



Influence of Macroeconomic Indicators on Mutual Funds Market in India

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Abstract:

Mutual funds have been developing as a favored investment choice in comparison to other investment avenues. However, the investor has to analyse the various macroeconomic factors before undertaking any investment decision. There are several factors at the macroeconomic level which have a stimulus on the investment choices. Investors need to evaluate the risk and reward linked with investing in the schemes. In this context, the present study attempts to identify the macroeconomic factors which influence the mutual funds market. Existence of causal relationship has been analysed using the Vector Auto regression and Block Exogeneity Wald test. It is evident from the analysis that the Real macroeconomic variables considered for the study do not have a significant influence on the Mutual funds market and were not found to be reliable to even predict the market movements.

Keywords: Causal relationship, Macroeconomic, Vector Auto Regression etc.

1. Introduction

Mutual fund is an investment vehicle set up in the form of trust which collects funds from the investors and invests the funds in the financial instruments such as equity, debentures, money market instruments. The securities so sold are known as Units and the investors who purchase those shares are known as Unit holders. The units are issued to the investors in the proportion of money invested by them. Every mutual fund is managed by a fund manager by undertaking necessary research and by using his investment management skills. The income earned from the units in the form of capital appreciation and other incomes are passed on to the unitholders in the proportion of number of units owned by them. However, mutual fund schemes are subject to market risk and the schemes' fund managers are expected to design the portfolio in accordance with the investment objective of mutual fund schemes.

2. Review of Literature

Jain (2005) evaluated the investment performance of mutual fund schemes in terms of risk and return and made their comparison with the benchmark indices. The results showed that the majority of the schemes underperformed the benchmark indices upto 1997-98 (except 1994-95) but after that period the majority of them outperformed the BSE Sensex and CNX nifty as per the Sharpe and Treynor indices. **Ande (2008)** attempted to determine the factors affecting the performance of open ended equity schemes. The study covered 78 open ended equity schemes for the period July 2004 to June 2007 for which the primary data was collected from fund managers of 8 fund houses. Data was

analysed using 6 points rating scale in which rating scale of 1 represented the least important factor and 6 represented the most important factor affecting the performance of mutual fund scheme. The study identified stock selection and timing, Risk management, Existing returns of the scheme and excess returns over the benchmark as the four core factors that influenced the performance of open ended equity schemes. **Rao and Daita (2012)** made an analysis of the factors influencing the investments in Mutual funds using EIC Approach by taking Reliance Capital asset Management Limited (RCAML) into consideration. ADF Unit root test, Correlation test and Granger Causality test were used for the analysis. The analysis revealed that the entire mutual fund industry is dominated by a few players and also found that the macroeconomic variables are not significant in influencing the mutual funds market. **Kumar (2013)** attempted to study the perception of investors about mutual funds in India. The researcher used chi- square test and Kenall's coefficient of concordance for the purpose of analysis. The study revealed that the Mutual funds are useful for small investors and have better expertise than the individual investor (AWS=4.54). it also concluded that Mutual funds give higher returns than the other forms of investments (AWS=4.02).

3. Objectives of the Study

1. To examine the nature of causal relationship at individual lags between mutual fund market and macroeconomic variables.
2. To study whether the combined effect of all lags of independent variable are significant in affecting the mutual fund flows in India.

4. Hypothesis of the Study

The objective of the study can be achieved using the following hypothesis:

H₀₁: Consumer price Index does not influence the mutual fund market.

H_{a1}: Consumer price Index influences the mutual fund market.

H₀₂: Gross Domestic Savings does not influence the mutual fund market.

H_{a2}: Gross Domestic Savings influences the mutual fund market.

H₀₃: Exchange rate does not influence the mutual fund market.

H_{a3}: Exchange rate influences the mutual fund market.

H₀₄: Growth rate (national income) does not influence the mutual fund market.

H_{a4}: Growth rate (national income) influences the mutual fund market.

H₀₅: Interest rate does not influence the mutual fund market.

H_{a5}: Interest rate influences the mutual fund market.

H₀₆: Nifty returns Index do not influence the mutual fund market.

H_{a6}: Nifty returns Index influences the mutual fund market.

5. Research Methodology

The present study is based on the Annual data covering a period of 15 years from April 2000 to March 2015. Stock prices are represented by daily closing of CNX Nifty Index. The data regarding all the variables that is, Consumer price Index, Gross Domestic Savings, Exchange rate, growth rate, interest rate have been obtained from Economic survey (various issues). Handbook of statistics on Indian Economy and the website of RBI. The data on Mutual Funds flow has been taken from the website of moneycontrol.com. Closing values of CNX Nifty Index have been obtained from the official website of SEBI.

6. Statistical and Econometric Tools

Analysis of the Annual data has been done using the econometric tools such as ADF unit root test, Vector Auto Regression (VAR) Estimate and Wald test. For that purpose, Microsoft excel, SPSS and Eviews have been used.

7. Analysis and Results

7.1 Vector Auto Regression Estimates

Within the VAR framework, the model fit of the individual equations has been examined. The table reveals that Jarque- bera statistics is greater than 0.05 in case of all the variables which implies that the selected variables are normal in nature. The presence of autocorrelation has been examined using Breusch-Godfrey Serial Correlation LM Test. The hypothesis under this test of autocorrelation are as:

H₀: There is no autocorrelation between the variables.

H_a: There exists autocorrelation between the variables.

The presence of autocorrelation has been examined at 5% level of significance. The null hypothesis will be accepted if the test statistics is greater than 0.05. The analysis reveals that the Breusch-Godfrey Serial Correlation LM Test statistics of all the variables is found to be greater than 0.05. So, the null hypothesis of no Autocorrelation between the variables has been accepted at 5% level of significance.

The presence of Heteroscedasticity has been examined using Breusch-Pagan-Godfrey Test. The hypothesis under this test of Heteroscedasticity are as:

H₀: There is no Heteroscedasticity between the variables.

H_a: There exists Heteroscedasticity between the variables.

The presence of Heteroscedasticity has been examined at 5% level of significance. The null hypothesis will be accepted if the test statistics is greater than 0.05. the analysis reveals that the Breusch-Pagan-Godfrey Test statistics of all the variables is found to be greater than 0.05. So, the null hypothesis of no Heteroscedasticity between the variables has been accepted at 5% level of significance.

Table 1: Assumptions of Regression Model

VARIABLE	NORMALITY (Jarque-bera statistics)	AUTO CORRELATION (Breusch- Godfrey Serial Correlation LM Test)	HETERO SCEDASTICITY (Breusch-Pagan- Godfrey)
CPI	0.557158	0.4382	0.4382
Exchange Rate	0.817486	0.0916	0.0852
Gross Domestic Savings	0.693579	0.7067	0.3920
Growth Rate	0.993.73	0.6255	0.1432
Interest Rate	0.87411	0.5397	0.1187
CNX Nifty	0.711341	0.7241	0.1150

Further, the model is free from multicollinearity as revealed by the group correlations between all the variables. It shows that there is no correlation between the independent variables.

Table 2: Testing of Multicollinearity

CPI	1.000000	-0.097564	-0.510656	-0.125682	-0.067981	-0.145126	-0.288200
Exchange Rate	-0.097564	1.000000	-0.076770	-0.072134	0.279596	-0.388602	0.264425
Gross Domestic Savings	-0.510656	-0.076770	1.000000	0.437507	0.013219	-0.305695	0.079384
Growth	-0.125682	-0.072134	0.437507	1.000000	-0.007999	-0.373015	0.255650

Rate							
Interest Rate	-0.067981	0.279596	0.013219	-0.007999	1.000000	-0.370635	0.634513
CNX Nifty	-0.145126	-0.388602	-0.305695	-0.373015	-0.370635	1.000000	-0.279894
MFS	-0.288200	0.264425	0.079384	0.255650	0.634513	-0.279894	1.000000

Table 2 shows that the coefficient of correlation between various independent variables is less than 0.50 in case of all the variables. So the model is from multicollinearity.

8. Vector Auto Regression Systems Model

Within the framework of the VAR systems model, the significance of the various lags (individually) of each of the various variables has been studied using the 'p' value. Analysis of Impact of Consumer Price Index and various lags of mutual funds on the dependent variable is as:

Table 3: VAR Systems Model (CPI and Mutual fund flows)

MFS = C(1)*MFS(-1) + C(2)*MFS(-2) + C(3)*CPI(-1) + C(4)*CPI(-2) + C(5)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.094108	0.342219	-3.197099	0.0187
C(2)	-0.622637	0.311449	-1.999159	0.0925
C(3)	0.017832	0.027608	0.645878	0.0423
C(4)	0.001033	0.028203	0.036620	0.9720
C(5)	-0.158484	0.096454	-1.643110	0.1515
R-squared	0.764194	Mean dependent var		-0.000222
Adjusted R-squared	0.606989	S.D. dependent var		0.172248
S.E. of regression	0.107983	Akaike info criterion		-1.310726
Sum squared resid	0.069962	Schwarz criterion		-1.129865
Log likelihood	12.20899	Hannan-Quinn criter.		-1.424734
F-statistic	4.861149	Durbin-Watson stat		1.992312
Prob(F-statistic)	0.043172			

The 'p' values of C(1) and C(2) are representing the mutual funds investments at lag 1 and lag 2 respectively whereas C(3). C(4) are representing the inflation rate as proxied by Consumer Price Index at lag 1 and lag 2 respectively. The analysis table reveals that C1 and C3 are significant since the value of 'p' is 0.0187 in case of C1 and 0.0423 in case of C3. It indicates that mutual funds investments and Consumer Price Index at lag 1 are significant in influencing the mutual funds investments in India. The value of $R^2 = 0.764194$, which shows that 76% variation in the dependent variable is caused by the independent variable. The 'p' value of f statistics also confirms that jointly mutual funds investments at lags and Consumer Price Index at lags are significant in affecting the dependent variable as represented by the f statistics of 0.043172. Durbin-Watson statistics is 1.992312 for the model which is closer to 2 which reveals that there is no autocorrelation in the model. These all parameters indicate that our model is a good fit.

Analysis of Impact of Exchange rate and various lags of mutual funds on the dependent variable is as:

Table 4:VAR Systems Model (Exchange rate and Mutual fund flows)

MFS = C(1)*MFS(-1) + C(2)*MFS(-2) + C(3)*ER(-1) + C(4)*ER(-2) + C(5)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.113780	0.336560	-3.309303	0.0162
C(2)	-0.571416	0.291321	-1.961468	0.0975
C(3)	-0.002483	0.004480	-0.554349	0.5994
C(4)	-0.006143	0.001208	-5.085264	0.0194
C(5)	-0.008270	0.033959	-0.243515	0.8157
R-squared	0.755619	Mean dependent var		-0.000222
Adjusted R-squared	0.592699	S.D. dependent var		0.172248
S.E. of regression	0.109929	Akaike info criterion		-1.275010
Sum squared resid	0.072506	Schwarz criterion		-1.094148
Log likelihood	12.01255	Hannan-Quinn criter.		-1.389018
F-statistic	4.637961	Durbin-Watson stat		1.471236
Prob(F-statistic)	0.047679			

The 'p' values of C(1) and C(2) are representing the mutual funds investments at lag 1 and lag 2 respectively whereas C(3). C(4) are representing the exchange rate at lag 1 and lag 2 respectively. The analysis table reveals that C1 and C4 are significant since the value of 'p' is 0.0162 in case of C1 and 0.0194 in case of C4. It indicates that mutual funds investments at lag 1 and Exchange rate at lag 2 are significant in influencing the mutual funds investments in India. The value of R² = 0.755619, which shows that 75% variation in the dependent variable is caused by the independent variable. The 'p' value of f statistics also confirms that jointly mutual funds investments at lags and Exchange rate at lags are significant in affecting the dependent variable as represented by the f statistics of 0.047679. Durbin-Watson statistics is 1.472312 for the model which is closer to 2 which reveals that there is no autocorrelation in the model. These all parameters indicate that our model is a good fit. Analysis of Impact of Gross domestic savings and various lags of mutual funds on the dependent variable is as:

Table 5:VAR Systems Model (Gross Domestic savings and Mutual fund flows)

MFS = C(1)*MFS(-1) + C(2)*MFS(-2) + C(3)*GDS(-1) + C(4)*GDS(-2) + C(5)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.122613	0.320266	-3.505252	0.0127
C(2)	-0.709603	0.312112	-2.273554	0.0634
C(3)	-0.006716	0.001632	-4.115201	0.0361
C(4)	-0.007890	0.016967	-0.465003	0.6583
C(5)	-0.006846	0.039986	-0.171208	0.8697
R-squared	0.685580	Mean dependent var		-0.000222
Adjusted R-squared	0.475966	S.D. dependent var		0.172248
S.E. of regression	0.124691	Akaike info criterion		-1.023007
Sum squared resid	0.093287	Schwarz criterion		-0.842146
Log likelihood	10.62654	Hannan-Quinn criter.		-1.137015
F-statistic	3.270685	Durbin-Watson stat		2.127467
Prob(F-statistic)	0.025015			

The 'p' values of C(1) and C(2) are representing the mutual funds investments at lag 1 and lag 2 respectively whereas C(3). C(4) are representing the Gross domestic savings at lag 1 and lag 2

respectively. The analysis table reveals that C1 and C3 are significant since the value of 'p' is 0.0127 in case of C1 and 0.0361 in case of C3. It indicates that mutual funds investments and Gross domestic savings at lag 1 are significant in influencing the mutual funds investments in India. The value of $R^2 = 0.685580$, which shows that 68.55% variation in the dependent variable is caused by the independent variable. The 'p' value of f statistics also confirms that jointly mutual funds investments at lags and Gross domestic savings at lags are significant in affecting the dependent variable as represented by the f statistics of 0.025015. Durbin-Watson statistics is 2.127467 for the model which is closer to 2 which reveals that there is no autocorrelation in the model. These all parameters indicate that our model is a good fit.

Analysis of Impact of Growth rate and various lags of mutual funds on the dependent variable is as:

Table 6: VAR Systems Model (Growth rate and Mutual fund flows)

MFS = C(1)*MFS(-1) + C(2)*MFS(-2) + C(3)*GR(-1) + C(4)*GR(-2) + C(5)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.186889	0.315758	-3.758855	0.0094
C(2)	-0.736782	0.304452	-2.420031	0.0519
C(3)	0.011442	0.004018	2.847685	0.0367
C(4)	0.008240	0.015740	0.523522	0.6194
C(5)	-0.011612	0.037098	-0.313006	0.7649
R-squared	0.703178	Mean dependent var		-0.000222
Adjusted R-squared	0.505297	S.D. dependent var		0.172248
S.E. of regression	0.121151	Akaike info criterion		-1.080606
Sum squared resid	0.088065	Schwarz criterion		-0.899745
Log likelihood	10.94334	Hannan-Quinn criter.		-1.194614
F-statistic	3.553541	Durbin-Watson stat		1.622261
Prob(F-statistic)	0.011317			

The 'p' values of C(1) and C(2) are representing the mutual funds investments at lag 1 and lag 2 respectively whereas C(3). C(4) are representing the Growth rate at lag 1 and lag 2 respectively. The analysis table reveals that C1 and C3 are significant since the value of 'p' is 0.0094 in case of C1 and 0.0367 in case of C3. It indicates that mutual funds investments and Growth rate at lag 1 are significant in influencing the mutual funds investments in India. The value of $R^2 = 0.703178$, which shows that 70.31% variation in the dependent variable is caused by the independent variable. The 'p' value of f statistics also confirms that jointly mutual funds investments at lags and Gross domestic savings at lags are significant in affecting the dependent variable as represented by the f statistics of 0.011317. Durbin-Watson statistics is 1.622261 for the model which is closer to 2 which reveals that there is no autocorrelation in the model. These all parameters indicate that our model is a good fit.

Analysis of Impact of Interest rate and various lags of mutual funds on the dependent variable is as:

Table 7:VAR Systems Model (Interest rate and Mutual fund flows)

MFS = C(1)*MFS(-1) + C(2)*MFS(-2) + C(3)*IR(-1) + C(4)*IR(-2) + C(5)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.116746	0.581664	-1.919915	0.0103
C(2)	-0.710543	0.472930	-1.502430	0.1837
C(3)	-0.069566	0.378308	-0.183886	0.8602
C(4)	-0.025730	0.269071	-0.095624	0.9269
C(5)	-0.011450	0.045065	-0.254080	0.8079

R-squared	0.669392	Mean dependent var	-0.000222
Adjusted R-squared	0.448986	S.D. dependent var	0.172248
S.E. of regression	0.127860	Akaike info criterion	-0.972803
Sum squared resid	0.098089	Schwarz criterion	-0.791942
Log likelihood	10.35042	Hannan-Quinn criter.	-1.086811
F-statistic	3.037090	Durbin-Watson stat	1.663793
Prob(F-statistic)	0.108704		

The 'p' values of C(1) and C(2) are representing the mutual funds investments at lag 1 and lag 2 respectively whereas C(3). C(4) are representing the Interest rate at lag 1 and lag 2 respectively. The analysis table reveals that C1 is significant since the value of 'p' is 0.0103 in case of C1. It indicates that mutual funds investments at lag 1 is significant in influencing the mutual funds investments in India. The value of $R^2 = 0.669392$, which shows that 66.93% variation in the dependent variable is caused by the independent variable. The 'p' value of f statistics confirms that jointly mutual funds investments at lags and Interest rate at lags are not significant in affecting the dependent variable as represented by the f statistics of 0.108704. Durbin-Watson statistics is 1.663793 for the model which is closer to 2 which reveals that there is no autocorrelation in the model. The analysis of the table values reveal that Interest rate is not a significant factor in influencing the mutual funds investments in India. Analysis of Impact of CNX Nifty and various lags of mutual funds on the dependent variable is as:

Table 8: VAR Systems Model (Nifty Returns and Mutual fund flows)

MFS = C(1)*MFS(-1) + C(2)*MFS(-2) + C(3)* Nifty(-1) + C(4) * Nifty(-2) + C(5)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.179007	0.311923	-3.779801	0.0092
C(2)	-0.676385	0.312307	-2.165768	0.0735
C(3)	-0.001122	0.001010	-1.11089	0.0437
C(4)	-0.000996	0.001101	-0.904603	0.0424
C(5)	0.031898	0.060358	0.528475	0.6161
R-squared	0.710255	Mean dependent var		-0.000222
Adjusted R-squared	0.517092	S.D. dependent var		0.172248
S.E. of regression	0.119698	Akaike info criterion		-1.104738
Sum squared resid	0.085965	Schwarz criterion		-0.923876
Log likelihood	11.07606	Hannan-Quinn criter.		-1.218745
F-statistic	3.676972	Durbin-Watson stat		1.736898
Prob(F-statistic)	0.046155			

The 'p' values of C(1) and C(2) are representing the mutual funds investments at lag 1 and lag 2 respectively whereas C(3). C(4) are representing the Nifty Returns at lag 1 and lag 2 respectively. The analysis table reveals that C1, C3 and C4 are significant since the value of 'p' is 0.0092 in case of C, 0.0437 in case of C3 and 0.0424 in case of C4. It indicates that mutual funds investments at lag 1 and Nifty Returns at both the lags are significant in influencing the mutual funds investments in India. The value of $R^2 = 0.710255$, which shows that 71.02% variation in the dependent variable is caused by the independent variable. The 'p' value of f statistics also confirms that jointly mutual funds investments at lags and Nifty Returns at lags are significant in affecting the dependent variable as represented by the f statistics of 0.046155. Durbin-Watson statistics is 1.736898 for the model which is closer to 2

which reveals that there is no autocorrelation in the model. These all parameters indicate that our model is a good fit.

9. Block Exogeneity Wald Tests

Block Exogeneity Wald Tests has been used to study the combined effect of all lags on the dependent variable.

The hypothesis for Block Exogeneity Wald Test are as:

H_0 : No causality exists between the variables

H_a : cause and effect relationship exists between the variables.

Table 9:Wald Test

Dependent variable: Mutual Funds Investments		
Excluded	Chi-sq	Prob.
CPI	2.530376	0.2822
ER	2.231079	0.3277
GDS	0.397545	0.8197
GR	0.776859	0.6781
IR	0.084292	0.9587
NIFTY	0.942381	0.6243

The null hypothesis of no causality between the variables will be accepted if $p > 0.05$ and the hypothesis will be rejected if $p < 0.05$. The table shows that $p > 0.05$ in case of all the selected variables. Therefore, the null hypothesis will be accepted. It implies that at all lags the variables, that is, Consumer price Index, Gross Domestic Savings, Exchange rate, growth rate, interest rate and nifty returns are insignificant in influencing the resource mobilization of mutual funds.

10. Conclusion

The institutional investors such as domestic mutual funds have gained a considerable role in Indian equity market. This study examines the interaction between mutual funds market and various macroeconomic variables using 15 years of annual data spanning from April 2000 to March 2015. The study observed that the Mutual fund flows are not considerably influenced by the variables, that is, Consumer price Index, Gross Domestic Savings, Exchange rate, growth rate, interest rate and nifty returns. This behaviour indicates that there are certain other macroeconomic factors that have an influence on the investments of mutual funds. The fund flow from mutual funds are considerably affected by their own lags, implying that they follow their own past strategy while making the investment decision.

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