Sequence of Returns Risk and Retirement Portfolio Resilience

Why retirement portfolio construction should respond not only to the mathematics of returns, but to the journey investors actually experience.

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Executive summary

Retirement Portfolio Resilience is the discipline of helping investors remain financially and emotionally invested throughout their retirement journey, regardless of the path markets take.

One of the greatest threats to achieving that objective is sequence of returns risk: the danger that poor investment returns early in retirement permanently impair retirement capital because withdrawals continue while portfolio values are depressed.

Key Insights
• **Sequence of returns risk describes retirement mathematically. Retirement Portfolio Resilience seeks to understand and respond to retirement as it is experienced.** • **Natural recovery capacity declines while loss-aversion sensitivity rises.** • **Cash can provide time. It cannot determine how much time markets will require.**

Over the past three decades, research by William Bengen, the Trinity Study, Wade Pfau and many others has established sequence of returns risk as one of the defining concepts in retirement-income planning.

Historical share market recoveries have ranged from approximately six months to more than seven years. Advisers commonly maintain one to three years of planned withdrawals in cash or liquid defensive assets. While these reserves provide valuable liquidity, their effectiveness ultimately depends upon the length of the market recovery.

This article combines established retirement research, historical market evidence and the Retirement Portfolio Resilience framework to explore how retirement portfolios can become less dependent upon a rapid and favourable market recovery.

An established body of retirement research

Sequence of returns risk is one of the most extensively researched concepts in retirement-income planning. Beginning with William Bengen's landmark research in 1994, and reinforced by the Trinity Study, Wade Pfau, Michael Kitces and many others, the evidence consistently demonstrates that the order in which investment returns occur can materially influence retirement outcomes.

Established Research Supporting Sequence of Returns Risk

Author	Year	Landmark contribution
William P. Bengen	1994	Demonstrated that poor investment returns early in retirement can materially affect sustainable withdrawal rates.
Trinity Study	1998	Confirmed that retirement outcomes vary significantly depending upon the historical sequence of returns.
Guyton & Klinger	2006	Developed dynamic withdrawal decision rules that respond to changing portfolio outcomes.
Wade D. Pfau	2013	Extended research into retirement sustainability and the importance of early retirement returns.
Pfau & Kitces	2014	Examined equity glide paths designed to reduce early-retirement vulnerability.
Morningstar	2010s -- 2020s	Expanded research into flexible withdrawals and retirement sustainability.

Collectively, this research established sequence of returns risk as a fundamental consideration in retirement portfolio construction. The academic question is now well understood.

This article does not revisit that evidence. It considers the next logical question:

If sequence of returns risk defines the retirement challenge, what should the portfolio-construction response be?

That question forms the foundation of Retirement Portfolio Resilience.

The hidden impact of sequencing risk

The impact of sequence risk can be illustrated through a simple example.

Consider two retirees who each:

- retire with $1 million;
- withdraw $60,000 at the beginning of each year;
- experience the same annual investment returns;
- achieve the same average annual return of 6 per cent; and
- differ only in the order in which those returns occur.

One retiree experiences poor returns early in retirement followed by stronger returns later. The other experiences exactly the same returns in reverse order. After ten years, the difference is striking.

- The investor experiencing the adverse early sequence finishes with approximately $539,000.
- The investor experiencing the favourable early sequence finishes with approximately $899,000.
- The difference is approximately $360,000.

The average return is identical. The outcome is not.

Early investment losses, combined with ongoing withdrawals, reduce the capital available to participate in the subsequent recovery. Once capital has been withdrawn, it no longer benefits from the returns that follow.

This simple example explains why sequence of returns risk has become a defining concept in retirement planning. The mathematics are compelling. They do not, however, fully explain the retirement experience.

Source: Gyrostat Corporate Presentation (30 June 2026).

Why retirement changes everything

The sequencing example demonstrates the mathematics of sequence risk. It does not fully explain the retirement experience.

During the accumulation years, investors typically possess several natural sources of recovery capacity, including:

- employment income;
- regular savings;
- ongoing portfolio contributions;
- the opportunity to purchase assets at lower prices; and
- time for markets and earnings to recover.

These characteristics do not remove investment risk. They increase an investor's capacity to recover from it. As investors transition into retirement, that recovery capacity generally declines. Employment income reduces or ceases. Portfolio contributions stop. Withdrawals begin. Time available to rebuild capital becomes more finite.

At the same time, the consequences of investment losses often become more significant.

Capital accumulated over a lifetime becomes increasingly difficult to replace. A major market decline may threaten not only portfolio values, but planned retirement spending, lifestyle, confidence and financial independence.

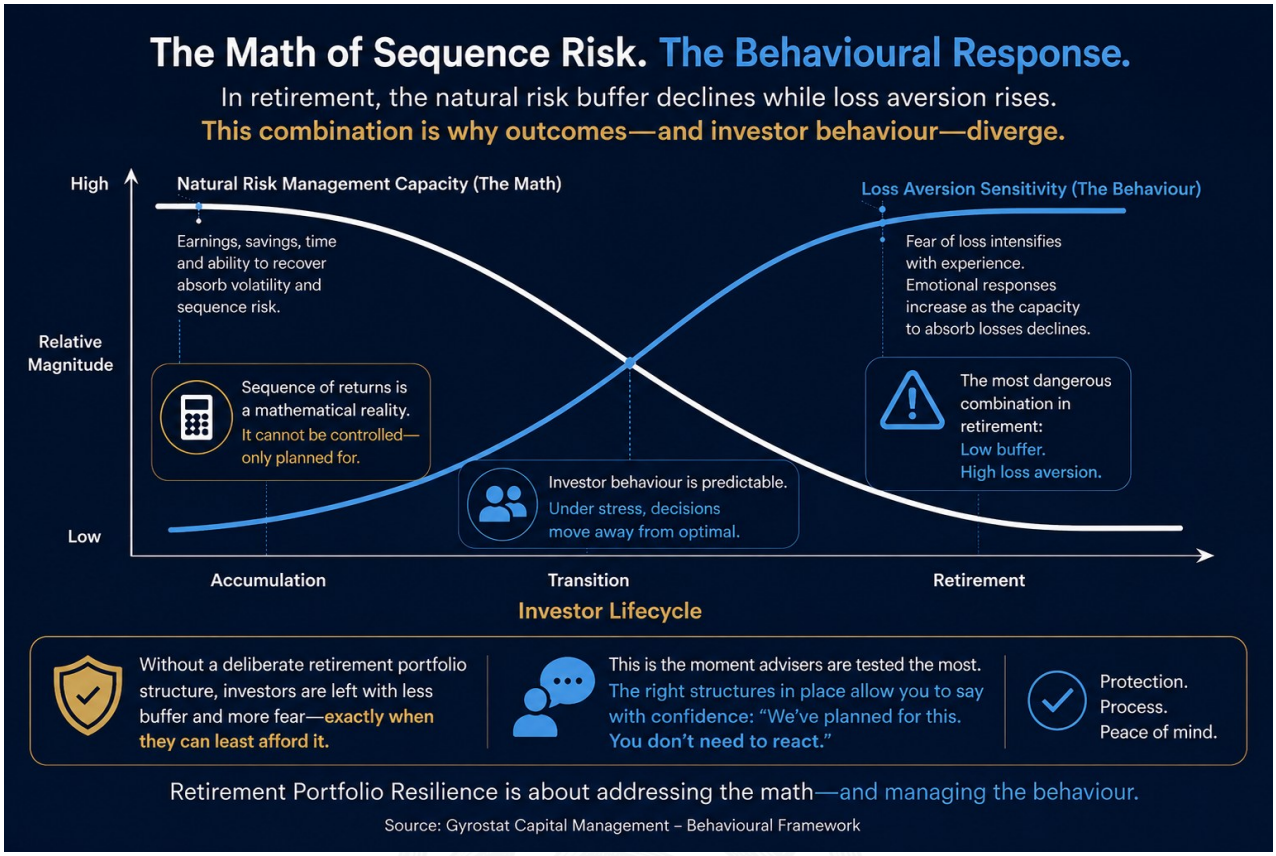
The result is a fundamental change in the retirement equation.

Natural recovery capacity declines while loss-aversion sensitivity rises.

This is the point at which the mathematics of sequence risk becomes the lived experience of retirement.

It is also the point at which sequence-risk awareness becomes inseparable from behavioural survivability.

The years surrounding retirement are therefore not simply another stage of investing. They represent one of the most important stewardship responsibilities for advisers, because decisions made during this period may influence retirement outcomes for decades.



Without a deliberate retirement portfolio structure, investors may find themselves with less capacity to recover at precisely the time they are least able to tolerate significant losses.

Recovery is a journey

Markets are often described as having recovered when an index returns to its previous peak.

For a retiree, recovery is not merely that final date. It is the entire journey:

previous peak -> decline -> market bottom -> recovery to the previous peak

Withdrawals continue throughout that journey. So may uncertainty, behavioural pressure and difficult portfolio decisions.

If major market declines consistently recovered quickly, sequence risk would be easier to manage. United States market history demonstrates otherwise. The following data examines US sharemarket falls greater than 20 per cent between 1956 and 2022, measuring both the decline and the subsequent recovery to the previous market peak.

United States Share Market Falls Greater Than 20 Per Cent

Decline began	Market bottom	Fall	Days to bottom	Recovery date	Days from bottom to recovery	Total peak-to-recovery journey
2 Aug 1956	22 Oct 1957	-21.5%	446	24 Sep 1958	337	783 days
12 Dec 1961	26 Jun 1962	-28.0%	196	3 Sep 1963	434	630 days
9 Feb 1966	7 Oct 1966	-22.2%	240	27 Jul 1967	293	533 days
29 Nov 1968	26 May 1970	-36.1%	543	6 Mar 1972	650	1,193 days
11 Jan 1973	3 Oct 1974	-48.2%	630	17 Jul 1980	2,114	2,744 days
28 Nov 1980	12 Aug 1982	-27.1%	622	3 Nov 1982	83	705 days
25 Aug 1987	4 Dec 1987	-33.5%	101	26 Jul 1989	600	701 days
24 Mar 2000	9 Oct 2002	-49.1%	929	30 May 2007	1,694	2,623 days
9 Oct 2007	9 Mar 2009	-56.8%	517	28 Mar 2013	1,480	1,997 days
19 Feb 2020	23 Mar 2020	-33.9%	33	18 Aug 2020	148	181 days
3 Jan 2022	30 Sep 2022	-25.2%	270	19 Jan 2024	476	746 days

Source: Gyrostat analysis of historical United States market index data. Recovery is measured as the index returning to its previous peak.

The 2020 decline completed the full peak-to-recovery journey in approximately six months. By contrast:

- the decline beginning in 1973 required approximately **seven and a half years**;
- the decline beginning in 2000 required approximately **seven years**; and
- the decline beginning in 2007 required approximately **five and a half years**.

At the beginning of a market decline, neither the adviser nor the investor knows which historical path the next recovery will resemble.

That uncertainty is the portfolio-construction problem.

Recovery duration is only part of the experience. The path itself may contain further falls, sharp rallies, reversals and prolonged periods without clear progress, all while withdrawals continue.

Retirement Portfolio Resilience therefore seeks to understand not only when markets recover, but the journey investors must travel to reach that point.

The important role of cash reserves

One common response to sequence of returns risk is to hold planned retirement spending in cash or highly liquid defensive investments.

Depending on an investor's circumstances, spending requirements and overall portfolio structure, advisers commonly maintain reserves covering approximately **one to three years** of planned withdrawals.

Cash reserves perform several valuable functions. They provide liquidity for near-term spending, reduce the immediate need to sell growth assets during market declines and may improve investor confidence during periods of market stress.

Cash therefore answers an important question:

> **How will near-term retirement spending be funded?**

It does not necessarily answer another:

> **What happens if markets have not recovered when the reserve has been used?**

That distinction is important.

A one-year reserve provides approximately one year of liquidity.

A three-year reserve provides approximately three years.

Neither determines whether markets will recover within that period.

If the recovery journey extends beyond the available reserve, advisers and investors may face difficult decisions, including selling growth assets before recovery is complete, reducing retirement spending, changing portfolio strategy or abandoning the original investment plan.

Cash addresses liquidity. It does not remove dependence upon the duration of the market recovery.

Or more simply:

Cash can provide time. It cannot determine how much time markets will require.

Retirement Portfolio Resilience

Sequence of returns risk defines the retirement challenge. Retirement Portfolio Resilience considers the portfolio-construction response.

Its objective is not to predict when markets will fall, how far they will decline or how long recovery will take. It is to reduce dependence upon favourable answers to those questions.

A resilient retirement portfolio should intentionally perform four complementary functions.

Retirement Portfolio Function	Purpose
Growth allocation	Long-term capital appreciation.
Defensive allocation	Stability and liquidity.
Retirement Income function	Sustainable retirement income.
Retirement Portfolio Resilience function	Address sequencing risk and behavioural survivability.

Growth and defensive remain fundamental asset-allocation decisions.

Retirement Income and Retirement Portfolio Resilience are complementary portfolio functions. Together they encourage advisers to look beyond asset allocation alone and consider whether each essential retirement objective has been intentionally addressed.

Conclusion

Sequence of returns risk transformed retirement planning by demonstrating that average returns alone do not determine retirement outcomes.

Retirement Portfolio Resilience extends that insight by considering how portfolios can become less dependent upon favourable market paths.

Sequence of returns risk describes retirement mathematically. Retirement Portfolio Resilience seeks to understand and respond to retirement as it is experienced.

The objective is not to control the market path. It is to help investors remain financially and emotionally invested throughout it.

Retirement Portfolio Resilience Framework

Retirement Portfolio Resilience is built upon five complementary pillars that together seek to help investors remain financially and emotionally invested throughout retirement:

- Sequencing-Risk Awareness
- Behavioural Survivability
- Risk-Pricing Discipline
- Retirement Portfolio Construction
- Resilience Across Market Environments

Educational series

This paper forms part of the Retirement Portfolio Resilience educational series.

Educational Paper	Primary Focus
☑ Dynamic Hedging and Retirement Portfolio Resilience	Institutional risk management and Risk-Pricing Discipline
☑ Sequence of Returns Risk and Retirement Portfolio Resilience	Sequencing-Risk Awareness
☑ Behavioural Survivability and Retirement Portfolio Resilience	Behavioural Survivability
☑ Retirement Portfolio Construction: Pairing Growth with Retirement Portfolio Resilience	Retirement Portfolio Construction and Resilience Across Market Environments

Together, these papers progressively build the evidence base and practical application of Retirement Portfolio Resilience as a framework for the prudent stewardship of retirement capital.

Each paper examines one dimension of retirement investing before integrating the concepts into the broader Retirement Portfolio Resilience framework.

Educational Progression

Institutional Risk Management

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Sequence-of-Returns Risk

↓

Behavioural Survivability

↓

Integrated Retirement Portfolio Construction

For further information about the Retirement Portfolio Resilience Framework, including supporting research, educational resources and the complete publication series, visit:
https://www.gyrostat.com.au/2026-05-29-Retirement-Portfolio-Resilience-Framework-Final.pdf

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