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Case study on Performance Evaluation Framework for Mutual Funds: Beyond Life-Cycle Insights

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ABSTRACT

The Indian mutual fund sector serves a variety of investors spanning multiple generations and varying degrees of risk appetite. In this context the case study aims to create an assessment model, for evaluating mutual fund performance. This model extends beyond financial metrics incorporating a wide array of factors. The research utilizes data, from 2025 obtained from Indian mutual fund screener websites and AMFI publications to examine the investment patterns of various generational groups, namely Generation Z (aggressive) Generation X (moderate) and Baby Boomers (conservative) and explores how they might utilize risk-adjusted indicators to enhance their portfolios. Such indicators consist of Sharpe and Sortino ratios, alpha, beta and expense ratios. Visual representations of data, such as risk, return scatter plots, and ratio comparison bars, make it easier for the respective profiles to understand which fund categories perform best for them. The case study further supports the chosen methodologies by combining established and emerging finance theories and providing proof that a thorough data-focused strategy not greatly enhances the investment decision-making process but also renders it more responsive, to behavioral and demographic factors. The results offer a wealth of insights that investors, advisors and fund managers can easily apply when planning their future portfolio strategies.

1. INTRODUCTION

Mutual funds have turned out to be necessary investment tools, which offer diversification, liquidity, and professional management to Indian investors. The participant demographics have notably diversified across generations, as the asset under management (AUM) in Indian mutual funds crossed ₹50 trillion in 2025 (AMFI, 2025).

Every generational group, Generation Z, Generation X, and Baby Boomers, has distinct investment concerns, which are the result of their risk tolerance, financial knowledge, and time horizon. Generation Z investors seek rapid wealth creation through equity, focused funds; Generation X mixes growth with income stability; and baby boomers concentrate on capital preservation through conservative fixed-income funds (Economic Times, 2025).

Traditional criteria for assessing funds largely rely on life cycle age categories and simple absolute returns, which rarely capture the complexities of risk, expenses and fund manager expertise. Theories rooted in life sciences, such as Markowitz's Modern Portfolio Theory from 1952 highlight the balance, between risk and reward. This approach enables optimization via diversification and minimizing variance.

The approach to assessing funds depends on risk-adjusted performance indicators like the Sharpe Ratio first presented in 1966 and the Sortino Ratio, developed in 1994. These metrics illustrate returns per unit of downside risk among other factors. Performance measures adjusted for benchmarks, including Jensen's Alpha, from 1968 and Beta additionally shed light on expertise and susceptibility to systematic volatility. Furthermore the cost components of a fund such as its expense ratio and portfolio turnover can as per Elton et al. 1993 Greatly impact the returns experienced by investors. This research presents a performance evaluation framework that produces investor profiles. It uses mutual fund categories and data from 2025 obtained from credible sources for evaluation; therefore the case study blends quantitative indicators, with behavioural perspectives. The goal is to offer investors and advisors sophisticated tools that go beyond basic

classification and support the development of well-informed and customized portfolios.

2. LITERATURE REVIEW

India's mutual fund sector has grown tremendously in popularity over years. By 2025 they manage than ₹50 trillion indicating that mutual fund adoption cuts across various age groups. Earlier the conventional methods, for evaluating funds in India focused solely on basic returns and age-based segmentation. Such an approach is overly basic compared to the needs of investors and the market risks involved. A key idea discussed here is Markowitzs Modern Portfolio Theory (1952) which essentially advises optimizing your portfolio by choosing a mix of risky and riskless assets. Later improvements introduced risk metrics such, as the Sharpe Ratio (Sharpe 1966) and the Sortino Ratio (Sortino 1994). These metrics offer investors insight into returns that are adjusted according to the risks involved. Other measures, such as Jensen's Alpha (1968) and Beta, similarly indicate the performance of the fund managers and the level of funds' co-movement with the market, respectively.
Elements like fund expenses (Elton et al. 1993) And concepts from finance such as prospect theory (Kahneman & Tversky 1979) assist in explaining investor results and the reasons, behind their decisions.
Recent studies suggest that investment choices ought to be tailored to each generation: Gen Z prefers growth through stocks Gen X seeks a balance between growth and security and baby boomers aim to protect their funds with low-risk assets. Consequently life-cycle approaches face criticism for overlooking these distinctions prompting a search for investment assessment methods. Mateus et al. (2025) Propose combining data with investor behaviour to provide superior guidance, on portfolio enhancement.

3. DATA AND METHODOLOGY

This case study utilizes a mixed-methodology approach. It combines world quantitative information with the psychological factors of investors to develop a thorough performance assessment model for Indian mutual funds. Data from the year 2025 was gathered from AMFI reports, mutual fund screening platforms and financial media outlets such, as Economic Times and Moneycontrol.com.

3.1 Investor Profiling

Investors from three generations are categorized based on their risk tolerance, investment horizon and fund selection: Gen Z (risk) Gen X (medium-risk) and Boomers (low-risk). Each group aligns with types of funds (such as small-cap for Gen Z, hybrid/large-cap for Gen X and debt/short-duration, for Boomers) allowing for focused and thorough evaluation.

3.2. Data Collection and Key Metrics

The performance data shows the five major categories of mutual funds with the inclusion of the five-year returns, standard deviation, Sharpe Ratio, Sortino Ratio, Alpha, Beta, and expense ratios. These figures give the basis for the comparisons between investor groups and fund types to be made, thereby facilitating both absolute and risk-adjusted performance reviews.

3.3. Analytical Framework

Risk-adjusted metrics (Sharpe, Sortino) show the return gained per unit of risk. Alpha and Beta determine how much a funds performance varies from its benchmark and market fluctuation. Expense ratios demonstrate the effect of fees on investors' returns. Comparative visual tools, like bar charts and scatter plots display results and the relationships, among risk, returns and investor behaviour based on demographics.

4. Contextualization and Interpretation

The results are analysed concerning established finance theories and actual investor behaviour. This premise leads to a thorough debate on the adjustment of portfolio strategies. The framework challenges the traditional life-cycle models.

Table 1. Investor Profiles

Generation Type	Risk Appetite	Investment Horizon	Preferred Fund Categories
Generation Z	Aggressive	10+ years	Small-Cap, Mid-Cap Equity Funds
Generation X	Moderate	5–10 years	Hybrid Funds, Large-Cap Equity
Baby Boomers	Conservative	1–5 years	Debt Funds, Short-Duration, Liquid

Sources: AMFI (2025); Economic Times (2025)

Performance Metrics and Definitions

1. **Sharpe Ratio** *Sharpe*, 1966:

$$S = \frac{R_p - R_f}{\sigma_p}$$

Measures excess return relative to total portfolio risk, where R_p = portfolio return, R_f = risk-free rate, σ_p = standard deviation of portfolio returns.

2. **Sortino Ratio** Sortino & Price, 1994):

$$S_d = \frac{R_p - R_f}{\sigma_d}$$

Focuses on downside volatility risk (σ_d) rather than overall risk.

3. **Alpha** *Jensen*, 1968:

$$\alpha = R_p - (R_f + \beta(R_m - R_f))$$

Measures fund's risk-adjusted excess return relative to market returns.

4. **Beta**:

$$\beta = \frac{Cov(R_p, R_m)}{Var(R_m)}$$

Represents fund volatility compared to the market.

5. **Expense Ratio** *Eltonetal.*,1993: Percentage of fund assets consumed by annual operating expenses.

Table: 2. Data Overview (2025 Indian Mutual Funds)

Fund Category	5-Year Return (%)	Std. Deviation (%)	Sharpe Ratio	Sortino Ratio	Alpha	Beta	Expense Ratio (%)
Small-Cap (Gen Z)	26	20	1.5	1.8	2.2	1.2	1.4
Mid-Cap (Gen Z)	20	18	1.4	1.6	1.8	1.1	1.3
Hybrid (Gen X)	12	9	1.3	1.5	1.1	1.0	1.2
Large-Cap (Gen X)	13	11	1.2	1.3	1.0	0.9	1.1
Debt (Boomers)	8	4	1.1	1.2	0.5	0.5	0.8
Short-Duration (Boomers)	7	2	1.0	1.1	0.3	0.4	0.7

**Sources: Moneycontrol.com (2025), AMFI (2025) *economictimes+1*

The table above clearly illustrates how the fund structure corresponds with the risk preferences tied to investor ages to maximize returns, risk management and cost efficiency. Gen Z funds focus on growth significant volatility, strong alpha and the most favorable risk-adjusted returns for building wealth over the long term. X funds offer a compromise, between returns and stability as hybrid and large-cap funds carry risk levels while maintaining robust Sharpe ratios. Boomer funds prioritize safeguarding principal reducing fluctuations and ensuring income in Debt and Short-Duration approaches albeit, with reduced returns and alpha.

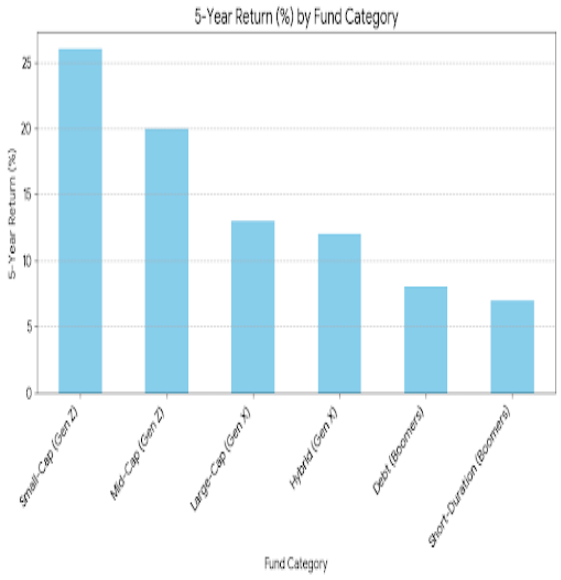


Fig 1. Comparative Analysis of 5-Year Returns Across Fund Categories

5-Year Return (%) by Fund Category

The bar chart displays the 5-Year Return (%) for each fund category ranked from highest to lowest. Small-Cap (Gen Z) shows the return at 26% whereas Mid-Cap (Gen Z) has a return of 20%. The smallest returns are seen in Short-Duration (Boomers) at 7%. Debt (Boomers), at 8%.

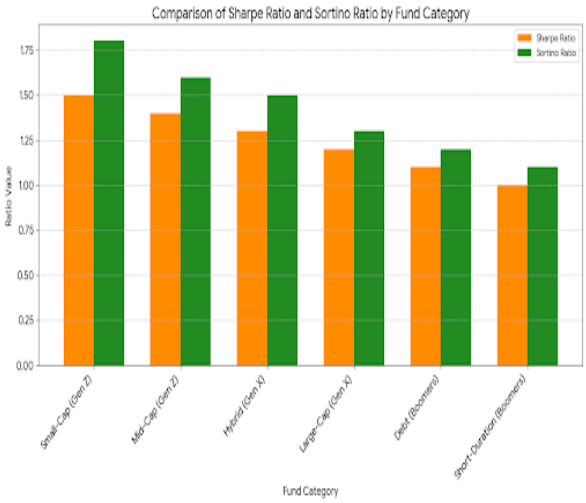


Fig. 2 Comparison of Sharpe Ratio and Sortino Ratio

The graph illustrates the Sharpe Ratio and the Sortino Ratio across each fund category. Both metrics assess returns adjusted for risk. The Sortino Ratio, which accounts for downside volatility exceeds the Sharpe Ratio in every fund. These ratios reach their peak for Small-Cap (Gen Z) (Sharpe ratio = 1.5 & Sortino ratio = 1.8). Conversely the lowest values, for both ratios are found in Short-Duration (Boomers) (Sharpe ratio=1.0 & Sortino Ratio=1.1).

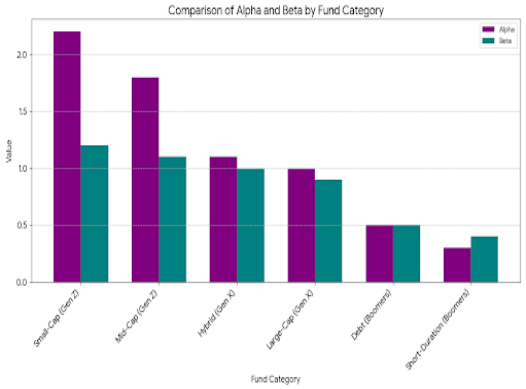
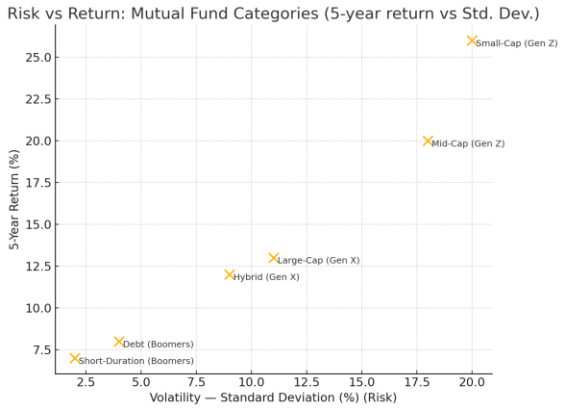


Fig 3. Comparison of Alpha and Beta

This comparative bar chart illustrates the differences between Alpha (a funds return relative to a benchmark) and Beta (a funds volatility relative to the market) for each fund. Small-Cap (Gen Z) demonstrates the past performance boasting an Alpha of 2.2. The cap-based funds possess a beta close to or, above 1.05 with Small-Cap (Gen Z) reaching the highest at 1.2. Both reach their peak values at Alpha=0.3 and Beta=0.4 indicating that the volatility is quite minimal relative, to the market and the outperformance is also minimal.

Table 3. Risk vs. Return Mutual Fund Categories

Category	5-Year Return (%)	Standard Deviation (%)	Primary Investor Generation
Small-Cap	26	20	Gen Z
Mid-Cap	20	18	Gen Z
Large-Cap	13	11	Gen X
Hybrid	12	9	Gen X
Debt	8	4	Boomers
Short-Duration	7	2	Boomers



Positive risk-return relationship: Categories with volatility (small-cap, mid-cap) yield superior 5-year returns; categories, with lesser volatility (debt, short-duration) provide reduced returns. Distinct generational segments: Gen Z capital is associated with risk and rewards; Gen X falls within the moderate-risk/moderate-reward range; Boomers belong to the low-risk/low-reward segment. Insight: For long-term investors with a high risk tolerance small/mid-cap stocks may be suitable; whereas, for conservative investors, debt or short-duration funds are better options to preserve more capital.

5. DISCUSSION

Generational Investment Strategies

Data supports that generational disparities are factors influencing mutual fund investments and expressed risk tendencies. Typically Generation Z investors lean towards portfolios heavily weighted towards small-cap and mid-cap funds offering substantial capital growth coupled with heightened volatility. Conversely Generation X tends to prefer hybrid and large-cap equity funds. On the hand Baby Boomers choose a capital protection approach and therefore prefer debt and short-term funds that carry minimal risk and provide consistent returns.

Brooks and Oikonomou (2018) observe that conventional approaches to life-cycle segmentation face growing criticism for not capturing demographic variations since todays investor decisions rely on much more than just age. Behavioral elements such, as knowledge, investment duration and psychological risk tolerance significantly influence how various generations behave when choosing mutual funds.

Selection Criteria and Behavioral Influences

When examining funds it becomes evident that focusing solely on absolute returns doesn't fully capture how individuals choose their investments. Certainly figures are important. Investors also consider aspects, like expense ratios the credibility of the manager and the opinions of their peers—particularly when these elements align with their personal experience and financial goals. Elton and his colleagues (1993) demonstrate that fund fees genuinely affect the returns investors receive so considering a fund's operational efficiency is logical. Kahneman and Tversky's Prospect Theory clarifies why many senior investors are more

concerned about losses, than overlooking substantial profits. They prefer funds that guard against losses at the cost of sacrificing greater gains. Studies like Holden and Schrass (2017) and the latest ICI research (2025) back this up—risk tolerance drops as people get older, so folks naturally shift toward safer asset classes.

The Case for a Multivariate Evaluation Framework

Recent studies, such as Mateus et al. (2025) Advocate for a comprehensive method of assessing funds. Than focusing on just one or two metrics this strategy combines risk-adjusted indicators (such as Sharpe, Sortino, Alpha and Beta) with data on investor habits and demographics. This represents an advancement, beyond the single-factor frameworks. It identifies trends and enhances the pertinence of financial guidance. Consider the Mateus-Mateus-Todorovic model. It steps up fund selection by looking at how funds stack up against their peer group and how often they beat their benchmarks, not just once, but consistently. That makes it easier to spot funds that really outperform, not just get lucky. This kind of thinking is catching on—both academics and professionals see the value in models that mix hard stats with the way real investors think and act.

Implications for Practice

Applying a framework of this kind equips both investors and advisors, with the means to create portfolios that genuinely align with individuals' lifestyles and mindsets than merely appearing attractive on paper. Asset managers can leverage these understandings to develop funds and promote them with greater success. For individuals—Gen Z, Gen X Boomers—this translates to options tailored to their needs and objectives reducing the common mismatch caused by overly simplistic models. The study also highlights that incorporating ESG elements and AI-driven analytics into these models enhances the precision and long-term relevance of advice. This transition is accelerating, particularly as regulations evolve and markets continue to fluctuate.

6. CONCLUSION

This case study utilizes combined risk-adjusted return metrics, efficiency analysis and generational behavior insights to develop a framework for assessing mutual fund performance. Merging these conceptual evaluations will aid in making informed investment choices and promote portfolio strategies aligned with evolving demographic demands. Expanding this framework by including ESG metrics and AI-powered analysis presents promising opportunities, for investigations.

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