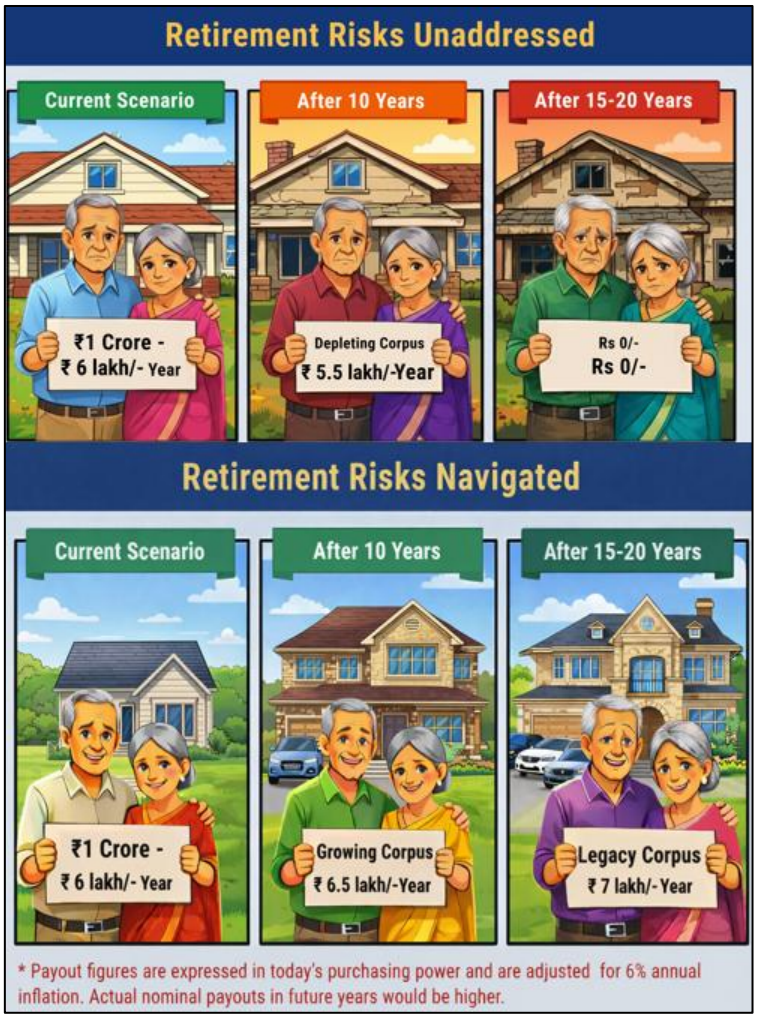
The Science of Retirement Planning:

Navigating Hidden Risks in a Long Retirement



A forensic comparison of FDs, life annuities, SWPs, & an aggressive equity biased strategy against risks of retirement planning.

A ₹1 crore corpus is subjected to a 60–100 year retirement span simulation incorporating inflation, longevity, and market

Three strategies fail. **Only one survives.**

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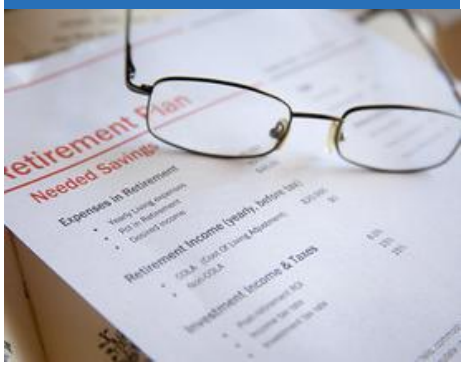
The Retirement Equation, Reframed

RETIREMENT PLANNING:

With life expectancy rising, inflation compounding over 30–40 years, and market returns arriving unevenly, retirement planning must transition from product selection to structural design.



How structure, sequencing, and sustainability determine long-term outcomes

Retirement success is not determined solely by starting corpus, but by how well that capital withstands inflation, longevity, and market volatility over multiple decades.

First, with a ₹1 crore corpus at age 60, annual payouts at ages 70, 80, 90, and 100 vary materially depending on withdrawal design and asset allocation.

Second, when income shortfalls are funded through capital drawdowns, traditional structures exhaust capital well before age 80, highlighting the impact of longevity and early drawdowns.

Third, required breakeven corpus for traditional solutions is 30-40x of annual expenses to sustain a 40-year horizon.

Finally, portfolio structure determines resilience. Fixed income prioritises predictability but struggles with purchasing power. Annuities eliminate longevity risk but compromise inflation protection. SWPs introduce growth but remain exposed to sequencing risk.

In contrast, a dynamically allocated, equity-biased structure supported by a debt buffer demonstrates stronger recovery and compounding potential under stress.

Omni Takeaway :

Over a 40-year retirement horizon, sustainability is driven less by average return assumptions and more by structural resilience. Strategies that preserve compounding during stress materially improve income durability and capital longevity.

From the CEO's Desk: The Retirement Question India Must Ask

Millions of Indians retire every year. As per a survey[1], Indians with current monthly expenses of around INR 1 lakh believe that an INR 1.3 crore corpus is sufficient for retirement.

The above raises a few questions:

- Q1: If you had INR 1 Cr at age 60 as the retirement corpus, what would be the annual payout to expect at 70, 80, 90 and 100?
- Q2: If the payout is not sufficient to maintain the expenses due to inflation and you eat into the capital, at what age will you be left with no money?
- Q3: If INR 1 Cr is not sufficient, then what is the ideal corpus size?
- Q4: How to invest this corpus so that it allows one to maintain one's lifestyle during retirement (inflation risk) and not run out of money in old age (longevity risk)?

These questions are interlinked. The required corpus size depends significantly on how the corpus is allocated and managed. Different asset allocation strategies can lead to materially different outcomes.

For most Indians, the default answer remains Fixed Deposits. This view is reinforced by finfluencers and amateur financial planners who argue that retirees should avoid risk and therefore invest only in "conservative" assets such as fixed deposits. Another commonly suggested alternative is annuity products offered by insurance companies.

Over the last 5–10 years, another approach has gained popularity: the systematic withdrawal plan (SWP) using hybrid or balanced mutual funds. These funds typically allocate around 65% to equity and 35% to debt. The recommended withdrawal rates typically range between 4%-6%[2] , with some advisors suggesting a more conservative 3%-3.5% withdrawal rate.[3]

Fixed deposits suffer from a fundamental challenge: inflation. Even to maintain the same standard of living, income requirements rise over time. For example, if INR 1 lakh per month is required today, it would rise to nearly INR 1.8 lakh after 10 years at a 6% inflation rate. However, with fixed deposits, payouts typically remain constant, and the corpus does not grow meaningfully in real terms.

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[1] https://www.business-standard.com/finance/personal-finance/indians-believe-rs-1-3-cr-corpus-is-ideal-for-retirement-is-this-enough-123100200136_1.html

[2] https://www.businesstoday.in/mutual-funds/story/conservative-4-aggressive-6-how-much-you-can-safely-withdraw-from-swps-expert-explains-495990-2025-09-27

[3] https://www.shriramfinance.in/articles/investments/2025/safest-retirement-withdrawal-rate

So there are two choices:

- Either, **become poorer** as the time goes on, meaning reduce your lifestyle and consumer fewer goods and services (inflation risk)
- Or, **be left with no money** if one is still alive after eating into their capital, depending on the withdrawal rates as one is forced to withdraw from the capital (longevity risk)

In the hybrid mutual fund SWP option, too, similar risks exist.

- Either, make do with 4%-6% of the initial corpus and choose to lead a poorer lifestyle like above
- Or, be left with no money if one increases withdrawals in line with inflation and takes the risk of living beyond the time when one eats into their capital
- In addition, there is an additional risk of Sequence of Returns which is discussed and analyzed in detail in the report

The key difference is that the capital is likely to last longer in this case since the asset allocation is likely to generate higher returns in the long term compared to Fixed Deposits.

In this report, we propose a third approach – Scientific Pay – an equity-biased strategy designed to preserve purchasing power in line with or better than inflation, while significantly reducing the probability of running out of money in old age. However, for this, one should be prepared to live the initial 3-5 years with potentially lower withdrawals if market conditions are unfavorable. For many retirees, this trade-off may be preferable to experiencing declining purchasing power later in life or exhausting capital by age 75-80. Additionally, many individuals between ages 60–65 may have the flexibility to generate supplementary income through consulting or self-employment, making early-year income variability manageable.

To evaluate these approaches rigorously, we simulate a severe sequence of returns scenario and compare outcomes across the hybrid mutual fund SWP strategy and the proposed equity-biased strategy. The report examines how much retirement corpus is required under each approach to sustain lifestyle without exhausting capital and also models how long a corpus of INR 1 crore would last under all three strategies. Before evaluating which approach works best, it is essential to understand the risks that shape retirement outcomes.

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Three Realities of Retirement : Longer Lives, Rising Costs, Unpredictable Markets

Retirement planning is often framed as a savings problem. In reality, it is a risk management problem. A successful retirement plan, therefore, is not defined only by how much one accumulates, but by how well it withstands longevity, inflation, and market volatility over decades. Understanding these forces is the first step toward building resilience into retirement income.

Once regular income stops, a retirement corpus must withstand three powerful forces. The cost of living continues to rise, steadily eroding purchasing power (inflation risk). People are living longer than ever, extending the period their savings must support them (longevity risk). And market returns do not arrive in a straight line - the order in which gains and losses occur can materially alter outcomes (sequence of returns risk). These risks are often underestimated because their effects unfold gradually, yet they have a profound impact on financial security over time.

Inflation Risk → Longevity Risk ↓	Low Inflation	High Inflation
Low Longevity	Income easier to sustain	Purchasing power gradually declines
High Longevity	Inflation compounded over long time erodes purchasing power significantly	**High Risk Zone:** Savings deplete + purchasing power falls

Exhibit 1 : Dual risk of inflation and longevity

Retirement risk is not driven by longevity or inflation alone, but by their interaction. As retirement duration extends, the cumulative impact of inflation becomes one of the primary threats to long-term income sustainability.

Purchasing Power Erosion : Understanding Inflation Risk

Inflation risk refers to the erosion of purchasing power over time — often a gradual and largely unnoticed process that can be described as *"The Silent Erosion"* of retirement income. Even if income remains stable in nominal terms, its ability to support the same standard of living declines if it does not grow in line with rising prices. What appears sufficient today may prove inadequate a decade later.

Exhibit 2 : Long Term Inflation Trends in India

The 10-year average inflation rate has been around 4.6%, while the 20-year and 30-year averages have been approximately 6.56% and 6.23%, respectively.[4] In recent years, inflation has moderated closer to 4%, and if macro stability persists, this trend may continue. However, for conservative retirement planning — especially over a 30–40 year horizon — assuming a 6% inflation rate provides a buffer against uncertainty.

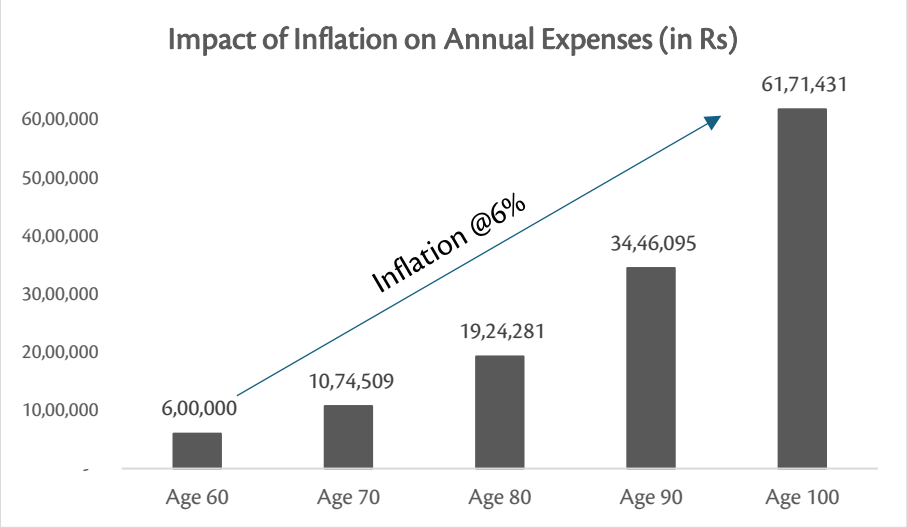
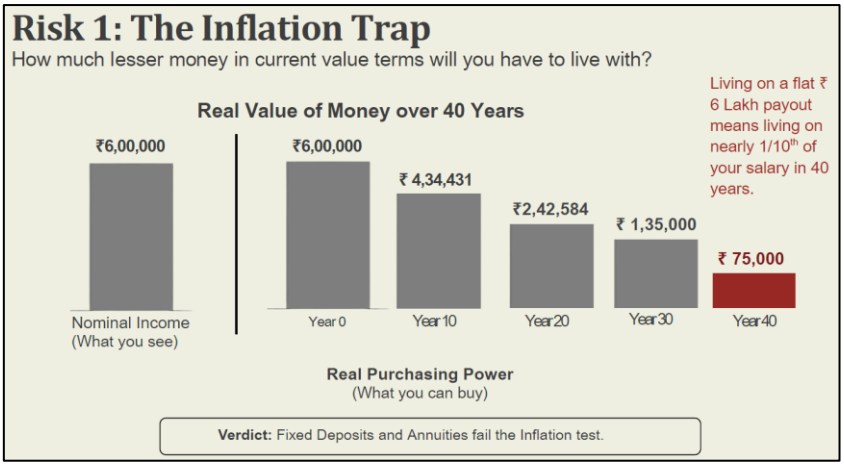


Exhibit 3 : Inflation Risk – Risk of Eroding Purchasing Power

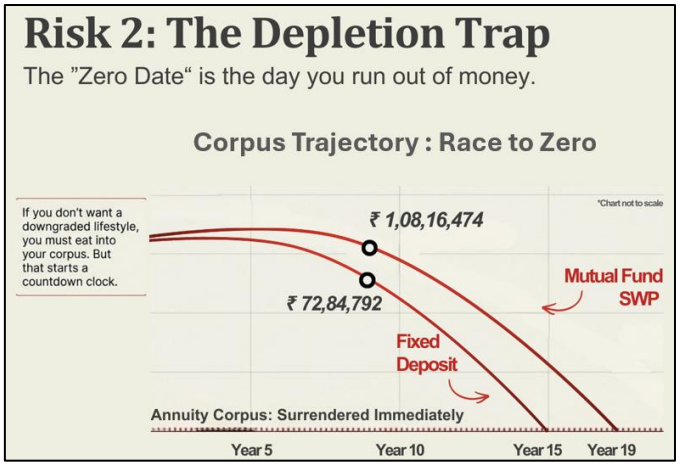
[4] Source : OmniScience Insights Lab



Expenses such as housing, utilities, services, and daily living costs tend to rise gradually, while healthcare costs often increase at a rate higher than general inflation. Because inflation compounds, its impact accelerates over time. A 6% inflation rate does not merely raise expenses only once, it continuously increases the cost base year after year, significantly altering income requirements over a 20–30 year retirement horizon, reinforcing the cumulative effect of this silent erosion.

Longevity Risk: The Risk of Living Longer

Longevity risk refers to the possibility that an individual may live longer than expected, thereby extending the period over which retirement savings must generate income. While living longer is a positive development, it increases the financial burden on retirement capital and raises the risk of reaching what may be termed the *"Zero Date"* — the point at which the retirement corpus is fully depleted.



Advances in medical technology, improved healthcare access, better nutrition, and rising living standards have steadily increased life expectancy. In India, life expectancy at the time of Independence was roughly 32 years, whereas today it stands at around 70 years. While the national average may be around this level and many financial plans implicitly assume life expectancy up to age 85, these assumptions can be conservative — particularly for the affluent segment. Higher income levels, better healthcare access, and greater awareness of fitness and preventive health often translate into longer lifespans. Empirically, many individuals observe their parents and grandparents living well into their late 80s and 90s.

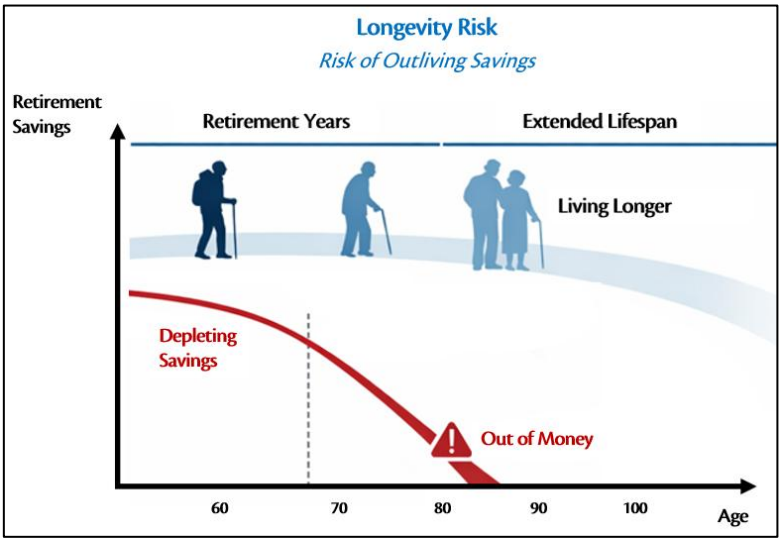


Exhibit 4 : Longevity Risk – Risk of Outliving Savings

Importantly, planning based on average or median life expectancy can be misleading. By definition, half the population will live beyond the median age, and a meaningful proportion will live significantly longer. If planning horizons underestimate survival probabilities, retirees risk encountering the Zero Date while still alive — a situation where income stops but expenses continue. Retirement planning, therefore, should not be anchored to median life expectancy but should incorporate upper-quartile survival assumptions to meaningfully reduce the probability of capital exhaustion.

Sequence of Returns Risk

The interaction between withdrawals and market performance introduces another critical dimension of retirement risk — the sequence in which returns occur. Sequence of returns risk refers to the impact that the timing of market returns can have on a retirement portfolio, particularly during the early years of withdrawals. Even if long-term average returns remain strong, experiencing market declines early in retirement can significantly reduce the portfolio's ability to recover, as withdrawals made during downturns may permanently erode capital — a dynamic that can be described as *"The Bad Timing Trap."*

To put this in perspective, consider an investor who retired just before the 2008 global financial crisis. Equity markets fell sharply during that period. If the retiree was drawing income from the portfolio at the same time, units would have been sold at depressed prices to fund expenses. Even though markets eventually recovered in subsequent years, the capital base would have already been reduced — meaning the recovery would compound on a smaller corpus.

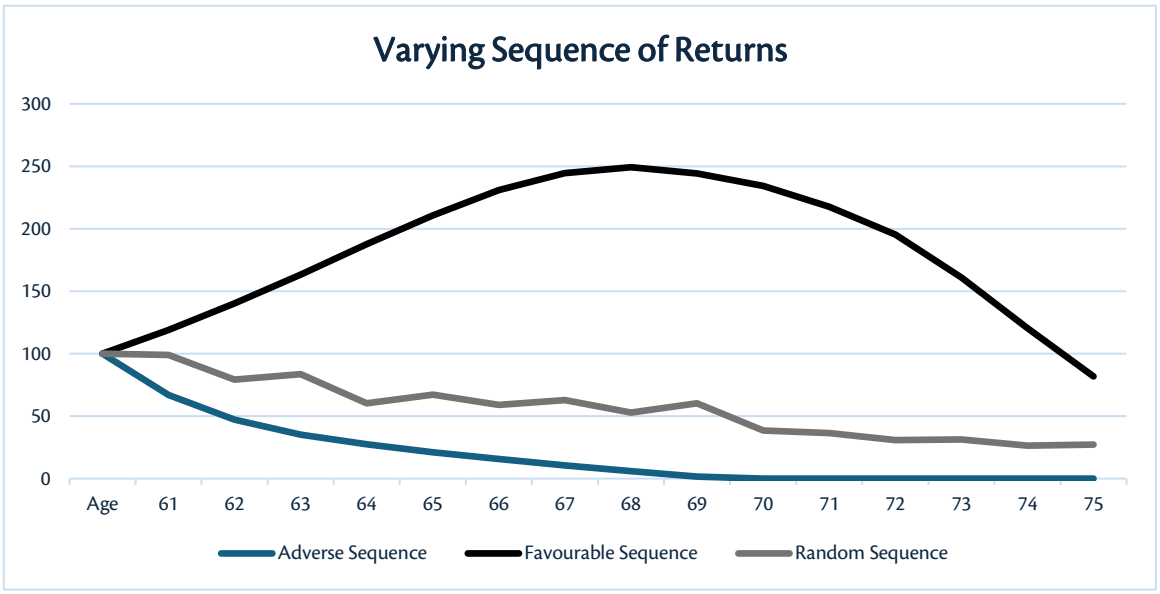


Exhibit 5 : Sequence of Return Risk

The chart above demonstrates that even when portfolios have identical average returns and the same withdrawal rate, final outcomes can differ materially depending on the order in which returns occur. In an adverse sequence — such as retiring into a 2008-type drawdown — early losses combined with ongoing withdrawals can permanently impair the capital base. Once reduced, subsequent positive returns have less capital to compound, increasing the probability of Bad Timing Trap. In contrast, the favourable sequence allows the portfolio to build a buffer in the initial years. When the drawdowns occur later, the impact is less damaging because they apply to a larger accumulated corpus.

Traditional Retirement Solutions

Fixed Deposits (FDs), insurance annuities, and Systematic Withdrawal Plans (SWPs) have traditionally formed the foundation of retirement income strategies due to their simplicity, familiarity, and perceived reliability. Each of these solutions addresses specific retirement needs, such as income predictability, capital preservation, or participation in market growth. However, underlying structures and longer retirement horizons have highlighted structural trade-offs when these solutions are used.

Fixed Deposits

Tax-saving FDs offer fixed returns (typically ~1.5% over inflation) with a 5-year lock-in period and relatively low risk. While they provide stability, returns are fully taxable and may struggle to keep pace with inflation over long retirement horizons. The capital remains largely static, limiting real wealth creation.

Importantly, when allocating to fixed income, we do not advocate taking incremental credit risk for higher yields, as that can put principal at risk. Allocations should ideally be towards high-quality instruments such as deposits with large scheduled commercial banks or predominantly AAA-rated debt.

Attempting to remain “safe” by allocating to so-called low-risk asset classes and then stretching within them for higher returns often leads to an unfavourable trade-off — high risk with limited return. A more rational framework is to take risk for higher upside potential in asset classes such as equities.

Life Annuity

Life annuities provide guaranteed income for life in exchange for an upfront lump sum investment, effectively eliminating longevity risk. Standard variants typically offer fixed payouts that do not adjust meaningfully for inflation, leading to a gradual erosion of purchasing power over time.

Even annuity options that incorporate annual step-ups or provide certain-period guarantees generally fail to keep pace with long-term inflation expectations. In addition, these variants often start with lower initial

payouts relative to the invested corpus, reducing income efficiency from the outset. As a result, while annuities address longevity risk, they do not adequately solve for inflation risk

Systematic Withdrawal Plan (SWP)

SWPs using hybrid funds offer market-linked returns. In this report, we assume an aggressive hybrid allocation of 65% equity and 35% debt to reflect the commonly recommended structure for retirement income through mutual funds. A 6% annual withdrawal rate, which is typical, is assumed for modelling purposes. While this provides higher growth potential, returns remain subject to market volatility and LTCG tax on gains above ₹1 lakh. Income sustainability therefore depends heavily on market performance and disciplined withdrawal management.

What's ScientificPay?

ScientificPay is an equity-biased strategy with a 75:25 equity-to-debt allocation as a starting framework, though the allocation is not rigid. The equity component is designed to drive long-term growth which could preserve purchasing power, while the debt allocation acts as a stability buffer to fund withdrawals without forcing equity sales during periods of market weakness.

The debt bucket is primarily used to meet income needs during market stress, reducing the need to liquidate equities at unfavourable valuations and allowing the growth component to compound over time. Conversely, when valuations are attractive and opportunities compelling, the portfolio may increase its equity allocation to capture long-term upside. In environments where equities appear significantly overvalued or risk-reward is unfavourable, the allocation may tilt more conservatively toward debt — and, if warranted, temporarily move predominantly or fully into debt.

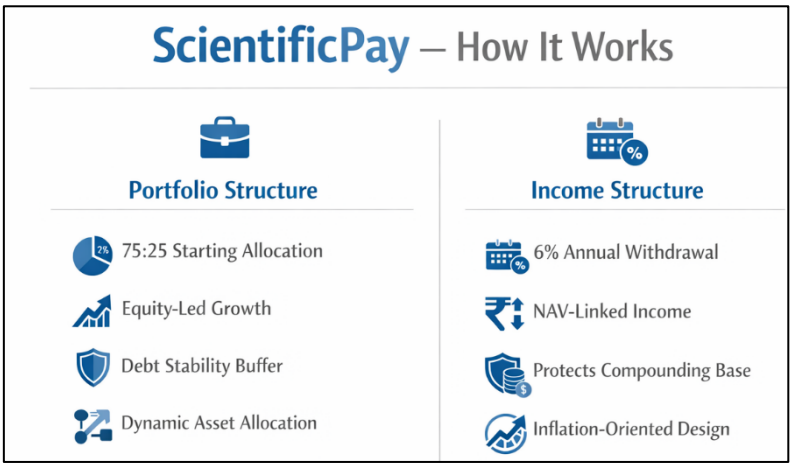


Exhibit 6 : ScientificPay Salient Features

Annual payouts under ScientificPay are set at 6% of portfolio value. Because withdrawals are linked to NAV rather than a fixed rupee amount, income adjusts in line with market performance. Payouts may be funded through a combination of dividends, interest income, realised capital gains, or capital depending on portfolio conditions. By avoiding fixed withdrawals irrespective of market levels, the strategy seeks to protect the compounding base over time.

Since this approach allocates significant part of the investment corpus to equities and with the inherent volatile nature of equities it is expected that the portfolio value will fluctuate significantly. The suggested withdrawals which are defined as a percentage of the portfolio value would also vary in rupee terms. Hence, for the initial 3 to 5 years investors should be prepared for the portfolio volatility and the lower payouts in the rupee terms if markets are unfavourable (sequence of returns risk).

Each of these solutions addresses a part of the retirement problem, but none fully resolves the combined challenge of inflation, longevity, and market volatility. Given these trade-offs, ScientificPay offers a more balanced approach — one that allows for growth, manages volatility, and adapts income over time.

The infographic below illustrates how these vehicles compare across key retirement outcomes.

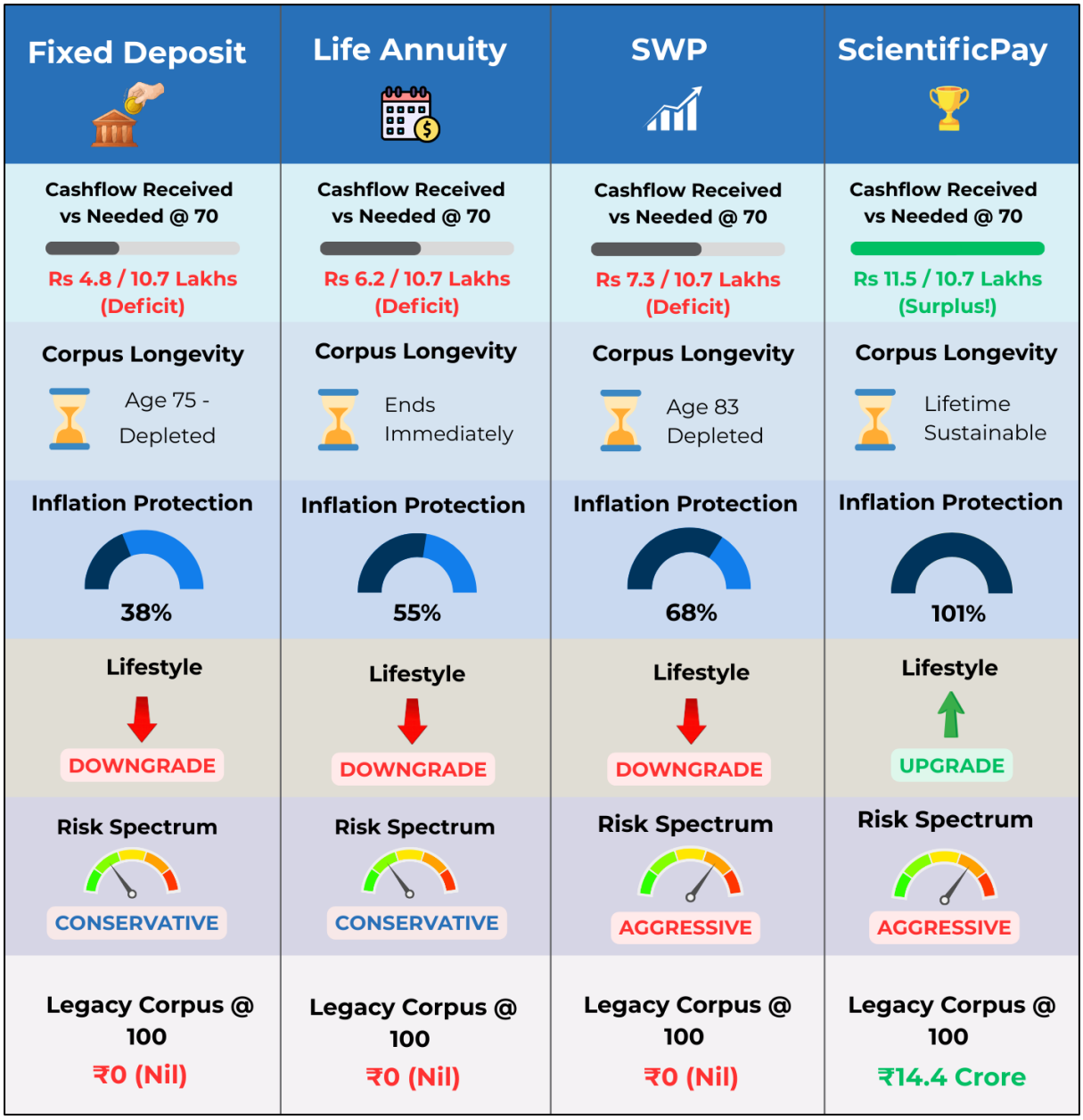


Exhibit 7 : Traditional Solutions vs ScientificPay with Rs 1 crore Corpus

* ScientificPay is not an investment product or offering, but a conceptual framework for retirement income structuring; please refer to the annexure and detailed disclaimers for further information.

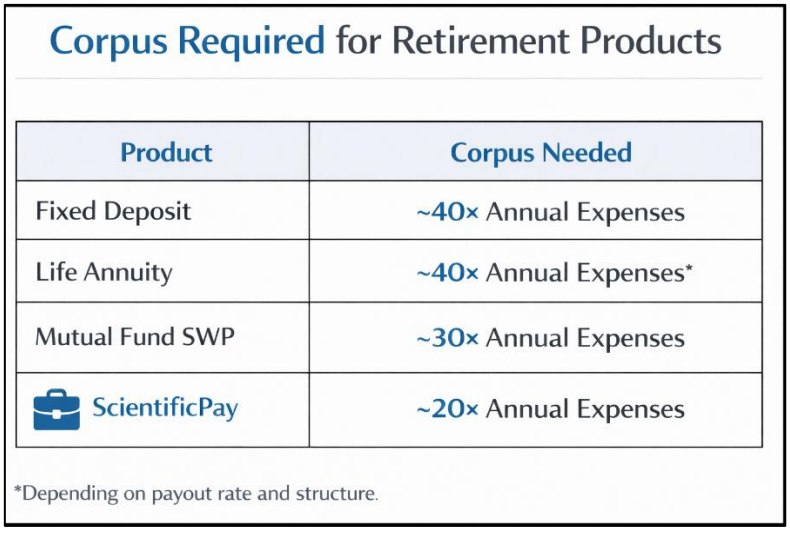
How Much is Enough?

The comparison across retirement products highlights one core reality: structure matters. Fixed Deposits and annuities offer stability but limited growth and inflation protection. SWPs provide growth potential but remain exposed to market, longevity and sequence of return risks. ScientificPay, a more aggressive strategy, aims to preserve purchasing power in line with or better than inflation, while significantly reducing the probability of running out of money in old age. Each approach produces materially different outcomes.

The key question, therefore, is not which product appears attractive in isolation, but how much capital is required at retirement to generate sustainable income under real-world conditions.

In this section, we model a defined retirement objective: an initial annual income of ₹6 lakh, growing at 6% per year. We evaluate the starting corpus required under each strategy and examine how it evolves over time, particularly under stress scenarios.

Our focus is not merely income generation, but long-term income sustainability — and how approaches such as ScientificPay may alter capital requirements, inflation resilience, and corpus durability over multiple decades.



Corpus Required for Retirement Products

Product	Corpus Needed
Fixed Deposit	~40× Annual Expenses
Life Annuity	~40× Annual Expenses*
Mutual Fund SWP	~30× Annual Expenses
ScientificPay	~20× Annual Expenses

*Depending on payout rate and structure.

Exhibit 8 : Breakeven Corpus Levels for Various Retirement Solutions

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Fixed Deposit

Fixed deposit–oriented strategy requires an estimated corpus of ₹2.3 crore to sustain withdrawals over a 40-year horizon. For an initial net annual income requirement of ₹6 lakh (growing at 6% annually), this translates to nearly 40 times annual expenses at the point of retirement. Assuming steady returns, the nominal corpus at age 85 is projected to grow to approximately ₹4.09 crore. Cash flows remain in surplus from age 60 to around 84, creating an accumulated buffer during the early retirement years. This surplus can then be deployed to offset the income deficit that emerges between ages 85 and 100.

Life Annuity

An immediate life annuity requires a breakeven corpus of approximately ₹2.36 crore, also translates to nearly 40 times annual expenses at the point of retirement, to generate lifetime income that meaningfully preserves purchasing power. The structure provides predictable payouts, resulting in a cash flow surplus from age 60 to around 75. This early-period surplus can be accumulated and deployed to offset the income shortfall that arises between ages 76 and 100.

Systematic Withdrawal Plan (SWP)

A SWP strategy requires a breakeven corpus of ~₹1.6 crore to sustain withdrawals across a 40-year retirement horizon. For an initial net annual income requirement of ₹6 lakh (growing at 6% annually), this translates to nearly 30 times annual expenses at the point of retirement. However, income drawn purely through the assumed SWP payout results in a cash flow deficit from the outset, with the shortfall funded through periodic drawdowns from the remaining corpus.

ScientificPay

With a recommended starting corpus of ₹1 crore, ScientificPay is designed to balance sustainable income with long-term growth potential. For an initial net annual income requirement of ₹6 lakh (growing at 6% annually), this translates to nearly 17 times annual expenses at the point of retirement. Under assumed return conditions, the corpus could grow to approximately ₹5.4 crore by age 85 and may potentially leave behind a legacy corpus of around ₹14.35 crore by age 100. While there may be a marginal cash flow deficit of roughly 6% in the first year, the strategy is expected to move into surplus thereafter under modelled scenarios. Outcomes, however, remain dependent on market performance and actual withdrawal patterns.

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Stress Test of Aggressive Strategies

In this section, we stress test aggressive, market-linked retirement strategies — specifically a traditional SWP approach versus ScientificPay — to evaluate how they perform under adverse conditions. While structure and allocation may appear sound in theory, the real test of any retirement strategy lies in its resilience during prolonged market stress.

To assess this, we simulate a severe sequence-of-returns scenario over a 40-year retirement horizon, assuming a ₹1 crore starting corpus, structured as follows :

- Year 1: Immediate market decline of −30%
- Years 2–4: 0% returns (no recovery phase)
- Years 5–7: Accelerated recovery phase delivering higher returns
- Years 8 onward: Normalised long-term average return assumption

The recovery returns in Years 5–7 are calibrated such that the portfolio realigns with the long-term compounded return trajectory over the full seven-year period.

We compare outcomes across the two approaches with a focus on corpus sustainability and deficit levels over time.

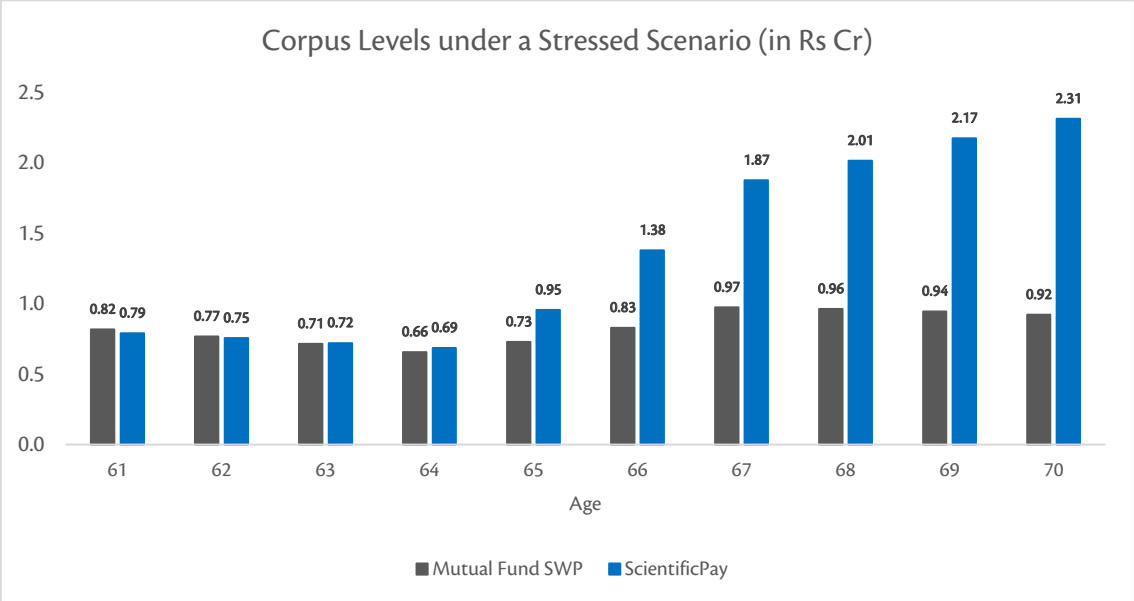

Exhibit 9 : Corpus Levels over Time (under a stressed scenario)

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Under the traditional SWP structure, the corpus declines steadily in the early stress years — falling from ₹1.00 crore at inception to ₹0.73 crore by age 65, and remaining under pressure thereafter at around 0.96 crore through age 68 before declining again. Early market losses combined with ongoing withdrawals impair the capital base, limiting its ability to recover meaningfully.

In contrast, ScientificPay also moderates in the initial years — declining from ₹1.00 crore to ₹0.72 crore by age 63 and ₹0.69 crore by age 64. The portfolio stabilises and begins recovering meaningfully from age 65 onward. The corpus rises to ₹0.95 crore at age 65 and crosses ₹2.01 crore by age 68, continuing to strengthen thereafter.

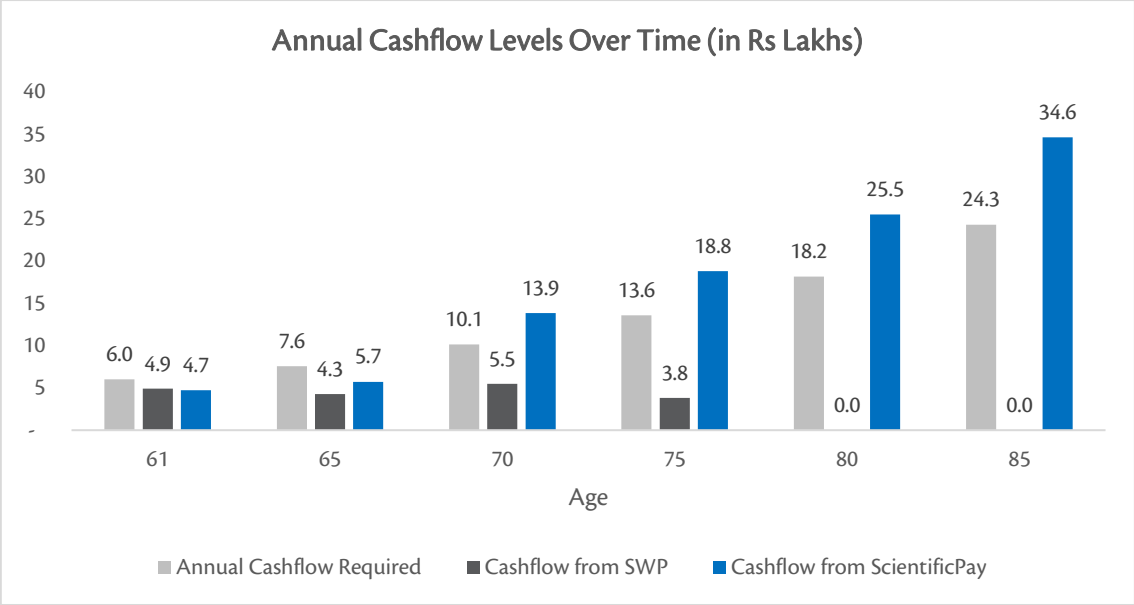

Exhibit 10 : Cashflow Levels over Time (under a stressed scenario)

Under the stress scenario, the traditional SWP approach generates persistent cash flow shortfalls relative to the required income. At age 61, while the annual income required is ₹6 lakh, the SWP generates only ₹4.9 lakh. The gap widens over time — by age 70, the required income rises to ₹10.1 lakh while SWP delivers just ₹5.5 lakh. By age 75, the cash flow from SWP falls to ₹3.8 lakh against a requirement of ₹13.6 lakh, and beyond age 80 the strategy effectively delivers no income, indicating capital exhaustion.

In contrast, ScientificPay initially runs below the required income in the early years (₹4.7 lakh versus ₹6 lakh at age 61, and ₹5.7 lakh versus ₹7.6 lakh at age 65). However, as the portfolio stabilises and compounds, cash flows strengthen meaningfully — reaching ₹13.9 lakh by age 70 against a requirement of ₹10.1 lakh, and ₹18.8 lakh by age 75 versus ₹13.6 lakh required. By age 85, ScientificPay generates ₹34.6 lakh annually against a required ₹24.3 lakh, creating a meaningful surplus.

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The key difference between the MF SWP and the ScientificPay approaches lies in the withdrawal mechanism during times of stress. In the MF SWP approach the withdrawal of units effectively results in selling of 65% equity and 35% debt even during times of market stress thus eroding the capital base permanently. A significant portion of the equity has been withdrawn while it could have aided in capital recovery during eventual market recovery.

In contrast, in the ScientificPay approach, the withdrawal during times of stress is only from the debt portion and equity portion is left untouched. Secondly, the withdrawal is as a percentage of NAV and hence the portfolio survives for longer without needing to withdraw from equity portion. When the market recovery comes the equity portion recovers fully.

This shows how a variable payout mechanism adjusts income to prevailing portfolio levels. While this may introduce short-term variability, it materially reduces long-term capital strain and improves sustainability. Over a 40-year retirement horizon, structural design matters more than headline return assumptions. The combination of a debt buffer and market-linked payouts materially improves the probability of sustaining income while preserving capital.

Breakeven Corpus to Withstand Stress

The stress test highlights how structure influences sustainability. However, beyond relative performance, retirees ultimately need clarity on one fundamental question: how much capital is required at the point of retirement to sustain income for 40 years? Under the modelled scenario :

- Traditional SWP strategy requires a starting corpus of ~ ₹1.5 crore to sustain withdrawals over a 40-year horizon and would effectively deplete the corpus by the end of the period.
- ₹1 crore under ScientificPay could potentially grow to approximately ₹14.4 crore over a 40-year retirement horizon, while generating sustained surplus cash flows across most years.

This outcome reflects the combined effect of equity-led compounding, a debt buffer that avoids forced selling during downturns, and a payout structure linked to portfolio value. While short-term variability may occur, the structure allows capital to recover and grow over time rather than being steadily eroded.

As with any market-linked strategy, actual outcomes will depend on realized returns. However, the modelled results illustrate the structural advantage of preserving the compounding base during periods of stress.

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Conclusion

The questions posed at the outset of this report were straightforward. The answers, however, required a structural evaluation of various factors. Based on the modelling and stress testing conducted, we summarise our findings below.

- The first question of sustainability of annual income from a ₹1 crore corpus varies materially depending on the structure of withdrawals and asset allocation.

Strategy	Actual Payout per Annum				
	60	70	80	90	100
Annual Payout Required	6 Lakh	10.75 Lakh	19.25 Lakh	34.5 Lakh	62 Lakh
Fixed Deposit	7.5 Lakh	5.5 Lakh	0	0	0
Life Annutity	7.8 Lakh	7.8 Lakh	7.8 Lakh	7.8 Lakh	7,78,000
SWP	6 Lakh	7.3 lakh	3.7 Lakh	0	0
ScientificPay	6 Lakh	11.5 Lakh	22 Lakh	42 Lakh	81 Lakh

  The analysis demonstrates that income sustainability is not driven by corpus size alone, but by structure — particularly how withdrawals interact with market returns and inflation over time.

- We next assessed the consequences of funding income shortfalls by drawing down capital — specifically, at what age the corpus would be depleted under different approaches.

Strategy	Nominal Corpus					Corpus Runout by
	60	70	80	90	100	
Fixed Deposit	1 Crore	73 Lakh	0	0	0	75
Life Annutity	0	0	0	0	0	Immediate
SWP	1 Crore	1.2 Crore	63 Lakh	0	0	83
ScientificPay	1 Crore	2 Crore	4 Crore	7.5 Crore	14.4 Crore	Never

  Under adverse sequencing, traditional structures face significant depletion risk, highlighting the mathematical impact of early drawdowns.

- Recognising that ₹1 crore may not sustain long-term inflation-adjusted income, we evaluated the breakeven corpus required under each strategy over a 40-year horizon, assuming survival until age 100 in light of improving medical care and rising affluence, and an initial annual income requirement of ₹6 lakh today.

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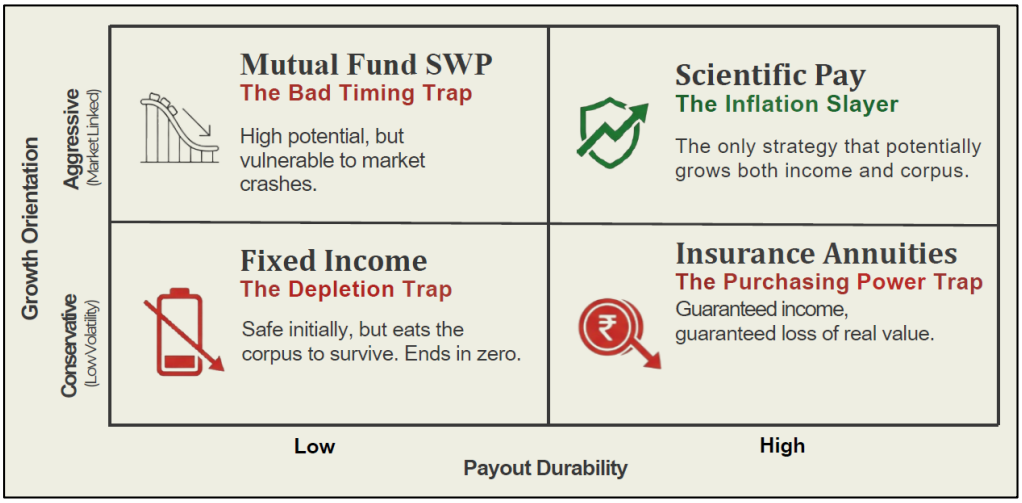
Strategy	Annual Expenses at Beginning of Retirement	Corpus Required	Corpus as a Multiple of Current Expenses
Fixed Deposit	6 Lakh	2.30 Crore	39x
Life Annutity	6 Lakh	2.35 Crore	40x
SWP	6 Lakh	1.60 Crore	27x
ScientificPay	6 Lakh	1 Crore	17x

Traditional solutions demand substantially higher multiples of annual expenses, reflecting their structural limitations in managing long-term risk.

- Finally, we examined how to invest this corpus so that it allows one to maintain one's lifestyle during retirement (inflation risk) and not run out of money in old age (longevity risk).



  - Fixed Deposit
    - FDs offer fixed returns with relatively low risk. While they provide stability, returns are fully taxable and may struggle to keep pace with inflation over long retirement horizons. The capital effectively erodes as cashflow deficits are funded by corpus, offering limited protection against both purchasing power erosion and longevity risk.
  - Life Annuity
    - Life annuities provide guaranteed income for life in exchange for an upfront lump sum investment, effectively eliminating longevity risk. Standard variants typically offer fixed payouts that do not adjust meaningfully for inflation, leading to a gradual erosion of purchasing power over time.
  - Systematic Withdrawal Plan (SWP)
    - While SWPs offer growth potential that can help address inflation and longevity risk, they remain highly vulnerable to sequence-of-returns risk. In a typical hybrid

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structure, withdrawals are executed proportionately, effectively forcing the sale of equity at depressed valuations, during market downturns. This permanently erodes the capital base, reducing the portfolio's ability to recover and sustain income over time.

- Scientific Pay
  - ScientificPay, a proposed equity-biased strategy with a 75:25 equity–debt allocation under normal conditions. Withdrawals are set at 6% of NAV annually, and funded from the debt bucket as long as it is available. In weaker market years, variable payouts avoid forced equity sales at unfavourable valuations.
  - Stress testing under a severe early market drawdown shows that traditional SWP structures can face sustained deficits and capital erosion. In contrast, the combination of a debt buffer and NAV-linked withdrawals allows ScientificPay to stabilise and resume compounding over time.

Modelled outcomes suggest that retirement success is ultimately determined not by how much one saves, but by how well the structure of the portfolio protects capital and sustains income across decades of uncertainty.

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Annexure

Normal Modelling Assumptions

This section outlines the key assumptions used in constructing the financial models for the four retirement solutions evaluated: Fixed Deposits (FD), Life Annuity, Systematic Withdrawal Plan (SWP), and ScientificPay. Common Assumptions-

- The models are designed using conservative and slightly strict scenarios to provide a realistic assessment of the risks and sustainability challenges faced during retirement.
- The modelling horizon spans 40 years (Age 60 to 100), based on annual projections.
- A starting retirement corpus of ₹1 crore is assumed for each solution.
- Annual cash flow requirement beginning at age 61 is ₹6 lakh (₹50,000 per month).
- Inflation is assumed at 6% annually throughout the retirement period.

Fixed Deposits Model Assumptions:

- FD returns assumed at a spread of 1.5% above inflation i.e., 7.5%
- Any surplus or deficit cash flow relative to annual requirements is added back to or withdrawn from the principal corpus.
- Taxation is applied at an average marginal tax rate of 20%

Life Annuity Assumptions:

- Average annuity payout is assumed at 7.78%, based on average prevailing rates across multiple life annuity products currently.
- Taxation is applied at an average marginal tax rate of 20%.

Systematic Withdrawal Plan:

- Aggressive fund allocation with an equity-to-debt ratio maintained at 65:35.
- Debt returns assumed at 7.5% (inflation plus 1.5% spread).
- Sustainable long-term equity returns assumed at 12% (inflation plus a 6% spread).
- Expense ratio assumed at 1.50% (regular plan).
- As withdrawals involve unit redemption, Long-Term Capital Gains tax is applied at 12.5%.
- Any annual surplus or deficit relative to required cash flow is reinvested into or withdrawn from the principal corpus accordingly.

ScientificPay:

- Portfolio structured with an equity-to-debt allocation of 75:25.
- Expense ratio assumed at 2.50%.
- Blended effective return of 13% assumed for the period, net of expenses and taxes.
- A fixed payout of 6% of NAV is distributed annually, without adjustments for surplus or deficit cash flows.

Assumptions for Stress Test of Aggressive products

Same assumptions as stated above for normal modelling except sequence of returns for equity portion, which is –

- Equity returns are assumed as -30% in the first year, followed by 0% returns in year 2, 3 and 4 to simulate early retirement stress scenarios. Subsequently, a three-year recovery phase with elevated returns is modelled to restore NAV to levels consistent with normal assumptions by year 7.

Breakeven Corpus Condition

The corpus is calibrated such that from age 60 to 100 the retiree experiences no cash flow deficit, and the portfolio value reduces to zero precisely at the end of the 100th year.

Disclaimers

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