

## An Analysis of Information Ratio and its Impact on Yearly NAV Returns of Multicap Equity Mutual Fund Schemes.

Abhijith<sup>1</sup> and Dr. P.Balasubramanian<sup>2</sup>

<sup>1</sup> Research Scholar, Department of Commerce and Management, School of Arts and Sciences, Amrita Vishwa Vidhyapeetham, Kochi, Kerala, India

<sup>2</sup> Head and Assistant Professor (Sr. Grade), Department of Commerce and Management, School of Arts and Sciences, Amrita Vishwa Vidhyapeetham, Kochi, Kerala, India

### Abstract

There has been a significant increase in the awareness, interest to learn, and to know about mutual funds among the general populace. This has led to a significant increase in people willing to invest in mutual funds. This paper is an attempt to evaluate the performance of select mutual fund schemes with operations in India. This study is based on the daily Net Asset Value for 5 years. The paper uses non-parametric tools in concurrence Sharpe and Jensen's Alpha techniques. The 10 selected mutual fund schemes were classified based on ownership owned by banks and standalone enterprises; this would help shed light on some interesting observations. The results shed light on the significant relationship between mutual fund returns and market returns, foreign exchange rate, inflation rate, beta of the mutual fund scheme.

### Keywords

*Mutual funds, Performance Appraisal, Net Asset Value, Indian Financial Markets*

## 1 Introduction

India's economy has grown at an average rate of 7.0563% from the start of this century (World Bank). This has led to the burgeoning of India's middle class to around 600 million people which represents more than 50% of India's population (Krishnan, S., & Hatekar, N 2017). The Indian financial market provides its populace with both short-term and long-term investment options which include but are not limited to the savings bank account, mutual fund schemes, fixed deposits in banks, post office saving schemes, public provident funds, Bonds and debentures issued by companies and other institutions, life insurance policies and equity shares. The assets managed by the Indian Asset management companies have increased to

Rs 26.07 trillion as of June 2020 (AMFI). There are a total of 1792 mutual fund schemes offered by the various mutual fund schemes as of July 2020, managing Rs.27.11 trillion in assets. Mutual fund as an investment vehicle is highly attractive to investors who want a low-risk diversified portfolio to provide them with an assured return. The volume of money involved in mutual funds makes it highly imperative to evaluate the performance of mutual fund schemes by the researchers, investors, and fund managers. The widespread research on this topic makes it easier for everyone to make accurate predictions of future performances of the mutual fund schemes. The independent review of the performance makes the study unbiased. The general populace and retail investors find it hard to find data on the performance of mutual fund

schemes. This paper is an attempt to make it easier for investors to make more informed decisions. It is generally accepted that mutual fund managers are well informed about price-sensitive information and make necessary adjustments to the portfolio. Even with the widespread dissemination of information related to mutual fund schemes most investors do not make use of this information.

## 2 Literature review

**Belghitar, Y., Clark, E., & Deshmukh, N. (2017).** The paper attempts to gauge the performance of Socially Responsible Investment (SRI) funds in the United Kingdom (UK). 27% of Assets Under Management in the UK were SRI funds as of 2015. The study excluded index funds. The study excluded funds whose investment was less than 70% in shares. In marginal Conditional Stochastic Dominance analysis, the Shapiro-Wilk test was used in the study. The study concluded that the SRI funds were performance was comparable to conventional funds. **Yi, L., Liu, Z., He, L., Qin, Z., & Gan, S. (2018).** The paper was an attempt by the researchers to explore the Chinese fund manager's market timing abilities for the period between July 2005 to June 2016, from the: market return, volatility, and liquidity dimensions. The sample was restricted to 336 equity funds. Bootstrapping as well as market timing models. Liquidity timing, return timing, and volatility timing were used in the study. The researchers were able to conclude that liquidity and volatility timings appeared to have a much stronger impact than timing ability. **Treynor, Jack L. (1965)** tried to create a measure called Treynor measure based on systematic risk to evaluate portfolio performance. They assumed the investor can reduce any unsystematic risk by investing his money in a diversified portfolio. The results will mislead "if the measure is applied during the bear phase of the market to the mutual fund's schemes with negative betas, it also ignores the rewards for unique or

unsystematic risk. The measure's major constraint was that it can be applied to the mutual fund schemes with positive beta during the bull phase of the market. It measures the risk premium an investor has to bear per unit of systematic risk". **Ferreira M.A., Keswami A, Miguel A.F. & Ramos S.B. (2013)** analysed the performance of open-ended equity mutual funds in twenty-seven countries. It was observed that the "diminishing return to scale in the performance of funds was only applicable to the funds in the US and the funds in other markets and funds in the US that invest in overseas markets were not affected by scale". It was also found that there is a "direct relationship between strong legal institutions and funds located in countries with 8 highly liquid stock markets with performance". **Bansal, S., Sanjeev Kumar, S., & Gupta, S. K. (2012)** Sharpe measure was used to assess the performance of 12 MF's, they found that only three of the twelve mutual fund schemes were outperforming and the rest nine out of the twelve mutual funds were underperforming. **Jayadev, M (1996),** the benchmark returns were compared with the performance of 2 growth-oriented MF's. After analysis, it was found that the MF's had underperformed. **Bahl, S., & Rani, M. (2012)** Sharpe, Jensen, and Treynor measures were used to study the performance of twenty-nine open-ended, growth-oriented equity MF schemes from April'05 to March'11. They found that all the MF's studies showed positive returns to the mutual fund holders, and fourteen of the mutual funds have outperformed the benchmark. It was observed the earnings provided by the MF's were higher than the risk-free return. Jensen's measure revealed that two-thirds of the MF's studied also showed positive alpha, which indicates better performance when compared to the benchmark index. **Sharpe (1966)** attempted to measure and predict the MF's performance. It provided an alternative model of rating performance known as Sharpe Ratio or Return-to-Variability

Ratio. "The author assumed that small investors invest fully in the mutual fund and do not hold any share or mutual fund portfolio to eliminate unsystematic risk. It was also concluded that an MF with relatively large unique risk may outperform the market in Treynor index and may underperform in Sharpe ratio". **Jenson, M.C. (1968)** focused on the ways to evaluate a fund manager's ability to offer good returns to the mutual fund investors. He selected a hundred and fifteen open-ended mutual funds from 1945-64 and applied an absolute measure of performance. The study concluded that none of the MF's was on average not able to predict security prices well enough to outperform..

This study distinguishes itself from earlier studies by further studying the performance of the bank's subsidiary Asset management companies and standalone Asset management companies. It then focuses on the impact of the Inflation rate, foreign exchange rate, market return risk, and government securities on the performance.

Thus, the objectives of this study are:

(a) To compare the performance of Bank Subsidiary Asset Management Companies and standalone financial institutions.

(b) To observe the impact of inflation, forex rate, market return, and beta on the performance of the mutual fund schemes.

The following hypotheses were derived to meet the objectives of the study:

H<sub>0a</sub>: The returns of bank subsidiary Asset Management Companies and standalone financial institutions are equal.

H<sub>0b</sub>: The standard deviations (return and risk) of bank subsidiary Asset Management Companies and standalone financial institutions are equal.

H<sub>0c</sub>: There is a significant relationship between average annual net asset value

returns and the selected independent variables.

### 3 Research Methodology

Ten open-ended Multicap mutual fund schemes (5 bank's subsidiaries and 5 standalone Asset Management Companies) were selected from the database made by the Association of Mutual Funds in India (AMFI). The criteria used to select the mutual fund schemes were (i) commenced scheme before 1<sup>st</sup> June 2015. (ii) data related to daily NAV for the period of study was available. The mutual fund schemes were selected based on their AUM. The risk-free rate was 1-year fixed deposits interest. The formulae for the "risk-adjusted performance measures" that would be used to evaluate the first objective of this study are:

$$\begin{aligned} \text{a) Sharpe Ratio} &= \frac{r_p - r_f}{\sigma_p} \\ \text{b) Treynor Ratio} &= \frac{r_p - r_f}{\beta_p} \\ \text{c) Jensen Alpha} &= r_f + \beta_p (r_m - r_f) \end{aligned}$$

Where,  $r_p$  is the returns provided by the mutual fund scheme.  $r_f$  is the risk-free return.  $\sigma_p$  is the total risk of the mutual fund scheme.  $\beta_p$  is the beta of the mutual fund scheme.  $r_m$  is the market return.

The four independent exogenous variables that were selected were inflation rate, forex rate, market return, and beta. The yearly average return on Net Asset Value is being considered as the dependent variable. The analysis of the relationship between the dependent variable and independent variable and the factor analysis is done in Statistical Package on Social Sciences.

### 4 Analysis and Interpretation

#### 4.1 Sharpe

The Sharpe Ratio of the 10 selected mutual fund schemes for the 5 years under study is presented in Table 1. It depicted the risk-

adjusted performance of the selected mutual fund schemes.

	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Kotak Standard Multicap Fund	-0.06	1.39	0.11	0.39	-0.23
HDFC Equity Fund	-0.42	1.29	-0.06	0.86	-0.97
Motilal Oswal Multicap 35	-0.20	1.65	0.35	-0.27	-0.63
Aditya Birla Sun Life Equity Fund	-0.05	1.62	0.09	-0.03	-0.58
UTI - Equity Fund	-0.29	0.50	1.07	-0.28	-0.39
SBI Magnum Multicap Fund	0.17	0.96	0.19	0.27	-0.75
Franklin India Equity Fund	-0.12	0.72	0.08	-0.22	-0.69
Nippon India Multi Cap Fund	-0.58	0.75	-0.16	0.63	-1.07
ICICI Prudential Multicap Fund	0.06	0.98	0.04	0.29	-0.84
IDFC Multi Cap Fund	0.38	0.87	0.62	-0.49	-0.15

Table 1 Sharpe Ratio of the selected mutual fund schemes

A higher Sharpe Ratio represents a higher risk-adjusted performance. The observation leads us to conclude that Kotak Standard Multicap Fund outperforms the other mutual fund schemes and it can also be seen that 2016-2017 was a good year for the mutual fund schemes. It was also observed that 2019-2020 was a bad year pan the mutual fund industry due to force majeure circumstances around the world. It is also seen that the Nippon India Multi Cap fund performs the worst among the mutual fund schemes.

#### 4.2 Treynor

The Treynor Ratio of the 10 selected mutual fund schemes for the 5 years of study is presented in Table 1. It depicted the returns to the risk-adjusted performance of the selected mutual fund schemes.

	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Kotak Standard Multicap Fund	-0.01	1.71	0.01	0.60	-0.19
HDFC Equity Fund	-0.07	-2.37	-0.23	0.79	2.46
Motilal Oswal Multicap 35	-0.04	0.24	0.95	-0.39	0.76
Aditya Birla Sun Life Equity Fund	-0.01	0.22	0.25	-0.07	1.26
UTI - Equity Fund	-0.05	0.06	0.46	-0.05	-0.26
SBI Magnum Multicap Fund	0.03	0.12	0.02	0.04	-0.53
Franklin India Equity Fund	-0.02	0.09	0.01	-0.04	-0.47
Nippon India Multi Cap Fund	-0.10	0.10	-0.02	0.11	-0.70
ICICI Prudential Multicap Fund	0.01	0.13	0.00	0.05	-0.59
IDFC Multi Cap Fund	-0.05	0.11	0.00	-0.07	-0.49

Table 2 Treynor Ratio of the selected mutual fund schemes

A higher Treynor Ratio represents a higher risk-adjusted performance. The observation leads us to conclude that Kotak Standard Multicap Fund outperforms the other mutual fund schemes and it can also be seen that 2016-2017 was a good year for the

mutual fund schemes. It was also observed that 2019-2020 was a bad year pan the mutual fund industry due to force majeure circumstances around the world. It is also seen that the Nippon India Multi Cap fund performs the worst among the mutual fund schemes.

#### 4.3 Jensen Alpha

The Jensen Alpha of the 10 selected mutual fund schemes for the 5 years of study is presented in Table 1. It depicts the performance of the mutual fund schemes in relation to the benchmark. The positive value shows that the fund outperforms the market.

	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Kotak Standard Multicap Fund	0.05	0.34	-0.02	0.40	-0.15
HDFC Equity Fund	0.05	0.20	-0.01	0.13	-0.31
Motilal Oswal Multicap 35	0.03	0.13	0.04	-0.04	-0.20
Aditya Birla Sun Life Equity Fund	0.06	0.10	0.01	0.05	-0.19
UTI - Equity Fund	0.02	0.25	0.10	-0.05	-0.08
SBI Magnum Multicap Fund	0.09	0.26	-0.02	0.02	-0.18
Franklin India Equity Fund	0.04	0.16	-0.03	0.02	-0.17
Nippon India Multi Cap Fund	-0.03	-0.02	-0.06	0.08	-0.31
ICICI Prudential Multicap Fund	0.07	0.01	-0.03	0.03	-0.22
IDFC Multi Cap Fund	0.02	0.03	-0.03	-0.06	-0.18

Table 4: Jensen Alpha of the selected mutual fund schemes

A higher Jensen Alpha represents an outperformance of the mutual fund scheme when compared to the market. The observation leads us to conclude that Kotak Standard Multicap Fund outperforms the other mutual fund schemes and it can also be seen that 2016-2017 was a good year for the mutual fund schemes. It was also observed that 2019-2020 was a bad year pan the mutual fund industry due to force majeure circumstances around the world. It is also seen that the Nippon India Multi Cap fund performs the worst among the mutual fund schemes. The observations from the Sharpe ratio, Treynor ratio, and Jensen Alpha show similar observations.

#### 4.4 Mann Whitney U Test

This test is used to evaluate if the two independent samples (bank's subsidiaries and standalone enterprises) show a significant difference or not. Mann Whitney U-Test is a nonparametric test that is primarily used to find out if the

independent samples belong to the same population. The average yearly Net Asset Value returns of the selected mutually are compared and assessed.

Ranks				
	Grouping	N	Mean Rank	Sum of Ranks
Average Yearly Returns	Banks	5	5.60	28.00
	Financial Institutions	5	5.40	27.00
	Total	10		

Table 4 Mean Ranks (Return)

It is observed that the bank's subsidiaries and standalone enterprises have been able to provide similar returns based on the yearly average returns on Net Asset Value. It was observed that both mutual funds have similar mean ranks which leads one to deduce yearly average returns on Net Asset Value of both groups are similar. We can accept  $H_{0a}$  which is "The returns of bank subsidiary Asset Management Companies and standalone financial institutions are equal".

Test Statistics <sup>a</sup>	
	Average Annual Returns
Mann-Whitney U	12.000
Wilcoxon W	27.000
Z	-.104
Asymp. Sig. (2-tailed)	.917
Exact Sig. [2*(1-tailed Sig.)]	1.000 <sup>b</sup>

Table 5 Mann-Whitney U Test (Returns)

Table 5 detects the statistical significance between bank subsidiary Asset Management Companies and standalone financial institutions. It can be observed that both one-tailed and two-tailed significance level is greater than 0.05 therefore we can accept  $H_{0a}$  which is there is no significant difference in the returns of bank subsidiary Asset Management Companies and standalone financial institutions.

Ranks				
	Grouping	N	Mean Rank	Sum of Ranks
Average Annualized SD	Banks	5	5.80	29.00
	Financial Institutions	5	5.20	26.00
	Total	10		

Table 6 Mean Ranks (Standard Deviation and Risk)

It is observed that the bank's subsidiaries and standalone enterprises have been able to provide similar Standard deviations. It can also be observed that bank subsidiaries have a slightly higher risk rank when compared to standalone enterprises.

Test Statistics <sup>a</sup>	
	Average Annualized SD
Mann-Whitney U	11.000
Wilcoxon W	26.000
Z	-.313
Asymp. Sig. (2-tailed)	.754
Exact Sig. [2*(1-tailed Sig.)]	.841 <sup>b</sup>

Table 7 Mann-Whitney U Test (Standard Deviation-Risk)

Table 5 detects the statistical significance of standard deviation and risk between bank subsidiary Asset Management Companies and standalone financial institutions. It can be observed that both one-tailed and two-tailed significance level is greater than 0.05, therefore we can accept  $H_{1b}$  which is there is a significant difference in the standard deviation of bank subsidiary Asset Management Companies and standalone financial institutions.

#### 4.5 Information Ratio

It is a ratio used to relate the yields of the selected mutual fund schemes over and above the returns of the benchmark index and its volatility. It measures the ability of the fund manager to outperform the market. A higher information ratio signifies the ability of the fund manager to outperform the market.

	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Kotak Standard Multicap Fund	0.09	0.10	-0.06	0.03	-0.02
HDFC Equity Fund	-0.01	0.02	-0.02	0.03	-0.04
Motilal Oswal Multicap 35 Fund	0.03	0.08	0.00	-0.02	-0.02
Aditya Birla Sun Life Equity Fund	0.11	0.09	-0.01	-0.01	-0.02
UTI - Equity Fund	0.05	-0.07	0.03	-0.03	0.00
SBI Magnum Multicap Fund	0.13	0.01	-0.03	0.02	-0.03
Franklin India Equity Fund	0.08	-0.08	-0.06	-0.03	-0.03
Nippon India Multi Cap Fund	-0.03	-0.01	-0.06	0.05	-0.06
ICICI Prudential Multicap Fund	0.08	-0.01	-0.05	0.02	-0.04
IDFC Multi Cap Fund	0.02	-0.01	-0.03	-0.05	-0.03

Table 8 Yearly information Alpha of the selected mutual fund schemes

It can be observed from table 8 that Kotak Standard Multicap Fund has the highest average information ratio, which leads us to conclude that its fund managers are better able to adjust their portfolio in relation to market volatility. It was observed that the SBI magnum Multicap fund had the highest yearly information ratio, all the funds had negative information in 2019-2020 due to force majeure circumstances.

#### 4.5 Regression Analysis

Four independent factors were analysed to find their impact on the Net asset value returns of the mutual fund schemes. Multiple regressions were used to analyse the contributions of the independent factors on the dependent factor in this case to the Net asset value returns of the mutual fund schemes.

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.725 <sup>a</sup>	.526	.519	165204	.526	61.385	6	9	.000

Table 9 Summary of regression analysis

The R-square value of 0.725 indicates that 72.5 percent of the changes can be affected by the selected independent variables.

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	5.32	6	.95	23.650	.000 <sup>b</sup>
	Residual	1.63	9	.009		
	Total	6.95	15			

Table 10 ANOVA table

The significant value is less than .000, which implies the effects of the independent variables are statistically significant.

Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.	Collinearity Statistics	
		B	Error Std.	Beta				Tolerance	VIF
1	(Constant)	-.081	.062			-.542	.320		
	Yearly Market Return	1.051	2.365	.635	.606	.852	.602	1.662	
	Yearly Inflation Rate	2.040	.594	-.301	.526	.042	.329	3.040	
	Yearly Forex Change	-.640	.183	.248	-.245	.16	.399	2.506	
	Yearly Beta	.217	.036	.437	.002	.805	.691	1.448	

Table 11 Coefficient Matrix

It can be observed that the inflation rate significantly affects the returns on net asset value. There exists a multicollinearity effect on the factors. All the abovesaid factors were previously studied and showed similar results.

### 5 Findings and Suggestions

The number of individuals investing in mutual funds has been growing consistently over the years. It was concluded that people prefer equity schemes even when they have a higher risk compared to other types of mutual fund schemes due to their inherent ability to outperform the market, provide better returns and scope for capital appreciation. A comparative study on the performance of bank subsidiary Asset Management Companies and standalone financial institutions was done. It was found that the returns offered by both sets of AMC's were similar with a negligible difference, the standard deviation between the sets was also similar. The factorial analysis showed the significance of the independent variable of the NAV returns.

### 6 Conclusion

It was concluded based on the study that the risk returns do not significantly differ between bank subsidiary Asset Management Companies and standalone financial institutions. It was also observed that there exists a significant relationship between returns provided by the selected mutual fund schemes and the independent factors.

## 7 Scope for further study

This study has analysed 10 Multicap equity schemes for a duration of 5 years. There exists a vast scope of future studies including but not limited to longer duration, more schemes, and different categories of schemes. There is also scope for studying other independent factors. There is also the option to compare similar schemes in different countries.

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### AUTHORS:

<sup>1</sup> Abhijith, Research Scholar, Department of Commerce and Management, School of Arts and Sciences, Amrita Vishwa Vidhyapeetham, Kochi, Kerala, India

<sup>2</sup> Dr. P Balasubramanian, Head and Assistant Professor(Sr. Grade), Department of Commerce and Management, School of Arts and Sciences, Amrita Vishwa Vidhyapeetham, Kochi, Kerala, India

### CORRESPONDANCE AUTHOR:

Abhijith, Research Scholar, Department of Commerce and Management, School of Arts and Sciences, Amrita Vishwa Vidhyapeetham, Kochi, Kerala, India

[abhijith3011@gmail.com](mailto:abhijith3011@gmail.com), +91-9497140129