

# **Assessing the Risk and Return of Australian Superfunds across Investment Options**

## **Short Discussion Paper**

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## 1. Introduction and Rationale of Study

The growth of the Australian Superfund Industry has been remarkable over the years with the recent data from a study by Willis Towers<sup>1</sup> highlighting that Australia is ranked third with an average annualised market growth of pension funds between 2011 and 2016, a rise to 13.8 per cent in local currency terms, after Norway (17.5 per cent) and China (22.8 per cent). In terms of asset allocation, the simple average portfolio for the top 20 pension funds in global markets shows that 41.7 per cent of total assets were invested in equities, 37.2 per cent in fixed-income securities, and 21.1 per cent in alternatives and cash. The Australian Superfunds tend to be more active in the asset allocation decision and are well known to have very low investment portfolios around conservative assets. The OECD report in 2016<sup>2</sup> details the asset allocation of different countries where it is clear that Australian superfunds tend to hold equity above 50 percent which is higher than the United States. However, while these active investment options contributes to higher level of return, the Australian retirement system is faced with the several challenges, including, an ageing population, a low super co-contribution as well as market conditions being very volatile.

The life-cycle options highlights that on average should be de-risking their investments as they are getting closer to retirement. However, a related issue as investors get closer to retirement is the longevity risk. Given, life expectancy in Australia has risen to 80.1 for men and 84.3 for women (2013)<sup>3</sup>, investors are faced with the challenge of how to make the retirement nest eggs last longer. Hence, the asset allocation decision becomes a very important decision not just for the younger working investors but is equally an issue for those who are older and closer to retirement. It becomes important to assess what is the appropriate mix of asset allocation that will ultimately maximise the return that will eventually increase the retirement nest egg. It is essential to realise that most probably having a risky investment strategy may pay off and maximise the investment nest egg rather than faced with a the possibility of running out of money at a later stage of retirement and live another 10-15 years on the public pension system. Hence, the key objective of this study is to analyse the key risk and return characteristics of Australian superfunds across different investment options. While

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<sup>1</sup> <http://www.morningstar.com.au/funds/article/3-super-funds-top-local-performers-in-global-study/8853>

<sup>2</sup> See pension at a glance 2016: <http://www.oecd.org/pensions/Highlights-2016-Pensions-Outlook.pdf>

<sup>3</sup> ABS 3302.0 - Deaths, Australia, 2013 Quality Declaration, LATEST ISSUE Released at 11:30 AM (CANBERRA TIME) 06/11/2014

investment choices depends on the risk profile, our study will provide an assessment of the risk and return trade off of different time varying investment options.

Our study is important given that we have still have a large number of individual fund members who fall in the default category in the investment options. Gerrans et al. (2010) highlights that the total assets in the default option of funds across the superannuation industry vary from 40 percent for retail funds to 70 percent for industry funds. The objective of maximising the retirement nest egg can be achieved only if investors chose the right investment option that adequately provides them with a reasonable return for the level of risk they are willing to take. At the same time, given the shift from defined benefit plans to defined contribution plans, individual fund members are very careful in choosing the investment strategy applied to their funds see for example Clare and Connor (1999) and we have also an increase in the investment choices available, Gerrans et al. (2006)). Given these current challenges in the market, an investor needs to achieve a higher return and hence in order to do so, there is the need to take more risk. While the investment choice should reflect an investor's risk profile, trying to avoid risk altogether may lead to a very low retirement income balance that is the risk of not having enough money to maintain the desired lifestyle. Investors should make the investment choice after taking into account various risk categories. Risk varies across investment options, for instance, shares, property and fixed interest securities might offer higher long-term returns than cash, but they also expose you to higher levels of risk, particularly in the short term. Risk is defined as the variability in returns that is it is indirectly the price an investor pay for returns. The modern portfolio theory highlights that the more risk an investor take, the higher the expected return.

There is a wide literature in the risk-return trade-off with mixed views as to what will be the best investment options as investors are at different stages of life. Davis (2001) outlines that the investment funds should be looking at the most efficient portfolio that is by considering the Markowitz's modern portfolio theory. He argues that once the efficient frontier is set, then the fund should identify the level of risk that it is willing to take to achieve the desired rate of return. There are numerous papers which examine the idea of de-risking and its relationship to the age of the investors. Samuelson (1989) suggests that investors should be more risk tolerant when they are young and decrease exposure to relatively risky equities in favour of lower risk cash and fixed interest securities as they age. Samuelson (1969) however highlight that a greater aggressive allocation is irrational with a constant investment opportunity set.

Samuelson (1991) further showed that the young investors should be more risk tolerant if the assumption of a random walk for securities is replaced with mean reversion that is a loss will ultimately be corrected to a profit over the long term. He further shows in his 1994 study that a desired for a minimum level of retirement wealth will imply an optimal investment strategy of declining equity allocation with age. However, a different view is from McNaughton, Piggott, and Purcal (1999) who suggest that an increasing equity allocation with age is more likely. Recently, Estrada (2016) looks into an aggressive asset allocation suggested by Warren Buffet of 90/10 investment option that is 90 percent being in growth strategy. Using the historical returns, he considers how a hypothetical investment perform over a long time period over 30 year's period starting from 1900 – 1930 and his final years include 1985 to 2014. His findings suggest that retirees might be able to lean heavily on stocks without putting their nest egg in grave danger. Given the mixed literature and the volatile state of the market over the past few decades, the focus of our focus is to assess how does the associated risk in each of the investment options translate in the expected return for a period of 27 years from January 1990 to December 2016. The objective of the study is to highlight the risk and return of the investment options which will further highlight the importance of making the right choice of investment options for members to maximise their retirement income.

## **2. Data and Modelling**

The data in the analysis will be primarily based on Morningstar Direct database. The sample period that we will consider a sample of 27 years starting January 1990 to December 2016. The choice of the data period captures a few key dates, including 1992 the year the Superannuation guarantee was introduced, and periods of high volatility including the South East Asian crisis in 1997 to 1998, the global financial crisis (GFC) from mid-2007 to 2009, and Chinese stock market volatility from August 2015 to February 2016, all of which has had significant impact on the Australian market. Australian superfunds were faced with significant losses in the crisis period, in particular the GFC. Many retirees in Australia have been heavily affected due to the relatively large investment losses in Australia because of the large share of equities which at the time of the GFC was around 57 percent before the crisis hit, compared with an average of 36 percent in the 20 OECD countries. Australian superfunds accounted for -26.3percent loss, which was the second largest in the world after Ireland<sup>4</sup>

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<sup>4</sup> See: OECD (2009), Pensions at a Glance: Retirement-Income Systems in OECD Countries, Figure 1.3

Further details on the historical price index, return index and the monthly historical asset allocation will be obtained from Morningstar Direct for each of the funds to calculate the historical returns. The historical asset classes that Morningstar Direct does provide include, cash, domestic and international shares, domestic and international fixed income securities as well as listed and unlisted property. The growth assets, shares and property, usually aim for higher average returns over the long term. However, this equally implies higher volatility that is higher risk in that it implies higher losses in bad years as compared to the return obtained from lower risk options. The Australian superannuation funds provide investors with a variety of investment options that can suit the investment profile of the investors including a mixture of growth assets up to a 'high growth option' where investors can have the option of investing up to 100 percent in growth assets like shares and property. We will consider two methods to assess the investment options. In the first option, we will consider the definition provided by Canstar<sup>5</sup>, that is, we will consider a multi-sector aggressive (where the growth assets<sup>6</sup> are between 81 percent-100percent), multi-sector growth (growth assets are in between 61-80 percent), multi-sector balanced (growth assets are in between 41-60 percent), and multi-sector moderate (growth assets are in between 21-40percent). In our second classification we will consider the guidelines provided by ASIC<sup>7</sup> and define the investment options as follows. An aggressive investment option will have 85-100 percent in growth assets, a growth investment option will be in between 71 to 84 percent; a balanced option will be between 31 to 70 percent; conservative option will be in between 1 to 30 percent and a cash investment option where we will have 100 in deposit taking institutions. Considering the two methods of defining investment options, will provide a better idea of the risk return trade off vary as the percentage of growth assets varies.

Hence, at a specific time, a fund is classified in one category depending on proportion of its growth assets. In addition, the classification of a fund can be time-dependent since the proportion of its growth assets can change over time. This characteristic represents the dynamic switching behaviour among investment options of a fund. Besides, our sample covers various crises as mentioned earlier which may also alter the nature of the risk-return relationship. Our analysis will consider both characteristics by employing the panel data model developed by

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<sup>5</sup> See <https://www.canstar.com.au/managed-funds/types-of-managed-funds-and-how-they-perform-long-term/>

<sup>6</sup> Growth assets are includes domestic and international shares, listed and unlisted property.

<sup>7</sup> <https://www.moneysmart.gov.au/superannuation-and-retirement/how-super-works/super-investment-options>

Feng et al. (2017). This model allows the relationship between risk and return to be different according to different defined time-varying categories, including investment categories and crises. As an example, the modelling framework can be specified as follows,

$$R_{it} = \alpha(Z_{it}) + \beta(Z_{it})\sigma_{it} + \theta(Z_{it})Control\ Variables + w_i + \varepsilon_{it}$$

where  $R_{it}$  is the return on superfund  $i$  at time  $t$ , and  $Z_{it}$  is a vector of time-varying category variables which captures the information of economic regimes (crisis and non-crisis) and the four categories of investment options defined above.  $w_i$  denotes fix effects and can be arbitrarily correlated with any other variables. The control variables that will be included are macroeconomic variables including, interest rates, inflation rate and GDP growth rate among others. We will consider different method to estimate risk ( $\sigma_{it}$ ) including rolling window method and univariate GARCH for each of the return series. Further, we will explore different variants of risk-return relationships including both CAPM (Capital Asset Pricing Model) and Fama French three factor model.

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