match a portfolio with a 'known' level of risk to the level of

risk tolerance suggested by the results of the questionnaire. This research suggests that the perception of risk by the investor may not bear any relationship to the traditional finance version of risk and an investigation of the perception of risk at the individual investor level would be valuable for financial advisers before recommending investments. This is somewhat supported by Kahneman, who suggests that in the context of questionnaire-based determinations of attitudes to risk "there is no such thing" (Kahneman, 2009, p. 1).

B. *Perception of past performance is a major contributing factor in investment decision-making – especially regarding those who chose residential real estate as their preferred investment.*

Despite the requirement for material describing regulated investments to display a warning that past performance is not indicative of future performance (and residential real estate is not a regulated investment in Australia), it appears that it plays a highly significant role in an individual's propensity to invest. The past performance warning should also apply to residential real estate marketing material and should be strengthened to discourage investors from making decisions solely on the basis if part performance.

C. *Perception of past performance is a more important factor even that the investor's expectation of future performance.*

Developing from recommendation 2, investors need to be encouraged to take a forward-looking view for their investment decisions rather than relying on past performance (backward-looking) as their key decision driver. A centralised government body could provide estimates of future expected returns across several asset classes, such as the three specifically studied here, that represent the investment choices available to non-professional investors. In this way, non-professional investors would have a basis for their investment decisions other than based on past performance.

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9. APPENDICES

9.1 Thesis Survey Questions

Welcome to the survey!

You are invited to participate in a research project investigating people's views on different investment preferences. This project is being conducted by a student researcher Mr Paul Moran as part of a Doctorate of Business Administration at Victoria University under the supervision of Dr Segu Zuhair and Dr Michael Ntalianis from the College of Business.

You will be asked a series of questions about yourself, as well as questions regarding your knowledge of, and attitude to, investments as outlined above. This is a voluntary survey, and your support will be highly regarded by the researchers.
The information you provide will be maintained in the strictest confidence as per the University's guidelines for data security and disposal. It will be used for statistical analysis as part of the research project.

As you will not be identifiable from your responses, there are no risks to you in this study. This will be an on-line survey, however, you may volunteer for a more detailed telephone interview. In this case, your responses to the survey will still remain unidentifiable to the researcher. Up to 10 participants may be selected for the follow-up interview. This interview will be used to broaden the knowledge gained from the survey.

This a part of an academic research project studying what people think about a number of different investments that they may consider during their life. Your participation will be greatly appreciated, and completely anonymous.

Please remember that there are actually no correct answers in the questionnaire - we are only after your opinion.

You must be over the age of 18 to participate in this survey. If you are over 18 and agree to participate, you will need to click the accept button below to begin. The survey should take no more than 15 minutes. You can exit at any time during the survey.

At the end of the survey, you may be asked to volunteer for a more detailed telephone survey that will take approximately 30 minutes. This is completely voluntary and the answers you provide here will not be able to be identified by the researcher as yours. We are looking for 10 volunteers.

If you have any queries or complaints about the way you have been treated, you may contact the Ethics Secretary, Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, email Researchethics@vu.edu.au or phone (03) 9919 4781 or 4461. You may contact the primary researcher via email at paul.moran1@students.vu.edu.au

Q54
❍ Agree to participate (1)
❍ Decline participation (2)
If Decline participation Is Selected, Then Skip To End of Survey

Q58 Over the past 3 years, which of the following do you think has produced the best investment returns?
- ❍ Superannuation (1)
- ❍ Australian Shares (2)
- ❍ Residential Real Estate (3)
- ❍ I don't know (4)

Q61 Over the past 3 years, which of the following do you think has produced the worst investment returns?
- ❍ Superannuation (1)
- ❍ Australian Shares (2)
- ❍ Residential Real Estate (3)
- ❍ I don't know (4)

Q60 Over the past 20 years, which of the following do you think has produced the best investment returns?
- ❍ Superannuation (1)
- ❍ Australian Shares (2)
- ❍ Residential Real Estate (3)
- ❍ I don't know (4)

Q62 Over the past 20 years, which of the following do you think has produced the worst investment returns?
- ❍ Superannuation (1)
- ❍ Australian Shares (2)
- ❍ Residential Real Estate (3)
- ❍ I don't know (4)

Q52 If you had a choice of making a single investment of any amount that you wanted to, what would you invest in?
- ❍ A negatively geared investment property (1)
- ❍ A good quality Australian share portfolio (2)
- ❍ A good quality managed superannuation fund (3)
- ❍ A positively geared investment property (4)
- ❍ Your current superannuation fund (the main one you use) (5)
- ❍ A highly ranked managed fund that invested in Australian shares (6)
- ❍ A self-managed superannuation fund (7)
- ❍ I don't know / I don't want to answer (8)

Q59 If an investment had performed much better than expected over the past 2 years, would you be:
- ❍ More likely to invest into it? (1)
- ❍ Less likely to invest into it? (2)
- ❍ Neither more likely or less likely to invest into it? (3)

These questions help to ensure that the questions we ask are relevant to you, we would appreciate you completing them.

Q1 What is your age?
- ○ 25 or under (1)
- ○ 26-35 (2)
- ○ 36-45 (3)
- ○ 46-55 (4)
- ○ 56-65 (5)
- ○ Over 65 (6)
- ○ Prefer not to answer (7)

Q2 What is your gender?
- ○ Male (1)
- ○ Female (2)
- ○ Prefer not to answer (3)

Q3 How would you describe your current relationship status?
- ○ Partnered (1)
- ○ Single (2)
- ○ Divorced (3)
- ○ Widowed (4)
- ○ Other/Prefer not to answer (5)

Q4 What is the highest level of education you have attained?
- ❑ Secondary (1)
- ❑ Trade Qualification (2)
- ❑ Diploma (3)
- ❑ University Degree (4)
- ❑ University Post-Graduate (5)

Q5 What do you describe as your country of origin?
- ○ Please select below... (1)
- ○ Australia (2)
- ○ Afghanistan (3)
- ○ Albania (4)
- ○ Algeria (5)
- ○ Andorra (6)
- ○ Angola (7)
- ○ Antigua and Barbuda (8)
- ○ Argentina (9)
- ○ Armenia (10)
- ○ Austria (11)
- ○ Azerbaijan (12)
- ○ Bahamas (13)
- ○ Bahrain (14)
- ○ Bangladesh (15)
- ○ Barbados (16)
- ○ Belarus (17)
- ○ Belgium (18)
- ○ Belize (19)
- ○ Benin (20)
- ○ Bhutan (21)
- ○ Bolivia (22)
- ○ Bosnia and Herzegovina (23)
- ○ Botswana (24)
- ○ Brazil (25)
- ○ Brunei (26)
- ○ Bulgaria (27)
- ○ Burkina Faso (28)
- ○ Burma/Myanmar (29)
- ○ Burundi (30)
- ○ Cambodia (31)
- ○ Cameroon (32)
- ○ Canada (33)
- ○ Cape Verde (34)
- ○ Central African Republic (35)
- ○ Chad (36)
- ○ Chile (37)
- ○ China (38)
- ○ Colombia (39)
- ○ Comoros (40)
- ○ Congo (41)
- ○ Congo, Democratic Republic of (42)
- ○ Costa Rica (43)
- ○ Cote d'Ivoire/Ivory Coast (44)
- ○ Croatia (45)
- ○ Cuba (46)
- ○ Cyprus (47)
- ○ Czech Republic (48)
- ○ Denmark (49)
- ○ Djibouti (50)
- ○ Dominica (51)
- ○ Dominican Republic (52)
- ○ East Timor (53)
- ○ Ecuador (54)

- ❍ Egypt (55)
- ❍ El Salvador (56)
- ❍ Equatorial Guinea (57)
- ❍ Eritrea (58)
- ❍ Estonia (59)
- ❍ Ethiopia Fiji (60)
- ❍ Finland (61)
- ❍ France (62)
- ❍ Gabon (63)
- ❍ Gambia (64)
- ❍ Georgia (65)
- ❍ Germany (66)
- ❍ Ghana (67)
- ❍ Greece (68)
- ❍ Grenada (69)
- ❍ Guatemala (70)
- ❍ Guinea (71)
- ❍ Guinea-Bissau (Bissau) (AF) (72)
- ❍ Guyana (73)
- ❍ Haiti (74)
- ❍ Honduras (75)
- ❍ Hungary (76)
- ❍ Iceland (77)
- ❍ India (78)
- ❍ Indonesia (79)
- ❍ Iran (80)
- ❍ Iraq (81)
- ❍ Ireland (82)
- ❍ Israel (83)
- ❍ Italy (84)
- ❍ Jamaica (85)
- ❍ Japan (86)
- ❍ Jordan (87)
- ❍ Kazakstan (88)
- ❍ Kenya (89)
- ❍ Kiribati (90)
- ❍ Korea, North (91)
- ❍ Korea, South (92)
- ❍ Kuwait (93)
- ❍ Kyrgyzstan (94)
- ❍ Laos (95)
- ❍ Latvia (96)
- ❍ Lebanon (97)
- ❍ Lesotho (98)
- ❍ Liberia (99)
- ❍ Libya (100)
- ❍ Liechtenstein (101)
- ❍ Lithuania (102)
- ❍ Luxembourg (103)
- ❍ Macedonia (104)
- ❍ Madagascar (105)
- ❍ Malawi (106)
- ❍ Malaysia (107)
- ❍ Maldives (108)
- ❍ Mali (109)

- ❍ Malta (110)
- ❍ Marshall Islands (111)
- ❍ Mauritania (112)
- ❍ Mauritius (113)
- ❍ Mexico (114)
- ❍ Micronesia (115)
- ❍ Moldova (116)
- ❍ Monaco (117)
- ❍ Mongolia (118)
- ❍ Montenegro (119)
- ❍ Morocco (120)
- ❍ Mozambique (121)
- ❍ Namibia (122)
- ❍ Nauru (123)
- ❍ Nepal (124)
- ❍ Netherlands (125)
- ❍ New Zealand (126)
- ❍ Nicaragua (127)
- ❍ Niger (128)
- ❍ Nigeria (129)
- ❍ Norway (130)
- ❍ Oman (131)
- ❍ Pakistan (132)
- ❍ Palau (133)
- ❍ Panama (134)
- ❍ Papua New Guinea (135)
- ❍ Paraguay (136)
- ❍ Peru (137)
- ❍ Philippines (138)
- ❍ Poland (139)
- ❍ Portugal (140)
- ❍ Qatar (141)
- ❍ Romania (142)
- ❍ Russian Federation (143)
- ❍ Rwanda (144)
- ❍ Saint Kitts and Nevis (145)
- ❍ Saint Lucia (146)
- ❍ Saint Vincent and the Grenadines (147)
- ❍ Samoa (148)
- ❍ San Marino (149)
- ❍ Sao Tome and Principe (150)
- ❍ Saudi Arabia (151)
- ❍ Senegal (152)
- ❍ Serbia (153)
- ❍ Seychelles (154)
- ❍ Sierra Leone (155)
- ❍ Singapore (156)
- ❍ Slovakia (157)
- ❍ Slovenia (158)
- ❍ Solomon Islands (159)
- ❍ Somalia (160)
- ❍ South Africa (161)
- ❍ Spain (162)
- ❍ Sri Lanka (163)
- ❍ Sudan (164)

○ Suriname (165)
○ Swaziland (166)
○ Sweden (167)
○ Switzerland (168)
○ Syria (169)
○ Taiwan (170)
○ Tajikistan (171)
○ Tanzania (172)
○ Thailand (173)
○ Togo (174)
○ Tonga (175)
○ Trinidad and Tobago (176)
○ Tunisia (177)
○ Turkey (178)
○ Turkmenistan (179)
○ Tuvalu (180)
○ Uganda (181)
○ Ukraine (182)
○ United Arab Emirates (183)
○ United Kingdom (184)
○ United States (185)
○ Uruguay (186)
○ Uzbekistan (187)
○ Vanuatu (188)
○ Vatican City (189)
○ Venezuela (190)
○ Vietnam (191)
○ Yemen (192)
○ Zambia (193)
○ Zimbabwe (194)

Q45 Do you work in financial services?
○ Yes (1)
○ No (2)

Now we'd like you to think about your current financial situation. Remember that we are not looking for exact answers...close enough is just fine

Q6 Considering all of your sources of income (wages, bonuses, rent, interest, dividends etc.), what is your best estimate of your household income last year?
○ Less than $60,000 pa (1)
○ Between $60,001 and $120,000 (2)
○ Between $120,001 and $180,000 (3)
○ Between $180,001 and $240,000 (4)
○ More than $240,001 (5)

Q7 What best describes your residential status?
○ Renting (1)
○ Own your home with a mortgage (2)
○ Own your home mortgage-free (3)
○ Living with relatives (4)
○ Other (5)

Q8 Thinking about the property that you currently live in, what do you estimate to be the value of that property?
- ❍ Less than $500,000 (1)
- ❍ Between $500,001 and $750,000 (2)
- ❍ Between $750,001 and $1,000,000 (3)
- ❍ Between $1,000,001 and $1,500,000 (4)
- ❍ More than $1,500,000 (5)

Answer If What best describes your residential status? Own your home with a mortgage Is Selected

Q9 What is your approximate mortgage value?
- ❍ Less than $150,000 (1)
- ❍ $150,001 - $300,000 (2)
- ❍ $300,001 - $450,000 (3)
- ❍ $450,001 - $600,000 (4)
- ❍ More than $600,000 (5)

Q10 Do you own or are you buying a residential investment property?
- ❍ Yes - Own outright (1)
- ❍ Yes - Buying with a mortgage (2)
- ❍ No (3)

Q11 Do you own or have you owned any Australian shares either directly or through managed funds?
- ❑ Yes - I currently own shares directly (1)
- ❑ Yes - I have owned shares directly in the past but do not own any now (2)
- ❑ Yes - I currently own shares through a managed fund (3)
- ❑ Yes - I have owned shares through a managed fund but do not own any now (4)
- ❑ No (5)

Answer If How would you describe your current relationship status? Partnered Is Selected

Q12 Thinking about how much you and your partner currently have in superannuation, what do you think is the approximate total of all of your accounts?
- ❍ Less than $75,000 (1)
- ❍ $75,001 - $150,000 (2)
- ❍ $150,001 -$300,000 (3)
- ❍ $300,001 - $500,000 (4)
- ❍ More than $500,001 (5)

Answer If How would you describe your current relationship status? Partnered Is Not Selected

Q31 Thinking about how much you currently have in superannuation, what do you think is the approximate total of all of your accounts?
- ❍ Less than $75,000 (1)
- ❍ $75,001 - $150,000 (2)
- ❍ $150,001 -$300,000 (3)
- ❍ $300,001 - $500,000 (4)
- ❍ More than $500,001 (5)

There are certainly no right answers to these next few questions. Please just answer with what you think is the best answer.

Q19 Compared to an average person you know, how would you rate your knowledge and understanding of Superannuation investing?
❍ Poor (1)
❍ Below Average (2)
❍ Average (3)
❍ Above Average (4)
❍ Very Good (5)

Answer If Thinking about the combined values of both your, and your partner's, current

superannuation balan... Less than $75,000 Is Selected

Q21 If you inherited $90,000 today but could only invest it into a superannuation fund of your choice, what would you predict the approximate value might grow to in 10 years' time?

Please ignore any future contributions
❍ Between $100,000 - $120,000 (1)
❍ Between $120,000 - $145,000 (2)
❍ Between $145,000 - $175,000 (3)
❍ Between $175,000 - $215,000 (4)
❍ Between $215,000 - $255,000 (5)
❍ Between $255,000 - $305,000 (6)

Answer If Thinking about the combined values of both your, and your partner's, current

superannuation balan... $75,001 - $150,000 Is Selected

Q33 If you inherited $180,000 today but could only invest it into a superannuation fund of your choice, what would you predict the approximate value would grow to in 10 years' time?

Please ignore any future contributions
❍ Between $200,000 - $245,000 (1)
❍ Between $245,000 - $290,000 (2)
❍ Between $290,000 - $355,000 (3)
❍ Between $355,000 - $425,000 (4)
❍ Between $425,000 - $505,000 (5)
❍ Between $505,000 - $610,000 (6)

Q34 If you inherited $270,000 today but could only invest it into a superannuation fund of your choice, what would you predict the approximate value would grow to in 10 years' time?

Please ignore any future contributions
- ❍ Between $325,000 - $365,000 (1)
- ❍ Between $365,000 - $440,000 (2)
- ❍ Between $440,000 - $525,000 (3)
- ❍ Between $525,000 - $640,000 (4)
- ❍ Between $640,000 - $765,000 (5)
- ❍ Between $765,000 - $920,000 (6)

Q35 If you inherited $360,000 today but could only invest it into a superannuation fund of your choice, what would you predict the approximate value would grow to in 10 years' time?

Please ignore any future contributions
- ❍ Between $395,000 - $480,000 (1)
- ❍ Between $480,000 - $580,000 (2)
- ❍ Between $580,000 - $700,000 (3)
- ❍ Between $700,000 - $850,000 (4)
- ❍ Between $850,000 - $1,010,000 (5)
- ❍ Between $1,010,000 - $1,240,000 (6)

Q36 If you inherited $450,000 today but could only invest it into a superannuation fund of your choice, what would you predict the approximate value would grow to in 10 years' time?

Please ignore any future contributions
- ❍ Between $490,000 - $600,000 (1)
- ❍ Between $600,000 - $725,000 (2)
- ❍ Between $725,000 - $880,000 (3)
- ❍ Between $880,000 - $1,060,000 (4)
- ❍ Between $1,060,000 - $1,260,000 (5)
- ❍ Between $1,260,000 - $1,530,000 (6)

Q16 How confident are you in your prediction?
_____ Please drag the slider (1)

Q23 Compared to an average person you know, how would you rate your knowledge and understanding of Australian Share investing?
❍ Poor (1)
❍ Below Average (2)
❍ Average (3)
❍ Above Average (4)
❍ Very Good (5)

Answer If Considering all of your sources of income (wages, bonuses, rent, interest, dividends etc.), what... Less than $60,000 pa Is Selected

Q34 If you inherited a good quality, blue chip portfolio of Australian shares worth $90,000 today, what would you predict the approximate value would grow to in 10 years' time?

Please consider all dividends will be re-invested into more shares.
❍ Between $100,000 - $120,000 (1)
❍ Between $125,000 - $145,000 (2)
❍ Between $145,000 - $175,000 (3)
❍ Between $175,000 - $215,000 (4)
❍ Between $215,000 - $255,000 (5)
❍ Between $255,000 - $305,000 (6)

Answer If Considering all of your sources of income (wages, bonuses, rent, interest, dividends etc.), what... Between $60,001 and $120,000 Is Selected

Q37 If you inherited a good quality, blue chip portfolio of Australian shares worth $180,000 today, what would you predict the approximate value would grow to in 10 years' time?

Please consider all dividends will be re-invested into more shares.
❍ Between $200,000 - $245,000 (1)
❍ Between $245,000 - $290,000 (2)
❍ Between $290,000 - $355,000 (3)
❍ Between $355,000 - $425,000 (4)
❍ Between $425,000 - $505,000 (5)
❍ Between $505,000 - $610,000 (6)

Q38 If you inherited a good quality, blue chip portfolio of Australian shares worth $270,000 today, what would you predict the approximate value would grow to in 10 years' time?

Please consider all dividends will be re-invested into more shares.
○ Between $325,000 - $365,000 (1)
○ Between $365,000 - $440,000 (2)
○ Between $440,000 - $525,000 (3)
○ Between $525,000 - $640,000 (4)
○ Between $640,000 - $765,000 (5)
○ Between $765,000 - $920,000 (6)

Q39 If you inherited a good quality, blue chip portfolio of Australian shares worth $360,000 today, what would you predict the approximate value would grow to in 10 years' time?

Please consider all dividends will be re-invested into more shares.
○ Between $395,000 - $480,000 (1)
○ Between $480,000 - $580,000 (2)
○ Between $580,000 - $700,000 (3)
○ Between $700,000 - $850,000 (4)
○ Between $850,000 - $1,010,000 (5)
○ Between $1,010,000 - $1,240,000 (6)

Q40 If you inherited a good quality, blue chip portfolio of Australian shares worth $450,000 today, what would you predict the approximate value would grow to in 10 years' time?
Please consider all dividends will be re-invested into more shares.
○ Between $490,000 - $600,000 (1)
○ Between $600,000 - $725,000 (2)
○ Between $725,000 - $880,000 (3)
○ Between $880,000 - $1,060,000 (4)
○ Between $1,060,000 - $1,260,000 (5)
○ Between $1,260,000 - $1,530,000 (6)

Q27 How confident are you in your prediction?
_____ Please drag the slider (1)

Q24 Compared to an average person you know, how would you rate your knowledge and understanding of Residential Real Estate Investing?
○ Poor (1)
○ Below Average (2)
○ Average (3)
○ Above Average (4)
○ Very Good (5)

Q22 If you purchased an investment property with a value of $400,000 today with the help of a $310,000 mortgage ($90,000 of your own money as a deposit), what would you expect the approximate value to grow to in 10 years' time? Please ignore any rent that might be earned.
○ Between $435,000 - $535,000 (1)
○ Between $535,000 - $645,000 (2)
○ Between $645,000 - $780,000 (3)
○ Between $780,000 - $940,000 (4)
○ Between $940,000 - $1,130,000 (5)
○ Between $1,130,000 $1,365,000 (6)

Q41 If you purchased an investment property with a value of $600,000 today with the help of a $420,000 mortgage (180,000 of your own money as a deposit), what would you expect the approximate value to grow to in 10 years' time? Please ignore any rent that might be earned.
○ Between $660,000 - $800,000 (1)
○ Between $800,000 - $970,000 (2)
○ Between $970,000 - $1,170,000 (3)
○ Between $1,170,000 - $1,410,000 (4)
○ Between $1,410,000 - $1,680,000 (5)
Between $1,680,000 - $2,050,000 (6)

Q42 If you purchased an investment property with a value of $800,000 today with the help of a $530,000 mortgage ($270,000 of your own money as a deposit), what would you expect the approximate value to grow to in 10 years' time? Please ignore any rent that might be earned.
○ Between $880,000 - $1,070,000 (1)
○ Between $1,070,000 - $1,290,000 (2)
○ Between $1,290,000 - $1,560,000 (3)
○ Between $1,560,000 - $1,880,000 (4)
○ Between $1,880,000 - $2,250,000 (5)
○ Between $2,250,000 - $2,730,000 (6)

Q43 If you purchased an investment property with a value of $1,200,000 today with the help of a $840,000 mortgage ($360,000 of your own money as a deposit), what would you expect the approximate value to grow to in 10 years' time? Please ignore any rent that might be earned.
○ Between $1,310,000 - $1,600,000 (1)
○ Between $1,600,000 - $1,940,000 (2)
○ Between $1,940,000 - $2,350,000 (3)
○ Between $2,350,000 - $2,820,000 (4)
○ Between $2,820,000 - $3,390,000 (5)
○ Between $3,390,000 - $4,000,000 (6)

Q44 If you purchased an investment property with a value of $1,600,000 today with the help of a $1,150,000 mortgage ($450,000 of your own money as a deposit), what would you expect the approximate value to grow to in 10 years' time? Please ignore any rent that might be earned.
❍ Between $1,750,000 - $2,140,000 (1)
❍ Between $2,140,000 - $2,590,000 (2)
❍ Between $2,590,000 - $3,120,000 (3)
❍ Between $3,120,000 - $3,770,000 (4)
❍ Between $3,770,000 - $4,500,000 (5)
❍ Between $4,500,000 - $5,400,000 (6)

Q25 How confident are you in your prediction?
_____ Please drag the slider (1)

Now we need you to think about how you see the risks associated with the investment options we have been looking at.

Q18 On a scale of 1-100, where 1 equals no risk and 100 equals very high risk, move the slider to where you think the risk of these investment would be? Remember that this is just your opinion.
_____ Superannuation Fund of your choice (1)
_____ Australian Blue-Chip Share Portfolio (2)
_____ Residential Real Estate Investment (3)

Now we would like to look at how you would like to invest money if you had a choice of any of the three options we have discussed throughout this survey. Again, there is no right answer - just what you would like to do.

Q28 If you had to invest $90,000 in one of the options below, which would be your MOST preferred investment?
❍ A Superannuation Fund of my choice (1)
❍ A Blue-Chip Australian Share Portfolio (2)
❍ A Residential Investment Property worth $400,000 with a loan of $310,000 (3)

Q54 If you had to invest $90,000 in one of the options below, which would be your LEAST preferred investment?
❍ A Superannuation Fund of my choice (1)
❍ A Blue-Chip Australian Share Portfolio (2)
❍ A Residential Investment Property worth $400,000 with a loan of $310,000 (3)

Q46 If you had to invest $180,000 in one of the options below, which would be your MOST preferred investment?
❍ A Superannuation Fund of my choice (1)
❍ A Blue-Chip Australian Share Portfolio (2)
❍ A Residential Investment Property worth $600,000 with a loan of $420,000 (3)

Q55 If you had to invest $180,000 in one of the options below, which would be your LEAST preferred investment?
❍ A Superannuation Fund of my choice (1)
❍ A Blue-Chip Australian Share Portfolio (2)
❍ A Residential Investment Property worth $600,000 with a loan of $420,000 (3)

Q47 If you had to invest $270,000 in one of the options below, which would be your MOST preferred investment?

❍ A Superannuation Fund of my choice (1)
❍ A Blue-Chip Australian Share Portfolio (2)
❍ A Residential Investment Property worth $800,000 with a loan of $530,000 (3)

Q56 If you had to invest $270,000 in one of the options below, which would be your LEAST preferred investment?
❍ A Superannuation Fund of my choice (1)
❍ A Blue-Chip Australian Share Portfolio (2)
❍ A Residential Investment Property worth $800,000 with a loan of $530,000 (3)

Q48 If you had to invest $360,000 in one of the options below, which would be your MOST preferred investment?
❍ A Superannuation Fund of my choice (1)
❍ A Blue-Chip Australian Share Portfolio (2)
❍ A Residential Investment Property worth $1,200,000 with a loan of $840,000 (3)

Q57 If you had to invest $360,000 in one of the options below, which would be your LEAST preferred investment?
❍ A Superannuation Fund of my choice (1)
❍ A Blue-Chip Australian Share Portfolio (2)
❍ A Residential Investment Property worth $1,200,000 with a loan of $840,000 (3)

Q49 If you had to invest $450,000 in one of the options below, which would be your MOST preferred investment?
❍ A Superannuation Fund of my choice (1)
❍ A Blue-Chip Australian Share Portfolio (2)
❍ A Residential Investment Property worth $1,600,000 with a loan of $1,150,000 (3)

Q58 If you had to invest $450,000 in one of the options below, which would be your LEAST preferred investment?

❍ A Superannuation Fund of my choice (1)
❍ A Blue-Chip Australian Share Portfolio (2)
❍ A Residential Investment Property worth $1,600,000 with a loan of $1,150,000 (3)

OK you are doing great, now a couple of questions to help us confirm your thought processes. These are not trick questions so just answer as best you can.

Q30 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)
❍ Do not know (4)
❍ Do not want to answer (5)

Q32 Imagine that the interest rate on your savings account was 2% per year and inflation was 3% per year. After 1 year, how much would you be able to buy with the money in this account?
❍ More than I could today (1)
❍ Exactly the same as I could today (2)
❍ Less than I could today (3)
❍ Do not know (4)
❍ Do not want to answer (5)

Q33 Buying shares in a single company usually provides a safer return than buying units in a managed share fund.
- ❍ True (1)
- ❍ False (2)
- ❍ Do not know (3)
- ❍ Do not want to answer (4)

And finally just a question or two about whether you use a financial planner or adviser.

Q13 Do you have an on-going professional relationship with a financial planner? This means that you meet regularly (at least annually) with a specific financial planner or adviser for a fee.
- ❍ Yes (1)
- ❍ No (2)

Answer If Do you have an on-going professional relationship with a financial planner? This means that meet regularly with a specific financial professional for a fee. Yes Is Selected

Q14 Is your financial planner or adviser a Certified Financial Planner (CFP)?
- ❍ Yes (1)
- ❍ Not Sure (2)
- ❍ No (3)

- ❍ Please click next to complete the survey (1)