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# IMPACT OF MUTUAL FUND ATTRIBUTES ON RETURNS

**SATHISH KUMAR B[1] & ELGIN A[2]**

[1]Associate Professor, Department of Commerce, Christ University, Bangalore, Karnataka, India

[2]Associate Professor, SAINTGITS, Institute of Management, Kottayam, Kerala, India

## ABSTRACT

This study analyses the impact of various variables related to the mutual fund on the performance of the mutual funds. Eight variables relating to the mutual funds were identified and its impact on the returns were analysed. The results revealed that the mutual fund returns are significantly influenced by all the fund related variables taken for the study like Portfolio turnover, Number of stocks in the portfolio, Beta, Expenses ratio, Concentration, Liquidity, Age of the fund, size of the fund. The study also reveals strong evidence that the size of the portfolio is negatively and significantly reflects the mutual fund performance, so, it is suggested that as funds size grows larger, they tend to become less efficient in their operations.

**KEYWORDS:** Mutual Funds, Sectoral Funds, Fund Attributes, Mutual Fund Performance

## INTRODUCTION

The development of economy largely depends on development of the capital market. The growth of the capital market depends majorly on the participants of the market. Retail investors are considered as one of the major participant of capital market. Operation in capital market is more complex from a retail investor point of view. Mutual Fund has emerged as one of the financial instruments in capital market, which acts as a solution to retail investors. Investors who are ready to take up risk in their investment move from traditional investment avenues like gold, silver, real estate to capital market. Mutual fund as a financial intermediary helps the retail investors to access the capital market in an efficient way.

Today mutual fund industry has become more competitive. The number of Asset Management Company and the schemes launched by them are fast growing. The mutual fund scheme objectives are overlapping with each other. To stand in the industry, the fund needs to show good performance. The performance of mutual funds is commonly judged by the returns they generate. This study makes an attend to identify and study the impact of various variables that influence the performance of the mutual funds.

## LITERATURE REVIEW

Blake, Elton and Gruber (1993), in their study of performance of bond funds, used a variety of single and multiple models in estimating the risk-adjusted return. They found that bond funds performance were relatively inferior to their benchmarks. The authors also identified that the underperformance of the bond funds were due to impact of fund expenses. More specifically, they estimate an inverse one-to-one relationship between expenses and return. This finding implies that an increase in expenses per one unit results in a reduction in return per one unit too. Malkiel (1995) also identified an inverse relation between return and expenses. In addition, Malkielbifurcated the expenses into advisory and non-advisory cost and provided evidence that the advisory costs affect positively performance. Carhart (1997) also reconfirmed the inverse relationship between return and expenses and insisted maintenance of expenses at constant levels to improve the performance of the funds.

Elton, Gruber and Blake (1996) in his study revealed that the size of assets is a major determinant factor of costs. He also argues that a mutual fund has the ability to reduce the expenses it charges investors as long as the assets under management grow. This relationship implies the achievement of economies of scale by mutual funds when the size of funds increases.

Malhotra and McLeod (1997) in their study have analysed the factors that affect the expenses of equity and bond funds. They found that the size of the asset, age, turnover, cash holdings and the 12b-1 fees influence the expense ratio of equity funds. The authors also found that the large funds having long history, low turnover, low redemption and 12b-1 fees leads to low expense ratios.

## RESEARCH METHODOLOGY

This study is carried out with an objective of measuring the impact of various mutual fund attributed on the return of the mutual fund. The study is carried out with 28 sectoral mutual funds. To avoid the net asset value changes due to distribution of dividends only growth schemes have been taken for the study. These 28 schemes have been selected on a systematic basis from the total 732 open-end mutual fund schemes available. Since the study is limited to sectoral schemes except 112 schemes others were ruled out. Out of these growth schemes counts only to 56. The period of study is fixed as 36 months. So, schemes which do not present data for the entire period of study have been ignored from the study. Authors like Plantinga and Scholtens (2001), Benson et al. (2006), have used this methodology to homogenize their database with the aim of bringing consistency to the analysis.

The average returns of the schemes taken for study are regressed on fund attribute by applying the following multiple regression.

$$\text{Return (R)} = \beta_0 + \beta_1\, X1 + \beta_2\, X2 + \beta 3\, X3 + \beta_4\, X4 + \beta_5\, X5 + \beta_6\, X6 + \beta_0\, X7 + \in j$$

## DEFINITION OF VARIABLES

Return is the dependent variable calculated as a average monthly return generated by the funds during the period of study. The following independent variables are taken as fund attributes.

Portfolio Turnover ratio (X1) is the portfolio turnover of the scheme expressed in percentage. This is calculated by averaging the total acquisition of securities and disposal of securities for the year as a percentage of the average net asset value of the fund. The turnover ratio shows how frequently the fund managers buy and sell securities. This measure the active management of portfolio and thus the aggressiveness of fund manager in managing the funds can be noted.

Number of Stock (X2) denotes the number of securities held in the portfolio as on the last day of the period of study.

Beta (X3) represents the riskness of the schemes. It is calculated using the returns of the fund.

Expenses ratio (X4) represents the expenses paid for operation of the schemes which include payment for management fees, trustee fees, audit fee and other administrative fee.

Concentration (X5) represents how the amount invested in assets is spread out. That is the percentage of asset under management held by top five securities. This is represented by a dichotomous value of one and zero. One represents spared out of investment and zero represents concentration of investment. When the values of investment in top five securities exceed 50 percentages, zero is assigned in contrast if the percentage of investment in top five securities is less than 50, one is assigned. This value is fixed based on the average percentage of top five holdings of all the schemes.

Liquidity (X6) represents the portion of the corpus held as cash and cash equivalents. This is also denoted by using dichotomous value of one and zero. The percentage of investment held as cash and cash equivalents is averaged and found to be 5 %. That is 95 % of the asset under management is invested in equity securities. A value one is assigned to schemes which has less than or equal to 94% of their corpus held as equity. In contrast zero is assigned to schemes with greater than 95% of corpus invested in equity securities.

Age (X7) of the funds is represented in months. The period from inception of the scheme to the last day of the period of study is considered as the funds age. Natural logarithmic value of age is taken for analysis.

Fund size (X8) is represented by the asset under management of the fund. Natural logarithmic value of fund size is taken for analysis.

## TESTING OF MULTICOLLINEARITY

While studying the relationships among variables, it is not always possible, to design controlled experiments, which provide sufficient sample information. Normally the variables are observed and simply recorded. Therefore, some or most of the explanatory variables are chosen randomly. This leads to high correlations among these variables. In case of multiple linear regressions, highly interrelated explanatory variables mean that the same phenomenon is measured using more than one variable. This is called as multicollinearity. The multicollinearity does not affect the goodness of fit or the goodness of prediction. However, it is problematic when estimating the individual effects of each dependent variable on the independent variable. So, the study has made an attempt to detect it. There are various methods available in the literature to detect multicollinearity. Some of these methods are listed below.

- Using correlation coefficients between any two of the explanatory variables. If these coefficients are, greater than 0.80 then it is an indication of multicollinearity.
- Using a singular matrix
- Leamer's Method
- Condition Number Test
- Detection for multicollinearity through tolerance or the variance inflation factor (VIF) multicollinearity is problematic if largest VIF exceeds value of 10
- Detecting multicollinearity by the magnitude of the eigenvalues of the correlation matrix of the repressors. Large variability among the eigen values indicates a greater degree of multicollinearity
- Variance Decomposition Proportions

The study has employed the following methods to detect multicollinearity. To test multicollinearity Tolerance and variance inflation factor (VIF) are taken. As a rule of thumb, a tolerance of less than 0.10 and/or a VIF of 10 and above shows a multicollinearity exists.

**Table 1: Tolerance and VIF**

| Variables | Tolerance | VIF |
|---|---|---|
| X1 | 0.628 | 1.592 |
| X2 | 0.352 | 2.838 |
| X3 | 0.815 | 1.227 |
| X4 | 0.176 | 5.673 |
| X5 | 0.396 | 2.526 |
| X6 | 0.751 | 1.331 |
| X7 | 0.614 | 1.628 |
| X8 | 0.221 | 4.528 |

From the above table it is inferred that none of the tolerance value is less than 0.1. Similarly, VIF values are less than 10. This is a sign of stating that multicollinearity does not exist.

To confirm that multicollinearity does not exist, the correlation coefficient between the dependent variables is studied. When the correlation coefficient between any two of the explanatory variables is more than 0.8, then it is concluded that multicollinearity exists.

**Table 2: Correlation between Dependent Variables**

| | Return | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 |
|---|---|---|---|---|---|---|---|---|---|
| Return | 1.000 | -0.065 | -0.734 | -0.169 | 0.458 | 0.522 | -0.387 | 0.336 | -0.209 |
| X1 | -0.065 | 1.000 | 0.106 | -0.056 | 0.070 | -0.083 | 0.453 | -0.425 | -0.225 |
| X2 | -0.734 | 0.106 | 1.000 | 0.225 | -0.523 | -0.737 | 0.138 | -0.405 | 0.279 |
| X3 | -0.169 | -0.056 | 0.225 | 1.000 | -0.323 | -0.211 | 0.000 | -0.136 | 0.126 |
| X4 | 0.458 | 0.070 | -0.523 | -0.323 | 1.000 | 0.314 | 0.040 | 0.216 | -0.730 |
| X5 | 0.522 | -0.083 | -0.737 | -0.211 | 0.314 | 1.000 | -0.227 | 0.436 | -0.071 |
| X6 | -0.387 | 0.453 | 0.138 | .000 | 0.040 | -0.227 | 1.000 | -0.249 | -0.147 |
| X7 | 0.336 | -0.425 | -0.405 | -.0136 | 0.216 | 0.436 | -0.249 | 1.000 | 0.039 |
| X8 | -0.209 | -0.225 | 0.279 | 0.126 | -0.730 | -0.071 | 0-.147 | 0.039 | 1.000 |

While observing the above table it is found that in none of the cases the value of correlation coefficient exceeds ± 0.8. This is a sign of stating that multicollinearity does not exist.

## TESTING HETEROSCEDASTIC

In statistics, a collection of random variables is heteroscedastic. Totest heteroscedasticity, Breusch-Pagan Test is employed. It is a test employed to analyze whether the estimated variance of the residuals from a regression are dependent on the values of the independent variables. The null hypothesis contends that the residuals are homoscedastic. By employing Breusch-Pagan Test the study has obtained a p value of 0.4286 which is greater than the significance level of 0.05. So, the null hypothesis is accepted. It is concluded that the residuals are homoscedastic. That is it is heteroscedastic.

## REGRESSION MODEL

**Table 3: Interpret the Coefficient of Multiple Determinations**

| Model Summary[b] | | | | |
|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** |
| 1 | 0.829[a] | 0.688 | 0.557 | 6.90782 |
| a. Predictors: (Constant), X8, X7, X3, X6, X5, X1, X2, X4 | | | | |
| b. Dependent Variable: return | | | | |

The above table shows that coefficient of multiple determination is 0.688; therefore, about 68.8 % of the variation in the independent variable (returns) is explained by the dependent variables taken for study. The regression equation appears to be useful for making predictions since the value of R Square is sufficiently large.

To determine if the model is useful for predicting the response ANOVA test is performed. The following are the results of ANOVA test.

**Table 4: Significance of the Regression Model**

| ANOVA[a] | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| 1 | Regression | 1998.983 | 8 | 249.873 | 5.236 | .001[b] |
| | Residual | 906.643 | 19 | 47.718 | | |
| | Total | 2905.625 | 27 | | | |
| a. Dependent Variable: return | | | | | | |
| b. Predictors: (Constant), X8, X7, X3, X6, X5, X1, X2, X4 | | | | | | |

From the above table it is observed that the F value = 5.236 and p value = 0.001. If the p is less than 0.05, the null hypothesis is rejected at 5% level of significance. That is, it is concluded that there exists sufficient confirmation to conclude that at least one of the predictors is useful for predicting returns. Therefore, the model is considered useful.

**Table 5: Testing the Significance of the Predictor Variables Which May Be Removed from the Full Model**

| **Model** | | **Unstandardized Coefficients** | | **Standardized Coefficients** | **T** | **P value** |
|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | | **Sig.** |
| 1 | (Constant) | -21.167 | 53.943 | | -0.392 | 0.699 |
| | X1 | 0.033 | 0.023 | 0.233 | 1.441 | 0.166 |
| | X2 | -0.0520 | 0.159 | -0.706 | -2.270 | 0.044 |
| | X3 | 5.230 | 12.070 | 0.062 | 0.433 | 0.670 |
| | X4 | 21.894 | 17.071 | 0.391 | 1.283 | 0.215 |
| | X5 | -3.614 | 4.160 | -0.177 | -0.869 | 0.396 |
| | X6 | -8.228 | 3.044 | -0.400 | -2.703 | 0.014 |
| | X7 | 0.799 | 3.242 | 0.040 | 0.246 | 0.808 |
| | X8 | 1.993 | 1.906 | 0.285 | 1.046 | 0.309 |

To test the testing the significance of the predictor variables on the independent variable t test with a null hypothesis stating that the predictor variable is not useful for predicting the independent variable is tested. The null hypothesis is rejected if p value ≤ 0.05 when 5% level of significance is applied. From the above table it is found that p value for all the dependent variables are greater than 0.05**.** This leads to rejecting the null hypothesis. That is the variables X1, X2, X3, X4, X5, X6, X7 and X8 are useful in predicting the independent variable. The regression model reads as follows:

Return = -21.167 + 0.033 X1 -.0520 X2 + 5.230 X3 + 21.894 X4 -3.614 X5 -8.228 X6 + 0.799 X7 +1.993 X9

Where

X1 = Portfolio turnover

X2 = No. of stocks

X3 = Beta

X4 = Expenses ratio

X5 = Concentration

X6 = Liquidity

X7 = Age

X8 = Fund Size

## CONCLUSIONS

It is concluded that the variables taken for analysis fit into the model. Multicollinearity test and heteroscedastic have been tested. The variables X1 (Portfolio turnover), X2 (No. of stocks), X3 (Beta), X6 (Liquidity) and X8 (Fund Size) have a negative correlation to against the return and the balance variable X4 (Expenses ratio), X5 (Liquidity) and X7 (Age) have a positive correlation. The analysis shows that the multiple regressions predicts 68.8 % of the variation in the independent variable (returns) against the dependent variable

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