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IMPACT OF INCEPTION RETURN AND SYSTEMATIC RISK ON REWARD RISK RATIO – WITH PARTICULAR REFERENCE TO ARTIFICIAL INTELLIGENCE (AI), BIG DATA, MACHINE LEARNING AND ALGORITHM TRADING BASED QUANT MUTUAL FUND SCHEMES IN INDIA

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ABSTRACT
Quant mutual funds are based on predictive analytics and systematically programmed investment strategies utilizing Artificial Intelligence (AI), Big Data Analytics, Algorithmic Trading, etc.; these funds ignore market-specific factors due to flexible diversification strategies in portfolio allocation; as a result, these funds have a greater emphasis on unsystematic risk as opposed to systematic risk. This study aims to examine how Inception Return and Systematic Risk influence the reward-to-volatility ratio. The analysis is based on a selection of Quant Money Managers Limited's mutual fund schemes (AMC). Only seven of the equity-based quant mutual fund strategies have been selected. The selection of seven quantitative mutual fund schemes is based on the portfolio turnover ratio. Sharpe's ratio, a performance evaluation metric, served as the dependent variable in the study. In the analysis, the independent variables are initial return and systematic risk. This study uses the Quality and Growth Stocks at Reasonable Price (QGARP) model and market-specific criteria to assist Quant Mutual Fund Managers with portfolio balance and diversification. Using investing and predictive analytics, fund managers of equity-focused quantitative mutual fund schemes diversify portfolios and reduce total risk with a high risk-to-reward ratio (Sharpe Ratio).
Keywords: Quant Mutual Fund, Predictive Analytics, Artificial Intelligence (AI), Big Data, Machine Learning, Algorithm Trading, Sharpe Ratio, Systematic Risk, Inception Return , Total Risk, BETA.

1. INTRODUCTION
Quant Mutual Funds will appear at the top of the research look at the performance chart of mutual funds in India. Quant Mutual funds work on the concept of quant investing. The concept

of quant investing is still very new to India. The history of quant investing is running since 1934 when the father of value investing, Benjamin Graham, wrote the first book "Security Analysis" (Anish Teli, 2020). Security Analysis is the first task for the mathematical metrics to buy and hold stocks in the field for quantitative investing. After this, John Greenbelt prepared quantitative principles and used the magic formula of investing; similar to quantitative investing, the study should remember Jim Simons. He wrote one book, "The Man Who Solved the Markets". Jim Simons is the Warren Buffet of quant investing. If the study looks at his return over time. His fund, "Medallion" has a 62% annualized returns (before fees) and 37% annualized returns (net of fees) from 1988-2021 (Nick Maggiulli, 2023). It has been among the best-performing funds worldwide in the last few years.

Quantitative Investing (QI) is all about predictive analytics. The study predicts the sector, stock, theme and market etc. It is a prediction of where investors achieve higher returns. This is the idea of Quantitative Investing (QI) based on predictive analytics. In Quantitative Investing (QI), there is a system fed with data. The study makes a framework with data. The quant mutual fund strategy is based on different factors and stored data sets. In the Indian context, the strategy behind quant investing is known by the name VLRT framework.

VLRT FRAMEWORK

V- VALUATION

L- LIQUIDITY

R- RISK APPETITE

T- TIMING

Consider the **VLRT framework, e.g. looks at the wealth creation and wealth destruction graph .**

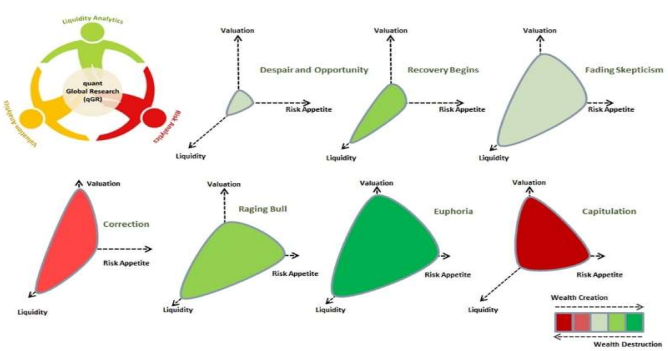

Figure 1st

Source- *https://quantmutual.com/about-us/investment-framework*

Wealth creation starts when valuations are too cheap. Liquidity is on the sidelines, as happened in March 2020. Also, when risk appetite was low. Generally, from despair and opportunity, recovery begins. Slowly, liquidity resumes and the valuation warstarts filling in. Then scepticism fades from incoming recovery—valuation and risk appetite correction increase. After the correction is a raging bull market with a low valuation, then kicks in euphoria with liquidity, valuation fully in and the risk appetite is maximum. In the euphoria stage, many IPO enter what researchers observe. They have fed this into the system with the help of Artificial Intelligence (AI), Big Data, Machine Learning Algorithm Trading, etc. This is the idea of Quant Investing, which Quant Mutual Funds in India use. How did the Quant Mutual Fund emerge in India? In 2018, Escort Asset Management Company (AMC) used to have 235 crores of AUM (Himanshu Srivastava , 2022). Since it is a small AMC & it is not easy to obtain the AMC license in India, Quant Capital acquired Escorts Asset Management Company (AMC) in 2018. Quant Capital used to be part of Reliance of Mr Anil Ambani. In 2018, they started giving quant strategies in their mutual fund offerings. This is how the fund house was born in India.

2. REVIEW OF LITERATURE

Naveen and Mallikarjunappa (2022)evaluated the performance of significant, mid, small, and multi-cap categories from equities diversified funds using statistical metrics such as standard deviation, beta, Sharpe ratio, Treynor's index, and Jensen's measure for risk-return analysis. The Nifty 100 TRI was used as a time series correlation analysis reference point. The pandemic effect was investigated using a multiple regression model, and the results researchers confirmed using residual diagnostics. Ninety-three open-ended ideas researchers chose from the four categories and studied for four years, from April 2017 to March 2021, with the COVID-19 phase ending in December 2019. Using a dummy variable, the researchers investigated how the pandemic influenced performance before and after it. Multi-cap, large-cap, and mid-cap funds are available.

Nur and Fernandika (2022) investigated the impact of fund age, fund size, expenditure ratio, and prior performance on the performance of fixed-income mutual funds from 2016 to 2019. Fixed-income mutual fund performance is analyzed using the Sharpe method. Multiple regression was used to analyze the study's data. According to the study, fund age has an enormous and unfavourable impact on mutual funds that invest in fixed income. Fixed-income mutual fund performance, on the other hand, is unaffected by fund size, expense ratio, or historical performance. Investors can benefit from the findings of this study by picking mutual fund products more carefully, particularly fixed-income mutual funds. Portfolio managers can use this study to assess mutual funds' effectiveness.

Elton & Gurber (2020) investigated the major quantitative models of performanceevaluation of mutual funds. The performance measurement of active equities and bond portfolios in the global mutual fund business was exposed by this study. The researchers concluded that bias, data sources, missing elements, and improved benchmarks affect how researcher mutual fund portfolio performance is measured.

Shreekant, Rai, Raman, and Bhardwaj (2020) used the performance evaluation techniques of actively managed and passive (index) mutual funds in India to analyze the risk exposures of government bond mutual funds. This study examined reward-to-risk ratios (Sharpe & Treynor) and Jenson Alpha to determine how bond mutual funds fared. The study found that actively managed funds beat passive bond mutual funds. Actively managed funds and passive (Index) funds performed similarly.

Tripathi et al. (2020) investigated the risk-return connection of selected equities (large-cap, mid-cap, and small-cap) open-end fund schemes. Several fund companies in India offer these funds for investment. This research examines the financial performance of a few open-end fund schemes (large, mid, and small-cap) regarding the risk-return relationship using statistical approaches like (Jenson s alpha, beta, standard deviation, and Sharpe ratio). According to the study's conclusions, 10 of the 15 funds fared researcher in a volatile market. Before investing, the researcher discovered that one should analyze the risk ratios of the fund.

Shreekant, Rai, Raman, and Bhardwaj (2019) investigate the risk-adjusted performance of equities, balanced, and debt mutual funds in India over various time horizons (three, five, and ten years). Regarding risk-adjusted returns, equities mutual funds beat debt and balanced (hybrid) mutual funds, although equity mutual fund returns researcher more volatile than the other two categories.

Sivabagyam et al. (2019) evaluated and contrasted the performance of 26 large-cap equity schemes from five asset management firms (Franklin Mutual Fund, India bulls Mutual Fund, UTI Mutual Fund, SBI Mutual fund, Axis Mutual fund). The five-year study period spans from 2013 to 2018. A benchmark called the BSE 100 index is created using data from www.bseindia.com. In the research study, the performance among Large-Cap Equity Mutual Funds of Selected Asset Management Companies was compared, and the performance of Large-Cap Equity Mutual Funds of Selected Asset Management Companies was analyzed. The study's methodology includes using tools for data collection, analysis, and sampling. In order to process the data and produce reliable conclusions, this research study uses Sharpe Index.

Bachal and Kale (2018) studied the performance of Indian multi-cap mutual fund schemes using risk-measuring tools (Alpha, Beta, Standard Deviation, and so on). According to this study, multi-cap mutual fund schemes achieved good risk-adjusted returns from 2013 to 2018.

Kamboj et al. (2018) assessed the yearly and periodical performance of five multi-cap mutual fund schemes from the top five asset management firms over five years from 1 April 2012 to 31 March 2017. The study calculates several absolute and relative performance indicators using Jensen Alpha, Sharp and Treynor Ratios, using the S&P BSE 500 as the benchmark index. According to the analysis, except for the HDFC Premier Multicap Fund, all schemes had higher risk-adjusted returns than the benchmark index. Birla Sunlife Equity Fund was the best performer, with higher average returns and risk.

Mamta and Ojha (2017) analyzed the risk-return connection of Indian equity-diversified mutual funds based on total and systematic risks. The investigation examined financial measures such as average return, Sharpe ratio, Treynor ratio, standard deviation, beta, and coefficient of determination (R2). The data was taken from amfiindia.com and various mutual fund programme researcher sites. According to the statistics, most of the funds chosen for the study outperformed the Treynor and Sharpe ratios. Small investors can engage in the stock market through mutual funds without significant risk. Diversification, or putting eggs in several baskets, is a crucial investing approach.

Berk and Binsbergen (2016) show that the CAPM model is best for analyzing mutual fund performance. The researcher urges fund managers to utilize this model when designing an ideal portfolio because it better explains investor decisions than multifactor models.

Gowri and Deo (2016) used risk-adjusted methodologies to assess the performance of fund of funds. The fund funds' performance was measured against the benchmark index (BSE 100), a proxy for market and risk-free returns. Samples were gathered from the websites of the appropriate AMFI, and AMC from 1 April 2007 to 31 March 2014, and returns were calculated using the NAV prices of the associated schemes. Risk-adjusted indicators used in the study include the Sharpe ratio, Treynor ratio, and Jensen alpha. According to an analysis of a sample of equity-oriented mutual funds, all of the funds had negative returns that were higher than the risk-free rate of return indicated by 91-day returns.

Lemshek and Rejnus (2015) assessed the absolute and relative risk-adjusted performance of 4,796 open-ended mutual funds in 27 emerging markets. This study examined the risk-adjusted performance of a few open-ended equities mutual fund schemes using risk-adjusted return ratios (Treynor, Sharpe), Jenson's Alpha, M-squared, and Carhot metrics. The researchers discovered that the performance of open-ended equity mutual funds in these developing countries does not outperform the market (relative benchmark indexes).

3. STATMENT OF THE PROBLEM

.Quant mutual funds are based on predictive analyticsand systematically programmed investment strategies using Artificial Intelligence (AI), Big Data Analytics Algorithm Trading etc.; these funds are ignored market-specific factors due to flexible diversification strategy in portfolio allocation; asa result, these funds have more focused on unsystematic risk instead of systematic risk. Due to this, it becomes essential to know in what way the impact of market-specific factors and benchmark return in risk-adjusted return generation of quant mutual fund schemes is essential. The study attempts to determine the impact of Inception Return and Systematic Risk on a reward-to-volatility ratio.

4. SCOPE OF THE STUDY

Quant mutual fund schemes are prevalent among aggressive and long-term investment-oriented retail investors in India due to being top mutual fund performers in the Indian Mutual Fund industry. This study's scope is limited to seven mutual fund schemes of Quant Investments Ltd in the mutual fund industry. This study has analyzed the relevance of systematic risk and Inception return on performance evaluation of Quant Mutual Fund Schemes in India. This study helps Quant Mutual Fund Managers in portfolio balancing and diversification strategy

based onthe Quality and Growth Stocks at Reasonable Price (QGARP) model with market-specific factors. This study also helps retail investors invest in Quant Mutual Fund Schemes based on market volatility. Horesearcherver, the study is mainly concentrated on only Inception Return (Benchmark Return), Risk (Standard Deviation), Systematic Risk (Undiversified Risk) and Reward Risk ratio under the performance evaluation of Quant Mutual fund schemes. Further study may be conducted on the effect of Quant Mutual Funds characteristics, including Portfolio Turnover Ratio, Expense Ratio, Age of Mutual Funds, Fund Size, Return and Risk on their risk-adjusted return.

5. OBJECTIVES

The main reasons behind this study are:

- To measure and evaluate the performance of selected quant mutual fund schemes.
- To know the potential total and systematic risks in selected quant mutual fund schemes.
- To find out the impact of Inception (benchmark) return and systematic risk on risk-adjusted return,

6. RESEARCH METHODOLOGY

Area of Study

The study is based on selected mutual fund schemes of Quant Money Managers Limited (AMC).

Type of Research

Descriptive

Sampling Technique

Non-Probability Sampling

Sampling Type

Judgmental Sampling

Sample design

In the sample design, the researcher has selected only seven equity schemes of Quant Mutual Funds out of tresearcherlve equity-based quant mutual fund schemes. These seven quant mutual fund schemes are selected based onthe portfolio turnover ratio. The portfolio turnover means how often the portfolio has changed in the last year. It is percent so 222%, which means almost it changed one time again double. Quant mutual funds schemes have more portfolio turnover due to a flexible diversification strategy in portfolio allocation using "Predictive Analytics" (combining robust technology and a multidimensional research approach).

Selected schemes

S.No.	Name of Schemes	Portfolio Turnover Ratio (%)
1.	Quant Large and Mid Cap Fund	222
2.	Quant Flexi Cap Fund	190
3.	Quant Mid Cap Fund	189
4.	Quant Absolute Fund	151

5.	Quant Tax Plan Fund	141
6.	Quant Active Fund	120
7.	Quant Small Cap Fund	97

Source - https://quantmutual.com/

Source of data collection

The study is an empirical work based on secondary data collected from various sources.The period of this study is ten years. The study is based on the website like

www.mutualfundsindia.com
www.amfiindia.com
https://quantmutual.com/
https://www.etmoney.com/mutual-funds
https://www.valueresearchonline.com/

Financial analysis tools for Performance Evaluation of Mutual Fund Schemes

The financial metrics used for the present study.

- Sharpe Ratio (Reward to Risk Ratio)
- Total Risk
- BETA
- Systematic Risk

Statistical Analysis Tools

The data was collected, inputted, and calculated into an excel sheet before being analyzed with SPSS. This study used Sharpe's performance evaluation measure ratio as a dependent variable. The independent factors in the analysis are inception return and systematic risk.

Hypotheses:

H1–The performance of equity-based quant mutual funds significantly impacts the potential risk-adjusted returns.

H2–Systematic risk is a significant assessment of equity-based quant Mutual fund's performance.

7. DATA ANALYSIS

Empirical Model:

An ordinary least square regression model was used to assess the influence of independent variables such as inception return and systematic risk on the dependent variable Sharpe ratio. Several regression models were employed in the study to determine the association betresearcheren the performance measurement approach and Sharpe's ratio and each explanatory or independent variable, as well as linear regression, in which the line that best fits the data according to a specified mathematical criterion is found.

Mutual funds and hyper funds may employ various development theories, studies, and performance evaluation approaches (Eling&Schuhmacher, 2007). Sharpe's ratio is amonginvestors' most popular approaches in mutual funds. It determines risk premiums and the other returns offered over and above the risk-free rate to entice investors to take on risk (Afza and Rauf,2009). A researcher must first ensure the descriptive characteristics before performing the statistical analysis. Table 1 presents the mean, standard deviation, and minimum and maximum values of mutual fund schemes' dependent and independent variables.

Table1:Descriptives for schemes

SN.	Name of Scheme	Mean	Sharpe's ratio
1	Quant Small Cap Fund	-0.676	1.42
2	Quant Active Fund	-0.525	1.22
3	Quant Tax Plan	-0.564	1.31
4	Quant Absolute Fund	-0.657	1.33
5	Quant Mid Cap Fund	-0.539	1.29
6	Quant Flexi Cap Fund	-0.526	1.22
7	Quant Large and Mid Cap Funds	-0.436	1.04

The above table shows the summary data of Sharpe's ratio for the various fund schemes utilized in this study, including the mean, standard deviation, and minimum values. Sharpe's ratio is a popular performance measuring technique that displays the fund's reward-to-risk (variability). Table 1 summarises Sharpe's ratio system. Sharpe's ratio variability is highest for Quant Small Cap Funds (1.42) and loresearcherst for Quant Large and Mid Cap Funds (1.04) among all schemes under consideration.

Table2:Descriptivestatisticsofthevariables

Variables	Mean	Std.Deviation
IR	4.460	1.096
BETA	1.94	0.962
SR	2.02	0.942

The accompanying table shows the mean and standard deviation of the dependent and independent variables of the listed mutual funds. Sharpe's ratio is a reward-to-risk ratio that compares the portfolio's risk premium to the total amount of risk in the portfolio. The risk premium is the additional return above and beyond the risk-free rate offered to entice investors to take on risk. The benchmark return is the inception return. Systematic risk (BETA *Standard Deviation of Market) is based on beta; it measures a security's volatility compared to the whole market. Sharpe's ratio has a mean value of 2.02 and a standard deviation of 0.94, as seen in table 2.

Table3:Pearsoncorrelationanalysisamongthevariables

Variables	IR	BETA	SR
IR	1		
BETA	.070	1	
SR	.058	.335	1

The Pearson correlation matrix betresearcheren mutual fund performance metrics, Sharpe's ratio and all independent factors are shown in Table 3. All correlations can be regarded as low because the most robust connection was found to be 0.335 betresearcheren Sharpe's ratio and systematic risk and is significant at the 1 percent level. The findings show that the variables have a low degree of correlation (correlation less than 0.8), indicating that multicollinearity is not an issue. VIF also inspects it. VIF is less than 10 for all variables, indicating that multicollinearity is not a problem. As a result, it was evident that the data were parametric.

Table4:RegressionresultsofSharpe'sratioformutualfunds

Model	R	R Square[b]	Adjusted R Square	F Change	Sig. F Change	Durbin-Watson
1	.876[a]	.767	.765	326.222	.000	
2	.908[c]	.825	.821	32.295	.000	1.773

Predictors: BT, IR_c

Dependent Variable: SR_d

Regression through the Origin[e]

ANOVA

Model		Sum of Squares	Mean Square	F	Sig.
1	Regression	380.521	380.521	326.222	.000[c]
	Residual	115.479	1.166		
	Total	496.000[d]			
2	Regression	409.144	204.572	230.819	.000[e]
	Residual	86.856	.886		
	Total	496.000[d]			

H1–The performance of equity-based quant mutual funds significantly impacts the potential risk-adjusted returns.

Table 4 describes Sharpe's ratio regression of independent variables on mutual fund performance as the adjusted R2 is highly significant. Inception return has been discovered to be a significant ($P<0.05$) element influencing mutual fund performance. Sharpe's ratio demonstrates that the beta coefficients are continually positive and statistically significant at the one percent significance level, implying that the bigger the market returns, the higher the Sharpe's ratio.

H2–Systematic risk is a significant assessment of equity-based quant Mutual fund's

performance.

Furthermore, systematic risk has been discovered to be an essential factor influencing mutual fund performance. Beta coefficients are consistently positive (0.000 p Value) and statistically significant at the one percent significance level, indicating that the higher the systematic risk, the higher the Sharpe's ratio performance.

8. CONCLUSION

This study examines mutual fund performance using Sharpe's ratio performance evaluation approach and provides an industry overview (Bajracharya,2017). Most mutual funds are designed so that the implications of performance have an influence even when the market is in a bullish trend. Analyzing the performance reveals that the critical predictive variables of Sharpe's ratio performance measuring methodologies are inception return and systematic risk. These variables have varying effects on the measuring of fund performance.

Inception Return has been discovered to be a significant component influencing the mutual fund performance indicator tool (Choudhary&Chawla,2014). Sharpe's ratio, as beta coefficients, is always positive and statistically significant, meaning that the greater the return, the greater the Sharpe's ratio. Similarly, systematic risk has been discovered to be an essential component influencing mutual fund performance since beta coefficients are always positive and statistically significant, showing that the higher the systematic risk, the higher the Sharpe's ratio performance. As a result, return and systematic risk favorably impact Sharpe's ratio. Thus from the above analysis, the study can conclude that quant funds may have a low correlation with the overall market (Sangeeta Ojha, 2022) but the higher the systematic risk, due to movement of the overall market is positively impacted on risk-adjusted return (Sharpe Ratio - a reward to risk ratio). This study underlines that fund managers of equity-focused quantitative mutual fund schemes diversify portfolios and decrease overall risk with a high risk-to-reward ratio (Sharpe Ratio) by utilizing investment analytics and predictive analytics. These schemes affect the whole market since systemic risk significantly impacts the real risk-adjusted return of these mutual fund schemes.

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