Exploring Performance Indicators and Patterns in Indian Mutual Funds

A DISSERTATION SUBMITTED FOR THE PARTIAL FULFILLMENT OF B.A.(Hons.) ECONOMICS-2024

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Declaration

I hereby declare that the Field work & Dissertation work titled "Exploring Performance Indicators and Patterns in Indian Mutual Funds" submitted to the Department of Economics, Faculty of Social Sciences, Banaras Hindu University, Varanasi is prepared by me under the guidance of Dr. Priyabrata Sahoo. The work is original and I further confirm that all the materials which I have taken and borrowed from the other sources and incorporated into this work are duly acknowledged. If any material is incorporated into this work without due acknowledgement, it will be entirely my responsibility. This has not been submitted to any other agencies/ institutions for any other purpose.

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CERTIFICATE

This is to certify that the Dissertation entitled Exploring Performance Indicators and Patterns in Indian Mutual Funds is a bonafide record of independent research work done by Naman Dudhoria under supervision of Dr. Priyabrata Sahoo and submitted to Banaras Hindu University in partial fulfillment for the award of the Degree of BACHELOR OF ARTS IN ECONOMICS

Signature of the supervisor

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Abstract

The dissertation's primary focus is on the exploration of performance indicators and patterns in Indian mutual funds by utilizing data sourced from indianmutualfunds.com. It deeply delves into the importance and implications of ratio indicators such as expense ratio, standard deviation, Sharpe ratio, beta, and Alpha when assessing mutual fund performance. Furthermore, the study adopts a cross-sectional design methodology to capture a snapshot view of the current landscape of the mutual fund industry in India, covering a wide array of fund categories and subcategories. In addition to ratio indicators, non-ratio indicators like fund size, minimum SIP, fund risk level, and fund rating are also taken into account during the analysis process to present a holistic overview of the mutual fund data being scrutinized. The overarching goal of the research is to unearth correlations and patterns among the selected performance indicators, thereby enhancing the depth of analysis and providing valuable insights for investors to make well-informed decisions regarding mutual fund investments.

The research methodology integrates both descriptive and inferential statistics to thoroughly analyse the performance indicators of Indian mutual funds. Central tendency measures are applied to both ratio and non-ratio indicators to offer a comprehensive understanding of the mutual fund data under investigation. Moreover, inferential statistics techniques such as correlation analysis and Chi-square test for association are employed to delve into the relationships between performance indicators, returns, company, and category of mutual funds. By analysing a diverse range of funds across different categories and subcategories, the study aims to comprehend the factors influencing the performance of Indian mutual funds, thereby providing crucial insights for investors in their decision-making process.

Correlation analysis is utilized in the research paper to explore the relationships between various performance indicators, returns, company, and category of mutual funds in order to grasp the factors impacting their performance. Furthermore, the Chi-square test for association is employed to further probe associations between different variables in the dataset, shedding light on the intricate interplay between various factors and mutual fund performance. The study aims to decipher the factors influencing the performance of Indian mutual funds by scrutinizing performance indicators through a blend of descriptive and

inferential statistics. By employing a cross-sectional analysis approach and employing purposive sampling criteria to select mutual funds representing diverse categories within the industry, the research endeavours to furnish a comprehensive overview of the current status of the mutual fund industry in India.

The examination of volatility and market sensitivity in different mutual fund categories is conducted to provide insights into the risk levels associated with these funds, revealing varying degrees of volatility and market sensitivity across distinct fund categories.

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Chapter 1: Introduction

Mutual Funds are a subject matter that garners immense interest not only from researchers globally but also from various investors seeking to understand its intricacies. Investors often view mutual funds as an attractive medium-to-long term investment vehicle due to its perceived advantages and potential returns. When delving into the realm of mutual funds, they can be classified into different categories based on their inherent characteristics. One such category is **Equity funds**, where the pooled funds are invested in the stocks of publicly traded companies. Within Equity funds, fund managers employ various strategies for stock selection, thereby influencing their investment decisions and the overall performance of the fund. For instance, some fund managers adopt a value-oriented approach, focusing on identifying undervalued stocks in comparison to their peers in the market. On the other hand, another strategy involves a growth-oriented approach, wherein managers seek out stocks exhibiting accelerated growth rates relative to their industry counterparts or the broader market. Furthermore, there are managers who opt for a balanced approach by including both growth and value stocks in their portfolios, aiming to achieve a diversified investment mix. These distinct approaches in stock selection contribute to the overall composition and performance of the Equity mutual funds.

Debt mutual funds are a specific category of mutual funds tailored for risk-averse investors seeking capital appreciation alongside satisfactory returns on their investments. These funds cater to individuals who prioritize stability in their investment portfolios and desire a steady stream of income. Investors opting for debt funds can benefit from two key features: capital appreciation and regular income. On the other hand, balanced funds, as the name implies, represent a blend of equity and debt instruments. They allocate their resources across both equity stocks and fixed income securities, aligning with the predefined investment goals of the fund. While the equity component facilitates growth opportunities, the debt portion ensures a level of return stability. The primary objective of balanced funds is to mitigate some of the risks associated with equity investments by introducing exposure to debt instruments, all the while striving to deliver satisfactory returns.

quantitative measures are utilized by investors to assess the suitability of different funds for their investment needs. The first measure is the **Expense Ratio**, which signifies the yearly costs associated with a fund, encompassing management fees and administrative expenses. It is generally preferred to opt for funds with a lower expense ratio as it indicates more efficient cost management. The expense ratio represents the *proportion of the total assets that are utilized for managing a mutual fund*. Particularly in the case of bond funds, where returns are often similar, expenses play a crucial role in the comparison process. Regulating bodies like SEBI have set limits on the charges that a fund can impose. Among the components contributing to the expense ratio, management and advisory fees hold significant weight. However, it is essential to note that a lower expense ratio does not automatically translate to a well-managed fund. A truly good fund is one that can deliver favourable returns while keeping expenses to a minimum.

Moving on, another vital metric for evaluating mutual funds is the **Standard Deviation (SD)**, which gauges the overall risk associated with the fund, encompassing market risk, security-specific risk, and portfolio risk. Within mutual funds, the *standard deviation serves as an indicator of how much the fund's returns deviate from the anticipated returns based on historical performance*. Essentially, it measures the volatility of the fund. By assessing the standard deviation, investors can grasp the extent to which the fund fluctuates concerning its average return over a specific time frame. A higher SD value implies that the Net Asset Value (NAV) of the mutual fund experiences greater volatility, rendering it riskier compared to a fund with a lower SD value.

The **Sharpe Ratio** comes into play as an *indicator of whether the returns from an investment are a result of sound investment decisions or excessive risk-taking.* A higher Sharpe Ratio is generally preferred as it signifies better risk-adjusted returns. This ratio, also known as SR, serves as a crucial tool for evaluating the return generated by a fund in relation to the risks assumed. By utilizing the Sharpe Ratio, investors can gain insights into the safety of investing in a particular fund by considering the level of risk involved. It provides a quantitative measure to help investors make informed decisions regarding the potential risks and returns associated with a specific fund.

Alpha is a metric that gauges the risk-adjusted performance of a fund in the financial market. Expanding on this concept, it serves as a quantitative measure of the fund's excess return relative to a specified benchmark such as the Nifty or Sensex. Essentially, *alpha reflects the fund manager's capability to generate returns that surpass the expected level considering the associated investment risk*. On the contrary, **Beta** is a numerical indicator that *evaluates the sensitivity of a fund's returns to fluctuations in its benchmark index. It essentially quantifies the fund's volatility concerning the overall market conditions.*

To delve deeper into the understanding of these financial terms, let us illustrate them through an example. Starting with Beta, this metric is denoted as a numerical value and computed by determining the covariance between Mutual Fund Returns and Benchmark Returns, divided by the variance of Benchmark Returns. Without delving into the intricate details of the mathematical formula, it is imperative to comprehend the essence of what Beta communicates to investors. A Beta value of 1 signifies that the fund's performance tends to align closely with its benchmark. Conversely, a Beta greater than 1 indicates a higher volatility level compared to the benchmark, while a Beta less than 1 suggests a lower volatility level relative to the benchmark. Therefore, depending on one's risk appetite, investors can make informed decisions on selecting mutual funds by analyzing the Beta values.

Transitioning to the discussion on alpha, let us consider two funds, namely Fund A and Fund B, to facilitate a comparative analysis. Initially, let's calculate the Alpha for Fund A. In the context of Fund A, the scenario unfolds with an Annual Return of 15%, Benchmark Index Return of 12%, Risk-Free Rate of 5%, and a Beta of 1.2, indicating that Fund A is anticipated to be 1.2 times more volatile than its benchmark index. The formula to compute Alpha involves subtracting the Risk-Free Rate and Beta multiplied by the difference between Benchmark Return and Risk-Free Rate from the Actual Return. Calculating the numbers, the Alpha for Fund A amounts to 1.6%, implying that the fund has exceeded its benchmark by that margin.

Shifting focus to Fund B, the scenario depicts an Annual Return of 12%, Benchmark Index Return of 10%, Risk-Free Rate of 5%, and a Beta of 0.8, suggesting that Fund B is expected to be 0.8 times less volatile than its benchmark. Upon applying the formula, the Alpha for Fund B is computed at 3%, indicating that the fund has outperformed its benchmark by that

margin. In the context of comparison, the higher Alpha value of Fund B (3%) in contrast to Fund A (1.6%) signifies that Fund B has surpassed its benchmark by a wider margin. Additionally, the Beta values provide insights that Fund A is anticipated to exhibit higher volatility than its benchmark, while Fund B is expected to display lower volatility levels. Hence, these numerical indicators play a crucial role in aiding investors to interpret and compare the performance of different funds in the financial landscape.

The Sortino Ratio, akin to the Sharpe Ratio, places its focus solely on the downside risk, taking into account the standard deviation of negative returns, rather than all returns. Its utilization involves the downside standard deviation (SD), a risk metric commonly used in the realm of finance to gauge the volatility associated with the negative returns of a specific investment. *The Sortino Ratio equation is structured as follows: Sortino Ratio = (Return of Fund - Risk-Free Rate) / Downside Standard Deviation of Fund.* For example, when dealing with a mutual fund that boasts a return rate of 10%, a risk-free rate of 5%, and a Downside SD of 8%, the resulting Sortino Ratio stands at 0.625. This value signifies that the fund has managed to yield 0.625 units of return for every unit of downside risk undertaken.

In addition to the aforementioned quantitative metrics, there exist several qualitative indicators that do not rely on ratios, including fund size, minimum SIP, fund risk level, and fund rating, among others. The primary objective of this study is to uncover relationships and trends within both ratio-based indicators and non-ratio indicators pertaining to mutual funds. Furthermore, the research seeks to delve into the performance of mutual funds based on categories and subcategories, aiming to provide a comprehensive analysis of the industry. This comprehensive investigation will shed light on the intricate dynamics at play within the mutual fund sector, offering valuable insights for investors and stakeholders alike.

Chapter 2: Literature review

Mutual Funds in India are financial instruments that pool money from multiple investors to invest in various securities like stocks, bonds, and money market instruments [1]. The Indian mutual fund industry has experienced significant growth, with assets under management increasing by 96% between 1997 and 2003, reaching 15% of the GDP [2]. The industry is dominated by the private sector, accounting for 91% of the mobilized resources, with individuals contributing over half of the net assets under management [3]. The industry offers a wide range of products, with over 1,000 mutual fund plans available from 44 fund houses in India, totalling around '13.46 lakh crores in assets under management as of December 2015 [4]. The Securities and Exchange Board of India (SEBI) regulates mutual funds in India, ensuring that fund objectives are clearly defined and that the board of directors represents shareholders' interests [5].

- S., Gayathri., S., Karthika., Gajendran, Lenin, Kumar. (2010). *Mutual Funds in India – Emerging Prospects, Issues and Challenges*. Social Science Research Network, doi: 10.2139/SSRN.1634302

Mutual funds in India, as discussed by S., Gayathri., S., Karthika., Gajendran, Lenin, Kumar (2010) in their research on 'Mutual Funds in India – Emerging Prospects, Issues and Challenges' published on the Social Science Research Network, aim to pool investors' money to invest in a variety of securities such as stocks, bonds, and other financial instruments. The specific objectives of each fund are clearly outlined in its prospectus, with the Net Asset Value (NAV) representing the share value of the fund. These mutual funds in India serve as crucial financial instruments in the investment landscape.

The pooling of money from multiple investors by mutual funds enables them to invest in a diverse portfolio of securities, including stocks, bonds, and other financial products, thereby spreading the risk across different assets. Investors who own units of mutual funds share in the gains, losses, income, and expenses of the fund based on

their holdings. Despite the comprehensive discussion on the various aspects of mutual funds in India, there appears to be a lack of detailed exploration of the specific limitations associated with these investment vehicles. The limitations, which are crucial for investors to consider before investing in mutual funds, are not explicitly outlined in the abstract of the research.

Further research and analysis are warranted to delve deeper into the potential challenges and drawbacks of mutual funds in India. By identifying and addressing these limitations, investors can make more informed decisions regarding their investment choices. Additionally, a thorough examination of the emerging prospects and issues in the Indian mutual fund industry can provide valuable insights for both investors and policymakers. Understanding the complexities and nuances of mutual funds in India is essential for ensuring the stability and growth of the financial market in the country. In conclusion, while the research sheds light on the promising prospects and existing challenges in the mutual fund sector in India, a more comprehensive exploration of the limitations is imperative for a holistic understanding of these investment vehicles.

- R., Nagarajan., M., Babu. (2005). *Mutual Funds in India*. SMART Journal of Business Management Studies, Mutual funds in India, as discussed by R., Nagarajan., M., Babu. (2005) in their research article titled "Mutual Funds in India" published in the SMART Journal of Business Management Studies, involve the pooling of investments from numerous investors in units of the same size. This illustrates the increasing importance of this particular financial tool within the Indian market, showcasing a trend towards collective investment schemes. The growing number of participants in the mutual fund industry is indicative of the expanding landscape of investment options available to individuals and institutions alike. Furthermore, the rising prominence of mutual funds in the Indian financial market can be attributed to various factors such as increasing awareness about the benefits of mutual fund investments, regulatory changes aimed at enhancing transparency and investor protection, as well as the performance track record of mutual funds compared to other investment avenues. An overview of mutual funds in India reveals a diverse range of offerings catering to different risk appetites and investment objectives, thereby

providing investors with a multitude of choices to suit their financial goals. The increasing prominence of mutual funds in the Indian financial market underscores the shifting preferences of investors towards professionally managed investment vehicles that offer diversification and expert fund management. This rise in popularity can be seen as a natural progression in the evolution of the Indian financial landscape, where mutual funds have emerged as a preferred investment option for many due to their potential for long-term wealth creation and risk mitigation. In conclusion, the rising prominence of mutual funds in the Indian financial market signifies a significant paradigm shift in the investment preferences of individuals and institutions, highlighting the increasing sophistication and maturity of the Indian financial ecosystem.

- S., Mohanan. (2006). *Mutual fund industry in India: development and growth*. Global Business and Economics Review, doi: 10.1504/GBER.2006.010138, The development and growth of the mutual fund industry in India, as discussed by S. Mohanan in 2006 in the Global Business and Economics Review, have been quite remarkable. The Indian mutual fund industry stands out as one of the most rapidly expanding sectors within the Indian capital and financial markets, experiencing a significant upsurge in total assets under management. The substantial increase in resources mobilized through mutual funds over the years has been a notable trend. Specifically, between 1997 and 2003, the mutual fund industry in India witnessed an impressive growth rate of 96%, indicating a robust and dynamic market environment. A noteworthy aspect of this growth is the dominance of the private sector, which accounts for a substantial 91% of the total mobilized resources in the industry. Interestingly, it has been observed that investors in the Indian mutual fund market tend to have a shorter stay duration compared to their counterparts in the United Kingdom and the United States, reflecting unique patterns of investor behaviour and market dynamics. Furthermore, the majority of mutual fund investors in India are concentrated in urban centres, highlighting the urban-centric nature of the market and the potential for further expansion and penetration into rural areas.

- Priyanka, Sengar., B., K, Upadhyay. (2017). *Mutual Funds in India (An Emerging Trends and Prospects)*. International Journal of Advance Research, Ideas and Innovations in Technology, Mutual Funds in India have been the subject of study by Priyanka, Sengar., B., K, Upadhyay in their 2017 paper titled "Mutual Funds in India

(An Emerging Trends and Prospects)" published in the International Journal of Advance Research, Ideas and Innovations in Technology. The research highlights the evolving nature of Mutual Funds in India, presenting positive prospects for investors in alignment with global trends. Within Indian literature, the terms "Mutual Fund" and "Investment Trust" are often used interchangeably, reflecting the growing awareness and interest in this investment vehicle.

The significance of Mutual Funds is on the rise among investors as they offer various benefits, including professional management and diversification of investment portfolios. Through their study, Priyanka, Sengar., B., K, Upadhyay have identified numerous opportunities for investment within the Indian market, shedding light on the potential for growth and returns. Additionally, the paper delves into the benefits and different types of schemes available in the realm of mutual fund investment, providing a comprehensive overview for both seasoned and novice investors alike.

One of the challenges highlighted in the research is the lack of easily accessible information sources for conducting thorough analysis and making informed investment decisions. This emphasizes the need for improved transparency and dissemination of data within the Indian market to facilitate better decision-making processes for investors. Despite this challenge, the study underscores the vast opportunities present in the Indian Market economy, signalling a promising landscape for those looking to diversify their investment portfolios and capitalize on emerging trends and prospects.

In conclusion, the research by Priyanka, Sengar., B., K, Upadhyay contributes valuable insights into the evolving dynamics of Mutual Funds in India, offering a comprehensive analysis of the benefits, opportunities, and challenges within this growing sector. By exploring the various facets of mutual fund investments, the study aims to equip investors with the necessary knowledge and understanding to navigate the market effectively and make informed investment choices that align with their financial goals and risk appetite.

- Govindappa, Mani. (2021). *Review of Mutual Funds Investment in India*. doi: 10.17762/TURCOMAT.V12I2.1224, The mutual funds industry in India, as

examined by Govindappa and Mani (2021) in their publication entitled "Review of Mutual Funds Investment in India," has been experiencing a consistent and gradual expansion since its establishment in 1964. This growth is evidenced by the presence of more than 1,000 mutual fund schemes within the market and a cumulative Asset Under Management (AUM) amounting to '13.46 lakh crores as recorded by the end of December 2015. The burgeoning nature of the mutual fund sector in India highlights a notable trend towards increasing market participation and investment diversification among Indian stakeholders. This evolution is particularly observable in the adoption of innovative mutual fund offerings by Indian investors, showcasing a willingness to engage with a variety of financial products and services. Despite encountering certain challenges, such as a relatively modest growth trajectory in recent times, the Indian mutual fund industry remains resilient and continues to attract interest from both institutional and retail investors alike. It is noteworthy that institutional investors currently wield significant influence within the industry, exerting a substantial presence and affecting overall market dynamics. However, the industry's contribution to the country's Gross Domestic Product (GDP) through its AUM remains relatively low, hovering around the 5-6% mark, indicating further potential for growth and development. One of the critical hurdles faced by the mutual fund sector in India pertains to the limited financial literacy and awareness levels among the general populace, necessitating targeted efforts towards enhancing educational initiatives and disseminating pertinent information to prospective investors.

- Ujjwal, Bajaj. (2011). *Mutual Funds in India A Comprehensive Growth Analysis.* Indian journal of applied research, doi: 10.15373/2249555X/SEPT2013/112, Hira and Sadhak (1997) delved into the realm of Mutual Funds in India, focusing on a comprehensive analysis of various facets such as marketing strategies, investment practices, growth, development, performance, regulations, and investor protection. The paper sheds light on the multifaceted nature of the mutual funds industry in India, exploring the nuances of its growth trajectory, the intricacies of marketing strategies employed by different players, and the regulatory framework governing the sector. Moreover, the authors provide valuable insights into the investment practices prevalent in the Indian mutual funds market, highlighting key trends and patterns that shape investor behaviour and decision-making processes. Additionally, the paper

underscores the critical importance of investor protection mechanisms in safeguarding the interests of stakeholders in the mutual funds industry, emphasizing the need for robust regulatory oversight and enforcement.

In essence, the research conducted by Hira and Sadhak offers a holistic view of mutual funds in India, encapsulating the industry's evolution over time, the strategic initiatives adopted by market participants to drive growth and profitability, and the performance metrics used to evaluate the success of different funds. By examining the marketing issues, practices, and strategies prevalent in the Indian mutual funds landscape, the authors provide a nuanced understanding of how firms position themselves in the market, attract investors, and differentiate their offerings from competitors. Furthermore, the discussion on regulations and investor protection serves as a clarion call for policymakers, regulators, and industry stakeholders to collaborate in creating a conducive environment for sustainable growth and development within the mutual funds sector.

In conclusion, Hira and Sadhak's research serves as a seminal contribution to the body of knowledge on mutual funds in India, offering a comprehensive and insightful analysis of the various dimensions that shape the industry. By exploring the interplay between marketing strategies, investment practices, regulatory frameworks, and investor protection mechanisms, the authors provide a rich tapestry of information that can guide practitioners, policymakers, and academics in navigating the complexities of the Indian mutual funds market. Ultimately, the paper underscores the importance of balance and transparency in fostering trust and confidence among investors, thereby paving the way for the continued growth and success of the mutual funds industry in India.

- Haresh, Barot. (2015). *Mutual Funds in India*. Mutual funds, as elucidated by Haresh Barot in his 2015 publication titled "Mutual Funds in India," are deemed to be of paramount importance within India's financial landscape. These investment vehicles hold a significant place by providing a platform that caters to the needs of small investors, enabling them to access expert knowledge and various investment opportunities. In doing so, mutual funds serve as a critical component in the financial system of India, aiding in the aggregation of savings and facilitating the efficient

allocation of resources in the economy. It is unequivocally established that mutual funds represent the most suitable option for individuals with limited capital seeking to invest in the financial markets. The plethora of benefits they offer makes them the optimal choice, leaving no room for a superior alternative when it comes to empowering small investors. The involvement of financial intermediaries further accentuates the significance of mutual funds in the Indian financial system, underscoring their role in enhancing liquidity, providing diversification, and mitigating risks for investors. The intricate workings of mutual funds position them as a preferred avenue for small investors, offering a well-rounded and professionally managed investment solution that is tailored to their needs. Consequently, the reliance on mutual funds by small investors is not merely a preference but a strategic decision driven by the unparalleled advantages they bring. It can be inferred that the expertise and research capabilities embedded within mutual funds render them indispensable for individuals looking to grow their wealth through prudent investment strategies. In essence, the realm of mutual funds stands as a beacon of hope for small investors, guiding them towards financial prosperity and fostering a culture of informed decision-making in the realm of investments.

- R., Kathaian. (2012). *Performance of mutual funds in India*. ZENITH International Journal of Multidisciplinary Research, in his 2012 study titled "Performance of mutual funds in India," Kathaian explores the dynamics of mutual funds in the Indian financial market. These funds serve as vehicles for pooling funds from individual investors to collectively invest in a diversified portfolio of securities such as equities and bonds. Equity funds, in particular, have been observed to generally outperform income funds, indicating a higher potential for returns for investors. Notably, among the various types of equity funds, broker-backed equity funds have demonstrated superior performance compared to institutional funds, suggesting the influence of brokerage expertise on fund performance. This trend underscores the significance of strategic decision-making and managerial expertise in the realm of mutual fund investments. The outperformance of equity funds over income funds highlights the importance of asset allocation and investment strategies in achieving favourable returns for fund investors. Additionally, the consistent outperformance of equity funds over income funds underscores the potential benefits of equity market exposure in the Indian financial landscape. Furthermore, the superior performance of broker-

backed equity funds compared to institutional funds emphasizes the role of brokerage support in enhancing fund performance and maximizing investor returns. In conclusion, Kathaian's research sheds light on the performance dynamics of mutual funds in India and underscores the importance of strategic decision-making and expert guidance in achieving optimal investment outcomes.

Chapter 3: Gap, Objectives and Research methodology

Research gap:

While issues such as insufficient financial knowledge and investment trends centred on urban areas have been recognized, a more thorough investigation into the specific limitations and risks linked to mutual funds in India is necessary. This involves a detailed scrutiny of factors such as the validity or accuracy of all types of performance indicators (Ratio and Non-ratio) of mutual funds, revealing any hidden patterns, connections, and relationships that could affect investor returns, and evaluating the liquidity risks and pressures associated with withdrawals during market downturns. The impact of market fluctuations on the efficacy of mutual funds must be meticulously examined, considering how different economic circumstances can impact their performance. Moreover, a comprehensive evaluation of the Performance Indicators linked to mutual funds is crucial for providing investors with a comprehensive insight into the actual potential of their investments. Additionally, a thorough analysis of the categorical and managerial relationship with the returns or performance of Mutual Funds is essential.

Research Objectives:

1. To identify statistical relationships between ratio-based and non-ratio-based performance indicators of mutual funds in India.

2. To descriptively summarize the factors affecting mutual fund performance by category.

3. To find associations between mutual fund categories, managerial decisions, and their performance.

Research Methodology:

Quantitative Approach

Integration of Descriptive and Inferential Statistics: This approach will be used to analyze performance indicators of Indian mutual funds, aiming to understand the factors influencing their performance.

Cross-Sectional Design: Data will be collected at a single point in time to offer a snapshot view of the mutual fund industry's current state.

Exploratory Research Elements: These will uncover correlations and patterns among selected performance indicators, enriching the depth of analysis.

Data Collection

Secondary Data Sources

Primary Source: indianmutualfunds.com, a reputable platform for detailed information on mutual fund performance in the Indian market.

Data Variables:

Ratio Indicators: Expense ratio, standard deviation, Sharpe ratio, beta, Alpha, Expense Ratio.

Non-Ratio Indicators: Fund size, minimum SIP, fund risk level, fund rating etc.

Dataset Composition: A diverse array of mutual funds across different categories (equity, debt, balanced) and subcategories.

Dataset:
https://docs.google.com/spreadsheets/d/1Mt1RjNo5IYOG50JXRLZnQ32E5UHh4c3O/edit?usp=sharing&ouid=116626634978835071700&rtpof=true&sd=true

Sampling Strategy

Purposive Sampling

Criteria for Selection: Mutual funds with complete performance data representing diverse categories within the industry.

Data Analysis

Descriptive Statistics

Measures: Central tendency measures for both ratio and non-ratio indicators.

Purpose: To provide a comprehensive overview of the mutual fund data under investigation.

Inferential Statistics

Techniques: Correlation analysis and Chi-square test for association to explore relationships between performance indicators, Returns, company and category of mutual funds

Ethical Considerations

Constraints

Data Availability and Quality: Possible limitations due to the availability and quality of secondary data.

Contextual Bias: The generalizability of findings may be confined to the specific context of Indian mutual funds and may not be directly transferable to other financial markets or investment instruments.

Validation and Reliability

Techniques

Data Validation: Cross-validation and sensitivity analysis has been employed to assess the reliability and robustness of the research findings.

Interpretation of Results: Approach is cautious, considering potential sources of bias and limitations inherent in the research design and methodology.

Chapter 4: Results

Descriptive Findings

Categorical Distribution of Mutual Funds in India:
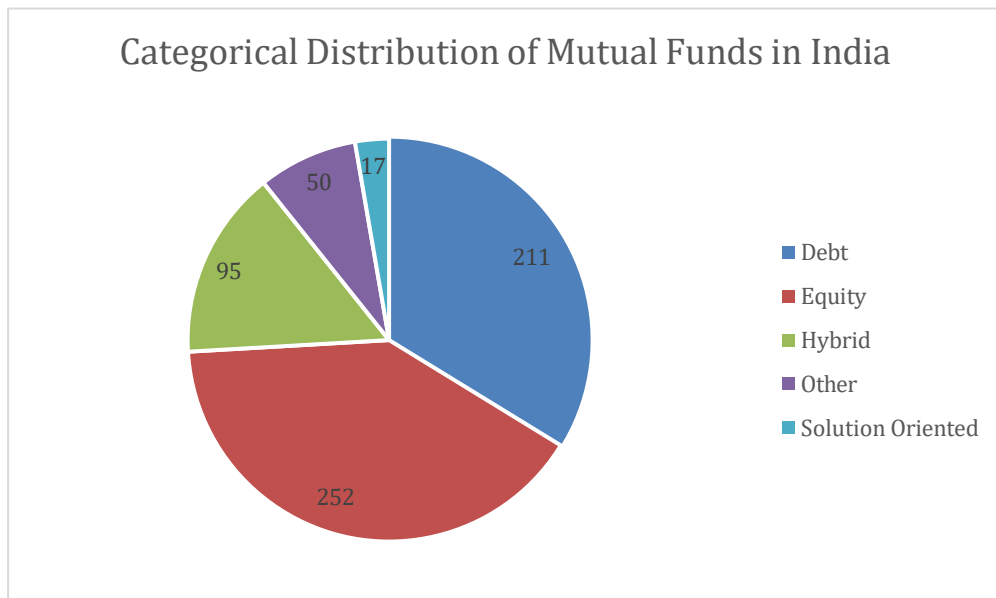
The following pie chart shows the share of different Mutual funds by category in the sample of 625 mutual funds.

Non-Ratio Indicators or General Features of Mutual Funds in India:

The table presented provides a comprehensive overview of non-ratio performance indicators categorized descriptively. It offers insights into various aspects including minimum SIP, minimum lumpsum, fund size, fund age, and annual returns.

Values	Categories				
	Debt	Equity	Hybrid	Other	Solution Oriented
Average of minimum SIP	614.6872038	473.015873	544.2105263	462	355.8823529

Average of minimum Lumpsump	3427.957346	2806.7857 14	3266.4210 53	2636	2552.941176
Average of fund size (In Cr)	4953.009479	5063.6656 35	4469.2712 63	1288.02 76	1277.823529
Average of fund age (in years)	9.734597156	9.4365079 37	9.1368421 05	9.86	8.705882353
Average of risk level	2.639810427	5.9603174 6	4.2105263 16	5.26	5.470588235
Average of rating	3.118483412	2.4325396 83	3.0526315 79	2.74	2
Average of returns_1yr	5.700947867	3.0289682 54	4.2473684 21	4.756	2.594117647
Average of returns_3yr	6.522748815	29.689682 54	15.723157 89	19.658	21.38823529
Average of returns_5yr	6.313270142	12.076587 3	8.5810526 32	10.928	9.747058824

(source: indianmutualfunds.com)

- From Initial Descriptive Analysis it is evident that average age of current mutual funds in India is around *9 years* across categories.
- Fund size or Asset under Management is greatest for Equity based Mutual Funds and a relatively small fund size is seen solutions oriented Mutual Funds
- Based on Risk Level, Debt Mutual Funds have been commendably safe and also returns for 3 years and 5 years have been constant.
- Point to be researched further is for all mutual funds except debt have shown high 3-year returns but comparatively lower 5-year returns

Ratio based Indicators for performance of Mutual funds:

The table presented provides a comprehensive overview of ratio performance indicators categorized descriptively. It offers insights into various aspects including minimum SIP, minimum lumpsum, fund size, fund age, and annual returns.

Values	Debt	Equity	Hybrid	Other	Solution Oriented
Average of expense ratio	0.409099526	1.082063492	0.795894737	0.2866	1.113529412
Average of sortino	2.334312796	3.103373016	2.859473684	2.6936	3.037058824
Average of alpha	2.260094787	3.374761905	2.698421053	0.7882	1.941764706
Average of beta	0.772227488	0.881706349	0.702421053	0.8206	0.742941176
Average of SD	2.387109005	16.96448413	7.604947368	13.4934	10.54058824
Average of Sharpe	0.966966825	1.460515873	1.360526316	1.1502	1.403529412

(source: indianmutualfunds.com)

- Lowest average Expense ratio is seen in other categories and is relatively better in debt based mutual funds
- Sortino and Sharpe has been more or less uniform across, Debt, equity and hybrid. Equity is minutely Higher amongst the three.
- An Alpha greater than zero is deemed good and all categories satisfy that and a higher Alpha indicates higher potential of long term returns and here Equity category has the highest alpha
- Generally, beta of around 1 or less is recommended and majorly across all categories Beta is less than 1 , lower the Beta shows lower volatility based on market prices.

- Statisticians have established that values within plus or minus 2 SD are closer to the true value than those beyond this range, leading to most QC programs initiating corrective action for data points outside of this threshold. This is worrisome as SD across categories have been higher whereas debt is the only category to have acceptable Standard Deviation.

Correlation Analysis:

Correlation Matrix:

The correlation matrix is a square matrix that displays the correlation coefficients between two variables. These coefficients quantify the strength and direction of the linear relationship between the variables. Typically used in multivariate analysis and statistics, a correlation matrix explores the relationships among various characteristics and performance indicators of mutual funds.

Column1	min_sip	min_lumpsum	expense_ratio	fund_size_cr	fund_age_yr	sortino	alpha	sd	beta	sharpe	risk_level	rating	returns_1yr	returns_3yr	returns_5yr
min_sip	1														
min_lumpsum	0.269727665	1													
expense_ratio	-0.111335483	0.001001257	1												
fund_size_cr	-0.12437034	-0.167789537	-0.139280041	1											
fund_age_yr	0.083522167	0.073790682	-0.059650655	0.14495808	1										
sortino	-0.067929308	-0.061066021	0.09550594	0.199485013	0.036563836	1									
alpha	-0.041398742	0.048881095	0.070626137	-0.00615518	-0.00718504	0.33746201	1								
sd	-0.171443153	-0.07255922	0.555203833	-0.035661845	-0.085338766	0.19106823	0.07877197	1							
beta	0.047776384	-0.035003833	-0.096475948	0.039664698	0.050952705	0.0236401	0.17056798	-0.336864441	1						
sharpe	-0.129459343	-0.048028243	0.224628001	0.132463203	-0.01246528	0.74734693	0.48448702	0.302407083	0.04424642	1					
risk_level	-0.171054885	-0.094972973	0.572242547	-0.000388983	-0.063479906	0.26289625	0.07152021	0.834119809	-0.003744581	0.420986371	1				
rating	0.090644163	0.015773221	-0.28077621	0.174019445	0.121327802	0.19876292	0.10330963	-0.175175589	-0.095980799	0.175676412	-0.163666397	1			
returns_1yr	-0.041615417	0.061126202	-0.000802424	-0.018052656	0.068886735	0.0481944	0.13479506	0.152637183	-0.682571649	-0.003007803	-0.138058712	0.25679276	1		
returns_3yr	-0.175916917	-0.07940735	0.509004207	0.002757604	-0.133330732	0.34573119	0.43979258	0.805663858	0.014020491	0.540315981	0.804360939	-0.132263042	-0.069633718	1	
returns_5yr	-0.136910587	-0.028935594	0.247724587	0.062651772	-0.097873235	0.2434729	0.41424132	0.600485416	0.157558525	0.457815494	0.659811518	0.043748389	-0.171269534	0.817264197	1

(source: indianmutualfunds.com)

On analysing Correlation Matrix:

1. Amongst performance Indicators-
   - Sortino and Sharpe have strong positive correlation.
   - Standard deviation is strongly positively correlated with risk level and 3-year returns.
   - Beta has strong negative correlation with 1-year returns.
2. Alpha shows no significant correlation with other performance Indicators and other parameters.

3. Also, there is a lack of correlation amongst different performance Indicators.

4. Risk Level is also strongly positively correlated with 3-year returns and 5-year returns.

5. 3-year returns and 5-year returns are positively correlated with each other.

Association analysis of category and Asset management company (AMC) with level of 3-year returns:

AMC and Level of 3-year returns-

Contingency table for AMC and 3-year returns:

A contingency table is a tabular representation of data where one variable is presented in rows and another variable in columns. This format allows for the examination of the relationship between the two variables through the analysis of the intersection of the data in the table cells. In this particular instance, the table is constructed to illustrate the association between AMC and the level of 3-year return. The levels are categorized based on the quartile in which the rate of 3-year return falls, ranging from 'low' for the lowest quartile to 'very high' for the highest quartile.

Column1	HIGH	Low	MID	VERY HIGH	Grand Total
Aditya Birla Sun Life Mutual Fund	11	6	17	6	40
Axis Mutual Fund	1	5	15	1	22
Bandhan Mutual Fund	0	0	1	0	1
Bank of India Mutual Fund	2	2	4	3	11
Baroda BNP Paribas Mutual Fund	5	8	2	2	17
Canara Robeco Mutual Fund	6	8	1	1	16
DSP Mutual Fund	4	10	5	6	25
Edelweiss Mutual Fund	5	3	4	2	14
Franklin Templeton Mutual Fund	5	6	3	9	23
HDFC Mutual Fund	8	7	11	11	37
HSBC Mutual Fund	8	10	6	7	31
ICICI Prudential Mutual Fund	10	5	14	16	45

IDBI Mutual Fund	5	2	5	2	14
IIFL Mutual Fund	0	2	0	1	3
Indiabulls Mutual Fund	3	3	0	0	6
Invesco Mutual Fund	7	10	2	2	21
JM Financial Mutual Fund	2	4	2	3	11
Kotak Mahindra Mutual Fund	4	10	7	7	28
L&T Mutual Fund	0	0	0	1	1
LIC Mutual Fund	6	5	4	1	16
Mahindra Manulife Mutual Fund	0	2	0	4	6
Mirae Asset Mutual Fund	3	4	0	2	9
Motilal Oswal Mutual Fund	2	1	2	2	7
Navi Mutual Fund	0	0	1	4	5
Nippon India Mutual Fund	8	7	12	9	36
PGIM India Mutual Fund	2	8	2	3	15
PPFAS Mutual Fund	0	0	0	1	1
Quant Mutual Fund	0	1	0	10	11
Quantum Mutual Fund	3	2	2	0	7
SBI Mutual Fund	9	10	9	14	42
Shriram Mutual Fund	0	0	1	0	1
Sundaram Mutual Fund	10	7	4	8	29
Tata Mutual Fund	10	4	3	8	25
Taurus Mutual Fund	8	0	0	0	8
Union Mutual Fund	2	2	1	2	7
UTI Mutual Fund	10	7	12	4	33
WhiteOak Capital Mutual Fund	0	0	0	1	1
Grand Total	159	161	152	153	625
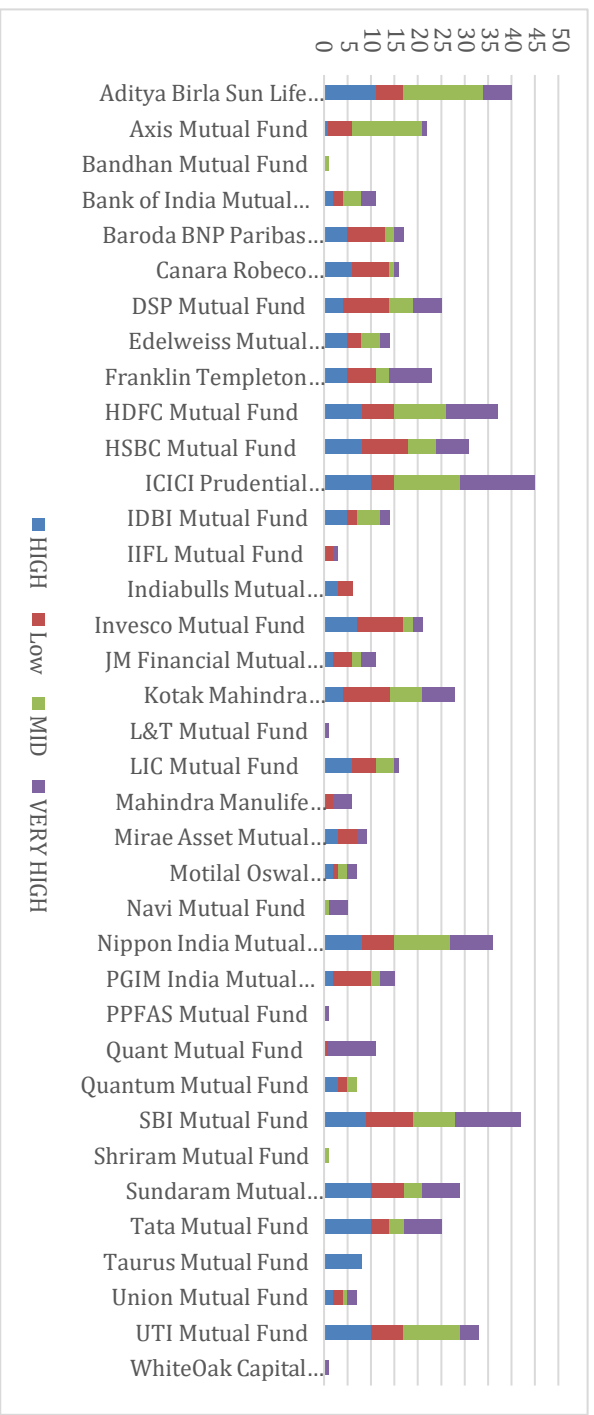
(source:

indianmutualfunds.com)

Null hypothesis −

H0: The categorical variables are independent.

Alternate hypothesis −

H1: The categorical variables are not independent.

Chi-square Results:

Test statistic	201.11265414673755
p-value	$5.11209835027789994 * 10^{-8}$
Degrees of Freedom	105
Level of significance	0.05
Chi-square Tabulated	129.91795528622893

Since, $\chi^2 tab < \chi^2 cal$ we reject the null hypothesis of Independence at $\alpha = 0.05$

Category and Level of 3-year returns-

Contingency table for Category and 3-year returns:

A contingency table is a tabular representation of data where one variable is presented in rows and another variable in columns. This format allows for the examination of the relationship between the two variables through the analysis of the intersection of the data in the table cells. In this particular instance, the table is constructed to illustrate the association between Category and the level of 3-year return. The levels are categorized based on the quartile in which the rate of 3-year return falls, ranging from 'low' for the lowest quartile to 'very high' for the highest quartile.

Column1	HIGH	Low	MID	VERY HIGH	Grand Total
Debt	0	144	63	4	211
Equity	109	0	10	133	252
Hybrid	16	17	51	11	95
Other	27	0	21	2	50
Solution Oriented	7	0	7	3	17
Grand Total	159	161	152	153	625
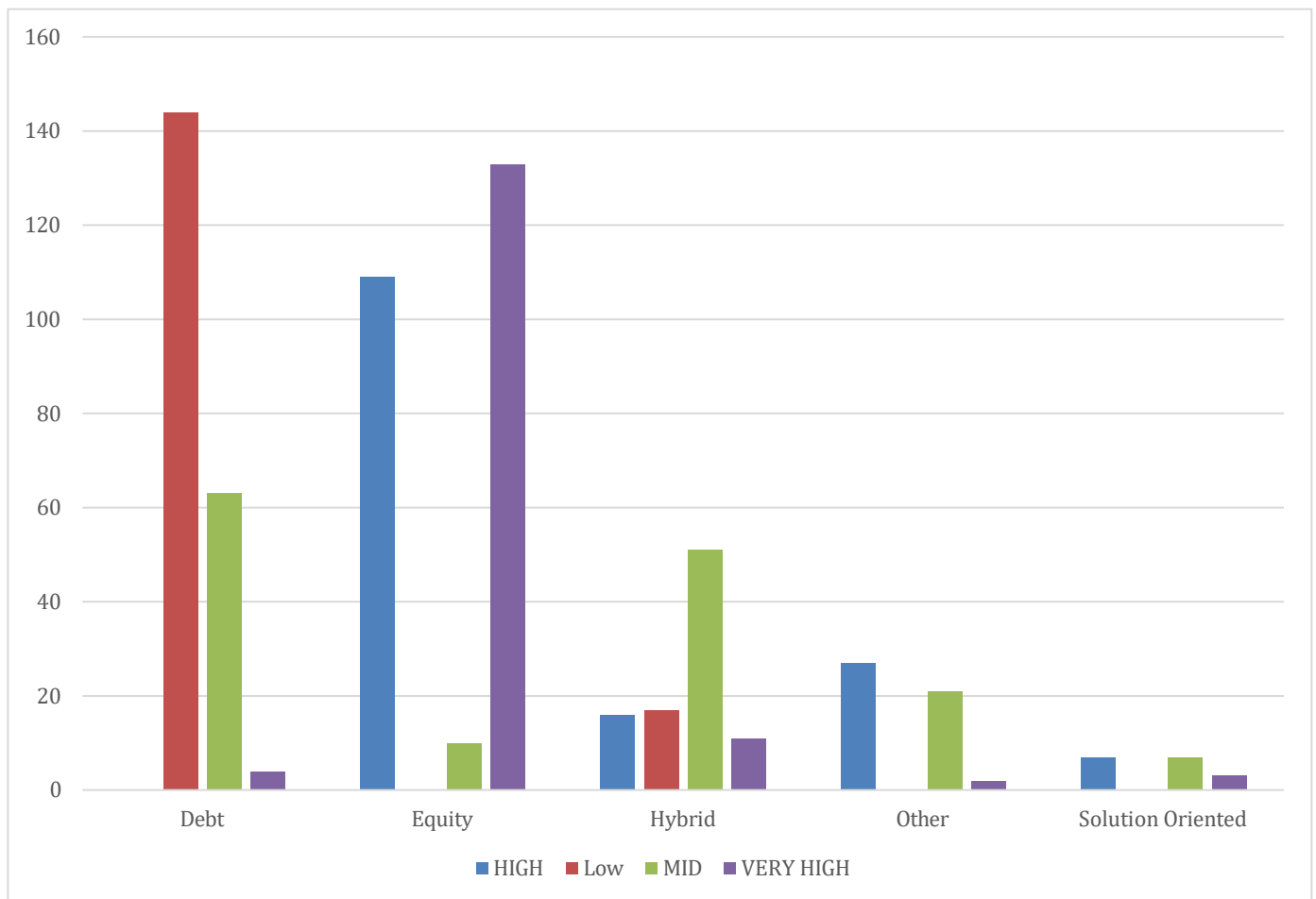
(source: indianmutualfunds.com)

Null hypothesis –

H0: The categorical variables are independent.

Alternate hypothesis –

H1: The categorical variables are not independent.

Chi-square Results:

Test statistic	567.288180176143
p-value	$3.1323117310739507 * 10^{-111}$
Degrees of Freedom	15
Level of significance	0.05
Chi-square Tabulated	24.995790139728616

Since, $\chi^2 tab < \chi^2 cal$ we reject the null hypothesis of Independence at $\alpha = 0.05$

Association analysis of category and Asset management company (AMC) with level of 5-year returns:

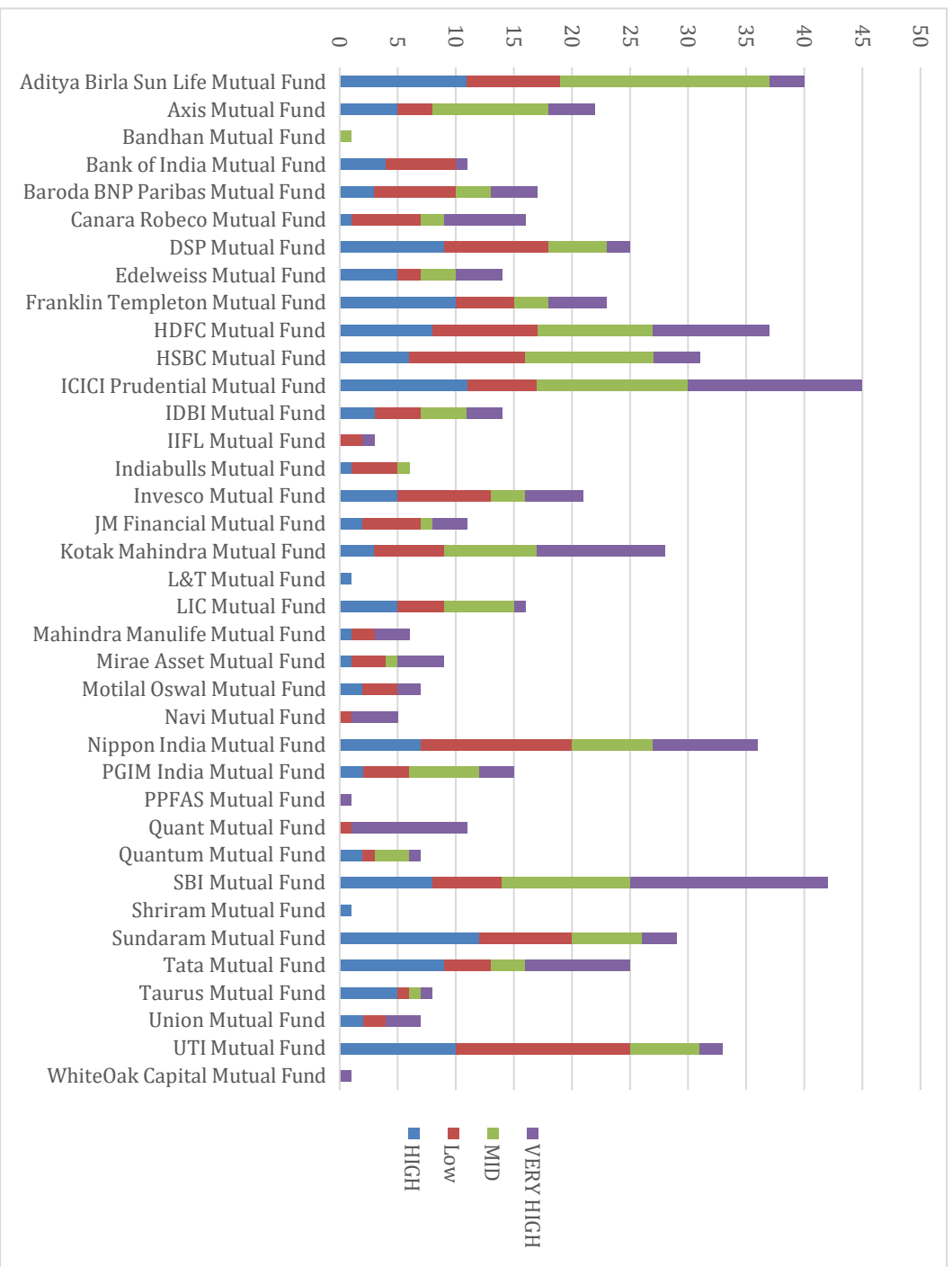*AMC and Level of 5-year returns-*

Contingency table for AMC and 5-year returns:

A contingency table is a tabular representation of data where one variable is presented in rows and another variable in columns. This format allows for the examination of the relationship between the two variables through the analysis of the intersection of the data in the table cells. In this particular instance, the table is constructed to illustrate the association between AMC and the level of 5-year return. The levels are categorized based on the quartile in which the rate of 5-year return falls, ranging from 'low' for the lowest quartile to 'very high' for the highest quartile

Column1	HIGH	Low	MID	VERY HIGH	Grand Total
Aditya Birla Sun Life Mutual Fund	11	8	18	3	40
Axis Mutual Fund	5	3	10	4	22
Bandhan Mutual Fund	0	0	1	0	1
Bank of India Mutual Fund	4	6	0	1	11
Baroda BNP Paribas Mutual Fund	3	7	3	4	17
Canara Robeco Mutual Fund	1	6	2	7	16
DSP Mutual Fund	9	9	5	2	25
Edelweiss Mutual Fund	5	2	3	4	14
Franklin Templeton Mutual Fund	10	5	3	5	23
HDFC Mutual Fund	8	9	10	10	37
HSBC Mutual Fund	6	10	11	4	31
ICICI Prudential Mutual Fund	11	6	13	15	45
IDBI Mutual Fund	3	4	4	3	14

IIFL Mutual Fund	0	2	0	1	**3**
Indiabulls Mutual Fund	1	4	1	0	**6**
Invesco Mutual Fund	5	8	3	5	**21**
JM Financial Mutual Fund	2	5	1	3	**11**
Kotak Mahindra Mutual Fund	3	6	8	11	**28**
L&T Mutual Fund	1	0	0	0	**1**
LIC Mutual Fund	5	4	6	1	**16**
Mahindra Manulife Mutual Fund	1	2	0	3	**6**
Mirae Asset Mutual Fund	1	3	1	4	**9**
Motilal Oswal Mutual Fund	2	3	0	2	**7**
Navi Mutual Fund	0	1	0	4	**5**
Nippon India Mutual Fund	7	13	7	9	**36**
PGIM India Mutual Fund	2	4	6	3	**15**
PPFAS Mutual Fund	0	0	0	1	**1**
Quant Mutual Fund	0	1	0	10	**11**
Quantum Mutual Fund	2	1	3	1	**7**
SBI Mutual Fund	8	6	11	17	**42**
Shriram Mutual Fund	1	0	0	0	**1**
Sundaram Mutual Fund	12	8	6	3	**29**
Tata Mutual Fund	9	4	3	9	**25**
Taurus Mutual Fund	5	1	1	1	**8**
Union Mutual Fund	2	2	0	3	**7**
UTI Mutual Fund	10	15	6	2	**33**
WhiteOak Capital Mutual Fund	0	0	0	1	**1**
Grand Total	**155**	**168**	**146**	**156**	**625**

(source: indianmutualfunds.com)

Null hypothesis –

H0: The categorical variables are independent.

Alternate hypothesis –

H1: The categorical variables are not independent.

Chi-square Results:

Test statistic	p-value	Degrees of Freedom
176.896210937254I2	$1.44208971448744069 * 10^{-5}$	105

Chart categories (x-axis 0 to 50):

Aditya Birla Sun Life Mutual Fund
Axis Mutual Fund
Bandhan Mutual Fund
Bank of India Mutual Fund
Baroda BNP Paribas Mutual Fund
Canara Robeco Mutual Fund
DSP Mutual Fund
Edelweiss Mutual Fund
Franklin Templeton Mutual Fund
HDFC Mutual Fund
HSBC Mutual Fund
ICICI Prudential Mutual Fund
IDBI Mutual Fund
IIFL Mutual Fund
Indiabulls Mutual Fund
Invesco Mutual Fund
JM Financial Mutual Fund
Kotak Mahindra Mutual Fund
L&T Mutual Fund
LIC Mutual Fund
Mahindra Manulife Mutual Fund
Mirae Asset Mutual Fund
Motilal Oswal Mutual Fund
Navi Mutual Fund
Nippon India Mutual Fund
PGIM India Mutual Fund
PPFAS Mutual Fund
Quant Mutual Fund
Quantum Mutual Fund
SBI Mutual Fund
Shriram Mutual Fund
Sundaram Mutual Fund
Tata Mutual Fund
Taurus Mutual Fund
Union Mutual Fund
UTI Mutual Fund
WhiteOak Capital Mutual Fund

Legend: HIGH, Low, MID, VERY HIGH

Level of significance	0.05
Chi-square Tabulated	129.91795528622893

Since, $\chi^2 tab < \chi^2 cal$ we reject the null hypothesis of Independence at $\alpha = 0.05$

Category and Level of 5-year returns-

Contingency table for AMC and 5-year returns:

A contingency table is a tabular representation of data where one variable is presented in rows and another variable in columns. This format allows for the examination of the relationship between the two variables through the analysis of the intersection of the data in the table cells. In this particular instance, the table is constructed to illustrate the association between Category and the level of 3-year return. The levels are categorized based on the quartile in which the rate of 5-year return falls, ranging from 'low' for the lowest quartile to 'very high' for the highest quartile

Column1	HIGH	Low	MID	VERY HIGH	Grand Total
Debt	0	125	82	4	211
Equity	106	10	21	115	252
Hybrid	25	28	28	14	95
Other	19	4	8	19	50
Solution Oriented	5	1	7	4	17
Grand Total	155	168	146	156	625
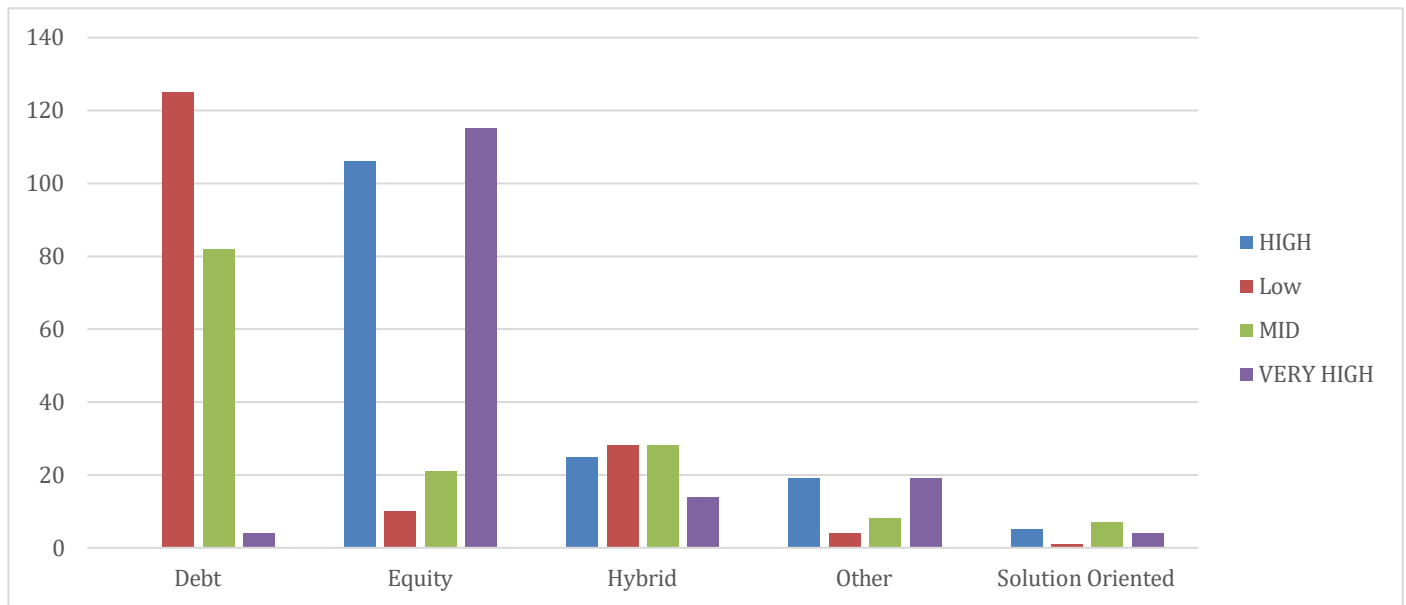
(source: indianmutualfunds.com)

Null hypothesis –

H0: The categorical variables are independent.

Alternate hypothesis –

H1: The categorical variables are not independent.

Chi-square Results:

Test statistic	374.01686695539036
p-value	$1.9656774352029463 * 10^{-70}$
Degrees of Freedom	15
Level of significance	0.05
Chi-square Tabulated	24.995790139728616

Since, $\chi^2 tab < \chi^2 cal$ we reject the null hypothesis of Independence at $\alpha = 0.05$

Chapter 5: Discussion and analysis of findings

Dearth in new fund offerings in India

In 2023, the New Fund Offerings (NFOs) of mutual funds amassed a total of nearly ₹20,000 crore, a significant decrease from the figures of ₹62,187 crore in 2022, ₹99,704 crore in 2021, and ₹53,703 crore in 2020. This decline serves as a prominent indicator of the shifting dynamics within the mutual fund sector, particularly in terms of the active and passive investment strategies being employed by market participants. The reasons behind this noticeable decrease in active mutual fund NFOs in 2023 can be attributed to several key factors.

Firstly, there has been a noticeable surge in investor interest towards passive funds. This shift can be partly attributed to the regulatory interventions by the Securities and Exchange Board of India (SEBI), which have aimed at ensuring that mutual funds adhere to their stated objectives by restricting the range of stocks that can be included in specific fund categories. This limitation has posed challenges for actively managed funds in consistently outperforming benchmark indices, thus driving investors towards passively managed options that better align with their investment preferences.

Secondly, the landscape of passive funds has significantly broadened over time. While previously passive equity funds predominantly mirrored specific sectors such as banking and large-cap indices, mutual funds now offer passive options across various categories including Equity, Debt, and Gold, as well as novel themes like ESG, Global, and Artificial Intelligence. Furthermore, the inclusion of passive equity-linked savings schemes (ELSS) since July 2022 has further diversified the passive fund market, making them more appealing to investors and prompting mutual funds to pivot towards passive strategies.

Moreover, Asset Management Companies (AMCs) may currently be focusing more on optimizing their existing schemes rather than introducing new ones. The extensive range of mutual fund schemes already available in the market might lead fund houses to prioritize

enhancing returns for current investors and maintaining stable assets under management, rather than venturing into launching new active schemes amid a competitive environment.

Additionally, the regulatory environment plays a role in the decline of active NFOs, with SEBI imposing fewer constraints on passive schemes compared to actively managed ones. Following the reorganization of mutual fund schemes by SEBI, AMCs face fewer limitations on the number of passive products they can introduce, while actively managed funds are subject to more stringent requirements. This disparity in regulatory treatment has incentivized mutual funds to lean towards passive offerings that are easier to launch and oversee due to their minimal fund management involvement.

Furthermore, the prevailing market conditions characterized by record-high levels may have instilled a sense of caution among fund houses regarding the launch of new active NFOs. The apprehension towards potential market corrections or downturns amid the current market exuberance has led to a reluctance in introducing new active funds, showcasing a prudent approach by market participants in light of uncertain market dynamics and associated risks.

During the period between January and July 2023, a total of 59 draft scheme information documents (SIDs) were submitted, with additional filings made in August by WhiteOak Capital Mutual Fund and Bajaj Finserv Mutual Fund, encompassing a mix of both passive and active fund categories.

Debt Mutual Funds: A safe Investment

The average 3-year return generated by a mutual fund typically hovers around 5.7%, a figure that closely aligns with the interest rates offered by Fixed Deposits (FDs) and savings accounts. Furthermore, there is minimal variance observed between the returns over a 3-year and 5-year period, reinforcing the stability of Debt-based mutual funds as a reliable financial instrument for generating consistent returns. This stability can be attributed to the inherent nature of Debt funds as low-risk investments, essentially involving lending money with an average risk level of approximately 2.6, significantly lower than that of debt and hybrid funds. Despite their dependable nature, Debt funds are not typically associated with long-term high returns, a characteristic reflected in their Alpha values. Despite the low beta associated with Debt funds, indicating limited market volatility, a comprehensive analysis

considering indicators such as alpha and beta can effectively elucidate the consistent returns, low risk levels, and relatively lower interest rates offered by these financial instruments.

Why are 3-year returns rate higher than 5-year returns rate:

Returns in the financial market can be influenced by whether the market is in a bull or a bear phase over a span of three years, impacting the overall investment outcomes significantly. The fluctuation in returns can be quite substantial during this period. However, when we analyse returns over a longer period, such as five years, the market may have already absorbed the various fluctuations, leading to a more realistic representation of returns. This is because extended time frames tend to mitigate the impact of short-term market volatility, resulting in a smoother trend in returns over time.

Various other factors can also contribute to the performance of mutual funds, such as business cycles. During economic expansions, corporate profits typically increase, which in turn boosts stock prices and mutual fund returns. This phenomenon is especially noticeable in equity-based mutual funds, where the average 3-year return across categories was approximately 29.68%, compared to around 12.07% for 5-year returns. On the contrary, during recessions, earnings might decline, leading to lower stock prices and potentially negative mutual fund returns.

Geopolitical risks, including wars, conflicts, and international tensions, can have a significant impact on global markets. For instance, economic sanctions can influence government bond rates and equity markets, given the interconnectedness of the modern global economy. Currency appreciation and depreciation also play a vital role in determining market movements. Moreover, factors like management changes and fluctuations in fund operating strategies can also affect the performance of mutual funds.

It is essential to note the strong positive correlation observed between 3-year returns and 5-year returns, indicating that fundamentally strong mutual funds tend to perform well over time. This correlation suggests that a fund with a robust foundation is more likely to deliver stable returns in the long term and potentially outperform during periods of short-term market volatility.

Failure of performance Indicators to paint a synchronized Picture:

An expense ratio is the yearly percentage of a fund's assets utilized for covering expenses, which encompass portfolio management, administration, marketing, and distribution. The calculation of the expense ratio involves dividing the total expenses by the fund's average net assets. Consequently, the expense ratios have the direct effect of diminishing a portfolio's rate of return. The Sortino metric evaluates the risk-adjusted performance of an investment, particularly mutual funds, by focusing on downside risk to assess the potential downsides of investments. It is essentially a variation of the Sharpe ratio, aiding in the appraisal of risk-adjusted performance by determining if the returns from an investment align with the level of risk assumed. A higher Sharpe ratio signifies that an investment or portfolio has yielded greater returns relative to the risk undertaken, implying superior risk-adjusted performance. While Sortino exclusively considers the Standard Deviation of downside risk, the Sharpe ratio encompasses the standard deviation for overall risk. This results in a notable positive correlation between them. However, it is intriguing to note the absence of a very strong correlation between Sharpe, Sortino, and the level of risk, potentially attributed to biases in risk assessment or the utilization of metrics beyond statistical tools like Sharpe and Sortino.

Alpha and beta serve as pivotal risk ratios for evaluating mutual funds and their anticipated returns, derived through the Capital Asset Pricing Model (CAPM) formula, establishing a mathematical relationship between market risk and fund returns. Alpha gauges a fund's performance relative to a benchmark index, such as the market, with the formula comparing mutual fund return to the risk-free return subtracted from the product of the benchmark return versus the risk-free return multiplied by Beta. An alpha above zero is desirable, with a higher alpha ratio indicating greater long-term return potential. Beta, on the other hand, measures a fund's volatility concerning market fluctuations, indicative of its relative risk and stability. The beta formula compares the mutual fund return minus the risk-free rate to the benchmark return minus the risk-free rate. A beta close to or below 1 is generally recommended, where a beta of 1 suggests lower risk and growth potential compared to ratios equal to or exceeding 1. The concept of standard deviation aids in assessing the volatility aspect of a fund.

Evidently, various performance indicators convey different insights, but the lack of correlation among factors indicating similar characteristics raises concerns. For instance, the absence of a strong positive correlation between beta and standard deviation, or the lack of

correlation between Alpha, Sortino, and Sharpe, along with the failure of a strong positive correlation between the expense ratio and alpha, is perplexing. Consequently, the elements utilized in computing these indicators lack jointly distributed features. Therefore, to effectively analyse a fund's actual performance, it becomes imperative to develop a comprehensive index that incorporates all performance indicators.

Associations between Category, AMC'S and Returns:

An association between the categories and level of returns was initially suspected, and this association was later confirmed through the application of the chi-square test. Our earlier discussions and descriptive studies provided insights indicating that debt, as a category, presented lower risk and less reward compared to equity, which was observed to be more volatile but offered higher rewards. The visual indications from these studies were substantiated by the results of the chi-square test of association.

Furthermore, our research also revealed that the Asset management company plays a significant role in determining the level of returns of a fund. Therefore, factors such as strong management practices and a positive company history should be taken into consideration before making any investment decisions. These findings underscore the importance of considering not only the categories of investments but also the entities managing them.

Conclusively, the results obtained from these analyses can serve as valuable tools for investors in making well-informed decisions. By relying on such data, investors can safeguard themselves against the temptation of being swayed by potentially misleading figures or overly optimistic return rates, thus enabling them to make prudent investment choices based on sound evidence and analysis.

Chapter 6: Conclusion and recommendations

This Dissertation provides a thorough examination of mutual fund performance in the Indian context, utilizing purposive sampling techniques to ensure a diverse representation across various fund categories. Through the utilization of a vast dataset, the research delves into essential facets such as the age of funds, their size, levels of risk, returns generated, and the impact of external factors such as business cycles and political stability on these funds.

Fund Age and Size Analysis indicates that the average age of mutual funds in India stands at approximately nine years, indicating a market that has reached a certain level of maturity. It is notable that equity-based mutual funds dominate in terms of assets under management (AUM), while solution-oriented mutual funds exhibit the smallest fund sizes, suggesting varying levels of market penetration and investor interest across different fund types.

Risk and Returns Examination reveals that debt mutual funds emerge as a relatively secure investment option, offering stable returns over both 3-year and 5-year periods with minimal fluctuations. Conversely, equity mutual funds, despite their higher volatility, showcase the potential for greater returns and long-term growth, as evidenced by their elevated alpha values compared to other fund categories.

Expense Ratios and Performance Metrics Findings demonstrate that debt mutual funds boast relatively low expense ratios, making them an appealing choice for risk-averse investors seeking cost-effective investment options. Moreover, both the Sortino and Sharpe ratios exhibit consistently high values across debt, equity, and hybrid funds, with equity funds slightly outperforming other categories. Positive alpha values across all fund types indicate the potential for long-term returns, particularly prominent in equity funds.

Volatility and Market Sensitivity Analysis reveals that the majority of mutual fund categories exhibit beta values below 1, indicating lower volatility in comparison to market fluctuations. While debt funds display acceptable levels of standard deviation, other categories showcase higher standard deviations, reflecting increased volatility levels within these funds.

Correlation Among Performance Indicators Strong positive correlations are observed between Sortino and Sharpe ratios, as well as between standard deviation and both risk level and 3-year returns. However, alpha values do not exhibit significant correlations with other performance indicators, underscoring its distinct role in assessing the long-term return potential of mutual funds.

Trends in New Fund Offerings (NFOs) A notable decrease in NFOs in the year 2023 signals a trend towards passive investment strategies, largely propelled by regulatory alterations and prevailing market conditions. The expanding array of passive funds, encompassing thematic and category-specific options, has garnered increased investor interest and participation.

Macro and Microeconomic Influences The research underscores the substantial impact of business cycles, geopolitical risks, and market dynamics on mutual fund performance. Additionally, regulatory frameworks and management strategies are identified as pivotal factors influencing fund returns and investor trust in the market.

Implications for Investors The insights derived from this analysis emphasize the necessity of adopting a comprehensive approach to mutual fund investments. Investors are advised to consider historical performance data, risk metrics, broader economic contexts, and the quality of fund management. A nuanced understanding of distinct attributes of various fund categories and the influence of external factors equips investors to make well-informed and strategic investment decisions.

Recommendations To mitigate risks and leverage diverse market conditions, investors are encouraged to diversify their portfolios across multiple mutual fund categories. Furthermore, given the observed volatility in shorter time frames, maintaining a long-term investment horizon is recommended to achieve more stable and consistent returns. Selecting funds managed by reputable asset management firms with strong track records is also advised to enhance the potential for sustained returns. Lastly, staying abreast of regulatory modifications and evolving market trends enables investors to adapt their strategies in alignment with the changing investment landscape.

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