

EVALUATING THE PORTFOLIO CONSTRUCTION STYLE OF LARGE-CAP EQUITY MUTUAL FUNDS IN INDIA.

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Abstract: The study is about identifying the pattern followed in portfolio selection in the case of large-cap equity funds. The objective of the study is to identify patterns in existing portfolio of large-cap equity mutual funds. It is done by applying various portfolio optimization, stock selection principles and sector allocation techniques. In this study, top down approach and stock selection technique inclusive of SML, alpha, regression coefficient, R-square, Sharpe ratio and Sharpe single index model have been applied to identify pattern followed by mutual funds in portfolio selection. The application of these principles not only revealed usage of stock selection and portfolio optimization principles but also the presence of certain patterns with additional findings related to better performance of large-cap equity fund.

Keywords - Risk, Return, Residual variance, Market variance, portfolio, Sharpe, SML etc.

I. INTRODUCTION

Mutual fund is one of the leading investment vehicles in India. In past few years, the mutual fund industry and its potential is increasing in a year-on-year basis. The average asset under management of the Indian mutual fund industry became Rs. 23.25 lakh crores in January 2018. As on 31st January 2018 asset under management was Rs.22.41 lakh crores.

The industry has grown to Rs.22.41 lakh crore from 3.26 lakh crore in 31st march 2007, which is six and half fold increase in 10 years. It also grown in three and half fold in span of five and half years from 5.87 lakh crore from March 2012. The total number of the accounts in mutual fund industry as on January 31st 2018 is 6.83 crores. The equity based pure equity, Equity linked saving scheme and balanced fund stood with 5.65 crores of the folios, from retail segment ^[1].The mutual fund performance totally depend on the diversification and selection of the stocks in the portfolio. Dedicated fund managers manages portfolio by selecting the stocks and its proportion, based on the schemes. In equity based mutual funds, Retail investors predominately placed large sum of investment in large-cap equity mutual funds This large-cap mutual funds withhold stocks of the top 100 large-cap companies in term of market capitalization.

The main concern of the retail investors, who invest in large-cap equity fund is justifiable return for the risk they are taking for that investment, so the fund manager must construct the portfolio to get justifiable return. Hence in this study the portfolio optimization and stock selection technique involving the excess return to risk (both systematic and unsystematic) is considered. The main aim of the project is to evaluate usage of the optimization technique and stock selection technique involved in the stock selection for portfolio in the large-cap equity fund, which outperformed bench mark ^[11]. The modern optimization and stock selection technique principles like sector wise investment allocation, SML (CAPM), Alpha, Sharpe Ratio, and Sharpe index model, Value at risk (VaR), Regression Coefficient and R² are calculated. These principles were evaluated with the selected stock and its proportion in portfolio of each fund. This application will determine that usage of this technique or consideration of this technique was involved in stock selection.

1.1. Statement of the problem

The study on asset allocation in Indian mutual fund (Narasimhan 1999) ^[4] concluded that the Indian fund manager are not explicitly adopting any technique in their fund selection, though the fund managers are well aware about the techniques. Later, study on performance evaluation in Indian equity mutual fund (Raju, Manjunath and Nagaraja 2015) ^[23] and performance evaluation selected mutual funds in India (Garg 2014)^[24] analyzed Indian equity mutual funds on the basis of return (performance) alone. These studies were done without correlating the portfolio construction. These studies were based on application of Jensen's alpha and Sharpe ratio. Hence, there is need for a study to understand the pattern and usage of the techniques in portfolio construction of large-cap equity fund.

The mutual fund provide comparatively guided investment in equity than individual self-investment in equity for a retail investor. It is achieved by the dedicated fund manager and their technique. However the real return from the equity investment got reduced

due to various expense for fund manager and other expenses. Hence, there is need for knowledge assistance for retail investors to earn return without cost to fund management, by investing in equity on their own.

There is also need for the assurance to retail investor who invested in mutual fund, that their investment amounts were parked in better portfolios with due diligence, substantiated with portfolio optimization and stock selection technique, rather than own personal judgment.

1.2. Objectives of the study

The primary objective of this study is to evaluate the pattern and style used in construction of the portfolio of the large-cap equity mutual funds in India, which have outperformed the benchmark. The secondary objective of the study is to determine influence of sector-wise allocation, portfolio optimization technique and stock selection technique in portfolio construction. The others specific objectives are listed below:

1. To analyse the similarities and differences in patterns, which were identified in portfolio of the large-cap equity fund by applying the techniques of stock selection and portfolio construction.
2. To determine factors that influence the differences in return among these large-cap mutual funds.
3. To identifying the factors that influence higher performance of large-cap equity fund, compared to benchmark.

1.3. Scope

The study is focused on outperforming large-cap equity mutual funds, as the large-cap equity segment is one of the most invested equity schemes in mutual fund. As the risk based return is important factor on the equity investment, both investor and fund manager have concern over it. Hence in order to identify pattern in portfolio, techniques based on risk and return were applied. The benchmark of the *S&P BSE 100* is considered. It was benchmark referred by these fund houses, as it included all 100 large-cap companies in its calculation (large-cap companies are top 100 companies in market capitalization). Hence, using it would be appropriate for study. The finding may implicitly suggest that these outperforming fund might have a common pattern and usage of some stock selection technique. The other findings might provide probable reason for fund's outperformance over benchmark.

II. REVIEW OF LITERATURE

Narasimhan^[4] (1999), analysed 30 schemes launched by six mutual funds, which include public sectors, private sectors and foreign funds. Based on the observation of the conceptual mind-set among Indian fund manager through the study, the author concluded with the finding that none of the fund managers adopted any particular allocation strategy to manage their money, though the fund manager aware of the techniques and strategic principles for fund selection, none followed it. No real strategy but basket of several intentions were present in fund selection. The research by **Kemp, Richardson, and Wilson**^[5] (2000) in their investment manager style analysis, described about the style analysis in UK context. It applied various method to determine the style of the individual fund manager and influence of these style in the outperformance of the fund over extended periods of time. The study concluded with considerable amount of style followed by fund manager.

Deb, Banerjee and Chakrabarti^[6] concluded that funds may get excess return than the benchmark, when the fund manager holds different securities within the asset class included by the benchmark representing that asset class (Selection) or by having different sector allocation suggested by general market index. **Sharpe**^[13] (1992), found that the asset allocation accounted for the variability in the returns. He defined asset allocation as allocation of investor portfolio in some major asset class. Sharpe provided concept of the style analysis, where various variables are included to analyse the portfolio and to understand the style of allocation of the fund manager. He suggested a better alternative performance evaluation of portfolio using CAPM. The style formula Sharpe formulated was CAPM with addition of usage of reference of multiple index. Unlike usual CAPM formula with reference to single index, Sharpe's style analysis used more than one indexes in the reference for computation. Sharpe used regression coefficient and R^2 calculation. In the study, the style is determined using single index (S&P BSE 100) as in this case subjected funds are large-cap mutual fund. **Brinson, singer and Beebower**^[14] (1991) research concluded that 91.5% variation in returns of sampled 82 funds were explained by the funds asset allocation to bills, bonds and stocks.

These methodology can be used with single stock return as dependent variable and market return as independent variable. In order to explain the value of the proportion given to individual stock in portfolio in mutual fund, the computation on R-square can be done using individual stock return as dependent variable and NAV return of the fund as independent variable. **Amenc, Martellini, and Sfeir**^[15] (1992) created methodological framework to understand the risk adjusted performance of the mutual fund in variety of the investment style. The authors suggest in order understand the performance and style of investment in fund, take a required indices and calculate returns, form the peer with same objective, comparable managers and style and implement the performance evaluation theory to understand performance and style. He used modern portfolio theory. Thus, in this study on evaluation of style the peer grouping was done on large-cap equity fund. **Shah** (2015)^[7] explained that the investment management is a tedious process that can be divided into seven broad phases. Markowitz Model had serious practical limitations due the rigors involved in compiling the expected returns, standard deviation, variance, covariance of each security to every other security in the portfolio. Sharpe Model has simplified this process by relating the return in a security to a single Market index. In the CAPM theory, the required rate return of an asset is having a linear relationship with asset's beta value i.e. non-diversifiable or systematic risk. Author constructed optimal portfolio, evaluated its performance, rank the optimal portfolio and compare the performance of the BSE15 portfolio using Sharpe single index model. **Mandal**^[8] (2013), described in empirical study, optimal portfolio can be constructed using Sharpe single index

model, BSE Sensex indices considered as market bench mark and the daily price of stocks and index were taken in calculation from April 2001 to March 2011. Using the Sharpe index method cut off is calculated for stocks which have been sported based on the excess return to beta value. The optimal portfolio is constructed using stocks which have excess return above cut off value. The proportion of the portfolio of stocks is calculated using the basis of beta value, unsystematic risk, and excess return to beta ratio and cut-off rate of each of the stock.

Ramanathan, Jahnvi^[9] (2014), constructed optimal portfolio of banking and information technological sector using Sharpe single index model, twenty companies in this sector had selected and then computed the Cut-off value for this stock using excess return to beta value and the portfolio is constructed with the stocks that was having excess return value above cut off value. **Varadharajan**^[10] selected equity portfolio of 22 companies belong to power and steel sector. The Sharpe index model is applied based on the prioritized excess to return value of the stock, the Cut-off value is calculated. Based on the cut off value seven companies were selected as component of portfolio. The research provide finding that best selection of the portfolio provide the best yield for the risk taken. **Agarwal, Mirza**^[16] (2017), applied the Sharpe ratio, Treynor ratio, Jensen alpha and Value at Risk (VaR) to understand performance of the mutual fund. The author by measuring performance individual fund and comparing it with benchmark detects outperformance and underperformance of fund. **Bajracharya**^[19] (2016), used the Jensen alpha ratio , Treynor ratio and Sharpe ratio to analyse the return performance of the Nepalese mutual fund. The author also explained the diversification and stock selection in portfolio using CAPM security market line.

2.1 Hypothesis:

Based on the reviews, following hypothesis can be derived:

Hypothesis 1: The outperforming large-cap equity funds in India have a style or pattern in portfolio construction.

Hypothesis 2: The stocks selected in portfolio of outperforming large-cap equity funds follow the basic stock selection criteria and portfolio optimization concept. It includes *sector wise investment approach (top down), Sharpe single index model, Security market line, Regression coefficient, R², Alpha and Sharpe ratio.*

Hypothesis 3: The pattern can be established by applying this stock selection and portfolio construction in existing mutual fund’s portfolio.

Hypothesis 4: There are differences and similarity in patterns among portfolio of large-cap equity funds.

Hypothesis 5: The outperforming large-cap mutual fund’s portfolio have investments made in stock with lower VaR (value at risk).

III. RESEARCH METHODOLOGY

The study is descriptive in which historical data is analyzed. The study also exhibit correlational behavior to minor extent. The secondary data for closing price of benchmark for 1237 days (January 2013-2018) was collected from Bombay Stock Exchange website, the closing price for each individual stock for 1237 days (January 2013-2018) was collected from private website^[3] and Bombay Stock Exchange. The risk free rate for 10 year government bond is take from Reserve Bank of India website. In this study 92 stocks are considered from top 100 as it has been predominantly in large-cap list for study period from January 2013-2018(1237 days). As the data of the stocks were taken for daily basis, the risk free rate is converted to daily basis for ease of calculation. The large-cap funds which outperformed benchmark^[11] were taken into consideration. It is evident from fact sheet of that, these fund have been constructed with benchmark as S&P BSE 100. Hence, in this study benchmark S&P BSE 100 is included for calculation and application. The study conducted through applying sector wise investment analyzing, Sharpe single index model, regression coefficient, CAPM, alpha calculation, VaR (Value at risk), Sharpe ratio principles in order to understand the pattern. The convenient sampling is used by selecting large-cap equity funds, which outperformed market. The three large-cap equity funds are conveniently taken as sample from set of outperforming large-cap equity funds of different mutual fund companies. The funds taken as sample are BSL frontline equity fund, ICICI prudential blue chip fund, SBI blue chip funds.

IV. CONCEPTUAL DESIGN AND DEFINITION

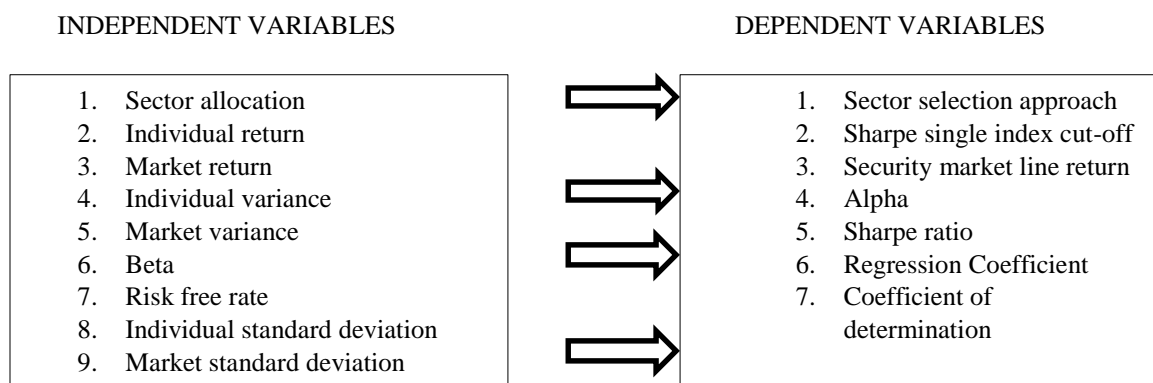


Figure 1.0. The conceptual design of relation between dependent variable and independent variable

Based on figure 1.0, the independent variables and dependent variables of the study are explained below,

4.1. INDEPENDENT VARIABLES:

4.1.1. Individual Return:

The individual return of stock is calculated daily for the given study period (January 2013-2018).

4.1.2. Market Return:

Market return is calculated daily for study period of 5 years on market benchmark (S&P BSE 100).

4.1.3. Beta Coefficient.

A measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole

$$\beta = r * (\sigma_y / \sigma_x) \quad (1)$$

Where, r = Correlation Co-efficient between individual stock and Market, σ_y = Standard Deviation of Individual Stock, σ_x = Standard Deviation of Market

4.1.4. Risk-free Rate of Return (R_f)

Risk-free rate of return is the return on a risk free asset. Here 10 year Government bond rate has taken into consideration for risk free rate of return. For the calculation purpose the risk free rate for 5 years duration is averaged and converted for the daily basis.

4.2. DEPENDENT VARIABLES:

4.2.1 Regression coefficient:

When the regression line is linear, the constant which explains the rate of change in one variable (independent variable) as a function of the rate of change in other variable (dependent variable) is known as Regression coefficient^{[17][13]}. It is the slope of the linear regression line.

In this study, the market return(x) is taken as independent variable whereas the dependent variable is individual stock return(y).

$$Y = aX + b \quad (2)$$

4.2.2 Coefficient of determination:

Coefficient of the determination is calculated using R-square method. Co efficient of determination^{[18][13]} value lies between 0 and 1. Coefficient of the determination explains change in one variable by changes in other variable. In this study, changes in individual stock is explained by changes in the benchmark (Sensex Top 100). Low coefficient of the determinant implicates the presence of other variables majorly influences the change in the individual stock price, than the changes in benchmark change.

$$R = \frac{(n(\sum xy) - (\sum x)(\sum y)) / (\sqrt{((n\sum x^2) - (\sum x)^2)((n\sum y^2) - (\sum y)^2)})}{\quad} \quad (3)$$

4.2.2. Security market line:

The security market line explains that at equilibrium the return and risk are in linear relationship. The security market line explains whether stock is underpriced or overpriced. The underpriced stock should be bought and overpriced should be sold. The security market line can be calculated using following formula:

$$R_s = R_f + (R_m - R_f) \beta \quad (4)$$

Where R_s - is return calculated through security market line. R_f - risk free rate, R_m - bench mark return, β - beta

If the R_p is greater than R_i (expected return), then it is overpriced, it is in above market line, whereas R_p is lesser than R_i (expected return), then it is underpriced, it is below market line.

In this study Security Market line calculation is considered, as it is more powerful CAPM calculation due to application of beta.

4.2.3. Excess return to Beta ratio.

It is the returns in excess of the risk-free rate for the systematic risk taken.

$$\text{Excess Return-Beta Ratio} = (R_i - R_f) / \beta_i \quad (5)$$

Where, R_i = the expected return on stock, R_f = the return on a riskless asset, β_i = the expected change in the rate of return on stock associated with one unit change in the market return.

4.2.4. Cut-Off Point

The point which is maximum in cut off calculation, the stock with the excess return value above this value is selected. This is the point at which an investor decides whether or not a particular security is worth purchasing. The formula given by Sharpe model,

$$C_i = \frac{(\sigma_m^2 \sum_{i=1}^N ((R_i - R_f) \beta_i / \sigma_{ei}^2))}{(1 + \sigma_m^2 \sum_{i=1}^N (\beta_i^2 / \sigma_{ei}^2))} \quad (6)$$

Where, σ_m^2 = variance of the market index, σ_{ei}^2 = Residual variance i.e. unsystematic variance not related to market movement.

4.2.5. Alpha:

Alpha is measure of the excess return of the stock or fund over benchmark. It is actually measure the difference between actual return and expected performance of the stock. The positive alpha indicates better return performance by stock. The alpha can be calculated using following formula.

$$R_i = \alpha + (\beta * R_m) \quad (7)$$

$$\text{Whereas } \alpha = R_i - (\beta * R_m) \quad (8)$$

4.2.6. Sharpe Ratio:

The Sharpe is measure of risk adjusted return of the portfolio or stock. The shape ratio is calculated by excess return of the stock over the risk free rate with reference to standard deviation of the stock (unsystematic risk).

$$\text{Sharpe Ratio} = (R_i - R_f) / \sigma_i \quad (9)$$

4.2.7. Sector allocation pattern:

The sector allocation pattern is about understanding on what pattern the allotment were made on the sectors over portfolio of funds. The most known pattern is using top-down approach where the allotment is made on sector based on macro level indicators. The percentage of the allotment is made on sectors, based on various factor like budget, demand on that sector, growth of the sector, stability of the sector. The top down approach can be simply explained as that investment made on stocks by first selecting promising sector and then selecting good stock within the sector.

4.3. Style analysis:

The style analysis is process of understanding style and strategies of investment in fund by using variety of variables. The style analysis can be done using the concept of CAPM, regression coefficient and R^2 . Sharpe used the CAPM SML as a basis by using more than one reference index to understand the style of the fund. In this study, single market index is used as reference. Style analysis can be done on funds with diversified asset class.

4.4. Asset under Management (AUM):

Asset under management is total value of the investment or market value handled under that specific fund. It can be simply quote as total amount invested under the fund or total current value of the investment under the fund.

V. ANALYSIS AND INFERENCE

5.1. Sector-wise selection:

The portfolio of the large-cap equity funds consist of the stocks from different sectors. Consolidating and analysing sector wise proportion in portfolio provide certain findings.

As per table 1.0, it is evident that the large-cap equity mutual fund have portfolio of stocks, where the stock selection were conducted primarily on basis of sector. I.e. the investment is considered on sector-wise. It also evident from the sample, that all the three large-cap equity fund, major proportion of investment was in the finance sector and lesser percentage in consumer service sector. The portfolio of these three outperforming mutual fund schemes showing similarity, by having investments made in the following sectors: finance, consumer product, information technology, metal and mining, automobile, industry/engineering, power utilities, health care, oil and gas, consumer service, construction, pharmaceutical. In this amount allotted to the finance (major) and consumer service (minor) sector differs among these three large-cap equity funds. Even though there is commonality in major and minor proportion preference among these funds, the rest of the allotment varies. Each fund has given different proportion or allotment to rest of the sectors.

Table 1.0 shows that second major proportion were given to consumer product sector by BSL frontline equity fund, whereas for ICICI prudential blue chip fund second major is IT sector. Whereas SBI blue chip fund gives second major proportion to automobile. Funds of different mutual fund companies also shows difference by including different additional sectors, other than common 10 sectors among them (finance, consumer product, it, metal and mining, automobile, industry/engineering, power utilities, health care, oil and gas, consumer service, construction, pharmaceutical). Example: SBI blue chip fund have chemical and fertilizer sector additionally. The value (percentage) of proportion given to the each sector varies for each individual large-cap mutual fund of different mutual fund companies.

The above findings suggest that primarily the mutual fund companies construct portfolio by initially allotting specific proportion of investment (AUM) on the basis of sector, the selection of the sector plays key role in selection of the stocks of large-cap companies. As all three outperforming fund have given major and minor preference to common set of sector respectively and having common set of the sector in their portfolio, it is evident that selection of sector for portfolio plays key role in performance of fund. it also possible that difference in amount of investment in individuals sector among funds, might be reason for difference in return among the outperforming individual large-cap equity fund.

5.2. Sharpe Single index

Sharpe single index is predominant portfolio construction principle. The Sharpe single index computation in both sector wise and over all large-cap wise, substantiate the previous finding and along with finding that stock has been selected based on its performance within the sector. Table 1.1 shows, When Sharpe single index computation done in sectorial basis, major proportion of the portfolio (i.e. major percentage investment made in portfolio) consist of the stocks that have excess return to beta greater than the cut-off point value of the large-cap sector wise. However, these major proportion stock's excess return to beta value is not greater than cut off value, when Sharpe single index calculation is done on large-cap companies wise. All the three sample funds have commonality by presence of stocks having better performance on basis of sector (measured by Sharpe single index model) in major proportion of portfolio. Thus the study indicate that the presence of major proportion of the stocks, which have greater performance (performance measured through Sharpe single index model) within the sector, in portfolio, might be another reason for the better performance of these large-cap equity funds.

5.3. Value at Risk (VaR)

Table 1.1 displays, each stock used in the portfolios of the outperforming large-cap equity mutual fund have less than 40 rupees value at risk for the 1000 rupees investment on every individual stock. It implies that the stock used in the portfolio will not have loss more than 40 rupees for investment of 1000 rupees in 95% of the time. This calculation of Value at Risk were calculated using Historic method.

5.4. Coefficient of Determinant

Table 1.1 shows, the coefficient of determination of the stocks selected in portfolio all these three outperforming large-cap mutual fund is being less than 50%. It means that the change in the percentage of the individual stock value is 50% reason due to the market changes. The study provides that the majority of the stocks in the portfolio of the outperforming fund have less than 50% impact from market in their price change. Hence, heavy downward movement or upward movement or surges affect less on the portfolio stocks and its return. Hence, the funds were able to produce better outperforming return. These sample funds shows similarity by selecting major stocks having less 50% of coefficient of the determination and it might be reason for their better performance.

Based on table 1.1, Considering the security market line, positive Sharpe ratio, positive alpha, positive regression coefficient, Sharpe single index criteria as the basic principle for the stock selection. The following are the total percentage proportion of stock that follows all 5 criteria:

1. ICICI prudential blue chip fund – 65.1% out of 87.07% of portfolio consist of stock follows all 5 principles
2. BSL frontline equity fund – 61% out of 79.14%
3. SBI blue chip fund- 49.22% out of 69.06 %

Above analysis has revealed that these large-cap equity mutual fund consist of portfolio, where major proportion of the portfolio consists of stocks having positive value in alpha, regression coefficient, and Sharpe ratio and above security market line (underpriced). Hence, the fundamental stock selection concepts are primarily used to select stocks for portfolio to get better return. it is understandable from the study that satisfaction of stocks selection factors by major proportion of stocks in portfolio might be reason for the better return achieved by these funds. All three funds similarly have major proportion of portfolio which have positive value in above mentioned factors.

Table 1.0: Sector-wise Allocation in portfolio of each fund:

Sector	BSL Frontline	ICICI focused blue-chip	SBI Blue-chip fund
Financial	41.30%	32.96%	31.98%
consumer product	11.30%	7.53%	8.57%
IT	7.70%	8.28%	2.3%
metals mining	6.70%	3.36%	2.25%
Automobile	6.60%	8.41%	10.53%
industry/engineering	6.20%	3.77%	4.03%
power utilities	6.10%	6.09%	7.49%
HealthCare	5.70%	6.24%	1.49%
oil and gas	5.50%	7.83%	1.29%
consumer service	3.00%	2.19%	1.76%
Construction		3.75%	9.8%
Pharmaceutical		6.24%	5.45%
Chemical & fertilizer			4.2%

Source: Consolidated from Facts sheets, January of Aditya Birla sun life mutual funds, ICICI prudential and SBI mutual fund

Table 1.1: The proportion of investment and values of stock selection principles in portfolio of three large cap equity fund.

Company	BSL front Line	ICICI prudential blue-chip	SBI blue chip	REG. Coeff	R ²	α	SML Line	sharpe ratio	VaR	Sharpe single index	
	(%)	% (allotment)	(%)							Sector wise*	Large-cap wise*
TCS	0.15			0.194	9.04%	0.069	Above	0.034	-22.1	above	below
RIL	1.91	2.18	1.46	0.068	8.08%	0.077	Above	0.014	-23.7	above	below
HDFC bank	7.11	6.47	8.85	0.508	47.3%	0.095	Above	0.054	-16.7	above	below
ITC	4.12	3.59	2.96	0.111	8.2%	0.028	Below	0.001	-23.8	below	below
HDFC	1.87	3.37	2.5	0.357	40.9%	0.074	Above	0.030	-25.7	below	below
HUL	1.59			0.205	10.9%	0.086	Above	0.044	-21	above	above
Maruthi	3.05	4.02	1.91	0.321	32.1%	0.168	Above	0.087	-21.8	above	above
SBI	2.05	4.41	2.71	0.001	0.24%	0.729	Above	0.026	-29.1	above	above
ONGC	0.36	1.46		0.095	11.3%	0.035	Below	0.001	-29.7	below	below
INFY	3.89	4.07		0.0052	0.2%	0.263	On the line	0.019	-21.8	above	above
ICICI bank	5.42	6.76	1.99	0.0089	1.3%	0.260	Above	0.018	-31.6	above	above
Kotak Mahindra	2.29	1.34	2.58								
				0.0319	3.1%	0.170	Above	0.025	-24.4	above	above
IOC	1.39	2.15	1.29	0.0588	6.5%	0.119	Above	0.021	-30.3	above	below
L&T	1.94	2.91	3.76	0.146	19.2%	0.027	Below	-0.001	-26.3	below	below
Coal India	0.56			0.219	17.2%	-0.004	Below	-0.017	-28.2	below	below
B. Airtel	0.13	2.19		0.2054	17.6%	0.057	Above	0.020	-27.7	above	below
Axis bank	0.63	3.48		0.0085	1.17%	0.363	Above	0.027	-30.7	above	above
HCL	1.84	1.68	2.3	0.0129	0.5%	0.153	Above	0.024	-25.7	above	above
NTPC	1.86	3.18	1.18	0.2585	21.3%	0.026	Below	0.002	-24.4	above	below
Wipro				0.0246	1.03%	0.059	Above	0.010	-21.6	above	below
Sun Pharma	0.37	2.29	0.89	0.1058	7.05%	0.012	Below	-0.004	-26.1	below	below
Hind Zinc	0.76			0.2145	23.3%	0.092	Above	0.032	-31	above	below
Vedanta	2.16			0.1839	31.5%	0.083	Above	0.021	-41.1	above	below
Ultra Tech		0.84	1.34	0.3164	32.7%	0.076	Above	0.032	-24.9	above	below
Tata Motor	0.66	0.79	0.87	0.2506	34.3%	0.053	Below	0.012	-32.9	below	below
Asian Paint		0.19		0.2801	23.7%	0.094	Above	0.043	-23.6	above	below
Indusind	2.33	2.56	2.78	0.3275	41.4%	0.128	Above	0.057	-27.2	above	below
BPCL				0.0839	9.2%	0.105	Above	0.024	-30.9	above	below
Power grid	1.24	1.8		0.2916	19.8%	0.058	Above	0.025	-21.1	above	below
M&M	1.63		2.8	0.0541	5.10%	0.052	On the line	0.007	-26.2	below	below
Bajaj Fin	2.41	2.78	1.07	0.0015	0.20%	0.919	Above	0.030	-31.9	above	above

Bajaj auto				0.315	25.1%	0.042	On the line	0.017	-21.5	below	below
Adani port				0.2024	27.1%	0.118	Above	0.039	-34.6	above	below
Yes Bank	1.9			0.012	2.4%	0.311	Above	0.025	-36.8	above	above
GAIL	2.08	1.9		0.1169	10.9%	0.065	Above	0.015	-26	above	below
Bajaj FinSer				0.1911	15.3%	0.161	Above	0.073	-28	above	above
Eicher		0.26	0.89	0.1811	15.1%	0.205	Above	0.094	-26.3	above	above
Grasim			1.4	0.0065	0.7%	0.284	Above	0.019	-23	above	above
Motherson	0.79	3.74	1.7	0.0463	4.3%	0.156	Above	0.030	-37.2	above	above
TITAN	0.43		1.61	0.1691	15.6%	0.114	Above	0.042	-28.5	above	below
Hero motor	1.47		2.37	0.2957	23.8%	0.068	Above	0.030	-22.4	below	below
JSW Steel				0.0013	0.2%	1.428	Above	0.037	-32.5	above	above
Godrej	0.43			0.0414	3.3%	0.109	Above	0.021	-31.2	above	below
Tata Steel		1.37		0.2414	36.5%	0.060	Below	0.016	-34.7	below	below
Nestle			2.83	0.1557	5.9%	0.045	Above	0.018	-20.5	below	below
B. Infratel				0.0963	5.2%	0.070	Above	0.024	-33.7	above	below
Dabur	0.87	0.75		0.218	12.3%	0.090	Above	0.047	-22	above	above
Tech Mahindra	1.61	1.97		0.0028	0.16%	0.416	Above	0.028	-24.6	above	above
Shree cement				0.1915	13.9%	0.125	Above	0.058	-26.4	above	above
BOSCH	0.47			0.2315	16.2%	0.069	Above	0.033	-23.2	above	below
HPCL	1.54	0.14	2.99	0.0223	3.0%	0.240	Above	0.028	-37.6	above	above
Britannia	0.99	2.02	0.81	0.1746	10.6%	0.193	Above	0.102	-21.8	above	above
Zee	1.85			0.2234	20.0%	0.095	Above	0.040	-29.3	above	below
Hindalco	2.51	1.99	2.25	0.2137	33.4%	0.092	Above	0.027	-39.5	above	below
Ambuja				0.3124	33.8%	0.035	Below	0.010	-27.2	below	below
Cipla		2.53		0.2483	17.4%	0.043	on the line	0.014	-23.9	above	below
United Spirits				0.134	10.4%	0.072	Above	0.024	-31.4	below	below
Piramal				0.1323	8.5%	0.155	Above	0.067	-27.9	above	above
Siemens				0.2749	36.8%	0.071	Above	0.024	-31.1	below	below
Pidilite			0.56	0.2411	16.1%	0.124	Above	0.067	-21.6	above	above
NMDC				0.2233	23.8%	0.011	Below	-0.008	-32.9	below	below
Cadillac				0.001	0.03%	0.607	Above	0.031	-28.2	above	above
DLF				0.1663	33.8%	0.064	on the line	0.012	-49.3	below	below
Marico				0.013	0.50%	0.146	Above	0.024	-22	above	above
PNB				0.0096	1.54%	0.302	Above	0.023	-39	above	above
Lupin		0.77		0.1671	9.85%	0.045	Above	0.014	-24.9	above	below
Sun Tv				0.1294	14.9%	0.108	Above	0.031	-39.4	above	below
BEL	1.12		2.62	0.0003	0.09%	3.292	Above	0.036	-27.3	above	above
UPL			2.51	0.1774	18.8%	0.165	Above	0.065	-32.9	above	above
Petronet	0.42		0.58	0.0481	4.2%	0.113	Above	0.023	-28.6	above	below
Oracle				0.19	8.6%	0.022	Above	0.004	-20.2	above	below
Biocon		0.65		0.0158	1.2%	0.224	Above	0.029	-27.5	above	above
Ashok Ley		0.76		0.1985	25.5%	0.153	Above	0.053	-34.4	above	below

ABB				0.1762	16.2%	0.074	Above	0.026	-27.1	above	below
Aurobindo	1.94		1.28	0.0298	3.1%	0.245	Above	0.039	-37.3	above	above
BOB	0.57			0.0092	1.4%	0.241	Above	0.017	-38.5	above	above
DR.Reddy	1.18			0.1586	8.3%	0.034	Above	0.009	-26.1	above	below
SAIL				0.2153	30.9%	0.022	Above	0.003	-36.1	below	below
CONCOR		1.2		0.1253	8.1%	0.088	Above	0.032	-27.5	above	below
BHEL				0.129	19.5%	-0.016	Below	-0.014	-37.4	below	below
B. Forge				0.0628	7.7%	0.168	Above	0.035	-30	above	below
Havells				0.0051	0.4%	0.417	Above	0.032	-27.2	above	above
Idea	0.51			0.1116	9.0%	0.028	Below	0.004	-37.5	below	below
ACC				0.3537	33.9%	0.027	Below	0.004	-24.5	below	below
TVS		1.95		0.1417	13.3%	0.278	Above	0.101	-31.2	above	above
Bajaj Hold				0.1649	7.6%	0.091	Above	0.050	-22.8	above	above
Colgate				0.0143	0.6%	0.096	Above	0.012	-20.6	above	above
Shree trans			1.06	0.1798	21.1%	0.086	Above	0.026	-34.9	above	below
UB				0.1509	12.5%	0.028	Below	0.006	-32	below	below
P&G	0.16		0.36	0.1591	4.9%	0.108	Above	0.067	-17.2	above	above

**** Refers to excess return to beta value compared with cut off value, Reg-Coeff: Regression coefficient, R²: Coefficient of determination, α - Alpha value**

VI. FINDINGS

Based on the above study following findings have been obtained:

- 1) There has been common pattern and style found among the outperforming large-cap mutual fund.
- 2) The pattern followed in sample outperforming large-cap equity mutual fund as:
 1. The outperforming fund's portfolio selection, primarily involves allocation in sector wise, which is based on various macro factor. Hence, primarily investment (AUM) is allocated in sector wise.
 2. All three funds gave major allocation to finance and minor allocation to consumer service segment
 3. All three funds similarly included finance, consumer product, information technology, metal and mining, automobile, industry/engineering, power utilities, health care, oil and gas, consumer service, construction, pharmaceutical sectors in their portfolio.
 4. The difference in value of the return among funds is due to inclusion of additional sectors and differences in percentage values of the investment allotment to sector among the individual funds.
 5. The major proportion of portfolio consist of stocks, which have greater performance (based on Sharpe single index calculation) within the sector.
 6. Hence both Sharpe computation and selection allocation implicitly indicate strong probability usage of top down approach in the portfolio selection process.
 7. The major proportion in portfolios of all three funds consist of stocks having less than 40 rupees value at risk in 95% of probability for every 1000 rupees invested. It is substantiating the hypothesis the portfolio are constructed with considering probability of the lesser value risk.
 8. In total portfolio, higher percentage of portfolio consist of the stocks which are positive in Sharpe ratio, alpha, regression coefficient and under-priced (above the Security market line). As major proportion follows the basic stock selection criteria, it might be probable reason better performance of these funds.
 9. All stocks that's been selected in portfolio of the three large-cap mutual fund have less than 50% of the coefficient of determination. These might be reason for consistent outperformance over benchmark as it has smaller influence from surges in market.
 10. The coefficient of determination of individual stocks in the portfolio of the funds does not influence in the percentage allocation to the individual stocks in portfolio.

VII. LIMITATIONS

There is major possibility that stock selection would have been due to influence of personal ethical value and ideology of the fund manager, which cannot be included in study. The portfolio considered included only the stocks contributing 65-80% of the proportion of whole portfolio of the fund. whereas remaining proportion are not considered, as it consist of future, small amounts in bonds,

Cash and stocks with low proportion started in less than 6 months. Influence of these other asset in portfolio are considered in study. The effectiveness of regression and coefficient of determination, Sharpe ratio and alpha may defer on applying in portfolio than individual stock. The limited set of principles used for the study, there are possibility of different set of the factor may influence selection.

VIII. FUTURE SCOPE

The study will assist future research on the detailed study of the portfolio selection criteria followed by fund manager for different funds. It also helps to understand the reason for the certain fund to outperform its benchmark. This study might help understand the necessity for following of the portfolio optimization and stock selection principles, to provide better returns as AMC are directed to shorten the categories of fund into 32 categories including 10 equity, 16 debt and 6 hybrid funds^[2]. As the mutual funds are directed to follow the total return index in near future, this study might help to construct the portfolio with relevance of optimization and selection strategies with reference of total return index, to obtain outperforming return.

IX. CONCLUSION

The study provide constructive findings that fulfils the hypothesis and provide solution for the problems stated. It has been inferred through study that application of stock selection principles and the analysis of allocation on sector basis revealed that the three outperforming large-cap equity funds implicitly follows the approach of top down in portfolio selection primarily. The study found large proportion of the stocks in portfolio implicitly fulfil basic stock selection principles and it has been identified implicitly, to be one of the probable reason for the better performance of the fund. The variation in percentage of allocation and inclusion of additional sector, was determined as probable reason for the changes in return among the different large-cap equity funds. It evident from the study, the each portfolio have been constructed with technical basis, expecting better performance than market. The study can be further used with other type of equity funds for benefit of retail investor.

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