Determinants of Mutual Fund Performance in India on the basis of economic variables

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Abstract: Mutual Funds have gained a recent trend in the years in a developing nation like India. As much of the momentum gained by Mutual Funds in India the other macroeconomic factors involved in its performance and affecting its NAV value has been discussed. Stock market indicates how well the economy is performing and plays a vital role in the economy’s development. Earlier a country’s GDP used to indicate how well the economy is performing but now there are many factors which are taken into account which can affect the growth of an economy. The study focusses to bring to light the factors responsible for the mutual fund NAV value and mentions which of these factors impact positively and negatively on the NAV value. The study has utilized secondary data to run a multiple regression analysis which has further deduced about the impact of its variable on NAV value.

Keywords: Mutual Fund. Multiple Regression Analysis. Macroeconomic Variables. Performance.

Introduction: A mutual fund is an investment tool which accumulates the savings of investors and is professionally managed by a fund manager who shares the goal of financial gain. The profits made by these investments are shared with the investors on the basis of the units held by them. It’s the best investment tool offered to common man with low amount to invest and minimized risk as it is invested in a diversified portfolio. Every Mutual Fund scheme has its own said strategy with varying objective.

Stock market indicates how well the economy is performing and plays a vital role in the economy’s development. Earlier a country’s GDP used to indicate how well the economy is performing but now there are many factors which are taken into account which can affect the growth of an economy. There are lot of researches which have been conducted as to see how various macroeconomic factors affect the movement of stock market. In the present study the factors which have been taken into consideration are: IIP, Cash reserve ratio, foreign portfolio investment, money supply, EUR/INR, USD/INR which might affect the average monthly closing prices of BSE SENSEX.

Various Macroeconomic variables which have been taken into consideration

Index of Industrial Production (IIP)

A short-term indicator which indicates the growth of the industry by measuring the status of production in an industrial sector for a specific time duration. It is directly proportional to stock market which indicates an increase in IIP will have risen in price of stocks whereas a sudden fall indicates a weak IIP.
Consumer Price Index (CPI)

CPI helps in measuring inflation which means rise in prices from the general level in an economy over a period of time. It has a negative relation with stock market as the consumption would decrease so would the company’s profit which would lead to stock price also falling.

Crude Oil Prices

Global Oil Prices directly affect the Indian economy as the domestic needs of oil is met through by importing from these countries. Crude oil which falls in commodities has an inverse relation with stock market. When there is a rise in crude oil price stock market prices fall whereas there is a fall then a sudden rise in stock prices could be observed.

Money Supply

Money supply refers to the amount of money circulated by country’s monetary authority. Money supply includes currency, printed notes, money in deposit accounts and other forms of liquid assets. It is directly proportional to stock market as if there is an increase in money supply the stock prices would go up.

Call Money Rate

It is a short-term finance used by banks which must be repaid on demand to meet short term reserve requirements. It has inverse relation when call money rate falls stock market becomes more attractive due to higher yields.

Foreign Exchange Rate

It is the exchange rate of one nations currency to another nations currency. A weak domestic currency can increase the inflation rate of a country which can lead to fall in stock prices. The stock prices would be in an appreciating state when the domestic currency value is increasing.

Foreign Portfolio investment

These are securities and investments which are held by foreign investors. FPIs are generally made of stock market, any buying or selling results in sharp rise or fall in stock prices. Whenever FPI take out their investments the stock market falls.

Cash Reserve Ratio

It is a minimum amount which has to be maintained with RBI without any ceiling rate in reference to the total net demand and time liabilities (DTL). Being an important tool of monetary policy to control the money supply in an economy, increase in CRR would lead to decrease in investment in equities. Decrease in CRR would supply more money in economy to help increase in investment in equities.

Review of Literature

The study suggests about the fund performance of mutual funds on the basis of NAV value. Lehmann and Modest (1987) The paper ascertains to whether conventional measures of abnormal mutual fund performance are sensitive to the benchmark chosen to measure normal performance. Principal-components, instrumental-variables estimator, Arbitrage Pricing Theory would be the factors. The choice of what constitutes it to be is the normal performance which is important for evaluating the performance of managed portfolio. Grinblatt and Titman (1994) suggests to compare the returns and performance on monthly basis as well as to analyse the determinants of mutual fund performance. The factors would be Net asset value, load, expenses, portfolio turnover Statistical tools, Stock Data and Mutual Fund Data. CAPM would be the model which was used in order for the study. The study reveals that the performance is positively related to portfolio turnover, but not to the size of the mutual funds or to the expenses that the funds generated. Jayadev (1996) study suggests that the growth oriented Mutual Fund are earning higher returns than the benchmark returns (or market Portfolio/Index returns) in terms of risk. The factors being considered are NAV, share price index and Secondary data. Janson Presents return and risk of the two funds along with market return and risk were the research methodology used for
measuring performance, as well as CAPM was also used. Daniel, Grinblatt, Titman and Wermers (1997) addresses the benchmark issue by introducing a new performance measurement method that forms benchmarks by directly matching the characteristics of the component stocks of the portfolio being evaluated. The factors would CS, CT and AS. CS, CT, and AS measures Secondary data CS, CT, and AS measures "three performance attribution components are presented for funds in different investment objective categories. Kudal (2011) examined the impact of macroeconomic variables on stock market after the global financial crisis of 2008. The study was conducted by using correlation analysis, factor analysis and multiple regression techniques. The future trend of Sensex was forecasted by using multiple macroeconomic variables such as gold prices, FDI, FPI, foreign exchange reserves, oil prices, exchange rates, call money rates and CRR. Out of these eight macroeconomic variables, three factors were sorted out by using Factor Analysis. The study concludes that overall model is significant at 75% level and all the variables are affecting the Sensex. Narang and Singh (2012) investigated the casualty between Gold price and Sensex by using monthly data for the period from 2002 to 2012. The Karl Pearson’s Correlation Coefficient, Augmented Dickey-Fuller (ADF) test, Granger Casualty test and Johansen’s Co-integration test was used to analyses the relationship between Gold prices and Stock returns. The study concluded that there was a positive relationship between both the variables from 2002 to 2007 after that due to global financial crisis correlation becomes weak. The study finally concludes that there was no casualty between both the variables. Both Gold prices and Sensex does not affect each other. Prof khan, Ikram (2011) analysed the equity and balanced schemes of five different mutual funds. A comparison was conducted on the performance of mutual funds with the benchmark index. Analysis was also conducted on the mutual fund performance in the index capital market mutual fund and market efficiency. Sharpe’s, trenor's ratio and jenson’s alpha was used as a methodology measure. It suggested that the fund scheme had outperformed the market which means the fund manager had been successful in the outperformance of the relevant benchmark during the study period. MS. Keswani (2011) analysed the effect of funds size on the performance of Balanced mutual funds in the Indian context, to ascertain the degree or power of relationship between fund size and performance. Return per risk, sharpe ratio, fund momentum, fund size was used as the methodology. The ANOVA model showed that the performance variable of micro- small, medium, and large balanced fund indicated that these variables are not significant of difference from each other. All the cases of differences leading to rejection of null hypothesis. Tripathi, Singh & Singh (2016) conducted a study on the relationship between Indian stock market represented by BSE Sensex and three macroeconomic variables i.e. FDI, IIP and WPI. Quarterly data was collected from 2002 to 2013. Statistical tools such as correlation and regression were used to analyze the data. It was concluded that IIP is a significant predictor of Sensex and WPI and FDI had less significant impact of stock market performance. Mohan and Prasad (2012) studied the impact of foreign institutional investors on Indian stock market. The two major indices BSE Sensex and NSE Nifty were taken under the study as dependent variables. The period of 1993 to 2014 was taken under study. The study mainly focused to analyze the trends, patterns and relationships of foreign institutional investors with stock market. The study concluded that there is a relationship between FII inflows and stock market volatility. The study also outlined that FII inflows are not the only cause of stock market volatility. There are other variables which can be studied to reveal the cause of stock market volatility. Chittedi (2012) investigates the long run and short run relationships between oil prices and stock prices in India. The monthly data was collected from April 2000 to June 2011. The study employed Autoregressive distributed lag (ARDL) approach to explore the long run and short run relationship. The study focused on the aspect how increased oil prices make stock market volatile. The study explains when oil prices are increased in the international markets, then the cost of production of oil consuming industries also increases, which in turn increases the cost of imported capital goods. These things adversely affect the profits of firms trading in India stock market. The study
concludes that volatility in stock market in India had a significant impact on the volatility of oil prices but global oil price movements did not have any significant impact on Indian stock market because there are some other important factors which are shaping the Indian stock market. Bunia and Das (2012) conducted a study on the casual relationship between gold prices and stock market returns. The study was conducted for the period from April 2001 to March 2011. The monthly data was taken for the stock returns of Nifty and Gold Prices. Various Econometric tools such as Augmented Dickey-Fuller (ADF) Unit Root test, Johansen’s Co-integration test and Granger Causality test was used for the study. The ADF Unit Root test was applied to check variables are stationary or not and it was concluded from the study that variables are said to be stationary at first level difference. It was concluded from Johansen’s Trace and Maximum Eigenvalue test that there exists long run equilibrium between variables. From the Granger Casualty test it was found that both the variables Granger causes each other and can be used to predict each other. Patel (2012) studied the effect of eight macroeconomic determinants on the performance of Indian stock market by taking two major indices namely Sensex and S&P Nifty. The study was conducted by taking monthly data from January 1991 to December 2011. The variables taken under study were interest rate, inflation, and exchange rate, index of industrial production, money supply, gold price, oil price and silver price. The prominent tools Augmented Dickey Fuller test, Johansen’s co-integration test, Granger Causality test and Vector Error Correction model (VECM) were used to analyze the data. The study confirmed that long run equilibrium exists between stock market indices and all macro-economic variables. The study also concludes that exchange rate is the major determinant to forecast stock market performance. So, RBI should try to regulate exchange rate properly. Kaur and Bhatia (2015) investigated the impact of ten macroeconomic variables i.e. broad money, call money rate, crude oil prices, exchange rate, foreign exchange reserve, foreign institutional investors, gross fiscal deficit, IIP, inflation rate and trade balance on the monthly closing prices of BSE 500 manufacturing firms. The time span from Apr2006 to Mar2015 was chosen by taking monthly data for the study. The econometric techniques ADF test, Multiple Regression and Granger Casualty test was used for the study. ADF test was used to check the stationarity of the data. From Multiple Regression, it was concluded that exchange rate and FII’s had no significant relationship with BSE 500. The same thing was also confirmed by using Granger Casualty that exchange rate and FII’s did not granger cause BSE 500. Kumar (2013) studied the effect of macroeconomic factors on the Indian stock market by applying Factor Analysis approach. The monthly data from Jan 2001 to May 2013 was taken for the study. CNX Nifty was selected as the stock market index and twelve macroeconomic variables i.e. money supply (M3), CPI, gold prices, crude oil prices, foreign exchange reserves, FDI, FII, call money rates, balance of trade, foreign exchange rate, repo rate, industrial growth rate were taken for the study. Principal Component Analysis was used for Factor Extraction. Three factors were extracted named as “Macro Environment”, “Industrial Performance” and “Policy Rates”. On these three factors, regression technique was applied. The study concludes that Factor 1 (Macro Environment) turns out to be highly significant. So, there is a need to maintain macroeconomic stability in the country to have a smooth stock market.

Research Methodology

The study was conducted in Punjab wherein the mutual funds performance was analyzed by using secondary data on which multiple regression analysis was conducted. Secondary data was used for the study from the duration 2016 -2020 for the ten macroeconomic variables which would be index of industrial production, inflation rate, crude oil prices, money supply, interest rate, foreign exchange reserves, EUR/INR, USD/INR, foreign portfolio investment and cash reserve ratio.

Research Objectives

The main objectives which are observed in this study are as follows:

- Analyzing the impact of macroeconomic variables on the performance of top five Large Cap Mutual fund schemes.
Analyzing the impact of macroeconomic variables on the performance of top five Mid Cap Mutual fund schemes.

Analyzing the impact of macroeconomic variables on the performance of Small Cap. Mutual fund schemes.

To analyze the data, multiple regression analysis was used to conduct the study for learning the impact of macroeconomic variables on the NAV value of Mutual Funds. The assumptions which are seen while conducting multiple regression analysis which have been mentioned below:

**Linear Relationship**: A linear relationship is expected between the dependent variable and the independent variable. Scatterplots depict whether the relationship is linear or curvilinear.

**Multivariate Normality**: All residuals are expected to be normally distributed in multiple regression.

**No Multicollinearity**: Low correlation is expected between the independent variables.

**Homoscedasticity**: Assumption states that the variance of error is found similar across varying independent variables.

The analysis is conducted between the independent and dependent variable for conducting the analysis the relationship required is supposed to be linear. Assumption is tested by linearity assumption through scatterplots. The multiple linear regression analysis is conducted between observed and predicted values is normally distributed. Normality can be checked by conducting analysis on residuals themselves.

Assumption is taken that there is no multicollinearity. Multicollinearity is checked by multiple ways:

- **Correlation Matrix**: Correlation coefficients should be less than 0.80
- **Variance Inflation Factor (VIF)**: VIF values higher than 10 indicate the multicollinearity is a problem.

If multicollinearity is found in data then the solution is to center the data. The mean score is subtracted from each independent variable to center the data. Last assumption which needs to be taken is homoscedasticity in which no clear pattern is indicated in the distribution.

**Result and discussion**

The analysis is conducted between the independent and dependent variable, for conducting the analysis the relationship required is supposed to be linear. Assumption is tested by linearity assumption through scatterplots. The multiple linear regression analysis is conducted between observed and predicted values is normally distributed. Normality can be checked by conducting analysis on residuals themselves.
Ongoing through the Anova Table it suggests the model is significant. R square being 77.9 percent suggests that any changes which are brought in NAV value is due to the macroeconomic variables which have been listed in the model, the remaining 22.1 percent changes in NAV may be due to market psychology, inflation and political factors. Here constant, foreign exchange reserve, weighted average call money rates, foreign direct investment which are of the value 0.000,0.034, 0.042,0.00. We can see that FDI, Call Money rates, Foreign Exchange reserve have impacted, majorly we can see that FDI has negatively impacted while Call Money rate and Crude Oil are positively impacted. The reason can be Additional inflows of FDI in firms may push out of the market other firms without FDI. This fact is referred to as a “market stealing” effect, when domestic firms are not so productive compared to the foreign ones However, when the most productive firms leave the market, in such cases FDI inflows are harmful for the recipient country. This is because the FDI negative influence weakens the competitive position of local producers and results in structural unemployment

REGRESSION EQUATION
NAV=109.283+0.00(Foreign Exchange Reserve) +2.651(Weight Average Call Money Rates)-0.02(FDI)
Ongoing through the Anova Table it suggests the model is significant. R square being 68 percent suggests that any changes which are brought in NAV value is due to the macroeconomic variables which have been listed in the model, the remaining 32 percent changes in NAV may be due to market psychology, inflation and political factors. Here constant, foreign exchange reserve, weighted average call money rates, inflation rate, foreign direct investment which are of the value 0.026, 0.05, 0.01, 0.00, 0.00. We can see that FDI, Call Money rates, Inflation rate have impacted, majorly we can see that FDI has negatively impacted. The reason can be Additional inflows of investment through Foreign Direct Investment in firms may push out of the market as compare to other firms who is about without FDI. This fact also called as a “market stealing” effect, in this effect domestic firms are less productive as compared to the foreign firms. Business with less productivity as compare to their average market productivity leaves the market as compare to industry benefits due to increases in productivity. Many productivity firms leave the market in those cases where FDI inflow are harmful for the recipient company because as FDI is negative influence and weakens the competitive position of a local producers and due to negative influence result in structural unemployment.
REGRESSION EQUATION

$NAV = 51.944 + 0.000(\text{Foreign Exchange Reserve}) + 3.986(\text{Weight Average Call Money Rates}) + 110.791(\text{Inflation Rate}) - 0.002(\text{FDI})$

Ongoing through the Anova Table it suggests the model is significant. R square being 58.1 percent suggests that any changes which are brought in NAV value is due to the macroeconomic variables which have been listed in the model, the remaining 40.9 percent changes in NAV may be due to market psychology, inflation and political factors. Here cash reserve ratio, foreign exchange rate, IIP, weighted average call money rates, inflation rate, foreign direct investment which are of the value 0.000, 0.047, 0.014, 0.000, 0.003, 0.035. We can see that FDI, Call Money rates, Inflation rate, foreign exchange rate, foreign exchange reserves have impacted, majorly we can see that FDI and Foreign exchange rate has negatively impacted while the others have impacted positively. The reason can be Additional inflows of investment through Foreign Direct Investment in firms may push out of the market as compare to other firms who is about without FDI. This fact also called as a “market stealing” effect, in this effect domestic firms are less productive as compared to the foreign firms. Business with less productivity as compare to their average market productivity leaves the market as compare to industry benefits due to increases in productivity. Many productivity firms leave the market in those cases where FDI inflow are harmful for the recipient company because as FDI is negative influence and weakens the
competitive position of a local producer and due to negative influence result in structural unemployment.

**REGRESSION EQUATION**

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\text{NAV} = 107.346 + 0.0002(\text{Foreign Exchange Reserve}) - 0.563 (\text{Foreign Exchange Rate (EUR/IND)}) + 32.208(\text{Index of Industrial Production}) + 12.298(\text{Weight Average Call Money Rates}) + 206.926(\text{Inflation Rate}) - 0.002(\text{FDI})
\]

It is observed that macroeconomic variables had positively and negatively impacted in case of NAV value. On running multiple regression analysis it is observed that FDI has a negative impact on the NAV value part of the reason being its negative influence weakens the competitive domestic market when compared to foreign ones. Thus known as market stealing leading to impacting the NAV value.

**Managerial Implication**

From the research conducted, we found out of all the independent variables some variables demonstrated a positive and significant impact on the NAV value while some impacted negatively. On conducting the analysis, we found that FDI had negatively impacted the NAV value while other parameters impacted but positively. Through this the fund manager can come to know out of all the macroeconomic variables which variable has a considerable negative impact. This would enable the fund manager to transition his funds and minimise the risk, in order to not impact his Portfolio Value. Performance of Mutual Fund is interdependent on many macroeconomic as as microeconomic factors as a whole in an economy. Microeconomic factors which happen on the individual scale or small scale can be controlled by an individual whereas its quite difficult to control a macroeconomic factor. The growth of a mutual fund and its NAV value is impacted by these macroeconomic variables. When compared to the developed nations the mutual funds face a lot of hurdles and challenges to reach to its full potential and expand. The opportunities in a developing market does encourage investors to invest in financial markets, but a major role is played by these macroeconomic factors which can affect its NAV value as its moment is directly linked to the financial markets. The local and global factors by this study would help them identify the factors involved and plan their strategy of investments accordingly.

**References**


