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Evaluating the Performance of Mutual Fund Managers: A Comparative Analysis of Market Timing and Stock Selection using the Treynor-Mazuy Model in the Indian Market

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Abstract

This research paper, "Evaluating the Performance of Mutual Fund Managers: The paper entitled “A Comparative Analysis of Market Timing and Stock Selection Using the Treynor-Mazuy Model in the Indian Market” analyses the vital mutual fund performance of the Indian market. It reviews previous research on mutual fund performance evaluation, market timing ability, and related issues, and attempts to reconcile conflicting prior findings. The data used for the study is from January 2019 to December 2023 and the sample is of Indian mutual fund managers using the Treynor-Mazuy market timing model. The results were consistent with previous study by Dr. Soumya Guha Deb, and they shed some light on fund managers' selectivity and market timing skills in the Indian market. Emphasising the importance of precise performance metrics for investors, fund managers and regulators, the study offers vital insights into the performance of fund managers in one of the world’s largest fast-growing countries.

Keywords: Treynor-Mazuy Model, Market Timing, Stock Selection, Mutual Funds, Performance Evaluation

Introduction

Background: Mutual fund performance evaluation has been a critical area of research in the financial sector for decades. The mutual fund industry has been growing exponentially over the years, with global assets under management reaching nearly $120 trillion in 2023. (Middle East Continues Its Year-On-Year Growth with AuM Reaching $2.3 Trillion in 2023, 2024) The need for accurate and reliable performance measures has become increasingly important. As such, investors, fund managers, and regulators rely on these measurements for informed decisions, efficient resource allocation, and market integrity.

The Indian mutual fund industry has, since its origin in 1963, witnessed drastic changes and growth. Beginning with a handful of funds, the pace of liberalisation in the Indian economy from the 1990s saw massive additions in terms of both numbers and assets under management. As on August 31, 2024, Assets Under Management stood at ₹ 66,70,305 crore,

underlining its importance in India's financial landscape. Indian Mutual Fund Industry's Average Assets Under Management (AAUM) Stood at ₹ 66.04 Lakh Crore (INR 66.04 trillion) as per reports from AMFI.

As the industry matures, the need for sophisticated techniques of performance evaluation increases. Investment, regulators, as well as fund managers, need robust methods to assess the performance of funds, especially to differentiate between the two essential parts of active management: market timing and stock-picking abilities

Market Timing: Market timing refers to a fund manager's ability to indicate where the broad market is going and to adjust the portfolio's exposure accordingly. A part of successful market timing is reducing exposure before the downturns and increasing before upswings. This ability is of great use in a country like India, where the market has constantly been volatile and kinetic in nature.

Stock Selection: Stock selection, or security selection, is the ability of a fund manager to choose individual stocks that outperform their peers or the broader market. This skill involves in-depth analysis of companies, sectors, and market trends to identify undervalued or high-potential securities.

Treynor-Mazuy Market Timing Model:

The Treynor-Mazuy model, introduced by Jack Treynor and Kay Mazuy in 1966, is designed to evaluate a fund manager's market timing ability. Treynor and Mazuy (1966) added a quadratic term to CAPM to test for market timing skill. They argued that if a manager can forecast market returns, he will hold a greater proportion of the market portfolio when the return of the market is high and a smaller proportion when the return is low. (Philippas, 2002) The model is expressed as:

$$Rp - Rf = \alpha + \beta (Rm - Rf) + \gamma (Rm - Rf)^2 + \varepsilon$$

Where:

- Rp is the fund return
- Rf is the risk-free rate
- Rm is the market return
- α (alpha) represents the fund's selectivity skill
- β (beta) measures the fund's market exposure
- γ (gamma) captures the fund's market timing ability
- ε is the error term

A positive and statistically significant γ indicates successful market timing ability.

Research Problem: Despite the growth and overall importance of the Indian mutual fund industry, few adequate studies exist that investigate the performance of the fund managers using advanced models such as Treynor-Mazuy, specifically in the context of distinguishing between market timing and stock selection abilities. The present study attempts to bridge this gap by asking

1. What is the case with Indian mutual fund managers regarding market timing and stock selection?
2. Is there a wide variation in prevalence rates of market-timing versus stock-picking skills between Indian fund managers?
3. How do these skills vary across categories of funds, for example, large-cap, mid-cap, small-cap, sector-specific?
4. Have these skills increasingly become prevalent over time, specifically at times of key market events or regulatory change?

Significance of the Study: This research is significant for several reasons:

1. Investor Decision-Making: By providing insights into fund managers' specific skills, this study can help investors make more informed decisions when selecting mutual funds.
2. Fund Management Practices: The findings may influence how fund managers in India approach their investment strategies, potentially leading to improved practices in both market timing and stock selection.
3. Regulatory Implications: Regulators can use this insight to refine the reporting requirements on performance and, consequently, enhance the transparency of the Indian mutual fund industry.

4. Academic Contribution: This falls within the emerging literature of emerging market mutual funds. The paper provides a comprehensive application of the Treynor-Mazuy model in the Indian context.
5. Market Efficiency: It really tries to investigate the existence of market timing and stock selection skills in Indian markets by providing evidence on the efficiency of the Indian markets.

Literature Review

(Nikolaos Philippas, 1998) investigates the performance of Greek mutual fund managers between 1993 and 1997, revealing that most fund managers did not exhibit significant market timing skills. (Bollen and Busse, 2001) find that the power of tests for detecting timing skills is notably increased by using daily data in comparison to monthly data, and a greater number of funds demonstrate market timing proficiency. This therefore questions earlier studies, which posited little evidence of such abilities, meaning that more mutual fund managers could time market movements than previously thought. (Javier Rodríguez, 2007) indicates poor market timing based on the TM model, with most fund managers showing negative timing coefficients. This discovery, however, was regarded as possibly misleading because multi-asset global funds trade in multiple marketplaces. (Keith Cuthbertson, 2007) analyses a range of funds over various periods, focusing on both linear and non-linear aspects of timing ability. Cuthbertson's findings indicate that while some fund managers demonstrate significant market timing skills, the overall evidence is mixed, with many failing to achieve consistent outperformance. (Soumya Guha Deb, Ashok Banerjee, and B.B. Chakrabarti, 2007) employs both the traditional model and the conditional model in evaluating the performance of 96 Indian mutual funds and the results indicated that Indian mutual fund managers lack market timing ability both in the traditional and conditional models. Also, conditional models display a decrease in both the negative market timing and stock selection abilities compared to the unconditional models.

(Georges Hubner, 2012) applies this model to analyse the relationship between returns and market performance, focusing on both linear and non-linear aspects of market timing, finding that while some managers exhibit market timing skill, the results are often mixed and dependent on the time frame and methodology used. (B.S. Bodla, 2012) finds evidence of both timing and selectivity skills, though results vary by fund and market conditions. The research emphasises the importance of contextual factors in evaluating performance and contributes to the understanding of managerial effectiveness in India's evolving mutual fund landscape. (V. Santi Paramita, 2013) tests the Treynor-Mazuy Conditional Model, extending it by incorporating macroeconomic variables to improve predictions of mutual fund returns. The study supports the importance of varying beta values depending on market conditions for more accurate return estimates. (Roy and Ghosh, 2013) find evidence of varying degrees of market timing skill among managers, influenced by market conditions and fund characteristics. (Chopra, Manju Punia, 2014) conclude that most Indian mutual fund managers do not possess consistent stock-picking or market-timing abilities. Only a minority of the funds outperformed their benchmarks, indicating superior stock selection. However, the overall market timing performance was poor, with only one fund manager exhibiting perfect market timing according to the Treynor-Mazuy model. Overall, the study reinforces the difficulty for mutual fund managers to consistently beat the market, especially when accounting for management fees. (Subrata Roy, 2014) observes that although the portfolio managers return positive returns to investors, they have not exhibited exceptional performances in diminishing diversifiable risk. Overall, the analysis shows that the abilities of the fund managers in market timing were not potent since several gamma values were negative. Stock selection abilities also could not achieve satisfactory performances of the schemes when viewed against market indices like BSE Sensex. (Subrata Roy, 2014) reveals that mutual fund managers exhibit varying degrees of performance based on market phases, suggesting that their timing skills are conditional rather than consistent. (Musah, Senyo, and Nuhu, 2014) discovered that six out of eight Ghanaian funds had strong negative selectivity (alpha) ratings, while only two showed favourable stock picking abilities. The overall data indicate that fund managers were mainly ineffective in projecting the magnitude of market returns over this period. (Parag Rijwani, 2014) shows that fund managers have not been able to time the market to earn investors higher returns. It indicates that something else affects fund performance. (V. Santi Paramita, 2015) finds that while single beta testing shows weak results, dual beta testing in bull and bear markets reveals that systematic risk factors such as interest rates and money supply significantly impact mutual fund returns. (Ömer Faruk Tan, 2015) concludes that South African fund managers lacked both selectivity and market timing skills during the study period, with only one fund showing significant results. (Naveen and Mallikarjunappa, 2016) Out of 271 schemes, only 62 showed statistically significant positive selectivity coefficients, while just 12 demonstrated significant market timing abilities. (Akhtar and Ansari, 2016) indicates that only 19 of 40 funds have favourable market timing ability, with two (ING Balanced Fund and Escorts Growth Plan) statistically significant positive timing. However, 21 funds exhibited negative timing abilities.

(V. Santi Paramita, 2018) show that while managers exhibit market timing skills in both bullish and bearish conditions, their selectivity ability is inconsistent. The dual beta model, which accounts for market fluctuations, provides a more nuanced understanding of mutual fund performance compared to the single beta model. (Yadav, Chandra, and Laxman, 2019) finds that only five showed positive market timing, and Sundaram Select Focus is the only statistically significant fund at the 5% level, which implies very limited market timing and selectivity abilities among Indian fund managers. (Bandi and Gupta, 2019) indicate that while some managers demonstrate notable timing and selection capabilities, overall performance varies significantly across funds and market conditions. (Lusiana Desy Ariswati et al. (2021)) made it evident that market timing skills had a positive contribution although very insignificant, whereas, the stock selection skills contributed more towards the mutual fund. However, when taking into consideration the macroeconomic condition, the result becomes better by a small margin of its mean, while a negative performance is depicted in the case of stock selection skills. (Damani and Vaidya, 2021) investigates both risk-adjusted returns and downside risk metrics such as the Sortino and Calmar ratios. The study discovers that, while relative fund performance measurements are stable and predictive, market timing skills, as analysed using the Treynor-Mazuy model, are unstable over time, rendering them unreliable for forecasting future success. (Jing Ding, 2023) critiques the limitations of parametric approaches by offering robust alternative tests that account for distributional assumptions, finding that while some managers exhibit significant market timing skill, these abilities may not be consistently replicable, highlighting the complexities involved in evaluating mutual fund performance. (Damani, Sethia, and Mehta, 2024) highlight the complexities of measuring market timing skills and the influence of market conditions on fund performance, contributing valuable insights to the ongoing discourse on mutual fund management effectiveness. (Bathia, A., Padhy, J., Tripathi, M.M., & Balasubramaniam, R., 2024) find that the ARIMA model is most effective for short-term stock predictions within the Nifty 50 sectors, with significant differences in accuracy depending on the forecasting period and industry, contributing to the understanding of financial modelling in the Indian stock market.

Research Gap

Our literature reviews suggest that the Treynor-Mazuy Market Timing Model (TM Model) has been applied to various markets, as well as on several parameters, over the last few decades. The TM Model has been used to analyse various markets like Australia in recent years, but very few papers are set in the Indian context and none of them are not recent enough to reflect the current market behaviours and realities. Our research papers addressed this research gap by analysing the mutual fund managers in India using data between 1st January 2019 and 31st December 2023, with the help of the TM Model.

Research Objectives

This research paper aims to assess the abilities of the Indian mutual fund managers in terms of the two aspects- market timing and stock selection. The following research objectives can be proposed:

1. To assess the market timing ability of Indian mutual fund managers: This involves identifying whether fund managers in India can predict market movements and act accordingly to adjust their portfolios, and whether they can outperform the market.
2. To evaluate the stock selection ability of Indian mutual fund managers: To determine if fund managers can decide which stocks will outperform the average market or do better than the benchmark standards.
3. To analyse the mutual fund performance across different funds and time frequencies: The study also intends to differentiate the market timing and stock selection abilities between 2019 and 2023, varying between 40 different mutual funds and data frequencies (i.e. monthly vs. weekly).

These objectives help provide a structured approach to assess how efficiently mutual fund managers in India generate returns and whether their performance is driven by stock-selection skills, or market-timing abilities, or both.

Research Hypothesis

Null Hypothesis (H0): Indian mutual fund managers exhibit significant market timing ability and significant stock selection ability, as measured using the Treynor-Mazuy model.

Research Methodology

Through this study, we seek to evaluate the performance of Indian mutual fund managers, focusing on their market timing and stock selection abilities using the Treynor-Mazuy model, during the period of the last five years. In this research paper, we have used the unconditional Treynor-Mazuy model. The unconditional Treynor-Mazuy model serves the primary reason of the main model and assesses a fund manager's market timing abilities by adding a quadratic term to the regression of excess portfolio returns versus excess market returns. This quadratic term reflects any curvature in the relationship, indicating if the management adjusts the portfolio's beta in reaction to market fluctuations. However, this model presupposes that the market circumstances influencing returns (e.g., interest rates, economic cycles) remain consistent throughout time, thus "unconditional." To evaluate the Treynor-Mazuy factor for each mutual fund we needed to select stocks and find the variables of the unconditional TM model (1996) equation.

We randomly selected 40 equity-based mutual funds (Refer to Annexure 1) from AMFI and collected weekly and monthly data from January 1, 2019, to December 31, 2023. The focus of our research is equity funds since market timing and security selection are more relevant in case of the equity funds than in the case of debt funds. We selected only 40 funds because our research abilities are limited to the scope of our knowledge as undergraduates, which is insufficient for working with a large dataset. During the initial phase of our study, we found data only on daily NAV, by using common knowledge about Excel software, we converted the daily data to weekly and monthly dataset values. We have assumed equal weightage for each mutual fund being assessed in the study.

Subsequently, the fund returns (Rp) were calculated using the Holding Period Return (HPR) method based on the Net Asset Value (NAV) data collected from AMFI. Risk-free returns (Rf) were obtained from 6-year T-bill rates on Investors.com, while market returns (Rm) were derived from NIFTY 50 index data from NSE's website. Once the necessary variables of the equation were collected and compiled, we then calculated the necessary variables: excess portfolio return (Rp - Rf), excess market return (Rm - Rf), and squared excess market return (Rm - Rf) ^2. All the above data was compiled and worked with on Excel.

After this, we imported the data from Excel to Jamovi 2.6.2. Using Jamovi 2.6.2, we performed linear regression analysis for each fund, applying the **Treynor-Mazuy model: (Rp - Rf) = α + β (Rm - Rf) + γ (Rm - Rf) ^2 + ε.** In this model, α (alpha) represents stock selection ability of mutual fund managers, β (beta) indicates systematic risk, and γ (gamma) signifies market timing ability of mutual fund managers. We analysed the regression results, interpreting positive and significant α as superior stock selection and positive and significant γ as superior market timing. Based on the p-values and positive or negative values of these coefficients, the presence or absence of market timing abilities of fund managers was identified.

The study compares results across funds and analyses overall trends in the Indian mutual fund industry. To ensure robustness, we compared weekly and monthly data results and considered applying resampling techniques. Finally, we acknowledged limitations and suggested areas for future research, such as applying conditional models or exploring alternative market timing measures.

Data Analysis and Findings

Data Analysis

Using the data of Rp, Rm and Rf, we estimated the parameters $\boldsymbol{\alpha}$, **β**, and **γ** through a regression analysis, where the dependent variable is the portfolio's excess return (Rp- Rf), and the independent variables are: the excess market return (Rm- Rf) and the square of the excess market return (Rm-Rf) ^2. By using the regression software Jamovi 2.6.2 we calculated the values of $\boldsymbol{\alpha}$, **β**, and **γ**. The regression equation gave us the values of the three coefficients that quantify stock selection, market sensitivity, and market timing. Each parameter in the model tells us something important about the portfolio manager's performance.

Stock Selection Ability (Alpha - $\boldsymbol{\alpha}$) - found in the intercept row in Jamovi Model coefficients

- $\boldsymbol{\alpha}$ measures how well the manager can pick individual stocks relative to the market.
- Positive and significant $\boldsymbol{\alpha}$: indicates that the manager can pick stocks that outperform the market i.e. strong stock picking skills.
- Negative $\boldsymbol{\alpha}$: indicates underperformance, where manager's stock selections underperform the market.

Market Sensitivity (Beta - β) - found in the excess market return row in Jamovi in Model coefficients

- **β** measures the sensitivity of the portfolio to the market. It shows how much the portfolio returns move with the market.
- **β** = 1: The portfolio moves in line with the market.
- **β** > 1: The portfolio is more volatile than the market.
- **β** < 1: The portfolio is less volatile than the market.
- A beta near 1 means the portfolio moves closely with the market, while **β** > 1 indicates more volatility than the market.
- Higher beta means higher market exposure.

Market Timing Ability (Gamma - γ) - found in the squared excess market return row in Jamovi in Model coefficients

- **γ** represents the market timing ability of fund managers.
- Positive **γ**: Indicates that the manager is successfully timing the market and adjust portfolio risk in response to market changes. This means that they can increase portfolio exposure during bullish markets and decrease during bearish markets, resulting in better-than-expected performance.
- Negative **γ**: Indicates poor market timing ability. The manager is making incorrect or slow market predictions, increasing risk exposure at wrong times.
- **γ** = 0: Suggests that the manager is not engaging in market timing, and their performance is purely a result of stock selection.

We also checked the statistical significance of each value, using p-values found in regression. A p-value < 0.05 means the result is statistically significant, meaning the coefficient likely has a meaningful relationship with the dependent variable which here is, the portfolio excess returns.

Table 1: Regression analysis of weekly data

Model Fit Measures

				Overall Model Test			
Model	R	R^2	Adjusted R^2	F	df1	df2	p
1	0.9692	0.9393	0.9371	433.3081	2	56	< .00001

Source: Jamovi 2.6.2

Table 2: Regression analysis of monthly data

Model Fit Measures

				Overall Model Test			
Model	R	R^2	Adjusted R^2	F	df1	df2	p
1	0.9692	0.9393	0.9371	433.3081	2	56	< .00001

Source: Jamovi 2.6.2

Table 3: Relevant model coefficient values for weekly data

Model Coefficients - Rp-Rf

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept	0.4399	0.1598	2.7533	0.00634	
Rm-Rf	0.4355	0.0464	9.3907	< .00001	0.5069
(Rm-Rf)^2	−1.6099	0.4996	−3.2228	0.00144	−0.1740

Source: Jamovi 2.6.2

Table 4: Relevant model coefficient values for monthly data

Model Coefficients - Rp-Rf

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept	0.9269	0.2387	3.8826	0.00028	
Rm-Rf	0.9519	0.0323	29.4383	< .00001	0.9735
(Rm-Rf)^2	−0.5756	0.2079	−2.7691	0.00761	−0.0916

Source: Jamovi 2.6.2

As seen in the above tables (Refer Tables 3&4), we found out that the weekly and monthly values for $\boldsymbol{\alpha}$, $\boldsymbol{\beta}$, and $\boldsymbol{\gamma}$ were as follows: -

WEEKLY

$\boldsymbol{\alpha}$ = 0.4399
$\boldsymbol{\beta}$ = 0.4355
$\boldsymbol{\gamma}$ = -1.6099

MONTHLY

$\boldsymbol{\alpha}$ = 0.9269
$\boldsymbol{\beta}$ = 0.9519
$\boldsymbol{\gamma}$ = -0.5756

Findings

From the data collected and applying the understanding of the interpretations of each parameter, we were able to conclude certain findings to prove our hypothesis. The findings from the research are as follows: -

Weekly:

- The $\boldsymbol{\alpha}$ value turned out to be 0.4399 (Refer Table 3), which is positive. Thus, we could conclude that the manager's ability to select stocks outperform the market and that the managers exhibit stock picking skills. The p- value of $\boldsymbol{\alpha}$ intercept was also < 0.05, which helped us conclude that the value was significant.
- The $\boldsymbol{\beta}$ value of the weekly data came to be 0.4355 (Refer Table 3), which is < 1 but not very far from it as well. This helped us reach a conclusion that the market volatility during a week is weak to moderate and that the portfolio is less volatile than the market.
- Lastly, the $\boldsymbol{\gamma}$ value for the weekly data was -1.6099 (Refer Table 3), this indicates poor market timing ability, i.e. the managers are making incorrect or slow market predictions and are increasing risk exposure at wrong times.

Monthly:

- The α value turned out to be 0.9269 (Refer Table 4), which is positive. Thus, we could conclude that the manager's ability to select stocks outperform the market and that the managers exhibit stock picking skills. The p- value of α intercept was also < 0.05, which helped us conclude that the value was significant.
- The **β** value of the weekly data came to be 0.9519 (Refer Table 4), is very near to 1. This indicates that the market volatility is strong and the portfolio moves almost in line with the market with minor deviations.
- Lastly, the **γ** value for the weekly data was -0.5756 (Refer Table 4), again indicating a poor market timing ability, i.e. the managers make wrong predictions about the direction of the market and are slow in adjusting to market changes.

Comparison Between Monthly and Weekly Data:

- The monthly data has higher α than that of the weekly data (0.9269>0.4399) showing that the manager is better at selecting mutual funds over a longer time horizon.
- The **β** is significantly lower in case of weekly data as compared to monthly data (0.4355<0.9519) signifying that the fund is less sensitive to the market movements on a weekly basis and moves more closely to the market monthly.
- The value of **γ** for both data is negative implying poor market timing ability. However, the effect is more noticeable in case of weekly data (-1.6099) as compared to monthly data (-5.5756) indicating that the manager's ability of market timing is more detrimental when assessed weekly than when assessed monthly.
- We preferred to choose 2 data sets mainly weekly and monthly because of three major reasons: -

1) It helps us capture and compare managers' performance abilities across two horizons - short term (weekly) and long term (monthly).
2) It helps us gauge a detailed view (weekly data) as well as an overall view (monthly data) of the parameters to be tested.
3) It helps us understand a comparative analysis and gives us findings which are comparable across long- and short-time horizons.

Conclusion

In this paper, our objective was to assess Indian mutual fund managers' abilities on two factors- stock-selection and market-timing. We used data from January 2019 to December 2023, and using the Treynor-Mazuy market timing model we can conclude that our findings, as listed in detail above, are in line with the findings of Dr. Soumya Guha Deb's research paper (2007).

We have found strong evidence that mutual fund managers in India have effective stock selection abilities. However, very little evidence was found on positive market-timing ability. For both weekly and monthly findings, α, indicator of stock-selection remained positive while γ, indicator of market-timing, remained fairly negative.

We can safely conclude that the stock selection ability of Indian mutual fund managers is more pronounced than their market timing ability. Hence, we will reject null hypothesis.

Limitations and Future Scope

Limitations

1. Model Specification: The Treynor-Mazuy model is extremely widely used but remains bounded by two kinds of limitations. Its quadratic form assumes a specific functional relationship between fund returns and market returns, which may fail to capture all aspects of the ability of market timing. The model may misclassify nonlinear strategies as market timing, thus generating false positives.
2. Look-Ahead Bias: Ex-post data usage in our analysis may cause look-ahead bias. Our analysis uses data that was not available when the decisions made by fund managers were due, while the decisions are taken based on information at the time.
3. Market Proxy Selection: The choice of market proxy-the Nifty 50 may not represent the investment universe of all funds under study. This may have implications for beta estimates and, indirectly, the evaluation of market timing and stock selection skills.

4. Heterogeneity of Fund Strategies: The Treynor-Mazuy model assumes a consistent investment strategy over time. However, fund managers may adapt their strategies based on market conditions, potentially leading to misspecification of the model.
5. Limited Time Frame: The study's time frame, while extensive, may not capture the full range of market conditions and cycles, potentially limiting the generalizability of our findings.
6. Macro Factors: The model does not explicitly account for macroeconomic factors that could influence fund performance, potentially attributing their effects to manager skill.

Future Scope

1. Alternative Models: Future research can utilise alternative models like the Henriksson-Merton model or the Ferson-Schadt conditional model for even more comprehensive evaluation of their market timing abilities. More robust insights would emerge from a comparison of results across multiple models.
2. High-Frequency Data Analysis: Utilising daily or even intraday data could provide more granular insights into market timing abilities, particularly for funds that engage in more frequent trading.
3. Machine Learning Methods: Advanced machine learning techniques could be employed to identify complex, non-linear patterns in fund manager behaviour that traditional models might miss.
4. Comparative Studies: Expanding this research to make cross-country comparisons with the performances of Indian mutual funds in other emerging markets or developed markets would add significant value
5. Segment-Specific Analysis: Further scrutiny of selected fund segments, say, in small-cap or sector-specific funds, would help determine if the ability to time the market or select individual securities is market segment-specific.

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ANNEXURE 1: LIST OF MUTUAL FUNDS

S.No.	Name of the Mutual Funds
1	Nippon India Small Cap Fund - Direct Plan Growth Plan - Growth Option
2	Motilal Oswal Midcap Fund-Direct Plan-Growth Option
3	HDFC Small Cap Fund - Growth Option - Direct Plan
4	Nippon India Growth Fund - Direct Plan Growth Plan - Growth Option
5	Aditya Birla Sun Life Digital India Fund - Growth - Direct Plan
6	ICICI Prudential Technology Fund - Direct Plan -Growth
7	JM Flexicap Fund (Regular) - Growth option
8	DSP India T.I.G.E.R. Fund - Regular Plan – Growth
9	Canara Robeco Consumer Trends Fund
10	LIC MF Infrastructure Fund-Regular Plan-Growth
11	Tata Infrastructure Fund -Direct Plan -Growth Option
12	ICICI Prudential Infrastructure Fund - Direct Plan -Growth
13	Invesco India PSU Equity Fund - Direct Plan - Growth

14	SBI Magnum MIDCAP FUND - DIRECT PLAN - GROWTH
15	Kotak Infrastructure & Economic Reform Fund- Direct Plan- Growth Option
16	SBI CONSUMPTION OPPORTUNITIES FUND - REGULAR - GROWTH
17	LIC MF Infrastructure Fund-Direct Plan-Growth
18	Nippon India Multi Cap Fund - Direct Plan Growth Plan - Growth Option
19	UTI Nifty 50 Index Fund - Growth Option- Direct
20	SBI LONG TERM EQUITY FUND - DIRECT PLAN -GROWTH
21	Nippon India Growth Fund - Direct Plan Growth Plan - Growth Option
22	HDFC Balanced Advantage Fund - Growth Plan - Direct Plan
23	HDFC ELSS Tax saver - Growth Option - Direct Plan
24	Quant Multi Asset Fund-GROWTH OPTION-Direct Plan
25	Axis Small Cap Fund - Direct Plan - Growth
26	Quant Mid Cap Fund - Growth Option - Direct Plan
27	SBI PSU Fund - REGULAR PLAN -Growth
28	SBI Magnum MIDCAP FUND - DIRECT PLAN - GROWTH
29	DSP Small Cap Fund - Direct Plan – Growth
30	LIC MF Nifty 50 Index Fund-Direct Plan-Growth
31	Edelweiss Mid Cap Fund - Direct Plan - Growth Option
32	BANDHAN Nifty 50 Index Fund-Direct Plan-Growth
33	Axis Bluechip Fund - Direct Plan – Growth
34	UTI Nifty 50 Index Fund - Regular Plan - Growth Option
35	Mirae Asset Large & Midcap Fund - Direct Plan - Growth
36	Kotak Equity Opportunities Fund - Growth – Direct
37	ICICI Prudential Nifty 50 Index Fund - Direct Plan Cumulative Option
38	BANK OF INDIA Small Cap Fund Direct Plan Growth
39	Motilal Oswal Flexi cap Fund Direct Plan-Growth Option
40	PGIM India Midcap Opportunities Fund - Direct Plan - Growth Option