# Your money or your life?

## Is either certain for retirees?

### Introduction

Retirees face uncertainties around their own lifespans as well as market risk

Death and taxes are the proverbial certainties in life. Life, however, is full of uncertainties. Just how long a recently retired 65-year old will actually live and what the share market is going to do for the first ten years of their retirement, are two big uncertainties. For a new retiree, those big uncertainties will impact how they plan for their retirement and how to draw on their retirement savings.

Anecdotally, we seem quite familiar with mortality. People often reflect on life being uncertain and, to paraphrase Shakespeare: we do not know when we might be shuffled off this mortal coil. On the other hand, financial models and retirement plans generally revolve around average or expected life expectancies, for the sake of convenience. This is a serious industry shortcoming.

This paper will discuss a concept initially presented by Moshe Milevsky[1] which compares the relative uncertainty of retiree lifespans and equity market returns to highlight the volatility of actual, versus expected, lifespans.

### Market uncertainty

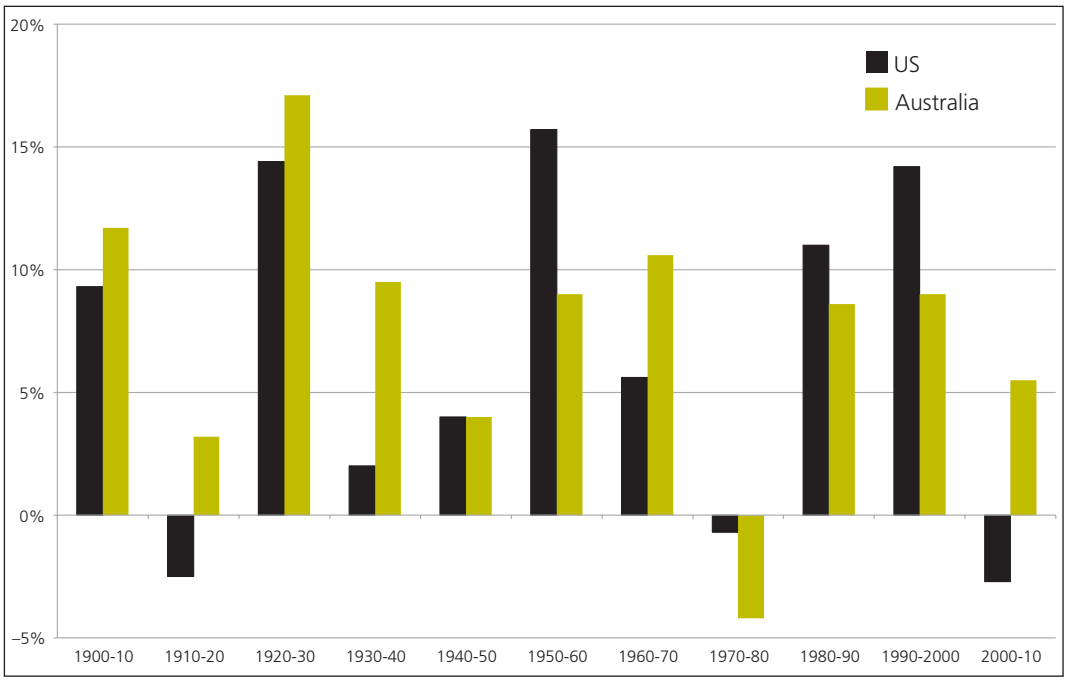
Most investors are aware that markets are volatile, especially equity markets. If a capital sum is invested for a period of time, the amount (or price) of capital available at the end of the period will be uncertain. The question is: how uncertain?

This question clearly depends on the investment timeframe. As a rule of thumb, equity markets are very volatile in the short term, but over the long run there is some reversion to the mean that partially reduces this volatility. For a retiree, the concern should be the uncertainty over a long term. This is because, as Kitces (2013) notes, the impact of returns in the first 5–10 years has a big impact on a retiree's capital base. So a 10-year period is an appropriate term to consider.

1 Presentation to Challenger clients, Melbourne November 9, 2013.

Keeping in mind a 10-year timeframe, this paper uses data from Credit Suisse[2] on equity markets based on earlier work by Dimson, Marsh and Staunton. It provides the real returns on equities for several countries, including Australia and the United States, since 1900, split into 10-year periods. The returns for each decade can be seen in Figure 1 for both Australia and the United States. These returns include all dividends and are before tax.

Figure 1 Historical real 10-year equity market returns




Source: Credit Suisse using data from Dimson, Marsh and Staunton.

Equity returns over 10-year periods vary a lot

One way to consider volatility is to look at the variation (standard deviation) from an average outcome (the mean). Using Australian equity market return data as an example, the average real growth of $1,000 over 10 years has been to a balance of $2,301: the mean. The variation of potential outcomes from this average is $1,089: the standard deviation. So the volatility in this example is the measure of variation from the mean, ranging between a high of $3,390 and a low of $1,212.

The co-efficient of variation (CV) measures the amount of uncertainty relative to the average

Another way to look at volatility is to use what is called a co-efficient of variation (the ratio of the standard deviation to the mean). Using the average 10-year Australian example, the co-efficient of variation is 47 per cent.

The CV for Australian equity real returns is 47 per cent

Over the long term, estimates of volatility are not always clear, and while history is not a predictor of the future, past data provide a guide to the uncertainty of equity markets. An equity market investment outcome could be about 47 per cent of what is expected to be earned over the long term. There is no doubt that if a retiree had all of their retirement savings in equities (not a common retirement asset allocation) there is a high level of uncertainty about the outcome after 10 years. This, of course, would not be a big surprise to advisers.

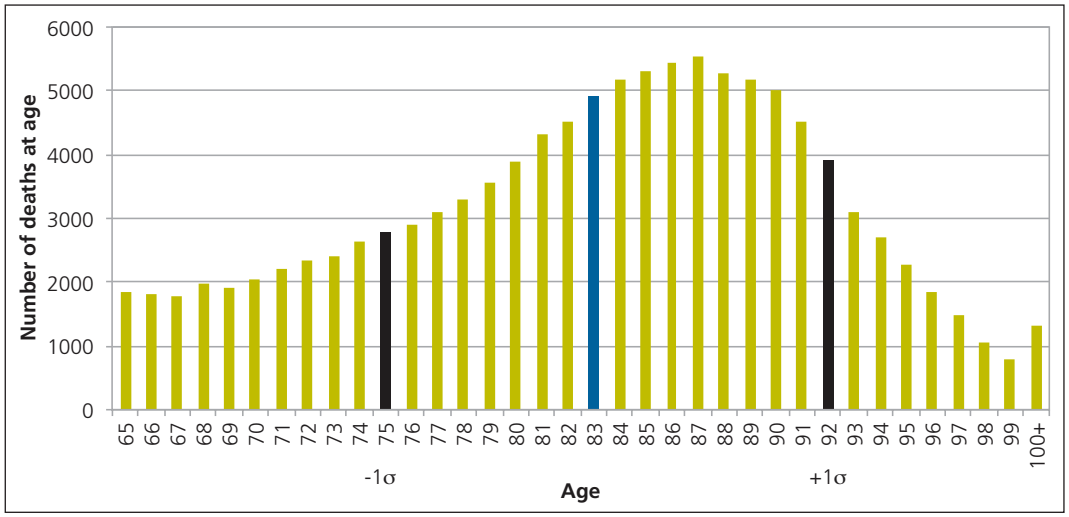
2 Credit Suisse Global Investment Returns Sourcebook 2011

## Life expectancy v actual lifespans

Having looked at equity market volatility, what about the variation of actual retiree lifespans from average life expectancies? How much certainty can a retiree have about the length of their own life? The answer to this question might be a surprise.

To measure the volatility of actual lifespans from average life expectancies, statistics on the age at death for a particular year are needed to determine the range of outcomes. The Australian Bureau of Statistics (ABS) publishes such data. The number of deaths of males and females in 2012, by each age, can be seen in Figure 2.

Figure 2 Number of deaths (males and females) by age at death (over 65), Australia 2012




Source: ABS.

The most common age at death in 2012 was 87

In 2012, the most common age at death was 87. Despite this, taking the probability of survival from age 65, the mean (average) length of life for a 65-year-old was 18.1 years or to age 83.1.[3] The range of actual lifespans around the mean point is represented by a standard deviation of 8.4 years either side of 83.1.

Remarkably, the co-efficient of variation, the range of actual lifespans proportional to the mean, is 47 per cent. A 65-year-old has a lot of uncertainty around how long they are actually going to live.

The CV for 65-year-old Australians' lifespans is 47 per cent

## Relative uncertainty

What is seen is that both equity market returns over 10 years and actual lifespans (versus average life expectancies) for 65-year-olds, have the same relative level of uncertainty: 47 per cent. While this result is generated through being selective with the equities data used, it does highlight that both the equity markets and actual lifespans at retirement are uncertain.

3 This age is lower than current life expectancy projections for this age group because of the baby-boomer demographic bulge skewing the age downwards. In other words, there are a lot more 66-year olds than there are 90-year olds and so there are more deaths occurring for 66-year olds than there would have been 25 years ago.

The information in the report has been compiled by the Challenger Retirement Income Research team.

Jeremy Cooper
Chairman, Retirement Income
02 9994 7178
jcooper@challenger.com.au

Aaron Minney
Head of Retirement Income Research
02 9994 7107
aminney@challenger.com.au

Philip Sainsbury
Research Analyst, Retirement Income
02 9994 7342
psainsbury@challenger.com.au

## The second dimension of longevity risk

What we can now see is that longevity risk is not just the risk of living longer and outliving retirement savings. Uncertainty around a retiree's actual lifespan is another, more complex, aspect of longevity risk. Planning a retirement to any fixed horizon is fraught with risk. If a retirement plan has too short a time horizon, a retiree can live beyond that planned horizon and have a long retirement period with insufficient income. If a retirement plan has too long a time horizon, say to age 100, capital could be left unused if that horizon isn't reached; resulting in a standard of living lower than could have been enjoyed.

## Summary

This paper shows that there are two retirement uncertainties of a surprisingly similar dimension: a retiree's actual lifespan and the money earned on equity investments (pre-tax investment returns). Uncertainty creates the possibility of surprises at either end. Many people will live much longer than their average life expectancy and many will not live that long.

Both forms of uncertainty need to be managed in retirement at the same time. The first step in doing this is to move away from planning for averages. Retirees know that they won't achieve average share market returns and will build a portfolio to adjust for this. They will almost certainly not live to their average life expectancy either. Many plans assumed they will and this has to change.



**Challenger Limited**
Level 15
255 Pitt Street
Sydney NSW 2000
Australia

www.challenger.com.au

16635/CG968/0614