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Aims and objectives

With an evermore complex financial system, an increasing emphasis on self-funded retirement for Australians, the expanding size of Australia's managed funds pool, and persistent evidence of financial illiteracy, the importance of financial planning is growing. The financial planning profession needs an academic platform for discourse on the issues of individual personal financial planning and wealth management, where issues of practice and policy can be debated with rigour, independence and evidence. Prior to the *Financial Planning Research Journal* (FPRJ), no journals fitted into this niche to provide a forum for dissemination of research in the specific area of personal finance and investments in the Australian context.

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  Journal articles: Knight, J. and Shi, L. (1996) 'Educational attainment and the rural-urban divide in China', *Oxford Bulletin of Economics and Statistics*, 58:1, pp. 83-118.

  Internet source: Henry, K. (2004) Australia China Economic Directions – Long Term

  Trends in the Australian Economy (unpublished speech at the Australia China Free Trade Agreement Conference, Sydney, 12 August), http://www.treasury.gov.au/documents/875/PDF/Australia_China_FTA.pdf (accessed on 04/01/2005).

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From the editors

The tide continues to turn in the world of financial planning in Australia. Recent legislation such as the *Corporations Amendment (Life Insurance Remuneration Arrangements) Act 2017* and the *Corporations Amendment (Professional Standards of Financial Advisers) Act 2017* has emanated from years of debate and reform associated with key reviews of financial adviser practices, remuneration structures, changes in regulation and compliance, consolidating industry standards, and increasing consumer awareness of the value, not just the pitfalls, of financial advice.

The new Financial Adviser Standards and Ethics Authority (FASEA) formed on 1 July this year has been tasked with rolling out the new set of educational and professional standards for financial advisers which will implement professional and education standards within the industry. The *Financial Planning Research Journal* looks forward to examining the implementation of these standards as a platform for the dissemination and debate of research in this area.

At the heart of all of these changes, however, is the consumer—the Australian individual, family, household and business. These are the people who will benefit most from the move to professionalism that is intended to increase their confidence in, and willingness to seek, financial advice. FPRJ has a key role to play in publishing work that measures and tracks the change in consumer sentiment toward financial planners and uptake of financial planning services, and ultimately, the improvement in financial knowledge, stability, and wealth in Australia. Indeed, determining if the proof is in that pudding and prosecuting an evidenced-based case for continued improvement will be a key role for the FPRJ community. Thus we encourage our authors to actively engage in and conduct research on these reforms.

We were also very pleased earlier this year to announce our first themed edition which is aimed to be published in early 2018. This will focus on diversity in financial planning. This is an important topic and one that will no doubt challenge the emerging profession. Expressions of interest are, at the time of writing, open for potential work to be included in this edition.

In this context, we are pleased to present Volume 3, Issue 2 of the *Financial Planning Research Journal*, the journal of the Financial Planning Association of Australia.

This issue contains five articles from domestic and international contributors ranging in scope from behavioural finance research, to baby boomer asset allocation through to investment strategy analysis. The first article in this issue by Luo Wang, Bin Li and Benjamin Liu investigates whether the leveraged life cycle strategy, in which leverage is used to buy stocks when investors are young, is able to produce better retirement outcomes than other investment strategies showing that leveraged life cycle strategy has a comparative advantage over the balanced strategy but is inferior when compared to dynamic life cycle strategy. The second paper in this edition is by Laura de Zwaan, Chrisann Lee, Yulin Liu and Toni Chardon regarding the implications for financial planners when dealing with overconfidence in financial literacy such as assessing when overconfident clients may indicate they understand advice when in reality they do not.

The third paper by Catherine M. Rickwood, Lester W. Johnson, Steve Worthington and Lesley White examines factors that determine the intention to save for retirement using a professional financial services planner. The fourth paper by Janine K. Scott examines experiences of financial advice clients in the New Zealand financial planning landscape revealing a lack of knowledge in differentiating between the types of advisers and each adviser's scope of service. The paper suggests implications include adopting a nationwide marketing campaign and significant regulatory changes to help all consumers identify appropriate financial service professionals for their needs, similar to those being implemented in Australia. The fifth paper in this edition by Tracey West provides insight into the role of equity holdings in the asset portfolios of baby boomers over the accumulation and consolidation life cycle phases, and identifies characteristics of baby boomer households that hold equities.

Finally, we would once again like to thank the FPRJ editorial board, our reviewers and the production team for their contribution to this edition. The time and effort required to deliver a journal edition is significant and without all your efforts the FPRJ simply would not happen. Particular thanks to Joy Lin, Sian Jones, Laura Phoenix and Alicia Stokes.

As editors for this edition, we hope you enjoy the fifth issue of the *Financial Planning Research Journal*.

Professor Mark Brimble and Di Johnson

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UNDERSTANDING THE LEVERAGED LIFE CYCLE INVESTMENT STRATEGY FOR DEFINED-CONTRIBUTION PLAN INVESTORS

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ABSTRACT

We investigate whether the leveraged life cycle strategy, in which leverage is used to buy stocks when investors are young, is able to produce better retirement outcomes than other investment strategies that are currently offered by defined contribution plan providers and those suggested in the literature. Using both historical and bootstrap simulations for the period of 1900-2011 in the US, we find that the leveraged life cycle strategy has an ability to reduce risk, though this ability is relatively insignificant. Further, the leveraged life cycle strategy shows a comparative advantage over the balanced strategy. However, the leveraged life cycle strategy produces retirement outcomes inferior to conventional life cycle strategy, and demonstrates significant inferiority when compared to dynamic life cycle strategy.

Introduction

Population ageing with its rising proportion of retirees, one of the most distinctive demographic events of the twenty-first century, has put considerable pressure on government social security programs. This situation has led governments to encourage funded private retirement plans, also known as defined contribution (DC) plans, where participants are responsible for building up retirement wealth through mandatory or voluntary contributions in their retirement account. This growing trend in DC plans has highlighted the importance of participants taking more control over the investment of their plan assets. This investment strategy is important as it defines future investment returns on their plan assets, which will determine retirement wealth adequacy at the end of the participant's working life. Although an individual's retirement wealth adequacy is a function of many parameters, investment strategy has been considered to be the most influential factor (Yuh, *et al.*, 1998). This defining feature leads to much debate about the current design of investment strategies that are adopted by DC plans.

Lifestyle (or target risk) and life cycle (or target date) strategies have long been recognised by DC plan investors. Lifestyle investment strategy, motivated by the seminal work of Modern Portfolio Theory (Markowitz, 1952), is built on the idea of "risk-based investing", or the notion that the fraction of savings allocated to stocks should be a function of investor's risk tolerance, and independent of their investment horizon (Merton, 1969; Samuelson, 1969). Life cycle investment strategy is built on the idea of "age-based investing", or the notion that investors should allocate a larger portion of their long-term investment to stocks or other risky assets when they are young and have a relatively long investment horizon, gradually shifting this allocation towards less risky assets as they approach retirement (Malkiel, 1996). Unlike lifestyle strategy, a life cycle strategy does not keep its target mix constant over time. Instead, it deterministically changes the target mix that is held in stocks and bonds according to a predefined "glide path", which gradually tilts the assets mix away from stocks and other risky assets towards less risky assets such as bonds and cash as investors approach retirement. Life cycle strategy has gained popularity with US defined contribution (DC) plan investors in recent years. Over the past 10 years, assets in life cycle funds have grown from $71 billion in 2005 to $763 billion in 2015 in the U.S. (Morningstar, 2015).

A number of studies suggest that life cycle funds may be a reasonable choice for investors (Hickman, *et al.*, 2001; Pang and Warshawsky, 2010; Pfau, 2010). However, extensive research has documented the inferior risk-return characteristic of life cycle strategy. Shiller (2005) indicates that life cycle strategy may not be optimal for investors who are saving for retirement. Poterba, *et al.* (2006) suggests that the retirement wealth distribution associated with life cycle investment strategies is similar to strategies that allocate a constant portfolio share to stocks. Schleef and Eisinger (2007) find little evidence that life cycle strategy either enhances or detracts from the overall performance of lifestyle strategy. Basu and Drew (2009) show that when moving away from stocks to low-return asset classes as the size of the retirement portfolio grows larger, investors may forgo the opportunity to earn higher returns. Lewis (2010) suggests the traditional approach of life cycle strategy may be too simplistic and further innovations may be needed.

Although lifestyle and life cycle strategies are designed to help investors achieve retirement wealth adequacy, they have been widely criticised for their poor performance during the period of the 2008 Global Financial Crisis (Halonen, 2009). This crisis has highlighted the problem of the deterministic fixed glide path of these investment strategies on the terminal wealth accumulation for DC plan investors, and the uncertainty as to whether those retirement savings would provide adequate retirement wealth, especially for those close to retirement. As a result, another stream of literature questions the deterministic nature of life cycle switching, and supports the idea of dynamically adjusting asset allocation as the retirement date approaches. Yoon (2010) explores a new approach to define the glide path of target date funds, which is to start with allocating a risk budget for each target date.

According to the pre-defined risk budget, the asset allocation of target date funds can be obtained by explicitly incorporating the term structure of risk. The findings show that the target risk-based glide path can afford larger exposure to stocks in early years, but it reduces stock allocation more aggressively than target-date funds as the target date draws near. Basu, *et al.* (2011) propose a dynamic life cycle strategy that is flexible in adjusting allocation between growth and conservative assets as the retirement date approaches, depending on the cumulative portfolio performance relative to a set target. Basu, *et al.* (2011) find that, compared with dynamic life cycle strategy, life cycle strategy produces inferior wealth outcomes for investors.

More recently, researchers have investigated investment strategies employing a leverage factor. Ayres and Nalebuff (2013) propose a leveraged life cycle strategy that invests a constant percentage of the present value of lifetime saving in stocks. This strategy is built on the notion of using leverage when the present value of future contribution is large relative to current savings, and then reducing leverage and finally un-leverage as current savings grow and the present value of future contributions declines[1]. Specifically, a leveraged life cycle strategy contains three phases. In phase one, investors' retirement savings are leveraged at 2:1 and fully invested in stocks[2]. In phase two, investors start to deleverage when the current savings exceed 20 per cent of discount lifetime savings (discounted at a real risk-free rate of 2.56%), until the current savings hit the desired level of market exposure, set at 50 per cent of discount lifetime savings allocated to stocks[3]. In phase three, investors maintain the market exposure at the desired level (50%), and the leverage is no

[1] The recommendation from the Merton (1969) and Samuelson (1969) life cycle investment theory is to invest a constant fraction of wealth in stocks. However, this study states that the mistake in translating this theory into practice is that young people invest only a fraction of their current savings in stocks, instead of the discounted lifetime savings. For example, those who invest 100 per cent in stocks of current savings in their 30s, are still likely to have less than 10 per cent of their lifetime savings if their risk aversion led them to invest 60 per cent of their lifetime savings.

[2] The reason for using 2:1 leverage is that the incremental cost of borrowing more than 2:1 leverage increases rapidly and exceeds the expected returns quickly.

[3] To choose 50 per cent stocks allocation is following Merton (1969), that the optimal or target stock allocation λ is determined by: $\lambda = (z - r) / (\sigma^2 * \gamma)$, where z is the expected future stocks returns, r is the relevant interest rate, σ^2 is the expected variance of future stock returns, and γ is the investor's constant relative risk aversion. Assume that for a typical investor who has a risk aversion of 4, the geometric mean of stock returns is 8.83 per cent with standard deviation of 14.3 per cent, and the relevant interest rate for the leveraged life cycle strategy is the margin rate, which is the geometric mean of 4.71 per cent call money rate plus 30 basis points. The optimal percentage target is then about 50 per cent stock allocation.

longer required. According to Ayres and Nalebuff, a leveraged life cycle strategy generates the same mean retirement wealth as the constant 74 per cent stock allocation strategy, but with a 20 per cent reduction in the standard deviation of retirement wealth. Compared to the traditional un-leveraged life cycle strategy that starts with 90 per cent stock allocation and decreases linearly to 50 per cent, the leveraged life cycle strategy leads to an 11.5 per cent improvement in certainty equivalent.

Both risk reduction and superior returns results provided by the leveraged life cycle strategy may suggest that a leveraged life cycle strategy represents an asset allocation approach worthy of investigation. Further, using the factor of leverage in the design of DC plan's investment strategy is relatively new. An important question then emerges: Is the leveraged life cycle strategy able to produce retirement wealth outcomes superior to other strategies that are currently offered by DC plan providers and those suggested in the literature in the US market? Although extensive research has documented the evaluation of life cycle, lifestyle, dynamic, and leveraged strategies for DC plan investors (Basu and Drew, 2010; Sharma, *et al.*, 2015; Pfau, 2010), there is no prior study investigating the comparative performance of leveraged life cycle strategy and other strategies that are currently offed by DC plan providers and those suggested in the literature.

This study is motivated to extend this issue by investigating whether the leverage life cycle strategy that is proposed by Ayres and Nalebuff (2013), is able to produce better retirement outcomes over the balanced, conventional life cycle, and dynamic life cycle strategies. Any results uncovered will provide a valuable contribution to the body of pension finance literature by embarking on a robust analysis of the balanced strategy, conventional life cycle strategies, dynamic life cycle strategies and leveraged life cycle strategies. Findings of our study have the potential to add value from investors' perspectives. Investment strategy is critically important for institutional investor's returns. They need to determine the most appropriate investment decision. The outcomes of this study may enhance investors' ability to improve fund returns by choosing different investment strategies. This study may be regarded as unique insofar as it is the first to synthesise the leveraged life cycle strategy with other investment strategies that are currently offered by DC plan providers, as well as those suggested in the literature.

By applying both historical and bootstrap simulations for the period 1900-2011, we show that leveraged life cycle strategy has an ability to reduce risk, though the risk reduction ability is relatively insignificant. Further, leveraged life cycle strategy demonstrates a comparative advantage over the balanced strategy. However, leveraged life cycle strategy produces retirement outcomes that are inferior to conventional life cycle strategies, and demonstrates significant inferiority when compared to dynamic life cycle strategies.

The rest of the paper is organised as follows. Section 2 describes the data and their summary statistics; Section 3 introduces the methodology; Section 4 presents the results; and Section 5 concludes the paper.

Data

The asset class return data used in this study comes from the dataset of global returns compiled by Dimson, Marsh, and Staunton (2002), which is commercially available from Morningstar and Ibbotson Associates. An updated version of this dataset, providing global returns from 1900 to 2011, is used in this study. We use this dataset because it is the only authentic dataset available for long-term nominal returns of stocks, bonds and bills of the US market[4]. It covers a period of more than 100 years that will have captured both favourable and unfavourable returns on individual asset classes over the entire twentieth century.

This long-term dataset allows us to investigate a large number of overlapping 40-year paths in the historical simulation, and provides a rich source of data for the bootstrap method in the meantime. For the purpose of parsimony, the nominal annual returns of US stocks and bonds are obtained from this dataset, where stocks are used as a proxy for growth assets and bonds are used as a proxy for defensive assets[5], while bills are used as a proxy for risk-free assets when we construct the leveraged life cycle strategy.

Table 1: Descriptive Statistics for the US Nominal Returns Data (1900-2011)

	Stocks	Bonds	Bills
Geometric Mean (%)	9.30	5.00	3.90
Arithmetic Mean (%)	11.27	5.38	3.95
Median (%)	13.78	3.67	4.07
Maximum (%)	57.09	40.36	14.71
Minimum (%)	-43.54	-14.90	-0.02
Standard Deviation (%)	19.97	8.87	2.82
Skewness	-0.37	1.22	0.73
Kurtosis	2.84	5.40	4.02
Jarque-Bera Statistic	2.62	54.55*	14.72*

Note: This table presents the summary statistics of nominal annual returns data for US stocks, bonds, and bills from 1900 to 2011. Geometric and arithmetic mean, standard deviation, median, maximum, and minimum are expressed in percentage. Skewness, Kurtosis, and Jarque-Bera statistic are numbers.

**represents statistical significance at the 5 per cent level.*

[4] Another reason is that it is important to retain the consistency with the proxy assets used in Ayres and Nalebuff (2013) for a comparison purpose.

[5] We acknowledge that international stocks, international bonds, and treasury inflation protected securities represent significant compositions of the portfolio construction. We do not include them in our study because of the paucity of reliable long-term return data.

Table 1 presents the descriptive statistics of the nominal asset class returns for the period 1900-2011. As expected, the lower risk is associated with bonds; the higher return is associated with stocks. For the US market, stocks provide a geometric mean return of 9.30 per cent, an arithmetic mean return of 11.27 per cent, with a standard deviation of 19.97 per cent. These high returns and high risks are contrasted with bonds, which has a geometric mean return of 5.0 per cent, an arithmetic mean return of 5.38 per cent, with a standard deviation of 8.87 per cent. Table 2 presents the correlation coefficients between the US nominal returns of stocks and bonds. The low correlation between stocks and bonds, which is 0.0665, provides a potential for diversification benefits.

Table 2: Correlation Matrix

US	Stocks	Bonds
Stocks	1	0.067
Bonds	0.067	1

Note: This table presents the correlation coefficients between the US nominal returns of stocks and bonds.

Methodology

An accumulation model is developed for a hypothetical DC plan investor before commencing the analysis of different investment strategies. Following Basu and Drew (2010), the terminal wealth of a DC plan portfolio is given by:

$$W = K \sum_{t=0}^{R-1} (1-p_t)\, S_t (1+r_t) \prod_{u=t+1}^{R-1} (1+r_u) \qquad (1)$$

where W is the terminal wealth at the time of retirement, K is the contribution rate, p_t is probability of unemployment in year t, S_t is the annual salary in year t, r_t is the rate of investment return earned in year t, and R is the number of years in the plan before retirement.

In order to estimate W, we need to model the contribution cash flows and investment returns for each period. Contribution cash flows depend on salary, contribution rate, and the probability of unemployment in any period, as cash flows of plan contributions are likely to be affected by the employment states. The salary in any period depends on the starting salary, salary growth rate, and the number of periods elapsed since the commencing employment. This is given by:

$$S_t = S_0\, (1+g)^{t-1} \qquad (2)$$

where S_0 is the starting salary of the plan participant, and g is the salary growth rate.

Investment returns depend on the returns of individual asset classes in the portfolio and weights assigned to them. Weights are determined by the investment strategy of the plan.

Therefore:

$$r_t = \sum w_{i,t} r_{i,t} \tag{3}$$

where $w_{i,t}$ is the weight assigned to the ith asset in month t, and $r_{i,t}$ is the return on the ith asset in month t.

The investment strategy ($w_{i,t}$), our primary variable of interest, decides weights of different asset classes in the portfolio. If we assign values to other variables in the accumulation model, the investment strategy ($w_{i,t}$) solely determines the variation in retirement wealth accumulated by an individual at the end of the working life. Probability of unemployment can be modelled as a binary variable. Table 3 outlines key assumptions attributed to the hypothetical DC plan investor[6]. For illustrative purposes, the investor is assumed to be fully employed during the entire investment horizon, and therefore contributions will be a constant percentage of salary over time. Contributions are assumed to be credited to the investor's account at the end of each year. We also ignore any taxes payable on investment returns and any transaction costs that may be incurred in managing the investments.

Table 3: Key Assumptions

Variable	Assumption
Starting Balance	$0
Starting Salary	$25,000
Salary Growth Rate	4% p.a.
Contribution Rate	9% p.a.
Starting Age	25
Retirement Age	65

Note: This table outlines key assumptions attributed to a hypothetical DC plan investor.

The objective of this study is to investigate whether the leveraged life cycle strategy is able to produce better retirement outcomes than those of other investment strategies that are currently offered by DC plan providers and those suggested in the literature. Following the leveraged life cycle strategy proposed by Ayres and Nalebuff (2013), we assume a two-asset world where stocks are the growth asset and bonds are the defensive asset, the investor's optimal target percentage is 50 per cent stocks and 50 per cent bonds allocation, and the maximum leverage is at 2:1. The leveraged life cycle strategy generally contains three phases. (1) Investors' retirement savings are leveraged at 2:1 and fully invested in stocks. (2) When the current savings exceed 20 per cent of discounted lifetime savings (discounted at risk-free rate that is represented by the mean of bills' return), investors start to deleverage as savings continue to rise, until the current savings hit the

[6] The rationale of these assumptions is explained in detail by Basu and Drew (2009) and Basu, *et al.* (2011).

desired level of market exposure, which is 50 per cent of discount lifetime savings allocated to stocks. (3) Investors maintain the market exposure at the desired level (50/50), and the leverage is no longer required.

With respect to the margin interest, we examine two different rates: risk-free rate plus 100 basis points and risk-free rate plus 200 basis points[7]. Based on two different margin interest rates, we construct two leveraged life cycle strategies, namely LLC100 and LLC200, where LLC100 represents the aggressive leveraged life cycle strategy and LLC200 represents the conservative leveraged life cycle strategy. For the purpose of doing a comparative analysis, this study examines nine different prototypical investment strategies that consist of three constant lifestyle strategies, two life cycle strategies, two dynamic strategies, and two leveraged life cycle strategies. Table 4 outlines the details of each strategy.

Table 4: Investment Strategies

	Investment Strategy Symbol	Description
Lifestyle strategy	100 stocks	100% stocks allocation
	100 bonds	100% bonds allocation
	Balanced	60% stocks and 40% bonds allocation
	LC90	Modelled after Vanguard Target Retirement Funds. Start with 90% stocks, 10% bonds allocation for the first 20 years, and then decrease the stock weights 2% annually in a linear pattern to reach an allocation of 50% stocks and 50% bonds at retirement.
	LC95	Modelled after Principle Funds. Start with 95% stocks, 5% bonds allocation, and experience a gradual decline 1% annually away from stocks to reach an allocation of 56% stocks and 49% bonds at retirement.
	DLC2020	Start with 100% stocks for the first 20 years. At the end of 20 years, if the target is achieved, the assets are switched to a portfolio comprising of 80% stocks and 20% fixed income; otherwise, remain invested in 100% stocks. This process is also carried out for the next 10 years. In the last 10 years, the assets are switched to a portfolio of 60% stocks and 40% fixed income if the target is achieved. Otherwise, remain invested in 100% stocks.
	DLC3010	Similar to above, except that it starts with 100% stocks for the first 30 years. This process is carried out for the next 5 years. In the last 5 years, the assets are switched to a portfolio of 60% stocks and 40% fixed income if the target is achieved. Otherwise, remain invested in 100% stocks.

[7] Ayres and Nalebuff (2013) use broker call money rates plus 30 basis points as the margin interests. We are using risk-free rate plus 100 and 200 basis points because of the unavailability of the broker call money rates data. We also believe that portfolio selection is built on the assumption that borrowing at risk-free rate, and using risk-free rate plus 100 basis points and 200 basis points will fairly demonstrate the cost effect of leverage.

Table 4: Investment Strategies (continued)

	Investment Strategy Symbol	Description
Leveraged life cycle strategy	LLC100	Start with leverage at 2:1 and fully invested in stocks. When the current savings exceed 20% of discount lifetime savings; investors start to deleverage as savings continue to rise, until the current savings hit the 50% stock allocation. After that, investors maintain the market exposure. Risk-free rate plus 100 basis points is used as the margin rate.
	LLC200	Similar to above, except that, instead of using risk-free rate plus 100 basis points as the margin rate, it uses a risk-free rate plus 200 basis points as the margin rate.

Note: This table describes different investment strategies that are examined in this study.

Historical and bootstrap simulation methods are employed in this study. The historical simulation has a long history in the pension finance studies (Shiller, 2005). Sometimes referred to as rolling periods, it calculates end-of-the-period portfolio values from historical stocks and bonds returns. At the completion of the analysis of a hypothetical worker's whole working life period, the sample whole period is rolled forward by one year, and another analysis is then conducted. In this study, stock and bonds returns from 1900 to 2011 devise 73 separate draws for our hypothetical investor, who experiences 40 years' returns. According to our assumptions, the hypothetical worker first starts working in 1898 and the first year's ending portfolio value is only the nine per cent contribution that is deducted from salaries. The second year's ending portfolio value is the portfolio returns plus the second year's contribution. The process of calculating annually rebalanced portfolio value continues through the whole working life period. At the completion of the first analysis of 40 years' period, the first year's returns are dropped and the 40 years' period sample is moved forward by one year. The process of dropping the earliest year and adding the next year's returns continues until the available stocks and bonds returns data are exhausted. The portfolio is rebalanced at the end of each year to maintain the targeted asset allocation. This method has, however, been widely criticised for relying heavily on the returns from the middle years of the whole dataset (Cooley, *et al.*, 2003). For instance, the data of 1939 and 2011 have been used only once.

Therefore, we resort to an alternative bootstrap simulation method to further investigate the retirement wealth outcomes of different strategies. The bootstrap simulation method, introduced by Efron (1979), is a technique that involves resampling row vectors with replacements to generate synthetic time series. By resampling row vectors, this method can retain the cross-correlation between asset class returns. It has been used in a number of studies in the pension fund literature (Basu and Drew, 2009; Basu, *et al.*, 2011; Liu, *et al.*, 2011). In this study, we follow a random draw with replacement from the asset class returns. The historical asset class returns data is

randomly resampled with one replacement to generate asset class return vectors for each year of 40 years. Asset class return vectors are then combined with asset classes weights in the portfolio to generate portfolio returns. This process is iterated 10,000 times. Hence, each asset allocation has 10,000 investment return paths resulting in 10,000 wealth outcomes at the end of the 40-year horizon.

The Retirement Wealth Ratio (RWR) is used as the measure of retirement wealth. This measure, originated by Basu and Drew (2010), is calculated by dividing terminal wealth to terminal salary. The rationale behinds the RWR is that the participant's post-retirement income expectations are closely linked to their immediate income before retirement.

Results

Our comparison of different strategies starts with Table 5, which shows the distribution for wealth accumulation outcomes at retirement by using the historical simulation method, expressed as RWRs. The distribution of RWRs for different asset allocation strategies provides us a fair view of their relative appeal to the retirement investor. For any of these parameters, a higher value generally indicates a more attractive strategy. In addition to mean and median, the first and third quartile estimates of the distribution are examined. In order to compare leveraged life cycle strategies with constant, life cycle and dynamic investment strategies, all asset allocation strategies are separated into three panels. Panel A reports the comparison of leveraged life cycle and constant asset allocation strategies. Panel B reports the comparison of leveraged life cycle and conventional life cycle asset allocation strategies. Panel C reports the comparison of leveraged and dynamic asset allocation strategies.

Table 5: Distribution Parameters of Retirement Wealth Ratio (RWR)

Investment Strategy	Mean	Median	75th Percentile	25th Percentile
PANEL A (leveraged life cycle versus lifestyle investment strategies)				
LLC100	12.74	10.71	17.46	9.10
LLC200	12.54	10.57	17.11	9.00
Balanced	11.13	9.82	14.54	7.72
100 Stocks	17.26	17.87	21.20	13.72

Table 5: Distribution Parameters of Retirement Wealth Ratio (RWR) (continued)

Investment Strategy	Mean	Median	75th Percentile	25th Percentile
100 Bonds	5.53	3.76	8.12	2.91
LLC200 - Balanced	**1.41**	**0.75**	**2.57**	**1.28**
PANEL B (leveraged life cycle versus life cycle investment strategies)				
LLC100	12.74	10.71	17.46	9.10
LLC200	12.54	10.57	17.11	9.00
LC90	13.33	12.76	17.24	9.72
LC95	12.66	11.32	16.63	9.54
LLC200 - LC90	**-0.79**	**-2.19**	**-0.13**	**-0.72**
LLC200 - LC95	**-0.12**	**-0.75**	**0.48**	**-0.54**
PANEL C (leveraged life cycle versus dynamic life cycle investment strategies)				
LLC100	12.74	10.71	17.46	9.10
LLC200	12.54	10.57	17.11	9.00
DLC3010	16.96	18.32	20.49	14.98
DLC2020	16.39	17.69	20.45	13.20
LLC200 – DLC3010	**-4.42**	**-7.75**	**-3.38**	**-5.98**
LLC200 – DLC2020	**-3.85**	**-7.72**	**-3.34**	**-4.20**

Note: This table reports the distribution of RWR for different investment strategies by using historical simulation method. Mean, median, 25th percentile and 75th percentile are reported respectively. Specifically, Panel A reports the comparison results of leveraged life cycle and lifestyle strategies. Panel B reports the comparison results of leveraged life cycle and conventional life cycle strategies. Panel C reports the comparison results of leveraged and dynamic strategies. The details of each strategy are illustrated in Table 4.

Looking at leveraged asset allocation strategies alone, the aggressive LLC100 strategy generates highest and the conservative LLC200 generates the lowest mean, median, 75th percentile and 25th percentile results. This result indicates that the investor's portfolio value decreases as the borrowing costs increase. To be consistent with the discussion of results and for comparison purpose, the conservative leveraged life cycle strategy (LLC200) is examined in more detail.

The results in Panel A show that RWRs vary significantly across different asset allocation strategies. The 100 stocks strategy generates RWRs higher than the other strategies, and the 100 bonds strategy generates the lowest RWRs. These results show that portfolio value increases with a higher

stocks allocation. The results of comparing the baseline LLC200 leveraged life cycle strategy with the balanced strategy, demonstrate that the leveraged life cycle strategy outperforms the balanced strategy. For example, the LLC200 strategy in Panel A generates a median final RWR of 10.57 that is 0.75 higher than the corresponding balanced strategy. The differences of 75th and 25th percentile RWRs between the leveraged life cycle strategy and the balanced strategies grow even wider than those median results. The 75th percentile RWR of LLC200 is 2.58 higher than the corresponding balanced strategy. Panel B shows the simulation results of the leveraged life cycle and conventional life cycle strategies. The results show that the LLC200 strategy underperforms the corresponding LC90 strategy and LC95 strategy in most parameters. For instance, the LLC200 strategy generates lower (2.19 and 0.75) median RWRs than the corresponding LC90 and LC95 respectively. The only one exception occurs: when comparing 75th percentile estimates, the LLC200 strategy generates a higher (0.48) RWR than that of the LC95 strategy. Although differences between the conventional life cycle and leveraged life cycle strategies are relatively small, the results still indicate that the leveraged life cycle strategy underperforms conventional life cycle strategies. Results in Panel C are more prominent. The results of comparing the leveraged life cycle with dynamic life cycle strategies, indicate that the leveraged life cycle strategy is completely outperformed by the dynamic life cycle strategies. For instance, the LLC strategy generates lower (7.75 and 7.72) RWRs than corresponding DLC3010 and DLC2020 respectively. The comparative results between leveraged life cycle and dynamic life cycle strategy are relatively larger, with the smallest difference of RWR between the LLC200 strategy and DLC2020 when comparing 75th percentile estimates.

As higher volatility of stock returns can result in substantial losses for investors in later plan years due to the portfolio size effect (Basu and Drew, 2009), it is necessary to assess the riskiness of leveraged life cycle strategies and their competing strategies. One possible approach is to measure the tail risk, or the adverse wealth outcomes. A popular measure of tail risk used by academics and practitioners is value at risk (VaR). The concept of VaR is simple and straightforward in that losses greater than VaR are suffered only in extreme circumstances. In other words, if an asset allocation strategy is less risky, it may generate better VaR outcomes. This study compares VaR at different probability levels to illustrate the relative riskiness of different asset allocation strategies. However, VaR is not without shortcomings as a risk measure. VaR specifies the amount at risk at a particular probability level, though it tells nothing about the potential exposure to losses for outcomes that are worse than VaR (Balzer, 1994). On the other hand, expected shortfall (ES) is considered to be a better candidate for risk measurement since it overcomes the limitation of VaR. ES is actually the probability weighted average of tail losses (Dowd, 2005). Therefore, we incorporate ES in this study as well.

Table 6 reports the estimates for VaR at 99 per cent, 95 per cent, and 90 per cent confidence levels, as well as ES at 95 per cent confidence level. The results indicate that the leveraged life cycle strategy outperforms the balanced strategy (Panel A); it underperforms the conventional and dynamic life cycle strategies (Panels B & C) with one exception: that leveraged life cycle strategies generate better results than dynamic life cycle strategy in the estimates of VaR at 99 per cent confidence level. When we consider the average for all outcomes below 95 per cent VaR estimates, the conventional life cycle strategies produce the highest results, followed in order by the leveraged

life cycle strategies, dynamic life cycle strategies, and the balanced strategy generates the small ES estimate. These results suggest that plan investors concerned about the protection from extreme downside risk should select conventional life cycle strategies rather than other strategies.

Table 6: Value at Risk (VaR) and Expected Shortfall (ES) Estimates for Different Investment Strategies

Investment strategy	VaR at different confidence levels			ES at 95% confidence level
	99%	95%	90%	
PANEL A (leveraged life cycle versus lifestyle investment strategies)				
LLC100	5.29	6.12	6.72	5.50
LLC200	5.18	6.00	6.59	5.39
100 Stocks	4.80	6.04	7.60	5.17
100 Bonds	2.38	2.57	2.74	2.41
Balanced	5.03	5.78	6.20	2.56
LLC200 -- Balanced	**0.15**	**0.22**	**0.39**	**2.83**
PANEL B (leveraged life cycle versus life cycle investment strategies)				
LLC100	5.29	6.12	6.72	5.50
LLC200	5.18	6.00	6.59	5.39
LC90	5.55	6.14	6.52	5.78
LC95	5.36	6.16	6.65	5.6
LLC200 – LC90	**-0.37**	**-0.14**	**-0.07**	**-0.39**
LLC200 – LC95	**-0.18**	**-0.16**	**-0.06**	**-0.21**
PANEL C (leveraged life cycle versus dynamic life cycle investment strategies)				
LLC100	5.29	6.12	6.72	5.50
LLC200	5.18	6.00	6.59	5.39
DLC3010	4.80	6.04	7.60	5.17
DLC2020	4.80	6.23	7.78	5.21
LLC200 – DLC3010	**0.38**	**-0.04**	**-1.01**	**0.22**
LLC200 – DLC2020	**0.38**	**-0.23**	**-1.19**	**0.18**

Note: This table reports the VaR and ES estimates of RWRs for different investment strategies by using historical simulation method. VaR at 99%, 95% 90% confidence levels, and ES at 95% confidence level are reported respectively. Specifically, Panel A compares the VaR and ES leveraged life cycle and lifestyle strategies; Panel B compares the VaR and ES of leveraged life cycle and conventional life cycle strategies; Panel C compares the VaR and ES of leveraged life cycle and dynamic life cycle strategies. The details of each strategy are illustrated in Table 4.

In order to confirm these findings, we explore the distribution of RWRs and estimates of VaR and ES by using an alternative bootstrap simulation method, as illustrated in Table 7 for the wealth accumulation distribution of RWRs for different asset allocation strategies by using this method. The comparative results for different asset allocation strategies are generally consistent with the results in Table 5. These results demonstrate that the leveraged life cycle strategy outperforms the corresponding balanced strategy, and significantly underperforms the corresponding dynamic life cycle strategies, while the comparison of the leverage life cycle strategy with the conventional life cycle strategies, gives mixed evidence. For instance, the LLC200 strategy underperforms the LC90 strategy at the median and 75th percentile, but outperforms the LC90 strategy at the 25th percentile (0.06). The LLC200 strategy underperforms the LC95 strategy at the 75th percentile, but outperforms the LC95 strategy at the median and 25th percentile. The differences between leveraged life cycle and conventional life cycle strategy are all relatively small. Such mixed evidence may indicate that the leveraged life cycle strategy demonstrates a similar characteristic as the conventional life cycle strategies.

Table 7: Distribution Parameters of Retirement Wealth Ratio (RWR)

Investment strategy	Mean	Median	75th Percentile	25th Percentile
PANEL A (leveraged life cycle versus lifestyle investment strategies)				
LLC100	12.41	10.50	15.38	7.16
LLC200	12.22	10.31	15.11	7.09
100 Stocks	19.70	13.02	23.52	7.35
100 Bonds	4.86	4.53	5.62	3.74
Balanced	10.81	9.29	13.28	6.65
LLC200 - Balanced	**1.41**	**1.02**	**1.83**	**0.44**

Table 7: Distribution Parameters of Retirement Wealth Ratio (RWR) (continued)

Investment strategy	Mean	Median	75th Percentile	25th Percentile
PANEL B (leveraged life cycle versus life cycle investment strategies)				
LLC100	12.41	10.50	15.38	7.16
LLC200	12.22	10.31	15.11	7.09
LC90	13.61	10.69	16.68	7.03
LC95	12.71	10.28	15.62	6.96
LLC200 – LC90	**-1.39**	**-0.38**	**-1.57**	**0.06**
LLC200 – LC95	**-0.49**	**0.03**	**-0.51**	**0.13**
PANEL C (leveraged life cycle versus dynamic life cycle investment strategies)				
LLC100	12.41	10.50	15.38	7.16
LLC200	12.22	10.31	15.11	7.09
DLC3010	18.31	13.23	22.69	7.54
DLC2020	15.91	13.20	20.18	7.73
LLC200 – DLC3010	**-6.09**	**-2.92**	**-7.58**	**-0.45**
LLC200 – DLC2020	**-3.69**	**-2.89**	**-5.07**	**-0.64**

Note: This table reports the distribution of RWRs for different investment strategies by using bootstrap simulation method. Mean, median, 25th percentile and 75th percentile are reported respectively. Specifically, Panel A reports the comparison results of leveraged life cycle and lifestyle strategies. Panel B reports the comparison results of leveraged life cycle and conventional life cycle strategies. Panel C reports the comparison results of leveraged and dynamic strategies. The details of each strategy are illustrated in Table 4.

Next, we turn our attention to risk measures. Table 8 reports the estimates for VaR at 99 per cent, 95 per cent and 90 per cent confidence levels, as well as ES at 95 per cent confidence level in the bootstrap simulation method. These results are significantly different from Table 7. In all comparative results, the leveraged life cycle strategies outperform balanced, conventional life cycle, and dynamic life cycle strategies in terms of VaR at three different confidence levels and ES at 95 per cent confidence level. One possible explanation is that leveraged life cycle strategy has more ability to reduce risk than other strategies. This is consistent with the findings of Ayres and Nalebuff (2013), that the leveraged life cycle strategy using leverage to buy stocks increases short-term risk but it reduces long-term risk by enabling individuals to achieve better diversification across time. However, it is important to note that the differences are all relatively small. Investors may consider that the risk is not large enough to negate other strategies, especially dynamic life cycle strategies that have a strong ability to generate much better retirement outcomes.

Table 8: Value at Risk (VaR) and Expected Shortfall (ES) Estimates for Different Investment Strategies

Investment strategy	VaR at different confidence levels			ES at 95% confidence level
	99%	95%	90%	
PANEL A (leveraged life cycle versus lifestyle investment strategies)				
LLC100	3.03	4.28	5.16	3.52
LLC200	2.98	4.28	5.19	3.50
100 Stocks	2.02	3.36	4.50	2.53
100 Bonds	2.44	2.87	3.16	2.60
Balanced	2.94	4.01	4.85	3.35
LLC200 - Balanced	**0.04**	**0.27**	**0.34**	**0.15**
PANEL B (leveraged life cycle versus life cycle investment strategies)				
LLC100	3.03	4.28	5.16	3.52
LLC200	2.98	4.28	5.19	3.50
LC90	2.82	4.02	4.92	3.29
LC95	2.89	4.06	5.00	3.35
LLC200 – LC90	**0.16**	**0.26**	**0.27**	**0.21**
LLC200 – LC95	**0.09**	**0.22**	**0.19**	**0.15**
PANEL C (leveraged life cycle versus dynamic life cycle investment strategies)				
LLC100	3.03	4.28	5.16	3.52
LLC200	2.98	4.28	5.19	3.50
DLC3010	2.01	3.38	4.54	2.54
DLC2020	2.04	3.45	4.64	2.58
LLC200 – DLC3010	**0.97**	**0.90**	**0.65**	**0.96**
LLC200 – DLC2020	**0.94**	**0.83**	**0.55**	**0.92**

Note: This table reports the VaR and ES estimates of RWRs for different investment strategies by using bootstrap simulation method. VaR at 99%, 95% 90% confidence levels, and ES at 95% confidence level are reported respectively. Specifically, Panel A compares the VaR and ES leveraged life cycle and lifestyle strategies; Panel B compares the VaR and ES of leveraged life cycle and conventional life cycle strategies; Panel C compares the VaR and ES of leveraged life cycle and dynamic life cycle strategies.

Conclusion

This study investigates the relative performance of leveraged life cycle strategy and other investment strategies that are currently offed by DC plan providers, as well as those suggested in the literature. In particular, this study seeks to find whether leveraged life cycle strategy is able to produce better retirement outcomes than balanced, conventional life cycle and dynamic investment strategies for DC plan investors. Although, in reality, asset allocation strategies employed in the DC plan are more sophisticated than our prototypical asset allocation strategies represented in this study, the findings of our study at least cast some doubt on the relative performance of different investment strategies for DC plan investors.

Using the historical simulation method, we find that the leveraged life cycle strategy is able to produce better retirement outcomes than those of the balanced strategy, but it produces retirement outcomes inferior to the conventional life cycle and dynamic life cycle strategies. However, using the bootstrap simulation method, the results tell a slightly different story. These results suggest that the leveraged life cycle strategy demonstrates superiority over the balanced strategy and inferiority to the dynamic life cycle strategies, but it has a characteristic similar to conventional life cycle strategies in terms of RWR distributions. Further, the leveraged life cycle strategy shows more ability to reduce risk than other strategies.

The findings of this study have revealed several results. First, the leveraged life cycle strategy has the ability of risk reduction, which is consist with the findings of Ayres and Nalebuff (2013), though the risk reduction ability is relatively insignificant. Second, the leveraged life cycle strategy demonstrates a comparative advantage to the balanced strategy. In fact, balanced strategy shows inferiority to each strategy that has been examined, which may suggest that it is not an appropriate investment choice for DC plan investors. Third, the leveraged life cycle strategy demonstrates inferiority to conventional life cycle strategies in most cases. We attribute this result to the possibility that they may have similar risk-return characteristics, which is worth further investigation. In addition, compared to leveraged life cycle with dynamic life cycle strategies, the leveraged life cycle strategy demonstrates significant inferiority to dynamic life cycle strategies. Previously, some may have argued that leveraged life cycle strategies can be considered as superior investment strategies for DC plan investors as they show the ability of risk reduction. However, these risk reduction benefits may come at a substantial cost to the investors through giving up the significant upside potential of wealth (Basu, *et al.*, 2011; Hickman, *et al.*, 2001). Another interesting finding is that, as suggested by Basu, *et al.*, (2011), dynamic asset allocation strategies are able to produce much better retirement outcomes for investors. This may represent a superior alternative to the conventional deterministic life cycle strategy and is worthy of further investigation.

In terms of practical implications, the biggest challenge for leveraged life cycle strategies is how to convince investors to stay with the disciplined strategy during market downturns, such as in a situation where DC plan investors had 200 per cent of their savings in stock during the 2008-2009 crash. As the leveraged life cycle strategy demonstrates a relative risk reduction ability, it would be useful to investigate whether leveraged life cycle strategies have the real ability of risk reduction by using more risk measures. Nonetheless, this is an area of future research.

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OVERCONFIDENCE IN FINANCIAL LITERACY: IMPLICATIONS FOR PLANNERS

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ABSTRACT

Financial literacy of clients is an important consideration for financial planners as it has implications for determining financial capacity. Likewise, overconfidence is also an important concern, given that overconfident clients may indicate they understand advice when in reality they do not. Using an online survey, we gathered data on subjective and objective levels of financial literacy from a sample of university students. We then examined the associations between self-assessed and actual levels of financial literacy with the aim of identifying overconfidence. We find, generally, respondents do not overestimate their financial literacy; however, respondents with English as a second language were significantly more overconfident than other demographic groups. These findings can help planners in identifying clients who may be overconfident in their own financial literacy.

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Introduction

Financial literacy has been identified as an essential component of sound capital markets as it improves consumer and investor confidence and results in an overall more resilient financial system (ASIC, 2011; Hall, 2008). In Australia, the Government has been promoting the importance of financial literacy for over a decade, and in 2011 established the National Financial Literacy Strategy. On a macro level, the importance and benefits of financial literacy are well understood.

For individuals, improved financial literacy should lead to better financial outcomes, be that less debt management issues (Lusardi and Tufano, 2009), improved investment and wealth management (van Rooij, Kool and Prast, 2007; Capuano and Ramsay, 2011; Hastings and Tejeda-Ashton, 2008), or improved retirement savings (Lusardi and Mitchell, 2006). Indeed, even 'rented' knowledge, acquired through the use of a financial planner, can improve financial outcomes (Smith, Finke and Huston, 2012).

This paper adopts a definition of financial literacy as "the ability to make informed judgements and to take effective decisions regarding the use and management of money" (ASIC, 2011, p.12). This definition encompasses basic numeracy as well as understanding of financial concepts necessary to make financial decisions, and also the ability to recognise when one's ability is deficient and there is a need to seek advice from a planner. While there are many impediments to financial literacy, this paper considers overconfidence and its potential to impact on financial outcomes, particularly from financial advice.

There are three main issues to address with overconfidence and financial advice. The first is that overconfident people, by the nature of their bias, are unlikely or reluctant to seek financial advice (Finke, Huston and Winchester, 2011). These people have faith in their own ability to manage their finances. There are still times when overconfident people will seek advice though, which brings us to the second and third issues: curbing overconfident investment behaviour (Statman, Thorley and Vorkink, 2006; Odean, 1999), and overconfidence resulting in a lack of understanding. Both of these issues have implications for a planner fulfilling their best interests duty. In relation to curbing overconfident investment behaviour, a planner would need to convince a client of their overconfidence bias in order to provide appropriate advice. In relation to overconfidence resulting in a lack of understanding, a client needs to be fully informed in order to consent and successfully implement advice. Thus, it is important for planners to be aware of potential overconfidence in their clients so the education component of advice can be managed effectively.

This study has two aims. First, it seeks to identify the prevalence of overconfidence in financial literacy. Second, following previous research which determines characteristics of financial literacy (Atkinson and Messy, 2012), this study will seek to identify if there are demographic characteristics associated with overconfidence. From a sample of university students who took part in an online survey, we find most people can accurately identify their ability in eight areas of financial literacy; however, there are some key differences. This finding demonstrates the importance of planners using both self-rated and objectively-tested means to assess financial literacy of clients, and in addition assess overconfidence. Further, an examination of those who are categorised as overconfident in their financial literacy finds respondents with English as a second language (ESL)

were significantly more likely to be overconfident. This finding will assist planners to identify those clients at most risk of this form of overconfidence, allowing them to take further steps to identify this bias and provide appropriate advice.

The remainder of the paper is structured as follows. First, the relevant literature is discussed. This is followed by the methodology and then the analysis and results. Finally, these findings are discussed in the conclusion.

Literature Review

Financial planners are obligated to provide advice that is in the best interests of their clients (Corporations Act 2001 (Cth), s. 961B). This duty encompasses not only a duty to act in the client's best interests, but also a duty to provide appropriate advice and prioritise the client's interests. In order to be able to satisfy the best interests duty, planners need to have an accurate understanding of their clients, including their clients' attitudes and financial literacy. Planners need to be confident that clients understand the advice they are being given in order to properly discharge their duties (Teale, 2015).

While there is increasing recognition of the need to assess client's financial literacy in order to effectively explain financial concepts, the process of assessment is more complicated. Atkinson and Messy (2012) note there are several domains of financial literacy, such as managing money or choosing products. In addition, they note that knowledge is only one aspect. How one behaves and their attitudes also impacts on their financial capability (Atkinson and Messy, 2012; Oaten and Cheng, 2007). This study looks at the impact of one such behavioural bias – overconfidence. In particular, overconfidence in one's financial literacy.

Within the behavioural economics and psychological literature (e.g. Kahneman, 2003), overconfidence is seen as stemming from cognitive biases. Individuals tend to use quick and easy heuristics when forming ideas and judgements and then seek and attend to information confirming rather than refuting those ideas. The concern is that overconfidence can lead to faulty decision-making, more so when the knowledge base is also faulty. Overconfidence can also lead to excessive optimism with investors believing that their decisions will lead to better outcomes than are possible. De Bondt (1998), for example, showed that even experienced investors demonstrate these biases, believing that their own stock choices would do better than the broader market and downplaying the impact of diversification and market forces.

While under-confidence may lead to the feeling of stress that comes with money issues, and it could "manifest as apathy, resulting in a poor or suboptimal financial outcome" (Financial Literacy Foundation, 2007, p. 39), over-confidence may lead to individuals not recognising the need to become better informed or seek professional assistance and subsequently may result in poor decisions.

Overconfidence is of particular concern for planners given there are a number of ways it can potentially negatively impact on financial decisions (Porto and Xiao, 2016). There is evidence of behavioural issues where overconfident investors trade more and earn inferior returns (Barber

and Odean, 2001), and that overconfidence can lead investors to underestimate risks and shortcomings of certain investment options (McCannon, Asaad and Wilson, 2016). One of the main concerns for planners, however, is that overconfident clients may believe they possess more knowledge and understanding than they actually do. When a client's self-assessment of their financial literacy is higher than their actual ability, this is termed overconfidence. Similarly, lower self-assessed levels than actual capability indicates under-confidence.

Inaccurate understanding of finance and investing has been shown to drive investing behaviour (McCannon, Asaad and Wilson, 2016). Clients who are overconfident in their financial literacy may therefore pursue higher-level financial advice which perhaps they are not fully capable of comprehending. This can create problems for the efficacy of a financial plan, and could potentially lead to disputes.

There is little research that looks at the difference between individuals' self-assessed and actual financial literacy. Previous research suggests perceived financial literacy has a similar influence on financial behaviour as actual financial literacy (Allgood and Walstad, 2016). In that case a client's self-assessed financial literacy could be a better indicator of how they will approach financial decision-making. However, previous studies have found a discrepancy between survey respondents' self-assessed financial literacy and actual financial literacy (Ali, *et al.* 2014; Lusardi and Mitchell, 2011; Van Rooij, Lusardi and Alessie, 2011).

A further issue is that financial literacy is often considered a control in overcoming certain cognitive biases (Thaler and Benartzi, 2004). For instance, an understanding of the need for implementing a financial plan should prevent status quo bias and inertia. A false judgement on the financial literacy of a client could mean plans are not implemented, or that plans are not suitable for the client.

A final concern is that recent research has shown people who are overconfident in their financial literacy are more likely to be part of a self-managed superannuation fund (Bird, *et al.* 2016). Being a member of a self-managed superannuation fund (SMSF) is a role which brings with it trustee obligations and duties and it is vital that clients have a complete understanding of their role in order for their retirement planning to be effective.

Methodology

Given the above discussion, we were interested in answering the following research questions: RQ1. What is the extent of overconfidence in financial literacy? And RQ2. What characteristics are associated with overconfidence in financial literacy?

We used an online survey approach to collect data on respondents' financial literacy and demographic information. We constructed the questionnaire to measure both self-assessed and objective measures of financial literacy, as both are necessary in order to measure overconfidence and answer RQ1. Importantly, we asked respondents to self-rate their ability prior to objectively testing their ability, thus avoiding any influence the difficulty of the test question may have on their self-rated ability. Respondents were asked to self-rate their understanding of the following eight

topics: budgeting, saving, managing debt, investing, retirement planning, taxation, insurance, and superannuation.

The challenge of objectively measuring financial literacy means that there is no single question that can be administered to identify whether a person is financially literate. Accordingly, Atkinson and Messy (2011) argue that it is necessary to create a comprehensive set of questions that can directly test levels of knowledge, as well as explore attitudes and financial behaviours. To test actual levels of financial literacy, we asked fourteen questions that test the respondent's actual knowledge of general interest, inflation, investment, budgeting and saving, insurance, superannuation, and taxation knowledge. These questions were drawn from existing studies of financial literacy, including Lusardi and Mitchell's (2006) well-known questions, questions adapted from the Jump$tart Coalition's report on young adults financial literacy (Mandel, 2008), and others from the ANZ Survey of Adult Financial Literacy (ANZ, 2008) as well as Bateman, *et al.* (2012) and Chardon (2011). A summary of the objective test questions is given below in Table 1.

Table 1: Operationalisation of financial literacy constructs

Constructs	Questions	Source
Budgeting, saving, managing debt	1. Compound interest	Lusardi and Mitchell, 2009
	2. Inflation	Lusardi and Mitchell, 2009
	3. Budgeting	Mandell, 2008
	4. Borrowing	Mandell, 2008
	5. Credit card debt	Mandell, 2008
Investing	6. Risky assets	Lusardi and Mitchell, 2009
	7. Long period returns	Bateman, *et al.*, 2012
Superannuation, retirement planning, and insurance knowledge	8. Performance indicator	ANZ, 2011
	9. Concessional tax rate	Chardon, 2014
	10. Life insurance need	Mandell, 2008
	11. Car insurance	Mandell, 2008
Taxation knowledge	12. Assessable income	Chardon, 2014
	13. Tax payable	Chardon, 2014
	14. Negative gearing	Chardon, 2014

After obtaining ethical clearance, we distributed our survey in mid-2015 via four universities across Australia that agreed to email the survey to their students. While the use of convenience sampling can reduce external validity, we believe results can be generalised to other segments

of the population, not the least because financial behaviours formed during early adulthood will most likely persist (Shim, *et al.* 2010). In addition, we also distributed the survey through student Facebook sites of other universities to extend the coverage. All states are represented in the sample with the exception of the Northern Territory and Tasmania.

A total of 363 complete responses were received to the survey. A large portion of respondents were female (79%) which is a much higher representation than the 50.7 per cent of the general population (ABS, 2017), which could be an indicator of self-response bias. In terms of age, 44 per cent of respondents were over 20 years of age. While a large proportion of respondents live at home (56%), nearly two thirds (67%) are either working full-time, part-time or casually and close to 15 per cent of them had business as the main area of study in university. English as second language accounted only for 11 per cent of the sampled respondents which is lower than the general population of 22.2 per cent (ABS, 2017). A summary of the demographics of the respondents to the survey is provided in Table 2.

Table 2: Demographics of respondents

Demographics	Frequency	Per cent % (n=302)
Female	238	79
Indigenous	8	3
20 yrs and above	133	44
Non-English at home	33	11
Paid work	203	67
Studying business	42	14
Living at home	170	56

Analyses included a univariate summary of the measures of self-rated and tested levels of financial literacy, an assessment of the correlation and agreement between those two measures, measuring overconfidence in financial literacy, assessing the effects of a series of demographic predictors on self-rated and tested levels of financial literacy, and assessing those predictors on overconfidence. The statistical package Stata is used and Table 3 summarises all the variables and their definitions in this study.

Table 3: Definitions of variables in study

Variable	Definition
female	dummy variable for gender: 0 indicating *male* and 1 indicating *female*
indigenous	dummy variable for self-identification of being indigenous Australian: 0 indicating *no* and 1 indicating *yes*
above20	dummy variable for being 20 years old or above: 0 indicating *no* and 1 indicating *yes*
non_English	dummy variable for speaking a language other than English at home: 0 indicating *no* and 1 indicating *yes*
paid_work	dummy variable for doing paid work: 0 indicating *no* and 1 indicating *yes*
study_biz	dummy variable for studying business at university: 0 indicating *no* and 1 indicating *yes*
self_rate_avg	the average self-rating on the level of understanding of eight aspects of financial literacy (i.e., *budgeting, saving, managing debt, investing, retirement planning, taxation, insurance, and superannuation*) each on a five-band Likert scale (i.e., 1 – *very low*, 2 – *low*, 3 – *fair*, 4 – *high*, and 5 – *very high*)
test_overall	the total number of correct answers to a panel of 14 quizzes on various aspects of financial literacy
rescaled_test_overall	Rescaled test_overall to a range between 1 and 5: rescaled_test_overall = 4 x test_overall / 14 + 1
overconfidence	overconfidence in financial literacy: overconfidence = self_rate_avg - rescaled_test_overall

Analysis and Results

Self-rated financial literacy is measured by the average self-ratings of understanding for eight aspects of financial literacy (self_rate_avg). *Tested* level of financial literacy is measured by the total number of correct answers to the 14 questions on financial literacy (test_overall). The survey received 363 complete responses to the eight self-ratings and 316 complete responses to the 14 test questions.

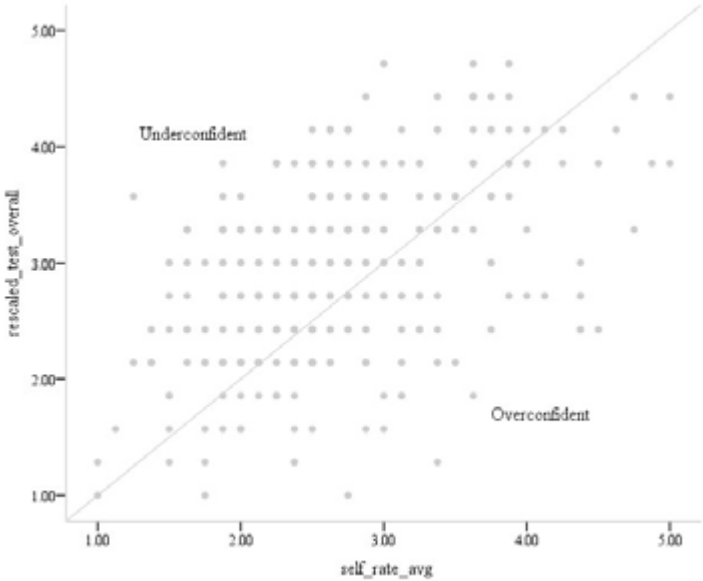
As shown in the first two rows of Table 4, the sample has an average *self-rated* level of financial literacy of 2.68 on a five-band Likert scale from *very low* (1) to *very high* (5); and on average the respondents correctly answered nearly half of the 14 *tested* questions. Both measures were close to normal distributions.

Table 4: Numerical summary of self-rated and tested levels of financial literacy in sample

Variable	N	M	Mdn	SD	Skew	Kurt	Min	Max	Q1	Q3
self_rate_avg	363	2.68	2.50	.79	.62	.19	1.00	5.00	2.13	3.13
test_overall	316	6.70	7.00	2.75	.02	-.49	.00	13.00	5.00	9.00
Overconfidence	316	-.23	-.25	.80	.35	.15	-2.32	2.09	-.79	.23

As can be seen in the scatter plot in Figure 1, self-rated and tested levels of financial literacy demonstrate a moderate positive linear correlation with a Pearson's r of .48 ($p < .001$). However, a strong positive correlation between two quantitative measures does not necessarily mean a high level of agreement (Bland and Altman, 1986).

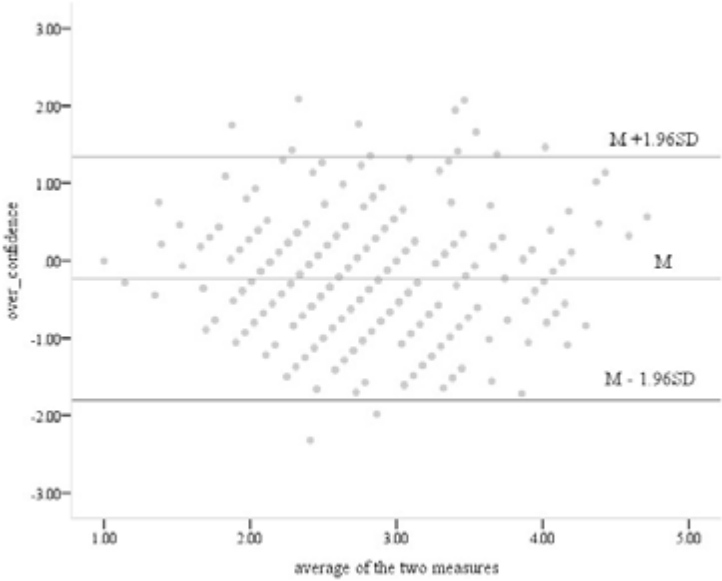
Figure 1. Scatter plot of self-rated and tested levels of financial literacy



To assess the agreement between self-rated and tested levels of financial literacy, the number of correct answers to the 14 test questions (test_overall) is rescaled to the average of self-ratings of understanding for the eight aspects of financial literacy (self_rate_avg). The rescaling calculation can be found in the variable summary in Table 3. In the scatter plot in Figure 1, points close to the 45-degree line represent respondents showing fair confidence in financial literacy, whereas points far below and above the 45-degree line respectively indicate overconfidence and under-confidence.

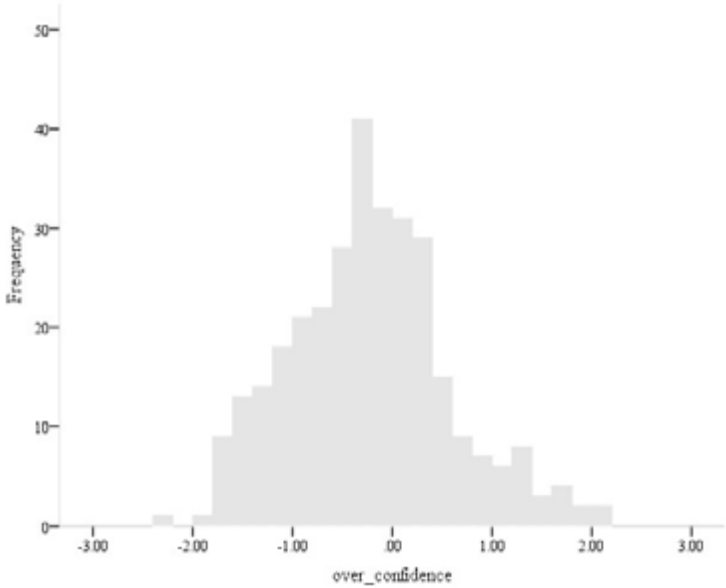
A Bland–Altman (Bland and Altman, 1986; 1999) plot (Figure 2) is constructed to assess the agreement between self-rated (self_rate_avg) and tested (rescaled_test_overall) levels of financial literacy. On average the two measures are statistically different at the one per cent level (M_diff = -.231, t(315) = -5.128, p < .001, 95% CI = -.320, -.142). It is 95 per cent accurate to conclude that the population's average self-rated level of financial literacy is slightly lower than its average tested level. Results of a simple linear regression of the difference between the two measures on their average show no sign of proportional bias (B = -.016, t(314)= -.236, p =.814).

Figure 2. Bland–Altman plot of self-rated and tested levels of financial literacy



The difference between self-rated (self_rate_avg) and tested (rescaled_test_overall) levels of financial literacy can be a measure of overconfidence, where zero means perfect fair confidence, positive values indicate overconfidence, and negative values indicates under-confidence. In answering RQ1, most respondents in the sample tend to be slightly under-confident, while some are extremely overconfident (Table 4). Therefore, the distribution is slightly skewed to the left (Figure 3).

Figure 3. Histogram of overconfidence in financial literacy



To answer RQ2, we assess the effects of a series of demographic predictors on self-rated and tested levels of financial literacy by estimating models for Seemingly Unrelated Regression (SUR) (Zellner, 1962). The SUR approach is preferred to separate ordinary least squares (OLS) regressions on both of the financial literacy measures because the disturbance terms of these two equations are highly likely to be contemporaneously correlated (i.e., unconsidered factors that influence the disturbance term in the self-rated financial literacy equation probably influence the disturbance term in the tested financial literacy equation). Ignoring this contemporaneous correlation and estimating these equations separately leads to inefficient estimates of the coefficients. SUR takes the covariance structure of the residuals into account and efficiently estimates both equations simultaneously with a generalized least squares (GLS) estimator. Further, cross-equation restrictions and testings can be performed with the simultaneous estimation of SUR.

Table 5 presents the results of the SUR models. The sample size is 302 with listwise deletion of missing data. The unconstrained model estimates different sets of regression coefficients for two dependent variables. Two equations' residuals are significantly moderately correlated. When the regression coefficients of all six predictors are constrained to be equal across two equations, the test result is statistically significant at the five per cent level ($\chi^2_{(6)} = 15.22$, $p = .019$), suggesting that not all of the regression coefficients are the same across two equations. With a series of further tests, it is found that only the coefficient of non_English is significantly different between two equations. Therefore, the final constrained model is estimated with all predictors constrained except for

non_English and the constraints are not statistically significant ($\chi^2_{(5)} = 7.09$, p = .214). Thus, the results of the final model in Table 5 confirms that: compared to males, females on average have a lower level of both self-rated and tested financial literacy; self-identified indigenous students have a marginally significant higher level of both financial literacy measures, and so do students doing paid work; and students of 20 or more years of age have a significantly higher level of the two measures. Whether students are studying business does not have a significant effect on either measure. Students speaking a language other than English perceive themselves to have a higher level of financial literacy; however, their tested financial literacy is not significantly different from their peers.

Table 5: Seemingly unrelated regressions of self-rated and tested levels of financial literacy

	Unconstrained model				Constrained model			
	self_rate_avg	*p*	rescaled_test_overall	*p*	self_rate_avg	*p*	rescaled_test_overall	*p*
female	-.454	<.001	-.594	<.001	-.526	<.001	-.526	<.001
indigenous	.347	.193	.409	.117	.379	.090	.379	.090
above20	.195	.024	.268	.002	.233	.001	.233	.001
non_English	.299	.030	-.168	.214	.268	.052	-.139	.304
study_biz	.057	.644	-.023	.849	.016	.880	.016	.880
paid_work	.241	.009	.055	.550	.145	.064	.145	.064
constant	2.748	<.001	3.251	<.001	2.86	<.001	3.14	<.001
$\chi^2_{(d.f.)}$, *p*	35.37(6)	<.001	46.28(6)	<.001	55.22(6)	<.001	50.67(6)	<.001
R-squared	.105		.133		.099		.128	
residuals *r, p*	.441, <.001				.432, <.001			
joint constraints test: $\chi^2_{(d.f.)}$, *p*	n.a.				7.09(5),.214			

A multiple linear regression model is estimated to assess the effects of a series of predictors on overconfidence. Table 6 presents the estimates of regression coefficients. Residual analysis suggests that the assumptions of normality and constant variance of the error are met in this sample. The model has overall significance ($F(6, 295) = 2.477$, p=.024) at the five per cent level. The regression coefficient estimates and their p values indicate that speaking a

non-English language at home and doing paid work have statistically significant positive effects on overconfidence in financial literacy. This sample also suggests that females, non-indigenous people, people under 20, and business students tend to be more overconfident in financial literacy. However, the evidence of those effects is not found to be statistically significant.

The multiple linear regression only examines the effects of predictors on the conditional mean of the dependent variable. Quantile regression (Koenker and Hallock, 2001) is employed to conduct a more comprehensive assessment of the predictors' effects on overconfidence of financial literacy across the distribution of the dependent variables. The results show that the effects of all predictors are quite consistent across the spectrum of overconfidence. The Breusch-Pagan test also confirms the homoscedasticity ($\chi^2_{(1)} = .21$, $p = .649$).

Table 6: Regression coefficient estimates

	B	β	t	p
Constant	-.504	-	-4.090	<.001***
female	.139	.071	1.230	.220
Indigenous	-.063	-.013	-.222	.824
above20	-.073	-.045	-.792	.429
non-English	.466	.184	3.193	.002***
paid_work	.187	.111	1.897	.059*
study_biz	.080	.035	.612	.541

** significant at 10% level, ** significant at 5% level, *** significant at 1% level*

Conclusion

This study has proposed that while assessing financial literacy of clients is important for financial planners, they must also give consideration to the self-rated versus actual financial literacy. There is evidence that self-rated financial literacy has an influence on financial behaviour (Allgood and Walstad, 2016), so it should be considered equally as important as actual financial literacy. Differences between self-assessed and actual financial literacy can manifest as overconfidence or under-confidence, and while both potentially have negative behavioural and knowledge-based consequences for financial capacity, this study has focused on overconfidence given the risks for financial planners in ensuring they satisfy their best interests duty as discussed earlier.

In answering RQ1, we find that overall the sample was slightly under-confident in its financial literacy. In terms of characteristics and answering RQ2, the main finding is that respondents who speak a language other than English at home are more likely to be overconfident in their financial literacy in that they self-rate their understanding higher than their actual tested understanding. In addition, we find females have both lower self-rated and actual financial literacy consistent with

prior research (Atkinson and Messy, 2012), while indigenous students, students doing paid work, and students over 20 all have marginally higher self-rated and actual financial literacy. These findings underscore the importance of planners using both self-rated and objectives measures when determining a client's level of financial literacy.

Interestingly, we did not find a significant difference for gender and overconfidence for the student sample. Prior studies have found men are more overconfident (Barber and Odean, 2001; Croson and Gneezy, 2009). This lack of finding could result from the low proportion of males in the sample reducing the statistical power to identify the difference between gender groups, or it could be the sample being university educated. Atkinson and Messy (2012) find that generally financial literacy increases with education; it could be that perhaps overconfidence is tempered by education. Further research could therefore explore the extent to which completion of tertiary education influences overconfidence in financial matters.

The main limitation in this study is the proportion of female respondents. While this may influence our findings, we believe that given males are more prone to overconfidence than females (Barber and Odean, 2001; Croson and Gneezy, 2009) our findings would only be stronger with a more balanced gender breakdown. In addition, the study is limited in generalisability given the results are drawn from a sample of university students. Future research could ascertain if these findings hold for other samples.

A final area for future research is to seek to understand the nature of overconfidence with those who speak a language other than English at home to determine if this difference stems from a less nuanced understanding of the language, particularly in the test questions, or from cultural differences. It would also be interesting to explore if there are other significant differences for financial planning advice and implementation between English speakers and those that do not speak English at home.

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CUSTOMER INTENTION TO SAVE FOR RETIREMENT USING A PROFESSIONAL FINANCIAL SERVICES PLANNER

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ABSTRACT

This paper presents the results of an investigation into the factors that determine the intention to save for retirement using a professional financial services planner. The sample of 289 individuals aged between 30-65 years in Australia revealed that self-efficacy and attitudes are the main factors that cause a consumer to save for retirement, using the services of a financial planner and/or accountant. Structural equation modelling (SEM) analysis indicated that subjective knowledge and goal clarity have a negligible effect on behavioural intentions in this context. Furthermore, it was found that goal clarity, subjective knowledge and perceived risk did not have a direct impact on behavioural intentions. With 57 per cent of the variance explained, these results are considered robust. Finally, a number of opportunities for further research are outlined.

Introduction

Saving for retirement is an important national and international issue and consequently encouraging saving is beneficial (Clark, Strauss and Knox-Hayes, 2012). Research has shown (Harrison, Waite and White, 2006; Holland, 2008; Lusardi and Mitchell, 2007b) that planning has a critical role in the process of wealth accumulation. Given the role financial planners have in assisting individuals to prepare financially for retirement, it is beneficial to know what drives a person to use their services (Harrison, 2003).

Obtaining professional financial advice has been found to be important for a number of reasons. This includes the ability of financial advisers to clarify and explain information associated with the range of investment products and services available in the market (Harrison, Waite and White, 2006), and the skill of financial planners to assist consumers with developing a financial plan that accommodates the short-term needs and long-term goals of the consumer (Holland, 2008). Additionally, planning has been found to be beneficial to a cross-section of consumers with higher and lower incomes, with planning being the key to wealth creation rather than wealth being the causal factor for planning (Holland, 2008; Lusardi and Mitchell, 2007b).

How retirees pay for their living and health costs is one of the key issues facing governments as an ageing population will increasingly be comprised of people who are no longer working. It is costly for governments to provide aged pensions and heavily subsidised health care services as the ratio of working to non-working people becomes increasingly disproportionate. The ratio of working age people to older people in Australia is expected to decrease from 5:1 today to 2.7:1 by 2050 (Australian Treasury, 2010). In the United States, as baby boomers have become older, approximately 77 million baby boomers have gradually left the work force. Thus, in 2012 the baby boomer work force participation declined from 80 per cent to 40 per cent (Toossi, 2012).

Poor levels of and poor attitudes towards savings have been identified in the United States (Fox, 2005; Hershey and Mowen, 2000; Howlett, Kees and Kemp, 2008; Moschis and Burkhalter, 2008), among immigrants in Europe (Topa, Moriano and Moreno, 2012) and the population of the Netherlands (van Rooij, Lusardi and Alessi, 2011). The Reserve Bank of Australia has revealed that the negative aggregate household savings rate that occurred between the early 1970s and the early 2000s has been reversed (Finlay and Price, 2014). However, the ageing population is predicted to produce substantial fiscal pressures and place significant burden on government spending (Australian Treasury, 2010). Globally, the OECD has identified that the cost of not saving for retirement could put significant strain on the economies of nations (OECD, 2005).

Katona (1975, p. 235) made the observation that “Plans to save often represent good intentions that are not carried out at a later date”. Financial planners provide consumers with comprehensive and integrated financial advice across a range of products and services. This advice is tailored to meet the specific goals and financial needs of the individual. Our study seeks to establish the extent to which attitudes, self-efficacy, perceived risk, goal clarity, and subjective knowledge drive the intention to use a financial planner to assist with the process to save for retirement.

Background

The Financial Planning Industry

Historically the Australian government has had a major role in the expansion of the financial services industry through the development and implementation of legislation designed to protect customers and strengthen the industry (Cull, 2009). While Australia suffered considerably less than many other countries during the Global Financial Crisis (GFC) 2007-2009, its impact was still felt, indicated by a slowing in the economy, a rise of two per cent in unemployment, a large decline in equity prices, and a reduction of household wealth by nearly 10 per cent by March 2009 (ABS, 2011). The collapse of Storm Financial, a financial planning firm based in Queensland that lost almost A$3 billion in investor funds and leaving many of those investors destitute, led to a parliamentary joint committee enquiry (Washington, 2010; McKeown, 2012). As a result of that enquiry, in 2012 the Australian government introduced the Future of Financial Advice (FoFA) reforms, designed to give greater protection to retail investors, as well as 'ensure the availability, accessibility and affordability of high quality financial advice' (The Treasury, 2016), with compliance to these reforms mandatory from July 1, 2013.

Obtaining professional advice has been found to be beneficial, and yet the industry has had a difficult and troubled past, with perceptions of the industry negatively impacted (Robertson, 2015). Consequently, the research question and focus of this study is:

RQ: What are the main factors that influence a customer's intention to use a financial planner and/or accountant to assist with saving for retirement?

Consumer Behaviour and Saving

A unique attribute of saving for retirement is that it involves making a decision about purchasing saving or investment products and services in the present, the benefits of which will only be realized in the distant future. In making that decision, a person must simultaneously choose to forego purchasing other goods or services that will provide more immediate rewards, such as a holiday, a new car or a new sound system.

Financial planners have a role in both assisting with explaining investment product information and developing retirement savings plans. It has been found that financial advisers are an important information source when consumers are seeking knowledge on credit and investment-based products (Howcroft, Hewer and Hamilton, 2003), with another study revealing that planning affects wealth (Lusardi and Mitchell, 2007b). A study by Loibl and Hira (2009) found that the less involved customer (i.e., the customer least likely to seek information) is more likely to use the services of a financial planner for investment decision-making. Other research by Hira, Rock and Loibl (2009) suggests that among other variables, planning for retirement, having financial knowledge and a strong internal locus of control were significant contributors to maximizing retirement contributions. Literature reveals that subjective knowledge (as opposed to objective knowledge and experience) (Flynn and Goldsmith, 1999; Grace, Weaven and Anderson, 2008; Hershey and Mowen, 2000; Howlett, Kees and Kemp, 2008), goal clarity (Canova, Rattazzi and Webley, 2005; Crespo, del

Bosque and Sanchez, 2009; Featherman and Pavlou, 2003; Lee, 2009; Stawski, Hershey and Jacobs-Lawson, 2007), and perceived risk (Llewellyn, 2005; Mitra and Reiss, 1999) are all significant contributing factors to whether or not a person saves.

Behavioural Intentions

In his review of the relationship between intention and behaviour, Sheeran (2002) suggests that behavioural intentions 'are people's decisions to perform particular actions' (p. 2). Intentions are indicative of how hard people are willing to strive, and the effort they are planning to exert to undertake the behaviour (Ajzen, 1991). Consequently, the stronger the intention to perform a particular behaviour, the greater the likelihood that the behaviour should actually occur.

The intention construct is central to theories concerned with attitude-behaviour relations and therefore to the development of a model in the context of this study (Sheeran, 2002). Of the theories and models developed to examine the attitude-behaviour relationship, it would appear that asking people how they intend to behave is the conduit to knowing how they will actually behave. Evidence for this exists in numerous studies that have demonstrated the effectiveness of measuring intentions as a predictor for a range of different behaviours (see Ajzen, 2005 for a summary).

Self-efficacy

Self-efficacy is a measure of an individual's perception of their ability to perform the behaviour (e.g., I am confident that I have the skills and ability to perform the behaviour) (Norman and Hoyle, 2004). According to Bandura (1977), whether or not people avoid or become involved with activities or behaviours depends on whether or not they consider themselves able to cope with or handle the particular task. Furthermore, both the amount of time and the effort people use to overcome difficulties or challenges associated with the task will be governed by their confidence in their abilities. As Bandura and Locke (2003, p. 97) state: "One cannot execute well-established skills while beset with self-doubt. In applying what one knows, a strong belief in one's performance efficacy is essential to mobilize and sustain the effort necessary to succeed". It has also been found that self-efficacy has a positive influence on accepting a difficult or challenging goal (Bandura and Jourdan, 1991; Bandura and Locke, 2003; Schwarzer, 1999; Vancouver, Thompson and Williams, 2001). However the relationship between goals and behavioural intentions, and goals and attitudes in the context of using a financial planner and/or accountant to assist with retirement savings plans is unexplored and therefore forms part of this study. On this basis, the following is hypothesised:

H1a: *Greater **self-efficacy** positively influences **behavioural intentions** towards using the professional services of a financial planner and/or accountant to save for retirement.*

H1b: *Greater **self-efficacy** positively influences **goal clarity** associated with using the professional services of a financial planner and/or accountant to save for retirement.*

Goal Clarity

A body of research exists that explores the role of goals on behaviour (Bagozzi and Dholakia, 1999; Dewitte, Verguts and Lens, 2003; Gollwitzer, 1993 and 1999). It has been found that people who think ahead are inclined to have savings plans (Grace, Weaven and Anderson, 2008; Rabinovich and Webley, 2007). Furthermore, Stawski, Hershey and Jacobs-Lawson (2007) found that retirement savings planning was predicted by retirement goal clarity, with planning then predicting involvement in the savings process. In the context of planning, financial literacy and housing wealth, planning has been shown to affect wealth (Lusardi and Mitchell, 2007a). That is, the more an individual plans, the greater their wealth. These precedents lead to the following hypotheses with respect to goal clarity and using the services of a financial planner and/or accountant to assist with saving for retirement:

H2a: *Increased **goal clarity** positively influences **behavioural intentions** associated with using the professional services of a financial planner and/or accountant to save for retirement.*

H2b: *Increased **goal clarity** positively influences **attitudes** towards using the professional services of a financial planner and/or accountant to save for retirement.*

Attitudes Towards Saving

There is a comprehensive body of literature that explores the attitude concept (Ajzen, 1991 and 2005; Cohen, 1972; Eagley and Chaiken, 1993; Fishbein and Ajzen, 1975) and its impact on consumer behaviour. Studies have also provided empirical support for the link between attitudes and intentions (Ajzen, 1988 and 1991). Furthermore, Armitage and Conner's (2001) meta-analysis revealed that attitude was a strong predictor of variance in intentions. This is substantiated in numerous studies (Fitzmaurice, 2005; Louis, *et al.*, 2007; Smith, Terry and Hogg, 2006) that have shown attitudes are positively related to behavioural intentions. The role that attitudes have on behavioural intentions associated with using the professional services of a financial planner and/or accountant to save for retirement is unknown and is therefore investigated in this study due to its demonstrated impact on people's behaviour in previous studies.

H3: *Greater positive **attitudes** positively influence **behavioural intentions** associated with using the professional services of a financial planner and/or accountant to save for retirement.*

Subjective Knowledge

Financial literacy is essential to making reasonable financial decisions (Lusardi and Mitchell, 2011). It has been found that subjective knowledge influences customer acquisition of financial products (Howcroft, Hewer and Hamilton, 2003) and has a positive impact on attitudes towards investing (Stawski, Hershey and Jacobs-Lawson, 2007). Subjective knowledge has also been shown to have an effect on perceived risk (Laroche, Bergeron and Goutaland, 2003). Given these influences in previous studies it is expected that subjective knowledge will have a similarly positive influence on an individual's behavioural intention to use a financial planner to save for retirement.

H4a: *Greater **subjective knowledge** positively influences **behavioural intentions** associated with using the professional services of a financial planner and/or accountant to save for retirement.*

H4b: *Greater **subjective knowledge** positively influences **attitudes** towards using the professional services of a financial planner and/or accountant to save for retirement.*

H4c: *Greater **subjective knowledge** negatively influences **perceived risk** of using the professional services of a financial planner and/or accountant to save for retirement.*

Perceived Risk

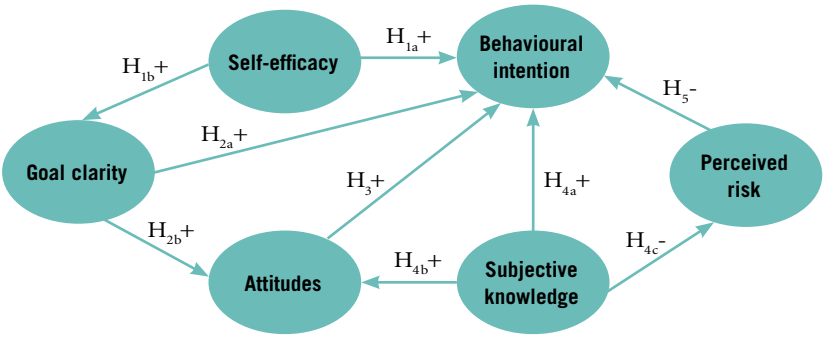
The concept of perceived risk was first introduced by Bauer (1960) as an idea that he hoped would "at least survive through infancy" (p. 389). Subsequently, the concept has not only survived infancy but it has spawned a range of studies that suggest risk is a central construct for consumer theory (Conchar, Zinkham, Peters and Olavarrieta, 2004; Howcroft, Hewer and Hamilton, 2003; Laroche, Bergeron and Goutaland, 2003; Lovelock, 2001). When considering risk, it is noteworthy that it is perceived risk not objective risk that is studied (Mitchell, 1999), because as Bauer (1960) stated, "If risk exists in the 'real world' and the individual does not perceive it, he cannot be influenced by it" (p. 395).

In general, evidence indicates that intangible products, such as financial planning services have a higher degree of perceived risk when compared directly with goods (Laroche, Bergeron and Goutaland, 2003; Mitchell and Greatorex, 1993; Murray, 1991; Murray and Schlacter, 1990; Zeithaml, Parasuraman and Berry, 1985). On this basis, the following is proposed in the context of this study:

H5: *Greater **perceived risk** of using a professional financial planner and/or accountant negatively influences **behavioural intentions** associated with using the professional services of a financial planner and/or accountant to save for retirement.*

The above hypotheses are visualized in Figure 1.

Figure 1: Conceptual Model



The method used to explore this model is described next.

Method

Participants

An email with a self-administered URL-embedded Web questionnaire was sent to 10,370 members of *The Australian Consumer Panel* (an "opt-in" database panel owned and managed by the Online Research Unit (ORU), a member of the Association of Market & Social Research Organisations (AMSRO) and ESOMAR World Research) with 289 recipients qualifying. In order to participate in the survey potential respondents were required to meet two criteria. First, they had to self-report that they had spare money to save for retirement (SFR) over and above the compulsory superannuation guarantee levy (SGL) received from their employer. Second, they were required to have the intention of using a qualified financial planner and/or accountant to assist them to SFR.

The *sampling population* for the study was employed people in Australia aged between 30 and 65 years. This age range was selected on the basis that by age 65 approximately 67 per cent of men and 84 per cent of women in Australia have retired (ABS, 2009) and previous research has shown that people under the age of 30 are not actively engaged with the concept of saving for retirement (Rickwood and White, 2009). The chosen sample reflected the age and gender distribution of the Australian population as reported by the Australian Bureau of Statistics Census Data (ABS, 2011). The majority of respondents were married (61.6%). Furthermore, 41.5 per cent had either one or two children, 52.2 per cent earned $50,001-$90,000 per annum, and the household income was concentrated at the high end, with 57.1 per cent earning above $90,000 per annum. Of this sample, 86.2 per cent were wage/salary earners and 21.5 per cent had a bachelor or other degree level qualification.

Questionnaire

The questionnaire was comprised of 51 questions, including three screening questions. Respondents who did not meet the criteria to continue through to the main survey were re-directed to a screen to complete demographic data. Questions were grouped based on gathering the relevant information to analyze and test the role of the factors identified in the conceptual model, on behavioural intention. That is, attitudes (8 items), self-efficacy (7 items), financial and/or functional risk (7 items), perceived knowledge (8 items), and goal orientation (6 items). Additionally, nine questions were concerned with gaining insights to the behavioural characteristics of respondents associated with saving and their past use/experience of a financial planner/ accountant to assist with their financial savings plans. The purpose of the study was to determine the key drivers for individuals to save for retirement using the professional services of a financial planner and/or accountant. Consequently, screening for participants with an intention to use a financial planner enabled the researchers to understand the key drivers that correlated with that intention. While this eliminated the population that were not intending to use a financial planner, the study purpose was not to explore the barriers or hurdles to financial planner use.

With the exception of the items associated with behavioural characteristics, the scales used in the survey were based on instruments previously tested for reliability and validity in studies published in the existing literature. These were: attitudes scale (Ajzen, 2002); behavioural intentions scale

(Ajzen 2002); self-efficacy scale (adapted from Manstead and van Eekelen, 1998; Norman and Hoyle, 2004; Povey, *et al.* 2000; Terry and O'Leary, 1995; Yi and Hwang, 2003); perceived risk scale (adapted from Featherman and Pavlou, 2003 and Lee, 2009); subjective knowledge scale (adapted from Flynn and Goldsmith, 1999); goal scale (adapted from Prestwich, Perugini and Hurling, 2008). Seven-point rating scales were used throughout the survey because they provide respondents with a broad enough range for discriminating between the two polar opposites, and it has been found that the interval between scale points is approximately equal (Osgood, Suci and Tannenbaum, 1957). The adjectives chosen to anchor the scales were determined logically based on previous research, and the results of pre-testing. The questions used to measure the constructs are provided in Appendix 1.

Analysis

Data were analysed by structural equation modelling (SEM) to undertake a confirmatory factor analysis (CFA), assess the reliability and validity of the measurement scales, as well as to estimate and analyse the theoretical model guiding this study. The CFA fit well (RMSEA[1] < 0.10; NFI, IFI, TLI and CFI > 0.9. See Table 1). SEM is a multivariate statistical technique that combines the methods of multiple regression and factor analysis to simultaneously estimate a series of interrelated dependence relationships, and determines the extent to which a hypothesised model is consistent with the sample data (Byrne, 2001; Hair, *et al.*, 2006).

SEM was considered the most appropriate quantitative technique for this study for three reasons. First, SEM can specify and estimate models with mediating variables between independent and dependent variables and thus be able to overcome the limitation of many multivariate techniques of only being able to address a single relationship at a time (Byrne, 2001; Hair, *et al.*, 2006). Second, SEM allows for multi-item scales and can reduce the measurement error allowing the researcher to assess the strength of relationship between any two factors (Hair, *et al.*, 2006). Finally, SEM enables testing and defining of theoretical models, particularly those that contain latent construct factors (Anderson and Gerbing, 1988; Hair, *et al.*, 2006).

Parameter estimates and critical ratio values in the CFA all loaded higher than 0.50 and were statistically significant ($p<0.05$). The measurement scales used in this study exhibited internal consistency and reliability (all values for construct reliability exceeded Garver and Mentzer's (1999) criterion value of 0.70). Additionally, the average variance extracted values for all constructs met the criterion value of > 0.50 (Fornell and Larcker, 1981; Garver and Mentzer, 1999). Discriminant validity was supported for all variables (the average variance extracted (AVE) for each construct exceeded the squared correlation between latent variables (Fornell and Larcker, 1981)).

[1] RMSEA: Root Mean-square Error of Approximation; NFI: Normed-fit Index; IFI: Incremental Fit Index; TLI; Tucker Lewis Index; CFI: Comparative Fit Index

Table 1: Fit indices for the confirmatory factor analysis

Model fit for the CFA	Goodness of fit indices							
	χ^2	*P*	*Df*	RMSEA	GFI	IFI	TLI	CFI
Sample n=289	560.90	.000	180	.086	.850	.906	.890	.905

Results

Key factors influencing retirement savings intentions

Of the nine hypotheses proposed in the conceptual model (see Figure 1), five were supported by significant paths (see Table 2). The relationship between self-efficacy and behavioural intention and goal clarity were positive, as hypothesised. Similarly, goal clarity was found to have a positive relationship with attitudes, and equally attitudes had a positive relationship with behavioural intention. Subjective knowledge negatively influences the perceived risk associated with using the professional services of a financial planner and/or accountant to save for retirement as hypothesised. Of the four unsupported paths, two were found to be insignificant (the impact of goal clarity on behavioural intentions, and subjective knowledge on behavioural intentions), and two were statistically significant but not signed in the hypothesised direction (the relationship between subjective knowledge on attitudes, and perceived risk on behavioural intentions). Since these last two findings were not as expected it is suggested that further investigation is warranted and suggestions for further research are made in the conclusion to this paper.

Table 2: Path estimates and critical ratio values

Relationship	Sample n=289		Hypothesis Supported/ Confirmed
	β	CR	
H1a Self-efficacy → behavioural intention	.510	7.361	Yes
H1b Self-efficacy → goals	.549	7.643	Yes
H2a Goal clarity → behavioural intention	-.019	-.284	No
H2b Goal clarity → attitudes	.227	3.519	Yes
H3 Attitudes → behavioural intention	.537	9.465	Yes
H4a Subjective knowledge → behavioural intention	.029	.563	No
H4b Subjective knowledge → attitudes	-.183	-2.833	No
H4c Subjective knowledge → perceived risk	-.164	-2.458	Yes
H5 Perceived risk → behavioural intentions	.151	3.043	No

Discussion

The purpose of this study was to examine the drivers that influence a person to save for retirement using the services of a financial planner and/or accountant. Our results revealed the variables that provide either a direct or indirect influence on behavioural intention in this context. Evidence of the effectiveness of the explanatory power of the model is that 57 per cent of the variance in behavioural intentions is explained, which compares favourably with other studies. A meta-analysis undertaken by Sutton (1998) revealed that on average, between 40 per cent and 50 per cent of variance in behavioural intention was explained in the studies reviewed.

Our results clearly indicate the strong influence of attitudes on using a professional financial services planner to assist with saving for retirement. Similarly, self-efficacy was found to be a key factor influencing behavioural intentions associated with using a financial planner and/or accountant to assist with saving for retirement. While goal clarity, subjective knowledge and perceived risk were hypothesized to have a direct influence on behavioural intentions, this was not found to be the case in this context.

The results from our model suggest that individuals with a strong belief in their ability to select and use the professional services of a financial planner and/or accountant to save for retirement, have the intention to use professional services for retirement saving. Furthermore, it was shown that the more positive a person's attitude towards using a financial planner and/or accountant to save for retirement, the more likely is their intention to undertake this behaviour, confirming findings from previous studies (Croy, Gerrans and Speelman, 2010; Lee, 2009; Louis, *et al*., 2007; Smith, Terry and Hogg, 2006). Thus for individuals to do something about saving for retirement using a professional service provider they must have both a positive sense of self-efficacy and a positive attitude towards this action. This is consistent with the findings of Armitage and Conner's (1999) meta-analysis, whereby attitudes and self-efficacy were found to be the main predictors of behavioural intentions.

According to Tang (1993), attitudes towards money have a cognitive, affective, and behavioural component. It is these verbal or non-verbal behavioural responses within a particular context that are the best indication of an attitude (Ajzen, 2005). Our results support many studies exploring the role of attitudes on behavioural intentions, including a study seeking to establish the factors that influence the adoption of internet banking (Lee, 2009).

Self-efficacy is based on a consumer's belief that they are able to handle a specific task. In this instance, the specific task measured requires a belief that the person has the ability, confidence, and possibility to save using a professional financial services planner and that this action is easy. The positive relationship found between self-efficacy and behavioural intention (path=.510) supported our hypothesis and that from previous studies including a study exploring young peoples' attitudes towards money (Engelberg, 2007).

Our results suggest that subjective knowledge and goal clarity have little or no direct influence on behavioural intention. This was surprising given findings from previous research regarding retirement savings (Croy, Gerrans and Speelman, 2010; Stawski, Hershey and Jacobs-Lawson,

2007). Such a result suggests that a person is primarily driven by a self-belief and a positive attitude towards this behaviour irrespective of their knowledge. Furthermore, having a clear goal to save for retirement with the assistance of a professional financial services planner is simply not enough to motivate a person to do something. However, given the indirect relationship between goals and self-efficacy and goals and attitudes, it would suggest that goals do have a role in the use of financial planners – albeit not a key driver.

Practical implications

For organisations, governments and financial planners seeking to encourage people to save for retirement this is valuable information as it can clearly guide any marketing or information campaigns undertaken. Providing aspirational images of what is possible without either firstly or simultaneously providing a means for a person to gain confidence about their abilities in this area may be ineffective in motivating a person to take action. Furthermore, based on our results, providing an environment and background that engenders a positive attitude towards saving for retirement with the assistance of a professional financial services planner, is also crucial for a person to do something in this area.

There are four ways in which self-efficacy can be built: personal experience; observing others; verbal persuasion; and a heightened emotional situation (Bandura, 1977). The most effective means of building self-efficacy is through personal experience, followed by observation of others. Consequently, providing a 'free' first consultation may assist in further encouraging individuals to utilise financial planning services. Developing and sharing case studies of individuals who have experienced the effectiveness of financial planning services would provide an indirect means of potential clients observing the impact of using a financial planner. Such case studies could be used online and in newsletters. These case studies could also be used to engage with government and organisations as they provide a practical way of demonstrating the effectiveness of financial planning. Raising awareness of the value of financial planners through advertising and communication campaigns could also build self-efficacy as campaigns could utilise story to demonstrate a heightened emotional situation or develop a scenario that emulates personal observation.

A key consideration for financial planners is that consumers are concerned about changing government rules and regulations regarding retirement savings (Rickwood and White, 2009). Unfortunately the global financial crisis impacted the trustworthiness of the financial services sector. In fact one study has revealed that financial services is the least trusted profession globally (Edelman, 2014). Past experience, current research and the findings from our study suggest that there is adequate knowledge, experience and evidence for the introduction of public policies and campaigns to be developed and executed designed to increase the population's positive attitude towards, and sense of self-efficacy about, using a qualified professional financial services planner to save for retirement, including certification such as the Certified Financial Planner (CFP).

For organisations, governments and financial planners the key findings and critical outcomes of this research is that self-efficacy and attitudes have been found to be the key drivers for a consumer to save for retirement using the services of a qualified professional advisor.

Conclusion

The literature suggests that attitudes and self-efficacy influence behavioural intentions. Our research confirmed that these factors are the two most critical variables in the context of using a financial planner and/or accountant to save for retirement – a previously unknown finding. Literature also proposes that when people think ahead they are more inclined to have savings plans. The relationship between self-efficacy and goals, and goals and attitudes suggests that these variables are also important for people to choose to use a professional financial services planner to assist with saving for retirement.

This study was limited in several ways. First, the sample was taken from a single country – Australia. Consequently, caution is recommended here on the basis that each government has its own regulatory regime and existing political, economic and social structures, that combined with cultural differences may lead to different results than those presented in this paper. Second, as the data collection was cross-sectional it was collected at a single point in time. Clearly, the data would be enhanced with a longitudinal study that investigated not only the behavioural intention of the respondent, but undertook a follow-up survey to ascertain the extent to which respondents *actually* sought the advice of an accountant or financial planner to develop a savings plan. Third, the focus of use of a professional financial planner was on 'saving for retirement' and not broader goals. Fourth, participants were selected on the basis that they had additional money to save for retirement beyond the superannuation guarantee levy. Finally, the sample is limited to individuals that indicated an intention to seek financial advice, aged between 30 and 65. Consequently, the results of the study cannot be generalised to the Australian population.

In addition to undertaking a longitudinal study there are three basic possibilities for further research. First, investigating the direct and indirect impact of perceived risk is worthy of examination as previous research (Laroche, Bergeron and Goutland, 2003; Murray, 1991; Zeithaml, Parasuraman and Berry, 1985) indicates that services have a high degree of perceived risk and consequently it would be expected that there would be some impact on behavioural intentions, in the context of using a professional financial services planner to assist with saving for retirement. Second, previous research has found that word-of-mouth (WOM) has a significant role in the selection and use of professional services (Bansal and Voyer, 2000; Ettenson and Turner, 1997; Sweeney, Soutar and Mazzarol, 2008; Thakor and Kumar, 2000). Consequently, examining the influence of WOM in this context would make a valuable contribution to both the literature and management. There may also be benefit to this field by further exploration of the knowledge construct and its relationship between, and influence on, self-efficacy, perceived behavioural control, attitudes, and behavioural intention that would provide valuable information regarding the role of financial education and its influence on behaviour.

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Appendix 1

Attitudes Scale

1. For me to save money on a regular basis is: good/bad; wise/foolish; important/unimportant; enjoyable/unenjoyable; beneficial/detrimental
2. For me to meet with a qualified financial planner and/or accountant on a regular basis to discuss saving for retirement is: good/bad; wise/foolish; important/unimportant; enjoyable/unenjoyable; beneficial/detrimental

Adapted from: Ajzen (2002)

Behavioural Intentions Scale

1. I intend to save money for retirement on a regular basis.
2. I intend to meet with a qualified financial adviser and/or accountant on a regular basis to discuss saving for retirement.
3. I want to save money for retirement on a regular basis.
4. I want to meet with a qualified financial adviser and/or accountant on a regular basis to discuss saving for retirement.
5. How likely or unlikely is it that you will save for retirement in the next month?
6. How likely or unlikely is it that you will meet with a qualified financial planner and/or accountant in the next month to discuss saving for retirement?

Adapted from: Ajzen (2002)

Self-efficacy Scale

1. I believe I have the ability to save for retirement on a regular basis.
2. For me to save for retirement on a regular basis from now on would be …..
3. How confident are you that you could save for retirement on a regular basis?
4. What is the likelihood that if you tried you would be able to saving for retirement on a regular basis from now on?
5. I believe I have the ability to select a good qualified financial planner and/or accountant to discuss saving for retirement.
6. For me to meet with a qualified financial planner and/or accountant on a regular basis from now on, to discuss saving for retirement would be ….
7. How confident are you that you could meet with a qualified financial planner and/or accountant on a regular basis to discuss saving for retirement?

Adapted from: Manstead and van Eekelen, 1998; Norman and Hoyle, 2004; Povey, et al., 2000; Terry and O'Leary, 1995; Yi and Hwang, 2003.

Perceived Risk Scale

1. When using the services of a qualified financial planner and/or accountant to assist me with saving for retirement I am afraid that I will lose money due to careless mistakes made by the planner and/or accountant.
2. To use a qualified financial planner and/or accountant to assist me with saving for retirement is expensive.
3. What is the likelihood that you will lose money if you use the services of a qualified financial planner and/or accountant? (Excludes any professional fees associated with the use of these services.)
4. The qualified financial planner and/or accountant might not perform well and could create problems with my retirement savings.
5. The regulations associated with qualified financial planners and/or accountants are not strong enough to protect my retirement savings.
6. What is the likelihood that there will be something wrong with the performance of the qualified financial planner and/or accountant?

Adapted from: Featherman and Pavlou (2003) and Lee (2009)

Subjective Knowledge Scale

1. I know pretty much everything about saving for retirement.
2. I do not feel very knowledgeable about saving for retirement.
3. Among my circle of friends, I'm one of the "experts" on saving for retirement.
4. Compared to most other people, I know less about saving for retirement.
5. I know pretty much everything about using a financial planner to save for retirement.
6. I do not feel very knowledgeable about using a financial planner to save for retirement. (R)
7. Among my circle of friends, I'm one of the "experts" on using a financial planner to save for retirement.
8. Compared to most other people, I know less about using a financial planner to save for retirement. (R)

(R) Reverse scored. Adapted from: Flynn and Goldsmith (1999)

Goal Clarity Scale

1. Set clear goals for gaining information about saving for retirement.
2. Thought a great deal about quality of life in retirement.
3. Set specific goals for how much will need to be saved for retirement.
4. Have a clear vision of how life will be in retirement.
5. Discussed retirement plans with a spouse, friend, or significant other.

Source: Adapted from Stawski, Hershey and Jacobs-Lawson (2007)

Goal Desire

1. How would you characterise your desire to achieve a financially comfortable retirement by visiting a financial planner? (no desire to very strong desire)
2. I want to achieve a financially comfortable retirement by using a qualified financial planner and/or accountant

Adapted from: Adapted from Prestwich, Perugini and Hurling (2008)

CONSUMERS OF FINANCIAL ADVICE IN NEW ZEALAND

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ABSTRACT

This study examines some key client-adviser characteristics within the New Zealand financial planning landscape. Through an online survey, participants were asked about their choice of financial adviser, their experience of financial advice and their view of the 2008 Financial Advisers Act. Descriptive results reveal a lack of knowledge in differentiating between the types of advisers and each adviser's scope of service. Clients of financial advisers who adhere to minimum education standards are significantly different from clients who contract the services of advisers without set standards. Implications include adopting a nationwide marketing campaign and significant regulatory changes to help all consumers identify appropriate financial service professionals for their needs.

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Introduction

After the 2008 global financial crisis (GFC) many individuals have grown weary of financial professionals. In New Zealand, trust and confidence in financial professionals has diminished within the past few years (Financial Markets Authority, 2015; Brunton, 2015). But the need for advice is growing. The Commission for Financial Capability highlights that approximately 60 per cent of New Zealand's population is enrolled in KiwiSaver. This is a government-endorsed voluntary retirement saving scheme instituted in 2007. Over time, as KiwiSaver balances grow, there will be an increased need for financial advice as many individuals will have accumulated a substantial amount of wealth for the first time in their lives (Financial Markets Authority, 2015).

Additionally, in New Zealand there has been increased regulation of financial advisers. The 2008 Financial Advisers Act (FAA) was intended to promote higher standards of care for professionals delivering financial advice. Moreover, a primary goal of the Act was to foster confidence and promote professionalism within the financial advice field. Currently, the FAA is being reviewed. The Financial Markets Authority (FMA) is the agency which serves as the regulator of financial professionals and capital markets in New Zealand. The agency has allowed various stakeholders, including financial advisers, product providers, academics and even consumers, to provide ongoing feedback and help shape the legislation.

Thus far, the FMA has conducted numerous surveys polling the public at large about the financial advice industry; however, they have yet to examine the preferences and knowledge of current or past clients of financial advisers beyond small focus groups. This type of analysis may aid in policymaking that can truly benefit current and future consumers of financial advice. Therefore, the primary aim of this paper is to examine the characteristics of individuals who use financial advisers in New Zealand, including their preferences and knowledge about the different types of financial advisers. This exploratory study is important to help inform the ongoing discussion regarding constructive financial adviser regulation in New Zealand.

Literature Review

The need for a financial adviser is oftentimes based on the ability and capability of the household to do its own financial planning (Hanna, 2011). The benefits of using a financial adviser include wealth accumulation and consumption smoothing; that is, reducing income and wealth shocks over time (Hanna and Lindamood, 2010; Finke, Huston and Waller, 2009). Financial advice is offered and delivered either in a comprehensive manner (where all the individual's financial needs and goals are taken into consideration for planning) or on a modular basis, e.g. mortgage or risk advice only (Winchester and Huston, 2015).

The range of financial professionals used to secure financial advice primarily includes bankers, lawyers, accountants, brokers, and financial planners/advisers. While needs for financial services vary among households, bank professionals are more accessible to the public at large (Chang, 2005). However, there is a shift away from seeking financial advice from bankers to paid financial professionals as risk tolerance and education increases (Chang, 2005).

Retirement planning is one of the primary areas for which people seek out financial advice (Marsden, *et al*., 2011; Bae and Sandager, 1997). Robb, *et al.* (2012) find that as financial satisfaction increases, the likelihood of obtaining advice on debt management or advice associated with loans decreases. However, as financial satisfaction increases, households are more likely to seek advice regarding savings and investment.

Pertaining to adviser competency and education, research is not well developed to gauge consumer preferences in this area. However, prior studies provide evidence that financial adviser credentials can serve as a proxy for trust and advice quality (Black, *et al*., 2002; Brealey, *et al*., 1977). Credentials can be a 'signal' of advice quality (Inderst and Ottaviani, 2010), and even payment structure can impact advice quality. An Australian-based survey of financial advisers and consumers found that advisers who were paid by commission only, delivered lower quality financial plans to clients (44%) (Australian Securities and Investments Commission, 2003). Positive financial outcomes for consumers of financial advice is most evident when the adviser's interests and the consumer's or client's interests are aligned (UNSW Business School, 2010).

The development of financial tools and a wider range of financial products have prompted the growth of various types of financial professionals. For example, in the past four decades or so, deregulation has allowed access for various professionals into the financial lives of households, further creating confusion in delivery of financial advice (Mandell and Klein, 2009). Brokerage firms, banks, and insurance companies now house financial advisers. While this can be seen as a benefit to consumers, given greater access to financial planning products and services, it also provides an umbrella for some professionals to take advantage of low consumer knowledge and awareness.

In fact, broader access to financial advice is a continuing regulatory issue particularly in the U.S., where broker-dealers have not been held to the same standards as financial advisers (Finke, 2012; Black, 2005; Laby, 2010). However, recent U.S. legislative changes have taken a positive turn in addressing the fiduciary (putting clients first) versus suitability issue (Ebeling, 2016). Australia's Future of Financial Advice (FoFA) reforms have recommended that investment advisers extend a fiduciary duty of care to clients, and more recently, professional advice and education standards have been lifted (Financial Planning Standards Board, 2017). Finke (2012) finds that when there are reduced conflicts of interest between a financial adviser and the client, the client benefits more from the planning relationship.

Financial advice in New Zealand

Providing financial advice in New Zealand has become more complex over time. While practitioners and academics in the country agree that the changes in regulation is a step in the right direction, and that the 2008 FAA has provided a good foundation for advisers and some protection for consumers, there is still too much complexity and growing costs associated with regulatory changes. The FAA has been under review since 2015 and into 2017. Again, during this review, the FMA (regulator) has allowed financial planning stakeholders to voice concerns about the FAA through various workshops and written submissions.

Even more, the Ministry of Business, Innovation and Employment (MBIE) has commissioned a few focus groups to gauge consumer preferences and issues regarding their access to, and experience of, obtaining financial advice (Brunton, 2015). These focus groups revealed similar findings associated with financial advice globally. For instance, trust is a consistent issue outside of a developed personal relationship among clients and advisers (Lachance and Ning, 2012). People who use advisers over the long run have more positive views than those most who have not used advisory services. The GFC may have also tainted the view of financial advisers.

Less than 10 per cent of New Zealanders seek out a financial adviser for professional advice (RaboDirect, 2011). Financial advice is primarily around insurance needs and investment planning (MBIE, 2011). Matthews (2013) highlights attitudes and behaviour related to KiwiSaver in New Zealand, and finds similar results to past studies. For example, turning to family and friends before considering or going to a financial professional is consistent with adviser use outside of New Zealand. Most New Zealanders prefer to conduct their own research before seeking professional financial planning assistance (RaboDirect, 2011).

At present, there are primarily three types of advisers in New Zealand: *Qualifying Financial Entities* (QFEs), *Registered Financial Advisers* (RFAs) and *Authorised Financial Advisers* (AFAs). The type of adviser depends on:

- Type of client—retail or wholesale
- The nature of the advice—if advice is personalised or general
- Types of products involved—investment-related or not

QFEs are institutions which house financial advisers. Individuals who work for QFEs can give investment advice, but that advice is limited to the products offered by the QFE. However, if the individual is an AFA within the institution, he or she can then advise on products beyond those offered by the QFE. RFAs have to 'register' with the FMA to provide advice on category 2 products, which are classed as having less risk and complexity. Category 2 products include, for example, consumer loans, term deposits (i.e. CDs) and insurance products. AFAs can provide comprehensive financial planning advice, including personalised advice and advice related to category 1 products. Category 1 products are investment-related products, deemed to be more 'complex' and riskier.

Only AFAs have to adhere to minimum education standards (equivalent to about nine months of first year university study) and meet continuing education requirements. At present, there are approximately 20,000 QFE advisers, 6,400 RFAs and 1,800 AFAs. An adviser with a Certified Financial Planner (CFP^{CM}) designation (which represents less than two per cent of the adviser population in New Zealand) takes on additional education beyond the minimum level required to be an AFA. The methodology used for this study is outlined next to explore the New Zealand consumer knowledge of financial advisers.

Methods

For this exploratory study, a survey was developed for consumers of financial advice in New Zealand. Survey participants (actual clients of financial advisers) were asked about their choice

of financial adviser, their experience of financial advice, their view of the 2008 Financial Adviser Act (FAA) in addition to a set of demographic questions. The questionnaire was distributed online and consisted of 24 questions. (See Appendix one for survey questions.) The survey was open for approximately one year. Representatives from various adviser groups were contacted via email to distribute the survey link to their adviser members, who were then asked to pass on the link to their clients. Each adviser group contact was provided with an electronic copy of the survey so as to alleviate any concerns about survey questions and promote transparency. The survey was also promoted at one of the larger financial adviser conferences in New Zealand, during which conference attendees were given information about the survey.

Financial advisers were broadly defined as including mortgage brokers, risk advisers and investment advisers. There was no way of knowing which representatives of the adviser groups passed on the link or the identity of their clients. Thus, all responses were anonymous. The total number of respondents was 457, of which 445 represented full responses. Descriptive analyses, presented below, are appropriate for this exploratory study.

Results

Descriptive statistics

Tables 1 and 2 show descriptive statistics for all households and households censored by type of financial adviser. Among all respondents, 59 per cent were male and 39 per cent female. Over 90 per cent identify themselves as New Zealand European, mostly based in Auckland and Bay of Plenty. The majority of respondents were married, aged 50 to 69, holding a Bachelor's degree or a vocational qualification. About 34 per cent report an income between NZD 80,000 – 140,000 ($56,000 - $98,000 USD), while 28 per cent of participants cite household income of over NZD140,000 (above $98,000 USD).

Table 1: Demographic characteristics for all survey respondents, N=445

Demographics		All households (in %)
Gender	Male	59
	Female	39
Marital Status	Single	46
	Married	54
Age	18-29	3
	30-49	18
	50-59	20
	60-69	23
	≥70	8

Table 1: Demographic characteristics for all survey respondents, N=445 (continued)

Demographics		All households (in %)
Education	Secondary School or Below	10
	Trade	19
	Bachelor's	23
	Higher Degree	16
Income	<$50,000	9
	$50,001-$80,000	11
	$80,001-$110,000	12
	$110,001-$140,000	12
	>$140,000	20
Financial professional	RFA	19
	AFA	12
	AFA & CFP	22
Adviser compensation	Fee-only	22
	Commission only	6
	Combination of fee and commission	23
Advice Services	Cash Management	31
	Personal Risk Management	38
	Property Risk Management	20
	Retirement Planning	64
	Investment Planning	84
	Other	3
Race	NZ European	91
	Maori	2
	Pacific Islander	2
	Asian	3
	Other	5

Table 2: Descriptive statistics for all households alongside those who use the services of a Registered Financial Adviser (RFA) or an Authorised Financial Adviser with the Certified Financial Planning designation, specific to New Zealand (AFA-CFP^{CM})

		All households *(n=445)*	**RFA** *(n=84)*	**AFA & CFP^{CM}** *(n=100)*
Gender	Male	59	72	62
	Female	39	26	36
Marital status	Single	46	33	27
	Married	54	67	73
Age	18-29	3	5	0
	30-49	18	11	23
	50-59	20	19	31
	60-69	23	46	34
	≥70	8	17	10
Education	Secondary School or Below	10	10	14
	Trade	19	33	26
	Bachelor's Degree	23	26	28
	Higher Degree	16	24	24
Income	Low Income (<$50,000)	9	25	14
	Mid-Low Inc. ($50,001-$80,000)	11	21	8
	Mid Inc. ($80,001-$110,000)	12	16	9
	Mid-high Inc. ($110,001-$140,000)	12	12	18
	High Inc. (>$140,000)	20	14	43
Financial Professional	RFA	19	100	0
	AFA	12	0	0
	AFA & CFP^{CM}	22	0	100
Adviser compensation	Fee-only	22	44	47
	Commission only	6	7	9
	Combination of fee & commission	23	46	40

Greater than 90 per cent of survey respondents report using a financial professional (at the time they completed the survey) or in the past. The majority of respondents (36%) cite using the services of a financial professional for over 10 years, while 34 per cent report using services from one to five years. Approximately 73 per cent of participants use a financial adviser. Most participants found out about their financial professional through a family member or friend.

Table 3 shows chi-square statistics for selected demographic and income characteristics based on the use of a RFA or AFA-CFP^{CM}. Recall that RFAs are limited to providing financial advice on less 'complex' products (category 2), whereas AFAs can provide personalised financial advice in addition to advice on category 1 or 2 products. A New Zealand financial adviser who has an AFA-CFP^{CM} status, has:
(i) Gone beyond the minimum education requirement for AFAs
(ii) Completed one year of supervision under a senior AFA
(iii) Completed and passed a comprehensive case study exam, and
(iv) Accumulated three years of industry experience.

Therefore, those who hold a CFP^{CM} alongside being an AFA were compared with RFAs. The steps listed above bears some similarity to the process used for obtaining the CFP® designation in the U.S., Australia, and other parts of the world.

Table 3: Chi-square statistics for demographic and income characteristics based on the use of a RFA or an AFA-CFP^{CM}

	RFA		AFA-CFP^{CM}	
	Chi-Square	**P-value**	**Chi-Square**	**P-value**
Male	32.67	**<.0001**	18.12	**<.0001**
Female	0.05	0.82	3.05	0.08
Secondary School or below	0.002	0.96	2.78	0.96
Trade Cert	13.57	**0.0002**	3.97	0.05
Bachelor's Degree	0.72	0.40	2.07	0.15
Higher Degree	4.76	**0.03**	6.23	**0.01**
Income <$50,000	30.85	**<.0001**	3.53	0.06
$50,001-80,000	1.08	0.30	1.19	0.28
>$140,000	2.26	0.13	41.47	**<.0001**

There is a high statistically significant difference between males who use RFAs and also among males who use an AFA-CFP^{CM}. Among clients who cite using a RFA, there is a significant difference when it comes to education and income. Specifically, we see a significant difference among RFA clients who have trade certificates and among those who have additional education beyond a

Bachelor's degree. The relationship is highly significant among RFA clients who fall within the lower income category (<NZD 50,000 / < $35,500 USD. Additionally, there is a significant difference among AFA-CFP^{CM} clients who have additional education beyond a Bachelor's degree; and also among AFA-CFP^{CM} clients who fall within the highest income group, over NZD140,000 (over $98,000 USD).

Based on the data, it is not possible to assess the direction or likelihood associated with the abovementioned demographic and income variables. However, some inferences can be made based on the nature of advice services, the differences in cost of service between the two types of advisers in New Zealand, and the chi-square results. It is apparent from this study that clients who utilise the services of an RFA possess lower education and lower income. Comprehensive financial planning (including investment services) may not be warranted for all households based on budget constraints and preferences. But this division of services among advisers may not be serving the public well.

Adviser selection and client satisfaction

Half of respondents chose their financial professional for security and peace of mind, while 44 per cent cite that they made the choice based on a lack of personal knowledge about financial matters. Competency and trust are the most important attributes ranked in choosing a financial adviser, consistent with prior research. Cost of service ranks lowest; this is interesting as cost of service is commonly cited as a barrier to engagement—and also among the top two reasons—alongside trust, for using professional advice (Lachance and Ning, 2012). However, this finding may be indicative of selection bias because the sample represents those who already contract or contracted the services of a financial professional, consisting of a sizeable portion of middle and upper income households.

Most respondents prefer their adviser to be a RFA or simply had no preference (28%). Only 26 per cent preferred the AFA designation. Almost 60 per cent preferred their adviser to be unaffiliated with another firm, i.e. independent. When asked about compensation preference, 34 per cent of respondents selected 'fee-only,' while 30 per cent selected a combination of fee and commission. Approximately 43 per cent of survey respondents cite that their financial adviser is/was compensated under a fee and commission model.

It is noteworthy that almost 70 per cent of respondents cite that they expected their financial professional to provide investment planning services; 59 per cent expected retirement planning services. This is in conflict with the majority (35%) of participants who cite the use of an RFA (–a financial professional not qualified to dispense investment advice nor engage in retirement planning). Investment and retirement planning services were also cited as the top services the financial adviser provided (84% and 64%, respectively). This is consistent with findings in Australia, where households age 55-59 demand retirement planning services above other financial planning areas (Clark, Fiaschetti, and Tufano, 2016). However, QFE advisers in New Zealand can only provide retirement and investment-oriented advice to do with their own products—which poses a fiduciary versus suitability issue, similar to that in the U.S.

Most respondents (34%) report being 'somewhat knowledgeable' about the 2008 FAA, but 46 per cent were unsure if the FAA was working well. This is consistent with the Brunton (2015) focus group findings. Clients did not see a change in their client-adviser relationship as a result of this piece of legislation. Almost 70 per cent of survey respondents reported being 'completely satisfied' with their financial professional. This is consistent with prior studies, where trust (and thus greater satisfaction) is higher within an established adviser-client relationship (Brunton, 2015; RaboDirect, 2011).

Conclusion and implications

The findings from this study help shed light on the knowledge and preferences of consumers of financial advice in New Zealand. Clients of Authorised Financial Advisers (AFAs) with a CFP^{CM} designation (the only group of advisers who currently have to meet minimum education and professional development requirements), are wealthier, older, and have more education. Registered Financial Advisers (RFAs) are not bound by any education standards. Clients of RFAs are also older, fall within the lower income bracket, and are less educated. Education and age has been demonstrated to influence the perceived value of using a financial intermediary (Jinkook and Jinsook, 2005). The majority of respondents who seek advice from a RFA cite retirement planning and investment services as the primary areas they receive advice on. This is troubling as RFAs are limited in the advice they can give, pertaining to financial products and services. If financial advisers are not upfront or fail to clearly communicate the scope of services to clients, which includes the products they are qualified to provide advice on, this issue will continue to hinder the growth of professional financial advice in New Zealand.

It is clear that using a financial adviser in New Zealand is not only affected by cost (as past surveys have demonstrated) but also by the perceived value of advice; individual characteristics and preferences possibly serve as additional advice-seeking barriers. Aside from wealth, an individual's education, risk tolerance and perceived value of financial advice all play a significant role in seeking advice (Jinkook and Jinsook, 2005). Future research can examine to what extent these attributes impact contracting the services of a financial adviser in New Zealand.

It is relevant to cite the limitations of this study. First, the survey sample does not reflect the population at large and therefore limited in diversified socio-economic and other demographic characteristics. As the majority of respondents were located in Auckland and the Bay of Plenty, this positively skews income distribution. However, it is important to note that the majority (over 30%) of financial service providers are located within Auckland (MBIE, 2011). Second, our survey was web-based and distributed primarily via email, therefore limited to individuals with access to electronic devices.

The financial service provider regulator in New Zealand, the Financial Markets Authority (FMA), has conducted many surveys which have clearly demonstrated that many individuals in New Zealand are unaware of the services a financial adviser can offer (FMA, 2015). This demonstrates a significant barrier to expanding the use of financial advisers in the country. A public awareness-raising campaign funded in part by the FMA, financial adviser industry groups in New Zealand,

and other professional stakeholders is warranted to promote awareness of (or distinction among) the different types of financial advisers, in addition to the differentiation in services. This type of campaign in the U.S. has been used to promote awareness of CERTIFIED FINANCIAL PLANNER™ professionals. At present, there is discussion around doing away with the adviser labels and placing advisers into two categories.

Promoting higher, and more uniform, financial adviser education standards is necessary for professional growth and better public perception of financial advice. As mentioned earlier in this paper, adviser credentials can serve as a proxy for trust and advice quality among consumers. Moving toward a uniform and higher set of education standards for all advisers, similar to Australia's degree qualification requirements for financial planners may increase transparency and trust, and in turn, increase the uptake of quality financial advice services. As new and younger entrants come into the adviser space, this seems like a positive next step. Transparency is key when it comes to the uptake and delivery of intangible services.

As prior research has shown, seeking financial advice depends on a number of characteristics related to human capital. With increased regulatory costs driving many financial advisers out of practice in New Zealand, the government may need to investigate the provision of a financial advice subsidy for individuals with monies in KiwiSaver nearing retirement. Given the limited distribution options associated with KiwiSaver at present, this is a major policy issue in New Zealand. Building consumer awareness of the role of financial advice and increasing the access to quality financial advice in New Zealand is a necessary ongoing discussion.

Notes

Surveys conducted by the Financial Markets Authority can be accessed at: http://fma.govt.nz/search-results/?Search=surveys.

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Appendix one

Survey Questions

Q1 Do you currently (or in the past) use the services of a financial professional? (This includes a financial adviser, mortgage broker, share broker, insurance agent/broker, banker, and/or accountant)

- ○ Yes (1)
- ○ No (2)

Q2 How long have you been with/were you with this financial professional?

- ○ <1 year (1)
- ○ 1 to 5 years (2)
- ○ 6 to 10 years (3)
- ○ >10 years (4)

Q3 What services do you/did you expect your financial professional to provide? Select all that apply.

- ☐ Cash management (1)
- ☐ Personal risk management (e.g. life insurance, income protection, disability insurance, etc.) (2)
- ☐ Property risk management (e.g. home insurance, car insurance, business insurance, etc.) (3)
- ☐ Retirement planning (4)
- ☐ Investment planning (5)
- ☐ Other, specify (6) _____

Q4 How did you find your financial professional?

- ○ Internet (1)
- ○ Family member or friend (2)
- ○ Co-worker (3)
- ○ Other, specify (4) _____

Q5 How would you rate your overall satisfaction with this financial professional?

- ○ Completely satisfied (1)
- ○ Somewhat satisfied (2)
- ○ Neither satisfied nor dissatisfied (3)
- ○ Somewhat dissatisfied (4)
- ○ Completely dissatisfied (5)

Q6 Why did you use choose this financial professional? Select all that apply.

☐ Lack of personal knowledge about financial matters (1)

☐ Lack of time to devote to financial planning (2)

☐ For security, peace of mind (3)

☐ Recommendation from a family or friend (4)

☐ Other, specify (5) _____

Q7 Rank the most important attributes in you choosing a financial adviser among other financial professionals:

_____ Convenience of adviser's location (office) (1)

_____ Competency (2)

_____ Education background (3)

_____ Cost of services (4)

_____ Reputation (5)

_____ Trust (6)

Q8 I prefer my financial adviser to be/have a(an):

○ Registered Financial Adviser (RFA) (1)

○ Authorised Financial Adviser (AFA) (2)

○ Qualified Financial Entity (QFE) (3)

○ Certified Financial Planner (CFP) (4)

○ Post-graduate degree or Diploma (5)

○ No preferences (6)

Q9 I prefer my financial adviser to be affiliated with a(an):

○ Bank (1)

○ Sharebroking firm (2)

○ Independent firm (3)

○ Insurance firm (4)

○ Accounting firm (5)

○ Other, specify (6) _____

○ No preferences (7)

Q10 If there was a choice in compensation, you would prefer your financial adviser to be compensated via:

- ○ Fee only, paid by you as the client (1)
- ○ Commission only, paid by the product provider (2)
- ○ Combination of fee and commission (3)
- ○ Other (4)
- ○ No preferences (5)
- ○ I don't know (6)

Q11 What type of financial professional do you/did you use? Select all that apply.

- ☐ Banker (1)
- ☐ Accountant (2)
- ☐ Sharebroker (3)
- ☐ Mortgage broker (4)
- ☐ Insurance agent/broker (5)
- ☐ Financial adviser (6)
- ☐ Other, specify (7) _____
- ☐ I don't know (8)

Q12 What type of financial adviser do/did you have?

- ○ Registered Financial Adviser (RFA) (1)
- ○ Qualified Financial Entity (QFE) adviser (2)
- ○ Authorised Financial Adviser (AFA) (3)
- ○ Certified Financial Planner (CFP) (4)
- ○ AFA & CFP (5)
- ○ Other, specify (6) _____
- ○ I don't know (7)

Q13 How is/was the financial adviser compensated?

- ○ Fee only, paid by you as the client (1)
- ○ Commission only, paid by the product provider (2)
- ○ Combination of fee and commission (3)
- ○ Other, specify (4) _____
- ○ I don't know (5)

Q14 What area(s) does/did your financial adviser provide services in? Select all that apply.

- ☐ Cash management (1)
- ☐ Personal risk management (e.g. life insurance, income protection, disability insurance, etc.) (2)
- ☐ Property risk management (e.g. home insurance, car insurance, business insurance, etc.) (3)
- ☐ Retirement planning (4)
- ☐ Investment planning (5)
- ☐ Other, specify (6) _____
- ☐ I don't know (7)

Q15 The 2008 Financial Advisers Act is the main legislation in New Zealand under which financial advisers are regulated. Rate your level of awareness/knowledge about this legislation. ('1' represents a lack of awareness/knowledge, '2' - little awareness/knowledge, '3' some awareness/knowledge and '4' represents a high level of awareness/knowledge.)

- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)

Q16 You selected that you are somewhat or highly aware/knowledgeable about the 2008 Financial Advisers Act. Do you think the Act is working well?

- ○ Yes (1)
- ○ No (2)
- ○ Uncertain (3)
- ○ Other, specify (4) _____

Q17 Has your relationship with your financial professional changed as a result of the 2008 Financial Advisers Act?

- ○ Yes (1)
- ○ No (2)
- ○ Uncertain (3)
- ○ Other, specify (4) _____

Q18 Please indicate your gender:

- ○ Male (1)
- ○ Female (2)
- ○ Prefer not to answer (3)

Q19 What is your ethnicity? Select all that apply.

- ☐ NZ European (1)
- ☐ Maori (2)
- ☐ Asian (3)
- ☐ Pacific Islander (4)
- ☐ Other, specify (5) _____
- ☐ Prefer not to answer (6)

Q20 Which region are you located in?

- ○ Northland (1)
- ○ Auckland (2)
- ○ Waikato (3)
- ○ Bay of Plenty (4)
- ○ Taranaki (5)
- ○ Gisborne (6)
- ○ Hawke's Bay (7)
- ○ Manawatu-Wanganui (8)
- ○ Wellington (9)
- ○ Tasman (10)
- ○ Nelson (11)
- ○ Marlborough (12)
- ○ West Coast (13)
- ○ Canterbury (14)
- ○ Chatham Islands (15)
- ○ Otago (16)
- ○ Southland (17)
- ○ Outside of NZ, specify (18) _____

Q21 Which range below includes your age?

- ○ 18 – 19 (1)
- ○ 20 – 29 (2)
- ○ 30 – 39 (3)
- ○ 40 – 49 (4)
- ○ 50 – 59 (5)
- ○ 60 – 69 (6)
- ○ 70 or older (7)
- ○ Prefer not to answer (8)

Q22 What is your current marital status?

- ○ Single (1)
- ○ Married/civil union (2)
- ○ Separated (3)
- ○ Divorced (4)
- ○ Widowed (5)
- ○ Prefer not to answer (6)

Q23 What is the highest level of education you have obtained?

- ○ No qualification (1)
- ○ Secondary school (2)
- ○ Trade certificate/Vocational qualification (3)
- ○ Bachelor's degree (4)
- ○ Higher degree (5)
- ○ Other, specify (6) _____

Q24 What is your annual household income?

- ○ <$50,000 (1)
- ○ $50,001 – $80,000 (2)
- ○ $80,001 – 110,000 (3)
- ○ $110,001 – 140,000 (4)
- ○ >$140,000 (5)
- ○ Prefer not to answer (6)

EQUITY HOLDINGS OF AUSTRALIAN BABY BOOMERS-COMPARING LIFE CYCLE PHASES

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ABSTRACT

This study aims to quantify the role of equity holdings in the asset portfolios of baby boomers over the accumulation and consolidation life cycle phases, and characteristics of baby boomer households that hold equities. The results did not confirm the hypothesis that baby boomer households have increased direct equity ownership in the consolidation phase and it is likely that the global financial crisis (GFC) reduced baby boomer household investment in equities. It may be of comfort to policy makers that baby boomer households are not at peak levels of equity market volatility exposure in this important pre-retirement consolidation phase.

Introduction

As a disproportionally large subgroup of the population, funding the impending retirement of the baby boomer generation (born between 1946 and 1966) is a challenge to Governments worldwide. Consequently, an increased onus on being self-funded in retirement mean that unlike any generation before them, baby boomers need to have well-developed financial literacy skills, in addition to access to financial education and advice. While Australia introduced compulsory retirement savings in 1992 via the *Superannuation Guarantee Charge*, the baby boomer population generally lack sufficient Superannuation savings to fully fund retirement (median superannuation balance is $47,000), and the scheme has some limitations in its coverage (those on welfare payments like disability support are not covered) (Keane, 2015). Thus, many baby boomers will draw on other assets such as equities and property to help fund consumption.

This paper focuses on the role of direct equity investment in satisfying this need. As an asset class, equities can play an important role in facilitating several key savings functions: they aid in providing diversification benefits to household portfolios that are often heavily weighted to property ownership; they have a higher risk/return profile than other assets commonly held by households (i.e. cash, property); and, they are highly liquid which assists in satisfying savings motives including storing wealth for a home deposit, precautionary savings and bequests. It is essential for investors to be aware that equities are an asset class that experiences a relatively high degree of price volatility compared to other assets, and thus investors may experience relatively high returns over long time horizons but risk losing money in any given year. This risk is a significant exposure for the baby boomer cohort who require as much capital as possible upon retirement when working incomes are foregone.

Many Australian households invest in equities both directly and indirectly through their superannuation fund holdings, self-managed superannuation funds (SMSFs), and other investment vehicles. Direct equity ownership is well represented among Australian households. With privatisation of many government organisations in the 1980s, favourable taxation treatment of dividends, and continued growth in returns for the ten years prior to 2014, household participation in equities in Australia of 27 per cent is comparable to the UK (also 27%, see Banks and Tanner, 1996) but lower than the US (with 36% participation, see Bertaut and Starr-McCluer, 2000). However, falls in equity prices since the start of the global financial crisis (GFC) saw the market capitalisation of the Australian stock market decline by 14 per cent between mid-2007 and March 2010. During this period, households sold equities to increase their cash deposits in response to the uncertain environment (West, 2015). Consequently, the GFC shook the confidence and retirement plans of 'baby boomers' to the extent of 'many (older) workers deciding to delay retirement and save longer following losses in superannuation and direct equity investment' (Humpel, *et al.* 2010, p. 130).

Thus, there is much interest in quantifying how vulnerable households may be to equity market fluctuations, particularly the portion of the population that are in the pre-retirement, rapid wealth accumulation phase. After briefly exploring the underlying theories of the 'life cycle hypothesis' and 'portfolio theory', this paper surveys the literature to get a sense of how well households implement investment concepts when managing their asset portfolios. Given the empirical evidence on households generally, it is expected that the equity holdings of baby boomers in the consolidation phase will be higher than they were in the accumulation phase, both in dollar values and portfolio share.

Accordingly, the wealth module of the Household Income and Labour Dynamics in Australia (HILDA) survey is employed, and the 2002 cross-section is used to represent the accumulation phase (baby boomers aged 38 to 56) and the 2014 cross-section represents the consolidation phase (baby boomers aged 50 to 68). Difference in means, logit and tobit analysis methodologies assist with assessing the difference between the equity holdings of the baby boomer generation in the accumulation and consolidation phases. In addition, the characteristics that determine equity ownership are examined in both phases. This particular cohort is of interest given the impending retirement of this disproportionally large subgroup of the population, and potential exposure to financial risk.

The outcomes of this study aim to inform policy makers, financial advisers and financial educators as to the exposure of Australian households to direct equity investment and therefore equity market volatility. As a consequence of this vulnerability, households may not be well prepared for retirement and defer to Government safety nets. On the other hand, as highlighted by portfolio theory, households can benefit from the addition of equities in the form of increased diversification and potential higher returns that are needed to fund a long retirement.

Theory

There are two theories that form the basis from which to compare household financial decisions in practice. First, Harry Markowitz showed mathematically how to construct an optimal portfolio where risk could be minimised or return maximised by varying the proportions of wealth held between the assets in his seminal 'Portfolio Selection' manuscript (Markowitz, 1952). This significant contribution to finance showed that risk specific to the individual asset can be diversified away as the number of assets in the portfolio increases, as far as they are not perfectly positively correlated. The risk reduction benefit achieved from diversification is an investment concept that is relatively easy to grasp.

At the same time, there is quite an 'art' to portfolio construction. Professional investors, such as fund managers and financial advisers, will have access to information and technical skills in order to make informed decisions about the future and calculate the required inputs, and the risk-profile of the portfolio will be determined methodically, i.e. by the fund objectives, a diagnostic tool or interview with a client. While such tools are not fool-proof, they do take some of the subjectivity out of investment decisions. However, for personal investors, the ability to make informed decisions that require subjective judgement will depend on the investor's level of investment knowledge and general financial literacy skills.

Second, Franco Modigliani and Richard Brumberg are credited with extending a consumption-savings function that became known as the Life Cycle Hypothesis (LCH) (Modigliani and Brumberg, 1954). Modigliani and Brumberg's contribution was to include a finite life span with a 'pre-working', 'working' and a 'retired' phase to address the main shortcoming of an assumption of an infinite life in previous models. Essentially, the LCH model recognises that individuals needs change over the course of their finite life, and thus an order of asset acquisition can be proposed (Paas, Vermunt, and Bijmolt, 2007).

For example, during the period of family formation people will put most of their savings into assets that help facilitate work or are required for the establishment of a household. After the initial

purchase of durables, savings flow into other kinds of assets. The acquisition of a house, for which many lenders require a significant deposit, may increase demand for savings products such as term deposits or equities. As family lives and careers progress, households are burdened with mortgage payments and costs of raising children. This is known as the accumulation phase.

In their late forties and fifties, when they are at their peak earnings capacity with grown children, they may accumulate savings rapidly and are motivated to save for retirement and bequest purposes, known as the consolidation phase. Equities may play a significant role in household portfolios in this life cycle phase. Finally, the retirement phase consists of spending down accumulated savings to fund consumption. Assets that are liquid and provide a steady income stream while maintaining capital investment are high in demand during this phase. While this pattern of asset acquisition may generally apply to households, there are reasons for variation. Demand for assets may vary due to reasons which include dual purpose assets (such as housing), access to credit, social pressures, macroeconomic conditions and personal attributes (such as risk aversion or myopia).

In summary, it is evident from these two perspectives on asset allocation that households face constraints and challenges to consistently construct an optimal portfolio that meet their risk and return objectives throughout all life cycle phases. Given these constraints, this study purports to understand the extent to which households attempt to invest 'well' and focus on the role of direct equities as a versatile asset that can be liquidated to fund a home deposit, diversify a portfolio, provide higher returns than other asset classes (subject to a higher risk tolerance) in order to meet savings motives, particularly that of retirement.

Literature Review

The extensive literature on household portfolios shows consistency across a number of jurisdictions on asset ownership, with much research concentrated in the United States (US). First, households are found to hold very simple asset portfolios that meet their needs (Bertaut and Starr-McCluer, 2000; McCarthy, 2004; Bucks, Kennickell and Moore, 2006). Second, direct equity investment is confined to those households that have higher levels of wealth, income, education, financial literacy, are older, and have a positive attitude to financial risk-taking. Where studies have investigated equity holdings with more detailed data, studies show that diversification within equity portfolios is very low (Goetzman and Kumar, 2008), households own few individual stocks (Kelly, 1995; Polkovnichenko, 2005), and there is evidence of local bias (Kelly, 1995; Huberman, 2001; Benartzi and Thaler, 2001).

Third, as the LCH model predicts, age is a significant determinant of asset ownership. In the early career building life cycle phase, households tend to overinvest in housing, and dependent children inhibit wealth accumulation and diversification (Bruekner, 1997; Flavin and Yamashita, 2002; Cocco, 2005; Pelizzon and Weber, 2008). As households progress to the consolidation and retirement phases, the portfolio share of equities rises, driven by the need to fund consumption in retirement and for bequest purposes (Cocco, 2005; Yao and Zhang, 2005; Kim, *et al.* 2012). However, equity holdings may be impacted by ageing and health issues, as these households divest of equities to fund retirement and medical expenses (Yao, Hanna and Lindamood, 2004; Edwards, 2010).

Fourth, macroeconomic conditions and events, such as the Great Depression, World Wars, the GFC, or even periods of high economic growth may impact asset holdings (Jianakoplos and Bernasek, 2006;

Fukuda, 2009; Malmendier and Nagel, 2011). For example, many people who experienced the Great Depression are reluctant to invest in equities (Malmendier and Nagel, 2011).

Fifth, attitudes to financial risk-taking are a characteristic that can greatly influence asset holdings, particularly higher risk assets like equities. Research shows that risk attitudes are not stable over time and people become more risk averse as they age, that is, that people may change how they respond to questions in between survey periods (Halek and Eisenhauer, 2001; Olivares, Diaz and Besser, 2008; Yao and Curl, 2011; Bucciol and Miniaci, 2011). Evidence for changing risk preferences over time is found in Australia (West and Worthington, 2013a, 2013b). Studies also show that financial risk tolerance tends to increase when equity returns increase and decrease when stock returns decrease (Bilias, Georgarakos and Haliassos, 2010; Yao and Curl, 2011; Malmendier and Nagel, 2011).

Sixth, studies consistently find females are significantly more risk averse than their male counterparts and thus have low participation rates in direct equity investment (Olivares, Diaz and Besser, 2008; Yilmazer and Lyons, 2010), another contention supported by Australian data (West and Worthington, 2013a). Thus, females bypass opportunities to earn higher returns on higher risk assets like equities, which particularly compounds a wealth accumulation disadvantage that women experience in taking time out of the workforce to care for children and part-time work (Parr, Ferris and Mahuteau, 2007; Jefferson and Ong, 2010; Austen, Jefferson and Ong, 2010).

Finally, it is not surprising that many of the characteristics discussed thus far feed into levels of financial literacy. Individuals who demonstrate higher levels of financial literacy tend to have higher levels of portfolio diversification and thus invest in equities (Guiso and Jappelli, 2008; Abreu and Mendes, 2010). Those with low financial literacy levels are more likely to avoid equity investments (Van Rooij, Lusardi and Alessie, 2011) which is evidenced by research in Australia (Worthington, 2005, 2006, 2009; ASIC, 2011). Much of the financial literacy literature identifies people who are young (aged under 24), elderly (aged over 70), women, those on low incomes, people with low levels of education, and people from non-English speaking backgrounds or of Aboriginal or Torres Strait Islander descent as being characteristics associated with low levels of financial literacy (Dvorak and Hanley, 2010; Hung, Yoong and Brown, 2012). Low levels of financial literacy and consequential financial decisions mean that returns earned fall short of the theoretical returns that could be earned by well-informed, disciplined investors (Burtless, 2010).

From this general examination of household portfolio composition it is evident that households have difficulty implementing a diversification strategy, and although they generally affirm the LCH, there are many factors that complicate their financial decisions. While there is extensive literature on household characteristics and asset investment, there is a distinct lack of literature that compares the investment patterns of the same households during the accumulation phase or consolidation phase, thus this paper is a novel contribution to the literature. This study also investigates household characteristics that are significant determinants of holding direct equities and having a higher portfolio share of equities for the baby boomer cohort in both the accumulation and consolidation phases, as determinants may change over time.

The consequence of uneducated financial decisions may have wider reach than impacting the household alone. In a report on national financial education strategies, the OECD's International

Network on Financial Education noted that households were partially responsible for widening the GFC because of their lack of understanding financial issues, as they 'accepted (sometimes unknowingly) to support more financial risk than what they could afford' (2009, p. 4). The OECD notes that the lack of awareness of households of the risks they face is a major problem, given the increased sophistication of financial products and the transfer of risk to households that are taking on more financial risk and responsibility for credit and retirement decisions. Households do not seek protection from risks either because they do not understand the need to be protected, or they overestimate their protection and their understanding of the risks they face (Laboul, 2011).

Data and Methodology

The purpose of this study is to understand the direct equity investment patterns of the baby boomer cohort during the accumulation phase and the consolidation phase. Quantifying the equity investment of baby boomers in the consolidation phase is of particular interest to assess their exposure to volatility and potential capital loss in this very important pre-retirement life cycle phase. Accordingly, this study employs data from the Australian HILDA survey, which is an annual survey of households on various topics including income, labour market and family dynamics, with additional modules added in various years. The survey aims to follow the 6,542 households and 13,969 individuals interviewed in wave 1 in 2001. As this study aims to compare the equity ownership of the accumulation phase with the consolidation phase of the baby boomers, the 2002 cross section will be used to proxy for the baby boomer cohort in the accumulation phase, as baby boomers are aged 38 to 56 (i.e. born between 1946 and 1966) and the 2014 sample will be used to proxy the consolidation phase, as baby boomers are aged 50 to 68 in 2014. The baby boomer cohort consists of 4,725 people in the 2002 cross-section of the HILDA survey and 4,914 people in the 2014 cross-section.

The wealth module is implemented every four years, and questions relate to the householder's assessment of their investment in assets such as bank accounts, cash investments, equities, superannuation, cash-in values of life insurance policies, trust funds, the family home and other property, business assets, vehicles and collectibles. The level of equity investment is used for direct investment in equities, but unfortunately, the HILDA survey does not collect detailed information on equity ownership other than an overall estimate of value. As this study is aiming to get an understanding of exposure to equity market risk in general terms, this level of data suffices and detailed analysis is left to future research.

The two dependent variables are defined as follows. The first dependent variable is a dummy variable for direct equity ownership (EQT_{owner}), where positive values (>$0) are identified as 1 and non-holders (≤$0) are 0. The second is the portfolio share of equities ($EQT_{portfolioshare}$), which is the dollar investment in direct equities as a proportion of the total assets. Table 1 shows the descriptive statistics for the two dependent variables and the asset classes for both the sample population and the baby boomer population, for 2002 and 2014. As can be seen in Table 1, the baby boomer population had a slightly higher participation rate for equity ownership than the sample population (48.4% vs 43.7%) for 2002 and for 2014 (39.5% vs 31.8%). Indeed, comparison of the two samples show that baby boomers have higher participation rates in most of the asset classes. By inspection alone, it is significant to note that the participation of baby boomers in direct equities

reduced by approximately nine per cent from 2002 to 2014 (0.484 to 0.395). This reduction was mostly offset by increases in participation in Other Property (0.233 to 0.304).

Regarding portfolio share, Table 1 shows that there are several assets that dominate the portfolio for the samples, such as the Family Home (32% to 44%), Superannuation (20% to 26%) and Vehicles (7% to 12%). For the sample population *compared to* (baby boomers), direct investment in equities comprised 3.9 (3.2) per cent of the total asset portfolio in 2002 and 2.3 (2.4) per cent in 2014. In 2014, the baby boomers reduced the portfolio share of equities by 0.8 per cent (0.032 to 0.024). This reduction could be due to either or both a reduction in the dollar value of equities and a rise in property prices (considering portfolios are heavily weighted towards property).

Table 1: Dependent Variable Descriptive Statistics

Parameter	Description	Sample Population				Baby Boomer Population			
		2002		2014		2002		2014	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Generation category	Generation Y	0.030	0.171	0.252	0.434				
	Generation X	0.321	0.467	0.307	0.461				
	Baby Boomer generation	0.399	0.490	0.310	0.462				
	Silent generation	0.207	0.406	0.126	0.332				
	Greatest generation	0.041	0.199	0.006	0.077				
Asset Class Ownership	Bank accounts	0.980	0.140	0.983	0.131	0.980	0.139	0.986	0.119
	Cash investments	0.032	0.176	0.012	0.110	0.024	0.154	0.012	0.107
	Equities (EQT_{owner})	0.437	0.496	0.318	0.466	0.484	0.500	0.395	0.489
	Superannuation	0.808	0.394	0.871	0.336	0.931	0.281	0.890	0.313

Table 1: Dependent Variable Descriptive Statistics (continued)

Parameter	Description	Sample Population				Baby Boomer Population			
		2002		2014		2002		2014	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Asset Class Ownership	Insurance	0.124	0.329	0.067	0.250	0.150	0.357	0.079	0.270
	Trusts	0.041	0.199	0.044	0.205	0.046	0.210	0.048	0.214
	Family home	0.721	0.448	0.663	0.473	0.785	0.411	0.797	0.403
	Other property	0.186	0.390	0.229	0.420	0.233	0.423	0.304	0.460
	Businesses	0.148	0.356	0.114	0.318	0.193	0.395	0.129	0.336
	Vehicles	0.912	0.284	0.930	0.255	0.941	0.235	0.959	0.198
	Collectibles	0.146	0.353	0.140	0.347	0.154	0.361	0.155	0.362
Asset Class Portfolio Share	Bank accounts	0.095	0.193	0.095	0.184	0.064	0.148	0.074	0.151
	Cash investments	0.003	0.027	0.001	0.019	0.002	0.019	0.001	0.011
	Equities ($EQT_{portfolioshare}$)	0.039	0.104	0.023	0.080	0.032	0.084	0.024	0.074
	Superannuation	0.203	0.230	0.262	0.257	0.223	0.225	0.264	0.237
	Insurance	0.009	0.052	0.012	0.074	0.010	0.052	0.009	0.056
	Trusts	0.005	0.044	0.007	0.054	0.004	0.041	0.005	0.043
	Family home	0.422	0.332	0.389	0.334	0.441	0.309	0.424	0.295
	Other property	0.060	0.156	0.084	0.183	0.073	0.165	0.099	0.183
	Businesses	0.035	0.126	0.019	0.086	0.044	0.136	0.019	0.082
	Vehicles	0.118	0.198	0.101	0.182	0.099	0.175	0.074	0.162
	Collectibles	0.011	0.061	0.008	0.053	0.009	0.051	0.006	0.041

As outlined in the literature review, factors that other studies highlight as significant determinants of asset selection include levels of wealth, income, education, age, gender, health, and household structure, as well as financial literacy and financial risk-taking factors. The descriptive statistics, expected signs and names for these variables are provided in Tables 2 and 3 for 2002 and 2014. Unfortunately, the HILDA survey does not ask questions that can test respondent's knowledge of financial concepts directly. Financial literacy literature indicates that goal setting and planning is

an important characteristic of a financially literate person (Dvorak and Hanley, 2010). Hence, the questions regarding 'Savings Habits' (asks respondents to indicate how regularly they save) and 'Investment Horizon' (asks respondents to indicate how far ahead they plan when investing) are employed as financial literacy proxies. Responses that are towards the 'Save regularly by putting money aside' and 'More than 10 years ahead' spectrum are considered to be financially literate, while the opposite end of the spectrum as shown in Table 3 is considered less financially literate.

The reference categories are designated with a hashtag (#) and are chosen based on being important for policy implications or that they comprise a relatively large proportion of the population. Results are interpreted with respect to the constant being equal to the mean of the reference category, and then the coefficients of each of the dummy variables in the regression is equal to the difference between the mean of the group coded 1 and the mean of the reference category. The p-value associated with that coefficient is the test of the category versus the reference category.

Table 2: Independent Dummy Variables, Descriptive Statistics, Baby Boomer Cohort

Parameter	Description	Variable sign	Expected sign	2002		2014	
				Mean	Standard Deviation	Mean	Standard Deviation
Gender	Female=1	FEM	–	0.524	0.499	0.529	0.499
	Male=1#	MAL	+	0.476	0.499	0.471	0.499
Household structure	Couples with children=1#	CWC	+	0.577	0.494	0.321	0.467
	Lone parents=1	LPC	–	0.097	0.296	0.079	0.269
	Lone person=1	LNP	–	0.117	0.321	0.164	0.370
	Couple=1	CPL	+	0.192	0.394	0.415	0.493
	Multi-family/ Other=1	MFO	–	0.017	0.130	0.022	0.146
Education category	Bachelor's degree and above=1	DEG	+	0.235	0.424	0.263	0.440
	Vocational qualification=1	VOC	–	0.300	0.458	0.358	0.479
	Year 12#=1	Y12	–	0.113	0.316	0.091	0.287
	Year 11=1	Y11	–	0.353	0.478	0.288	0.453

Table 2: Independent Dummy Variables, Descriptive Statistics, Baby Boomer Cohort (continued)

Parameter	Description	Variable sign	Expected sign	2002		2014	
				Mean	Standard Deviation	Mean	Standard Deviation
Health	Excellent health=1	EHT	+	0.098	0.298	0.063	0.243
	Very good health=1	VHT	+	0.343	0.475	0.300	0.458
	Good health#=1	GHT	–	0.334	0.472	0.357	0.479
	Fair health=1	FHT	–	0.116	0.320	0.162	0.368
	Poor health=1	PHT	–	0.027	0.162	0.042	0.200
Household income	<$20,000=1	INC1	–	0.042	0.201	0.037	0.188
	$20,000 to $49,999=1	INC2	–	0.152	0.359	0.183	0.386
	$50,000 to $99,999#=1	INC3	+	0.348	0.477	0.268	0.443
	>$100,000=1	INC4	+	0.458	0.498	0.513	0.500
Net wealth	Under $499,999=1	NW1	–	0.649	0.477	0.335	0.472
	$500,000-$999,999#=1	NW2	+	0.217	0.412	0.263	0.440
	$1,000,000-$1,499,999=1	NW3	+	0.061	0.239	0.152	0.359
	Above $1,500,000=1	NW4	+	0.047	0.211	0.231	0.422

 # denotes the reference category.

Table 3: Independent Financial Literacy Variables, Descriptive Statistics, Baby Boomer Cohort

Parameter	Description	Variable sign	Expected sign	2002	
				Mean	Standard Deviation
Financial risk prepared to take	Takes substantial financial risks expecting substantial financial returns	FIR	+	0.014	0.012
	Takes above average financial risks expecting above average financial returns		+	0.079	0.058
	Takes average financial risks expecting average financial returns		–	0.376	0.409
	Not willing to take financial risks		–	0.332	0.384
	Never has any spare cash		–	0.199	0.138
Savings habits	Don't save: Usually spend more than income	FIS	–	0.061	0.052
	Don't save: Usually spend about as much as income		–	0.261	0.172
	Save whatever is left over–no regular savings plan		–	0.389	0.432
	Spend regular income, save other income		–	0.069	0.077
	Save regularly by putting money aside		+	0.219	0.268
Investment horizon	The next week	FIH	–	0.195	0.194
	The next few months		–	0.230	0.246
	The next year		–	0.169	0.175
	The next 2 to 4 years		+	0.128	0.129
	The next 5 to 10 years		+	0.177	0.170
	More than 10 years ahead		+	0.101	0.086

Variance inflation factors (VIFs) were used to test for multicollinearity between some groups of the independent variables. Where the variable has been transformed into a dummy variable, the original variable has been used. For tests of age, education, income and net assets, VIFs were 1.088 for age, 1.048 for education, 1.307 for income and 1.231 for net assets. Tests of gender, household structure, health and income yielded VIFs of 1.001 for gender, 1.048 for household structure, 1.034 for health and 1.082 for income. The financial literacy and financial risk variables resulted in VIFs of 1.153 for saving habits, 1.188 for investment horizon, and 1.179 for financial

risk-taking. As a rule of thumb, VIFs greater than ten warrant further examination, but there is no issue here as the VIFs are universally very small (less than 1.4) (O'Brien, 2007).

The analysis consists of two parts. To compare the accumulation and consolidation phases, a difference in means test will be used to examine significant differences in means between equity ownership and the portfolio share of equities in 2002 and 2014. Then, a regression of the household factors on equity ownership and the portfolio share of equities is applied to 2002 and 2014 data sets. The two models are defined as follows.

Given that this dependent variable is specified as a binary response (0, 1), a logit model is appropriate and it models the probability of a positive outcome (1) given a set of regressors by maximum likelihood. The log likelihood function for logit is:

$$lnL = \sum_{j \in S} w_j lnF(x_j b) + \sum_{j \in S} w_j ln\,\{1 - F(x_j b)\} \qquad (1)$$

where S is the set of all observations j, such that $y_j \neq 0$, $F(z) = e^z/(1+e^z)$, and w_j denotes the optional weights. lnL is maximised where 0 corresponds to the 'constant only' model and 1 corresponds to perfect prediction for a discrete model (in which case the overall log likelihood is 0).

As $EQT_{portfolioshare}$ is naturally censored between 0 and 1, a tobit model is appropriate. The expected value of y is given as:

$$E(y_i | x_i, y_i > L) = x_i'\beta + \sigma \frac{\varnothing\{x_i'\beta - L/\sigma\}}{\Phi\{(L - x_i'\beta/\sigma)\}} \qquad (2)$$

where $\varnothing$ is the standard normal density and Φ is the standard normal cumulative distribution function, y_i is the observed variable, x_i denotes the vector of exogenous and fully observed regressors, β is the coefficient, σ is the standard deviation. As two-tailed censoring applies, estimates are observed in the interval [L, U], where L (lower limit or zero) and U (upper limit or 1) are the known censoring points.

Results

Participation in direct equities in accumulation and consolidation phases

The first analysis tests the hypothesis that there is a difference in the average participation in direct equities and the portfolio share of direct equities due to life cycle stage, i.e. that during the consolidation phase, baby boomer households increase their investment in direct equities to diversify and increase potential returns when compared to the accumulation phase. Multivariate means tests conclude that the means are likely different between 2002 and 2014 by rejecting the null hypothesis that the means are equal at the one per cent level. This result confirms that ownership levels have significantly changed over the 2002 and 2014 period, but it does not confirm the direction of the change. As mentioned previously, inspection of the descriptive variables show a nine per cent reduction in ownership in 2014, not an increase in ownership as expected.

Table 1 provides an indication that the baby boomer cohort increased their share of 'Superannuation'and 'Other Property' assets in 2014 as compared to 2002, by inspection of the mean values.

This finding has both positive and negative implications. The positive aspect is that baby boomers approaching retirement have not increased their exposure to equity market fluctuations, in fact they have reduced their exposure in the consolidation phase. However, it also indicates that those baby boomers who are not participating in equities are disregarding the benefits of equity investment, such as diversification and much needed higher returns to sustain a long period of retirement consumption.

Household Characteristics Relating to Likelihood of Direct Equity Ownership

Table 4 provides the estimated coefficients, standard errors and p-values of the parameters for the 2002 and 2014 logit regressions for the baby boomer cohort. The 2002 and 2014 logit models support the literature, in that households with lower levels of income (*INC1* and *INC2*), net wealth (*NW1*), being in poor health (*PHT*) and being a lone parent (*LPC*) significantly decrease the likelihood of direct equity ownership. In particular, *NW1* and *INC1* had very high coefficients for both models (*NW1*: -0.808 in 2002 and -0.963 in 2014; *INC1*: -0.845 in 2002 and -0.403 in 2014). This is not surprising as households with low levels of financial resources, which because of their low level of income or high levels of expenditure to income have little discretionary income available to contribute to savings. In addition, identifying as having poor health increases future income uncertainty and correspondingly household's lower investment in risky assets such as equities (Yao, Hanna and Lindamood, 2004).

Significant positive variables for both 2002 and 2014 logit regressions include the higher levels of net wealth (*NW3* and *NW4*), savings habits (*FIS*), savings horizon (*FIH*) and financial risk-taking (*FIR*). The highest level of net wealth (*NW4*) had particularly high coefficients (0.678 in 2002 and 0.986 in 2014), with the change showing that being in the highest wealth category increased the magnitude of likely ownership in 2014 since 2002. These results confirm key factors identified by the literature. First, households with higher levels of net wealth are more likely to have more diversified portfolios, thus increasing the likelihood of including equities in the portfolio. Second, higher levels of wealth also provide opportunity to acquire and practice financial literacy skills, or seek advice, thus enabling these households to develop good savings habits, have long savings horizons and be more willing to take financial risks. Thus, these households are more likely to understand risk, return and compounding concepts and want to avail of the risk/return profile of equities and to diversify their portfolio.

There are differences between the results reported in 2002 and 2014 in Table 4. First, there are a smaller number of significant coefficients. The lone parent with children household structure (*LPC*) is the only household structure variable that is significant in 2014. In 2002, both the lone person (*LNP*) and multi-family/other (*MFO*) households were significant negative coefficients, while being in a couple (*CPL*) household was significantly positive. The highest level of income variable (*INC4*) is also not significant in 2014, and the lower levels of income variables have lost their highly significant status (but are still significant at the 5% and 10% level). Surprisingly, being female (*FEM*)

in 2002 was a significant positive determinant of equity holdings, but was not significant in 2014.

Thus for the baby boomer cohort, variances in household structure, income level and gender impacted equity ownership significantly more in 2002 than in 2014. These results may be indicative of a number of changes the baby boomers have experienced as they transitioned from the accumulation phase to the consolidation phase. Namely, that as the cohort aged, financial decisions are determined more by wealth than by income, as households have now reached peak earnings and may be funnelling more into their wealth accumulation strategy. Also, household structures in the consolidation phase may not be as important as in the accumulation phase because some household expenses (mortgages and children's education) have been paid down (with the exception of lone parents that still have children in their care).

In addition, macroeconomic conditions in 2014 in Australia were substantially different to that of 2002, with the GFC in 2007-08 having a detrimental impact on economic growth (1% per annum of gross domestic product (GDP) in 2002 and 0.3% in 2014) (ABS, 2017). This experience may be the reason that the female coefficient was no longer significant in 2014, as females are well substantiated in the literature for being risk averse. Furthermore, the GFC may have exacerbated the wealth divide, and thus the wealthier portion of the population were able to continue holding equities while those in lower wealth categories liquidated their holdings.

The statistical significance of the financial literacy variables in equity ownership point to another issue regarding macroeconomic conditions noted in the literature- that low levels of financial literacy cause people to overweight their decisions based on recent events such as equity bull and bear markets (Yao, Hanna and Lindamood, 2004). To some degree, it may be a comfort that those who invest in equities have a higher degree of financial literacy, as these investors have increased awareness of financial risks and may be more able to withstand market fluctuations. From a public policy and financial education perspective though, there is more to do to increase financial literacy levels to attain better wealth outcomes for more of the population.

Table 4: Logit Regression Results for EQT_{owner}, Baby Boomer Cohort

Variable	2002			2014		
	Coefficient	Robust standard error	p-values	Coefficient	Robust standard error	p-values
FEM	0.127	0.070	0.069	0.074	0.068	0.278
LPC	-0.302	0.122	0.013	-0.309	0.153	0.043
LNP	-0.304	0.120	0.011	0.014	0.116	0.906
CPL	0.250	0.088	0.004	-0.006	0.079	0.940
MFO	-0.759	0.287	0.008	-0.167	0.243	0.493
DEG	0.108	0.122	0.373	-0.113	0.128	0.379

Table 4: Logit Regression Results for EQT_{owner}, Baby Boomer Cohort (continued)

Variable	2002			2014		
	Coefficient	Robust standard error	p-values	Coefficient	Robust standard error	p-values
VOC	0.030	0.118	0.801	0.019	0.124	0.880
Y11	-0.145	0.115	0.206	-0.103	0.129	0.424
EHT	0.090	0.116	0.437	0.030	0.130	0.815
VHT	0.065	0.076	0.395	-0.013	0.077	0.869
FHT	-0.081	0.111	0.470	-0.011	0.100	0.912
PHT	-0.390	0.235	0.096	-0.336	0.197	0.089
INC1	-0.845	0.219	0.000	-0.403	0.219	0.066
INC2	-0.376	0.107	0.000	-0.261	0.108	0.016
INC4	0.241	0.077	0.002	0.063	0.084	0.452
NW1	-0.808	0.079	0.000	-0.963	0.092	0.000
NW3	0.744	0.180	0.000	0.454	0.096	0.000
NW4	0.678	0.207	0.001	0.986	0.092	0.000
FIS	0.057	0.030	0.058	0.123	0.030	0.000
FIH	0.091	0.023	0.000	0.041	0.023	0.079
FIR	-0.494	0.043	0.000	-0.391	0.047	0.000
Constant	1.703	0.251	0.000	0.462	0.258	0.073
Number of observations	4725			4914		
Wald Chi2	846.910	0.000		837.430	0.000	
Log Psedolikelihood	-2714.409			-2781.297		
Pseudo R2	0.171			0.162		

Household characteristics relating to higher (or lower) direct equity portfolio share

Table 5 reports the tobit regression results for 2002 and 2014 for the portfolio share of equity ownership. The coefficients in these regressions are small because as described in Table 2, the portfolio share of equities accounts for between two and 10 per cent of household portfolios. For

both of the 2002 and 2014 models, there are many more significant positive coefficients than negative coefficients. Being in a couple household (*CPL*), having higher levels of net wealth (*NW3* and *NW4*) and the financial literacy and financial risk variables (*FIS*, *FIH*, *FIR*) positively increased the likelihood of an increasing portfolio share of equities. Being in the lowest net wealth category (*NW1*) was a significant negative coefficient for both 2002 and 2014, due to the limited opportunity to save after paying living expenses. As aforementioned, it is not surprising that higher levels of net wealth, financial literacy and financial risk taking are good indicators of equity investment in a household's asset portfolio.

The results for 2014 differ slightly to that of 2002. First, a multi-family/other household structure (*MFO*) and a low educational attainment (*Y11*) are negatively significant in 2002 but not significant in 2014. These factors most likely feed in to a low socio-economic profile of the household, as lower levels of education and being in share accommodation are indicative or lead to lower incomes and net wealth. In 2014, the second income category, *INC2*, is negatively significant at the five per cent level, and is the only income variable to be significant in both 2002 and 2014. It is somewhat surprising that income levels have not factored more significantly in determining the portfolio share of equities, but wealth is a very important determinant. Besides the minor variations in significant variables between 2002 and 2014, this analysis continues to show that no matter the life cycle phase, having higher levels of wealth, financial literacy and financial risk-taking are an extremely important determinant of equity holdings.

Table 5: Tobit Regression Results for $EQT_{portfolioshare}$, Baby Boomer Cohort

Variable	2002			2014		
	Coefficient	Robust standard error	p-values	Coefficient	Robust standard error	p-values
FEM	0.007	0.004	0.116	0.002	0.005	0.673
LPC	0.008	0.009	0.384	0.013	0.013	0.315
LNP	0.006	0.009	0.530	0.019	0.008	0.023
CPL	0.025	0.005	0.000	0.010	0.005	0.050
MFO	-0.036	0.017	0.038	-0.007	0.016	0.642
DEG	0.000	0.008	0.961	0.001	0.008	0.899
VOC	0.002	0.007	0.825	0.003	0.008	0.746
Y11	-0.013	0.007	0.078	0.000	0.009	0.986
EHT	0.006	0.007	0.403	0.002	0.008	0.806
VHT	0.003	0.005	0.467	0.002	0.005	0.659

Table 5: Tobit Regression Results for $EQT_{portfolioshare}$, Baby Boomer Cohort (continued)

Variable	2002			2014		
	Coefficient	Robust standard error	p-values	Coefficient	Robust standard error	p-values
FHT	-0.001	0.008	0.901	0.009	0.007	0.200
PHT	0.010	0.020	0.622	0.009	0.017	0.601
INC1	-0.024	0.018	0.177	-0.017	0.019	0.366
INC2	-0.012	0.008	0.131	-0.019	0.008	0.014
INC4	0.006	0.005	0.209	-0.002	0.006	0.681
NW1	-0.042	0.005	0.000	-0.049	0.007	0.000
NW3	0.033	0.009	0.000	0.029	0.006	0.000
NW4	0.058	0.013	0.000	0.074	0.007	0.000
FIS	0.003	0.002	0.084	0.006	0.002	0.003
FIH	0.005	0.001	0.000	0.004	0.002	0.006
FIR	-0.033	0.003	0.000	-0.026	0.003	0.000
Constant	0.077	0.016	0.000	-0.014	0.017	0.428
Number of observations	4725			4914		
F statistic	21.450	0.000		19.170	0.000	
Log Psedolikelihood	370.416			-25.887		
Pseudo R2	7.112			0.941		

Practical Implications for Financial Advice

This study offers some insights that are of practical use for financial advisers. For the baby boomer cohort, direct equity investment is like a double-edged sword, on the one hand the volatility puts capital at risk of loss, while on the other hand the relatively higher returns are somewhat necessary to fund longer life expectancies. For those that give it consideration, the shortening investment time horizon and increasing aversion to risk that comes with ageing, in addition to experiencing stock market crashes during their lifetimes, makes direct equity investment a wary proposition the closer they get to retirement. This study shows that baby boomers in 2014 are less invested in equities than they were 12 years prior. Thus advisers must understand these concerns and give them due consideration when formulating advice. Client education and tailored communication will be key to providing an investment strategy that benefits the client's wealth outcome but that the client can also digest.

Furthermore, financial advisers will need to consider their approach when formulating advice to clients that are at the margin, that is, those that are hovering below being categorised as having higher levels of wealth, financial literacy and financial risk-taking, as these clients are less likely to be inclined to invest in equities as a general rule. Females are also an important segment of the clientele that need tailored advice and communication strategies. Regular risk-profiling and data collection may help an adviser identify clients that need financial literacy education intervention.

Conclusion

This study seeks to measure the extent to which Australian baby boomer households ascribe to financial theory by increasing direct equity investment in the consolidation life cycle phase and garner insight into vulnerability to equity market volatility as they approach retirement. The 2002 and 2014 cross sections of the HILDA survey were employed to compare equity ownership and equity portfolio share of the baby boomer population in the accumulation phase and the consolidation phase. A number of conclusions can be drawn from the findings. First, the average level of equity investment and portfolio share are significantly different in 2002 to 2014. However, the descriptive statistics show that the direction of the change is not as predicted as participation in equity investments was reduced in 2014. Furthermore, the logit and tobit models highlighted differences in the significance of characteristics between the two periods, such as variances in household structure, income level and gender. Thus it can be argued that transitioning to the consolidation phase induces a change in financial decision-making, but that in this study the impact of the GFC and ongoing changed macroeconomic circumstances could not be disentangled.

Second, an elevated level of wealth is highly significant for equity participation and portfolio share. The results of the 2014 model show an increase in magnitude of high wealth level, and it can be inferred that the GFC may have exacerbated the wealth divide, and thus the wealthier portion of the population were able to continue holding equities while those in lower wealth categories liquidated their holdings. Concomitantly, higher levels of financial literacy and willingness to take financial risks were consistent with equity investment, and in combination with exacerbating the wealth divide, the market volatility derived from the GFC may have led people with lower levels of financial literacy to divest of equity ownership while those with higher levels persisted.

Overall, the results did not confirm our hypothesis that baby boomer households have increased direct equity ownership in the consolidation phase. While an avenue for future research, it is likely that the GFC reduced household investment in equities, particularly those household members who may have lower levels of wealth, income, financial literacy and willingness to take financial risk. Accordingly, these households are missing out on important diversification benefits that equities can provide as well as potential for higher portfolio returns. However, it may be of comfort to policy makers that baby boomer households are not at peak levels of equity market volatility exposure in this important pre-retirement consolidation phase.

These results have important implications for public policy and financial educators and advisers. Clearly, higher levels of financial literacy have positive impacts on minimising the risk exposure of a household's asset portfolio by the inclusion of direct equity investment as an important component of a diversification strategy. More financial literacy education may improve financial decisions made by those at the lower levels of income and wealth. Future research may benefit from more detailed decomposition of equity ownership and controlling for the macroeconomic environment.

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