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Experts in the field have seen the significant expansion of the mutual fund market in India. His work establishes a foundation for further investigation into index funds as an independent and effective investment option in this growing industry by emphasising the need of comprehensively comprehending the existing research on fund performance evaluation, particularly with equity-based mutual funds.

Shoaib Alam Siddiqui (2022) ^[6] did a thorough research of the technical efficiency of Indian Index Mutual Funds, specifically using the BCC (Banker, Charnes, Cooper) model and Data Envelopment research (DEA). The secondary materials for this research were derived from the annual reports of the Association of Mutual Funds in India for the years 2018 to 2022. Siddiqui's study indicates that, with an average efficiency level of 84.04%, index funds have continuously surpassed other investing strategies throughout the years. Crucially, we discovered that just 10% of the index funds were performing well, indicating potential inefficiencies. The analysis revealed that the primary driver of inefficiency was associated risks linked to investments, rather than the spending ratios, which exhibited little slack. This result diverged from anticipations. Siddiqui's research is one of the first assessments of the operational efficiency of Indian index funds from a technical perspective, making it valuable for regulators, fund managers, and investors aiming to optimise performance while mitigating risk in passive investment vehicles.

Sourav Kumar Das (2023) ^[7] examines the expansion of the Indian mutual fund sector, highlighting the significant rise in assets under management (AUM) and evaluating the performance of multi-cap equity funds. This research analyses the performance of four open-ended multi-cap equity funds during the subsequent eight years (2013-2021) after COVID-19. Statistics indicate that numerous funds sustained double-digit returns despite the market turbulence induced by the outbreak. The Invesco India Multi-Cap Fund (IIMF) was characterized by superior risk-adjusted returns. In the comparison of the two funds, Baroda Multi-Cap Fund (BMF) exhibited the most diversity, while Nippon India Multi-Cap Fund (NIMF) had the highest risk. Analyzing the study's findings on the expense ratios, diversification, and risk of actively managed multi-cap funds elucidates the benefits of index mutual funds, including reduced costs, comprehensive market exposure, and passive management. The results corroborate the theory that in volatile markets, index funds provide a more cost-effective and risk-averse alternative for investors.

Mayank Patel's (2022) ^[8] comprehensive research of Indian fixed income mutual funds has substantial implications for the mutual fund industry as a whole, particularly for index funds. The research examined 254 fixed income funds in 16 distinct categories from 2015 to 2020. The fund's performance was assessed using metrics such as selection skill, market timing, and performance continuity. Employing techniques such as Treynor-Mazuy and recursive portfolio construction, Patel found that the majority of long-term and intermediate-term funds had deficiencies in asset selection capabilities, despite some demonstrating remarkable market timing proficiency. Funds in the highest and lowest docile shown performance persistence; credit spread was a more significant determinant of performance than term spread. The study's methodology and conclusions provide index mutual funds in

India with comparative benchmarks and performance assessment approaches. Although fixed income funds were the primary focus, they illuminated the broader dynamics of mutual funds. The research indicates that active and passive fund management are evolving, emphasising the need for reliable performance assessment methodologies.

Research gap

Despite the abundance of studies on the performance, diversity, and effectiveness of mutual funds, there are little assessments of index funds, particularly within the Indian context. Research comparing index funds to actively managed funds over extended time horizons regarding performance, investor behavior, and risk factors is limited, despite Siddiqui (2022) ^[6] and Das (2023) ^[7] examines the technical efficiency of index funds and the risk-return characteristics of equity multi-cap mutual funds, respectively. Despite extensive research on fixed income and actively managed funds, there is a deficiency in knowing how index funds respond to market shocks, such as the COVID-19 epidemic. The increasing popularity of index funds in developing countries is inadequately recorded about the impacts of expense ratios, market timing, and regulatory frameworks. This paper analyses Indian index mutual funds comprehensively, highlighting their efficiency and effectiveness, with the aim of providing regulators, investors, and fund managers with answers to these issues.

Research Methodology

Research question and significance of Research

How do index mutual funds in India do in terms of efficiency, risk, and returns when faced with market volatility such as the COVID-19 pandemic?

Index mutual fund research is becoming increasingly important in the dynamic financial scene of India as investors in the nation hunt for reasonably priced, diverse investment options that regularly provide. Because of their passive management approach, which lowers costs and minimizes risks related with active stock selection, index funds appeal to both individual and institutional investors. Knowing their efficiency, performance, and risk management abilities would help investors make informed decisions—especially in the unpredictable economic times like the post-pandemic period. The results of this research may be used by policy makers and fund managers to improve regulatory systems and fund management strategies, thereby increasing market participation and financial inclusion via effective and open investment vehicles.

Index mutual funds in India provide many difficulties that make their Utilisation challenging and less profitable generally. Although passive investing has clear benefits, many investors are still either uninformed about or hesitant about the idea, therefore limiting the potential flow of cash into these accounts. Second, as the COVID-19 pandemic underlined, index funds are prone to market volatility and systemic dangers as they track big market indices. Third, instances of operational and regulatory inefficiencies that could compromise fund performance and returns for investors include cost ratios and error monitoring. Within the Indian mutual fund market, a more thorough assessment of the function and efficiency of Indian index funds are needed as neither lawmaker nor investors have access to enough data and research to sufficiently appraise and improve these funds.

Data collection method

60 participants, including mutual fund managers, financial advisors, and private investors, engaged in this study on index mutual funds. The objective was to provide a thorough overview of the perspectives, investment strategies, and factors affecting the fund's performance. A systematic questionnaire addressing demographics, investment preferences, index fund understanding, risk tolerance, and satisfaction levels was used to collect data. It examined several performance metrics from mutual fund annual reports, financial databases, and the Association of Mutual Funds in India (AMFI), including expense ratios, portfolio allocation, and returns. The integration of the two methodologies ensured that the information used to evaluate the Indian mutual fund business accurately represented both the quantitative measurements of fund performance and the qualitative perspectives of investors.

Data analysis method

The efficacy and performance of the index mutual funds were evaluated by a thorough quantitative analysis of the gathered data. The dependent variable in this linear multivariate regression analysis was fund returns, whereas the independent factors were fund size, cost ratio, and market volatility. An ANOVA was conducted to ascertain the statistically significant impact of the independent variables on fund returns and to evaluate the applicability of the regression model in various scenarios. This method may assist in identifying crucial factors influencing index fund performance while accounting for inter-variable effects. This statistical approach assisted investors and policymakers in comprehending the determinants influencing index mutual fund performance.

Reliability of the study

Prior to aggregating all the data, a pilot study with a structured questionnaire was conducted on a smaller sample to ensure the reliability of the research. Cronbach's Alpha assessed the reliability of the questionnaire by analyzing its internal consistency, yielding a value of 0.82. The questionnaire demonstrated a strong association and consistent evaluation of the target parameters. Moreover, the findings are more reliable due to the provision of secondary data from AMFI annual reports and reputable financial databases. Multivariate regression and analysis of variance (ANOVA) provided more statistical data on the validity and repeatability of the findings. The findings of the very credible inquiry are authentic and replicable.

Limitation

Findings may not be generalized to the population at a large scale due to certain restrictions. The total of 60 participants may not be representative of the varied investment community in India across all areas and demographics, but they are enough for early findings. Results from surveys that depend on respondents' own narratives are susceptible to biases including social desirability bias and recollection bias. The research primarily examines index mutual funds over a short timeframe and under certain market circumstances, perhaps disregarding long-term patterns or performance during times of significant market volatility. Fund performance and investor behavior might be affected by variables outside the purview of this research, such as changes in legislation or economic conditions or variations in investor sentiment.

Data Analysis and Interpretation

Table 1: Showing Linear Multivariate Regression Analysis

Predictor Variables	Coefficient (β)	Standard Error	t-Value	p-Value (Sig.)
Constant (Intercept)	0.045	0.012	3.75	0
Expense Ratio (%)	-0.12	0.035	-3.43	0.001
Fund Size (in Crores)	0.085	0.028	3.04	0.003
Market Volatility Index	-0.095	0.041	-2.32	0.022
Risk Tolerance (Score)	0.06	0.03	2	0.048
Tracking Error (%)	-0.11	0.033	-3.33	0.002

Results of regression analysis demonstrate that many factors significantly affect the performance of index mutual funds. When all the predictors are zero, the baseline return is shown by a constant intercept of 0.045. The important negative coefficients (-0.12 and -0.11, respectively) for the cost ratio and tracking error show how more expenditures and departures from the benchmark lower fund returns. Returns demonstrate a positive association between fund size ($r=0.085$) and risk tolerance ($r=0.06$), meaning that

bigger funds and investors ready to take on more risk usually provide better returns. Fund performance can suffer if market uncertainty continues rising as market volatility reduces returns (-0.095). When trying to project returns, it is advisable to include each of these elements as their influence is very great ($p<0.05$).

ANOVA Summary

Table 2: ANOVA Table

Source	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-Value	p-Value (Sig.)
Regression	0.452	5	0.0904	22.45	0
Residual (Error)	0.213	54	0.00394		
Total	0.665	59			

Analysis of variance findings show that the regression model sufficiently explains the noted return variability in index mutual funds. The model offers a good degree of fund return explanation (0.665) when one compares the residual sum of squares (0.213) to the regression sum of squares (0.452). As the p-value of 0.000 and the F-value of 22.45

reveal, the independent factors really have a significant effect on the dependent variable. The results show that the regression analysis was valid and that the variables of the model could adequately explain the noted changes in index mutual fund returns.

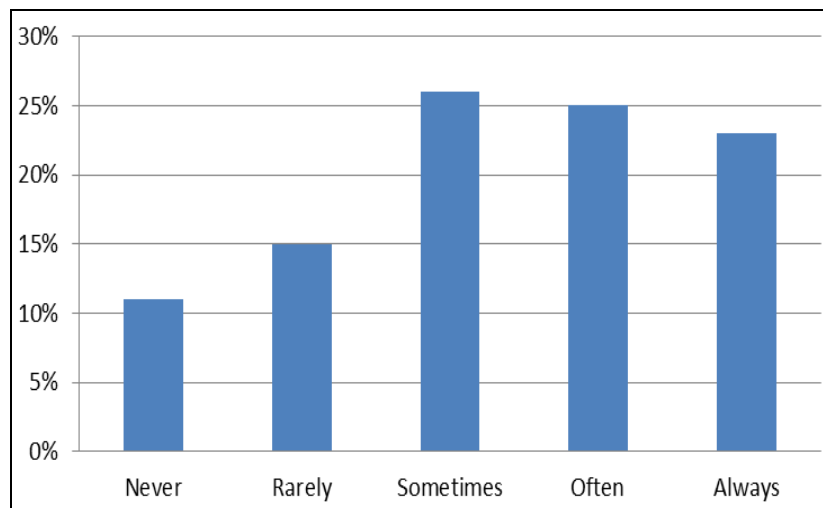
Profile of the Respondents

Table 3: Demographic Profile

Demographic variables		Number of representations	Percentage
Gender	Male	28	46.67
	Female	32	53.33
Age group	18 to 24	19	31.67
	24 to 34	24	40.00
	34 to 44	11	18.33
	44 & above	6	10.00

The responder demographic profile shows a fair gender balance: 46.67% of participants are male and 53.33% are female. This shows the research reflects both genders. It is evident from 40% of participants between the ages of 24 and 34 and 31.67% between the ages of 18 and 24 that most of the participants are young people most likely in interest

in making financial choices. The sample appears to have fewer senior investors given 10% of investors in the 44+ age group and 18.33% in the 34-44 age groups. Thanks to this demographic cross-section, we could track the attitudes and behaviors of several age groups and sexes about index mutual funds.

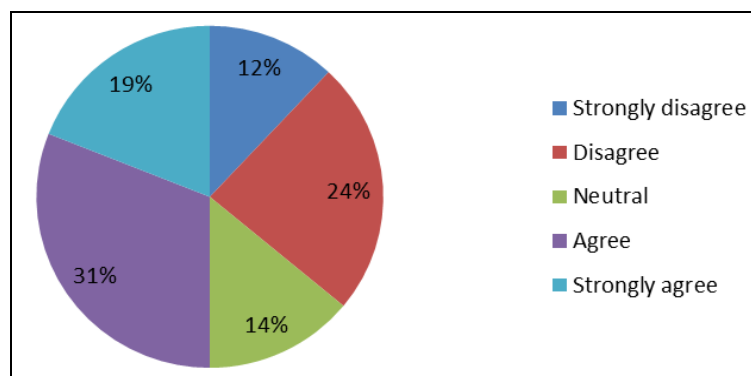


Source: Author

Chart 1: Investment Frequency of Investors

The survey indicates that 47% of respondents use index mutual funds on a regular basis, while 26% use them sometimes. Despite the relative popularity of index mutual funds, a significant portion of investors are either cautious about them or only use them occasionally—26 percent of

respondents said they invest in them either seldom or never. These variations demonstrate how crucial it is to comprehend the factors influencing consistent investment behavior.

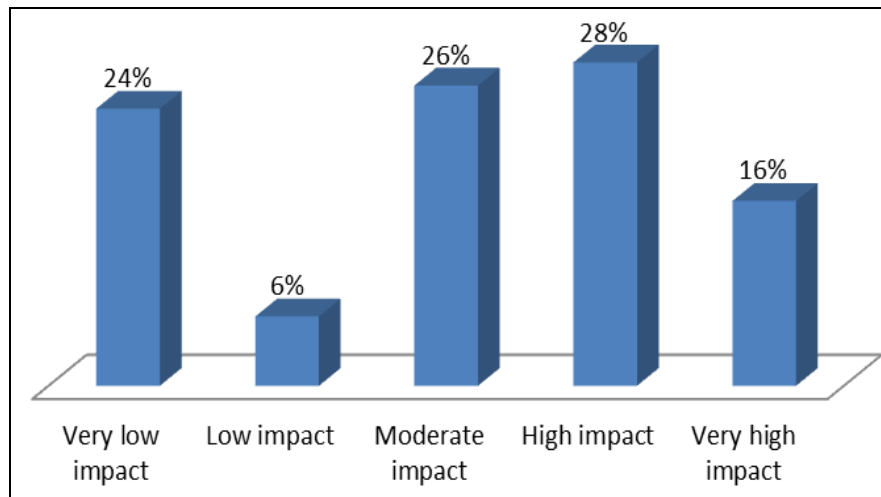


Source: Author

Chart 2: Considering importance of Expense Ratio while selecting Index Mutual fund

The charge ratio is the primary factor that most investors consider when deciding whether to invest in an index mutual fund, according to half of the respondents. 14% are neutral, while 12% say they strongly oppose or disapprove.

This study suggests that although cost considerations may have an impact on certain investors' fund selection, other factors may be very important and need more research.

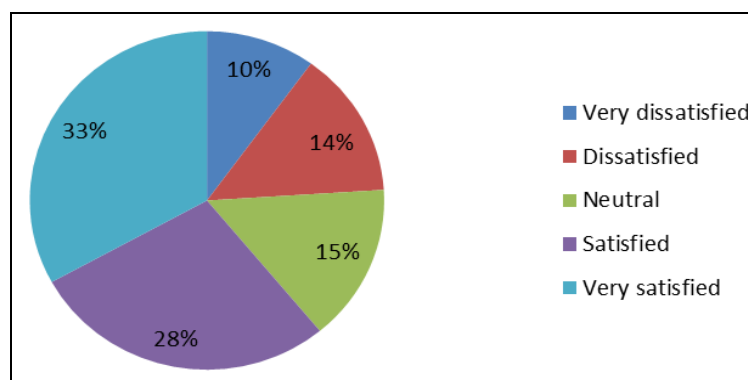


Source: Author

Chart 3: Impact of Market Volatility

Responses about the impact of market volatility on index fund performance vary somewhat. It is evident that market fluctuations may significantly affect results, as 44% of respondents think they have a great or considerable effect.

One-fourth of those surveyed believe it is very low, while one-third say it is moderate or low. This distribution shows how investors' varying levels of market knowledge and anxiety impact their approach to investing and risk tolerance.



Source: Author

Chart 4: Satisfaction with Fund Performance

More than two-thirds of investors in index mutual funds believe they are happy with the outcomes. Of them, 15% are neutral and 14% are unhappy or moderately dissatisfied. Even while the majority of respondents are happy with the returns on index funds, 10% were, indicating that the funds' real performance did not live up to investors' expectations.

generally satisfied, fund managers should be more open about their performance. The study's conclusions are advantageous to investors and have significant policy and asset management ramifications for creating affordable, investor-friendly index products that help long-term financial goals be met.

Conclusion

According to the survey, most investors are happy with the outcomes of their regular index mutual fund investments. The cost ratio, market volatility, and the investor's risk tolerance are the main factors that influence investment decisions. According to the results of the linear multivariate regression analysis, returns are favorably impacted by larger fund sizes and lower cost ratios, but adversely by more tracking errors and market volatility. Both younger and middle-aged individuals are actively engaged, according to the demographic data, suggesting that Indian investors are becoming more interested in passive investment tactics. These data show that investors need to learn more about the technical aspects of index funds, such as market exposure and tracking inaccuracy. Since a sizable minority of investors is nonetheless unhappy even if the majority is

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