

# Planning for Retirement: The Most Critical Years

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## Statement:

The specific sequence or order of portfolio returns (good, average, or poor) that will occur over the investment term (contribution/accumulation phase and income withdrawal/drawdown phase) plays a vital role in determining the successful outcome of one's retirement plan, i.e. accumulating sufficient retirement capital at retirement and providing sustainable retirement income over a long post-retirement period, say thirty years.

## Background:

Imagine two individuals, Alex and Bertha, contributing exactly the same percentages (15%) of their earnings each year, which adjust for inflation, to their retirement plans. Their contribution period will span over a period of thirty-five years and a planned post-retirement drawdown period of 30 years. Thus, in total the investment period spans over a 65-year period. Alex is ten years older than Bertha and Alex is now at the start of his 20<sup>th</sup> year of contribution, while Bertha is at her 10<sup>th</sup> year.

Alex and Bertha invest in identical investment portfolios with an expected portfolio return of 10% per annum. Over the next five years, however, portfolio return will be 5% per annum, and thereafter portfolio returns will resume at 10% per annum for the remainder of their respective investment careers. How will this period of lower returns affect the outcome of their retirement plans, but more importantly, how will it differ between Alex and Bertha?

First, if there was no slump in portfolio returns at any stage, both could have expected to accumulate about 14.2 times retirement capital relative to their earnings in the final year before retirement commenced. Once they retired, and withdrew at a level of 85% of their earnings in the final year before retirement (replacement rate = 85%), and adjusted the yearly income withdrawals by the inflation rate, their retirement plans would have lasted thirty years. But then this period of lower returns materialised...

For Alex it meant that the ratio of retirement capital to final earnings dropped to 11.8 times and his plan would yield sustainable income for a post-retirement period of 21 years. For Bertha, however, the retirement capital ratio would have dropped to 12.6 times and a sustainable income period of 23 years.

Clearly, Bertha would have been better off than Alex, all else being equal. Note, this difference is due to “luck” only, or more specifically, the specific time frame when the spate of poor returns arrived in their respective investment careers. More formally, this phenomenon is known as the **sequence of return risk**.

### **Objective:**

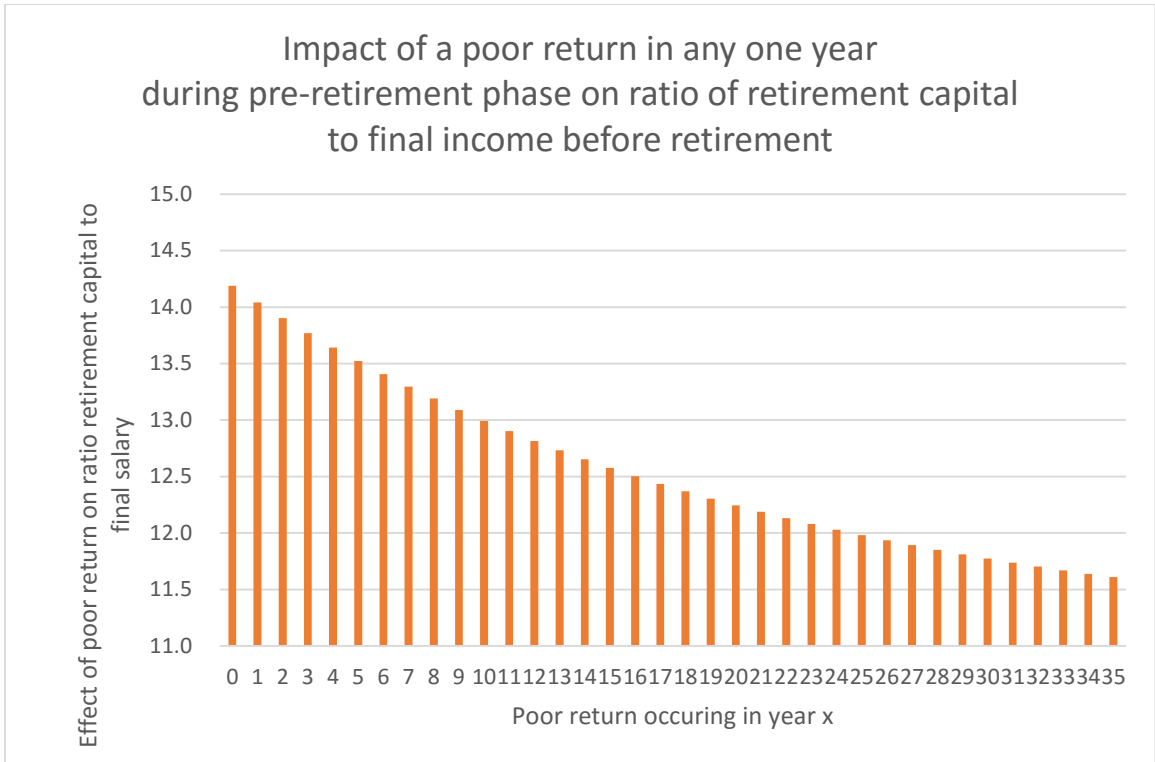
1. Identify the most critical period (years) during the pre-retirement phase that will affect the accumulation of retirement capital.
2. Once in retirement, the most critical period (years) that will affect the ability of one’s plan to yield sustainable income for a long-term post-retirement period.

### **Testing:**

#### **The contribution period**

Assume a contribution/savings rate of 15% of annual income, adjusted with inflation each year over a 35-year period. Furthermore, assume a constant portfolio return of 10% per annum. These assumptions yield retirement capital at the end of the 35-year period valued equal to 14.2 times the annual income in the final year before retirement.

To evaluate the effect of a poor return in a specific year on the final accumulated retirement value at the end of the 35<sup>th</sup> year, a negative 10% return is imposed, while the returns of all the other years are held at (positive) 10% return per annum.



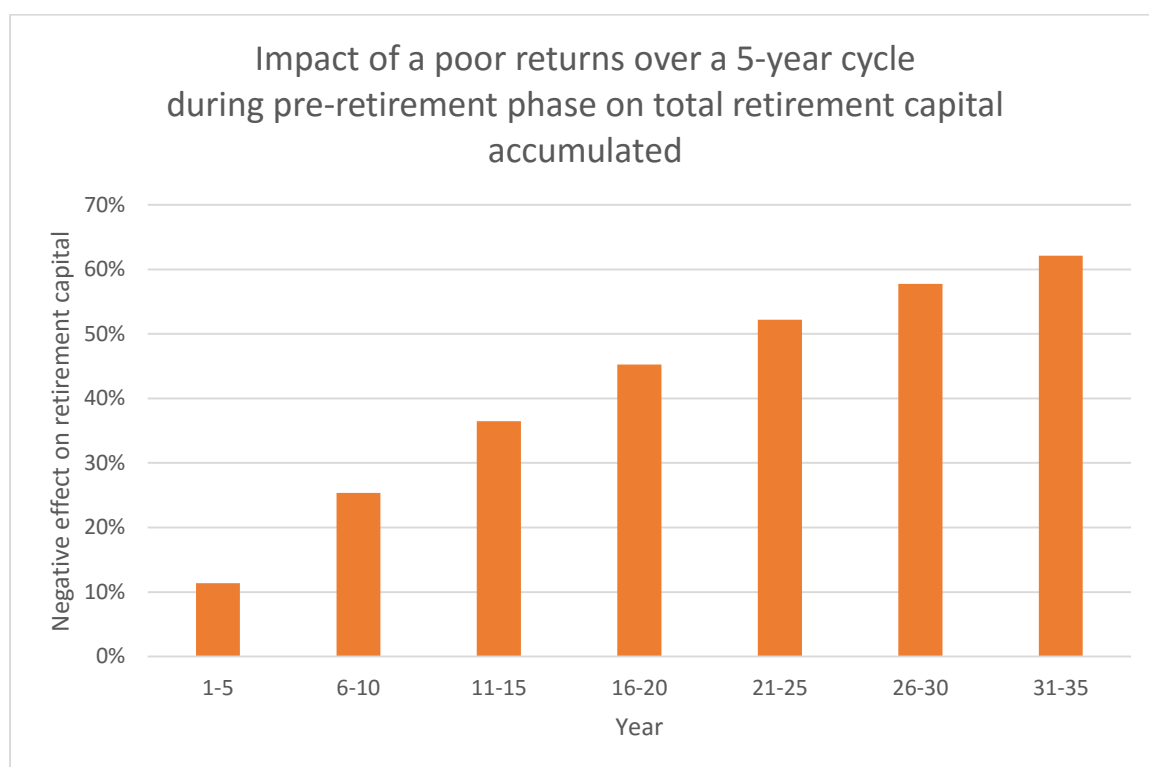
Source: DRW Investment Research



Source: DRW Investment Research

Clearly, poor returns in the latter years leading up to retirement day matters the most; in this example, the last three years have had individually a 18% negative effect on the final retirement capital accumulated whenever such poor returns materialised in any of those three years.

Alternatively, if these significantly poorer returns persisted during the final five years of accumulating retirement capital, one could expect a knock-on effect of more than 60% on the final values, i.e. the final retirement capital would be more than 60% less than if it did not happen.

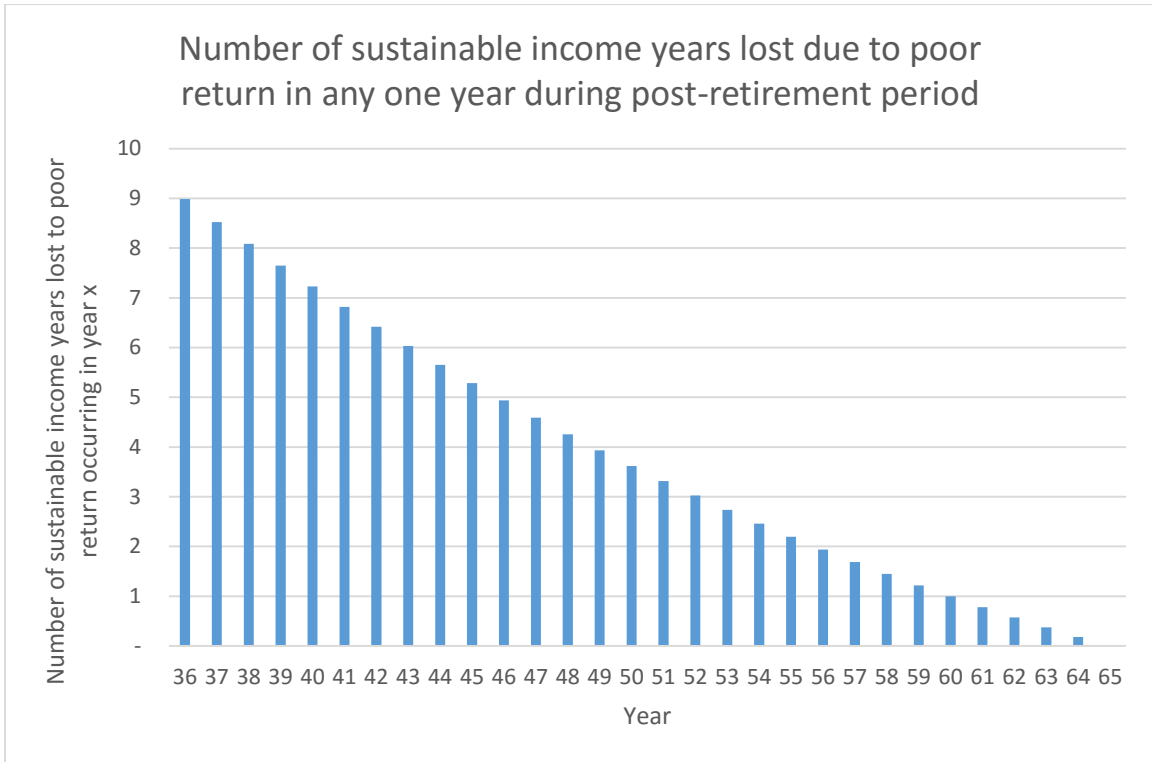


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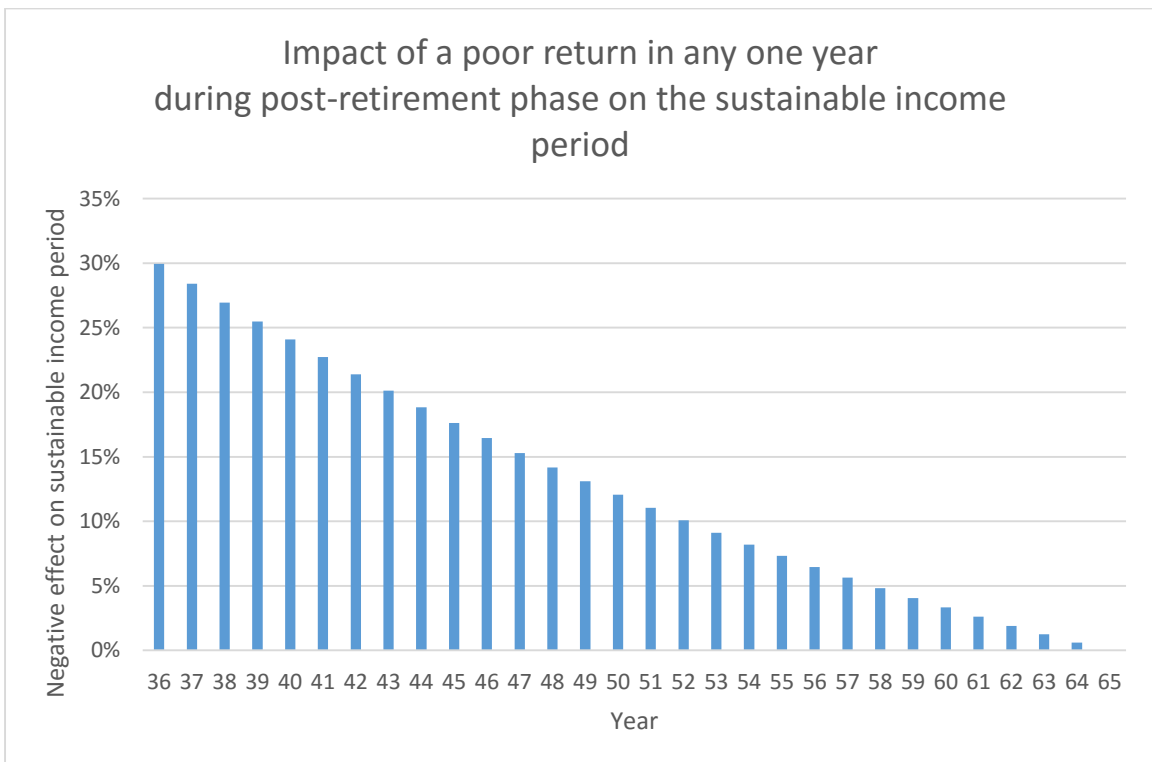
### The drawdown period

Assume a drawdown/withdrawal amount equal to 85% of income in the final year before retirement. Furthermore, assume a constant portfolio return of 10% per annum. Each year the withdrawal amount would increase by the inflation rate. These assumptions would yield a sustainable income period of maximum 30 years.

Consider the effect that a negative 10% return in any one year during the post-retirement phase would have had on the maximum sustainable income period, while the returns in any other year would have remained at (positive) 10% per annum.



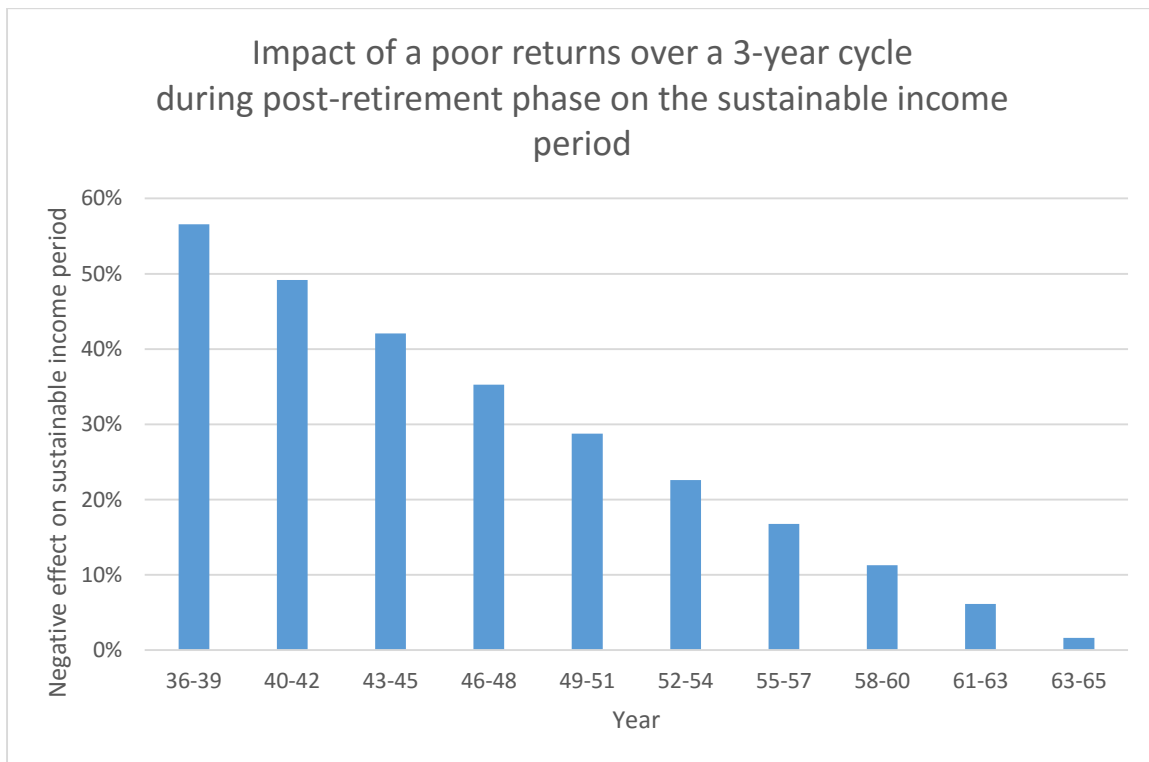
Source: DRW Investment Research



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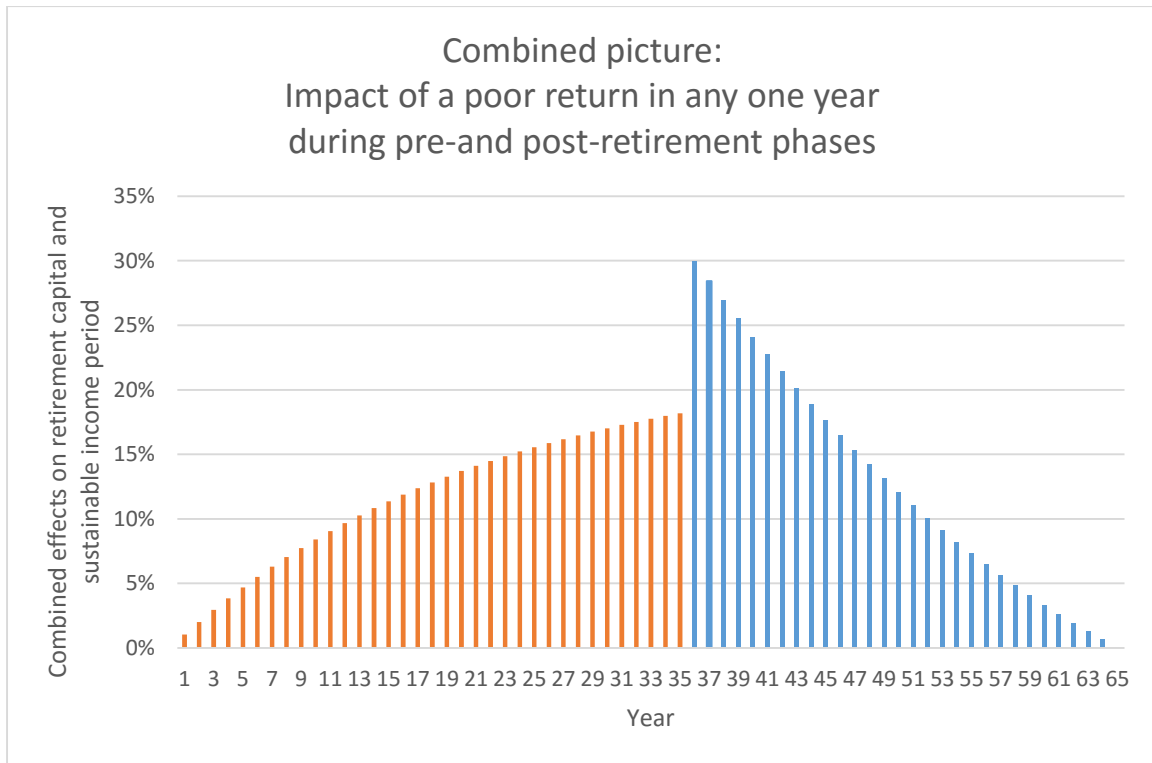
The first number of years of retirement are more critical than later years because the number of sustainable income years available will be diminished more by poor returns early on. For example, a negative 10% return in the first year of retirement (36<sup>th</sup> year) will reduce the maximum sustainable income period by 9 years or near 30% of the number of income years otherwise available.

Collectively, consecutive poor returns over the first three years of retirement (36<sup>th</sup> - 39<sup>th</sup> years) will reduce the number of sustainable income years by nearly 60% than otherwise would have been possible.



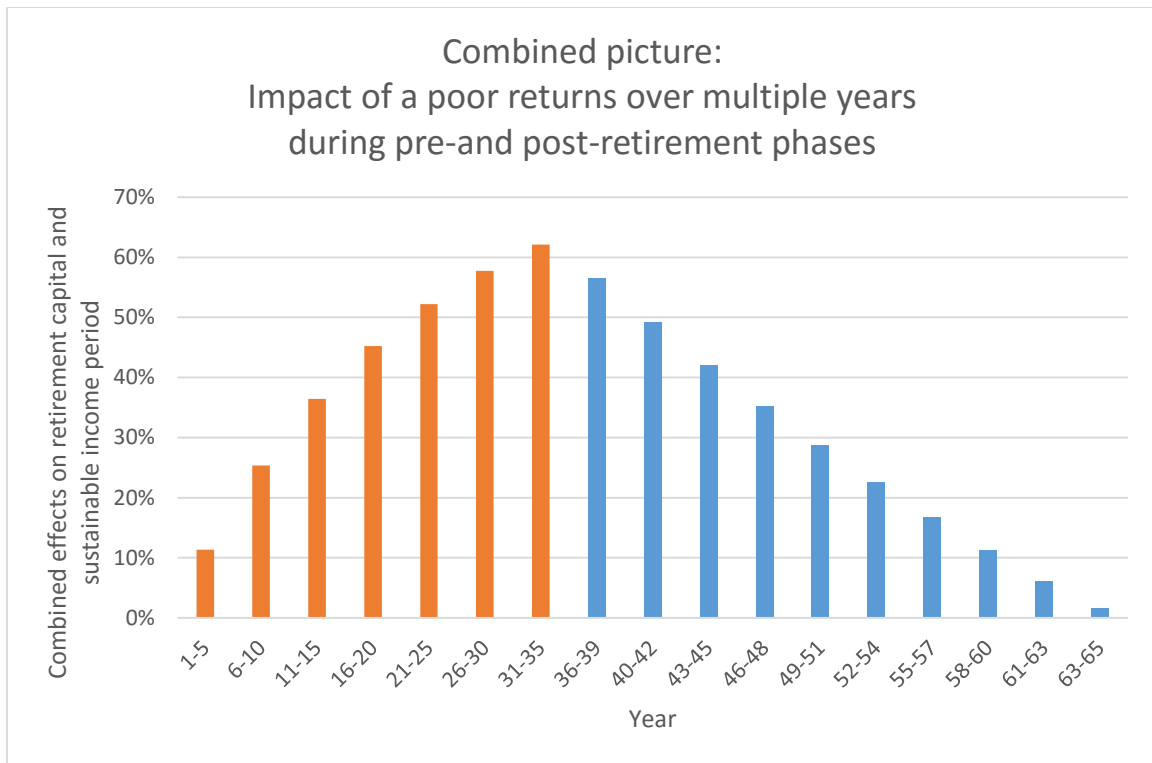
Source: DRW Investment Research

## The combined picture



Source: DRW Investment Research, Wade Pfau

The first part of the chart (years 1 – 35) displays the effect of a particularly poor return in any one year on the level of retirement capital accumulated, while the second part (years 36 – 65) shows the eroding effect of a similar poor return on the number of sustainable retirement income years available.



Source: DRW Investment Research

The effect of consecutive poor returns (5-year and 3-year cycles respectively) is shown on the retirement capital accumulated (years 1 – 35) and the depletion of number of sustainable income years (years 36 – 65).



## Concluding remarks:

The most critical periods of one's retirement plan are during the last few years before retirement commences and the first few years after retirement. Thus, investors should pay particular attention to prevent possible situations where they could lose significant retirement capital due to concentrated positions in risky assets.

Generally, employer-sponsored (occupational) retirement plans follow a life-stage or glide-path approach in reducing the exposure of risky investments in one's investment portfolio as one nears retirement. Individual retirement plans, like retirement annuities, however, do not necessarily automatically follow such approaches and investors therefore would require intervention if one needs to safeguard accumulated retirement capital near retirement.

At retirement investors could opt for buying guaranteed life annuities (securing income stream for life) and/or investment-linked living annuities. For the latter retirement product investors should wake against exposing themselves to concentrated levels of risky assets in their portfolios, especially during the first few years of their retirement.

Interestingly, the "mathematics" of sequence of returns implies a somewhat contra-dictionary approach to the general adage of less investment risk as one ages, as it emphasizes that the real risk to a successful retirement plan is concentrated around the "conversion" years.

Additional source:

Wade Pfau, Retirement Risks. Available at:

<https://retirementplannerblog.files.wordpress.com/2016/04/retirementrisks-retirementresearcher.pdf>