Commodity Mutual Fund Performance in Emerging Markets : The Case of India

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Abstract

Diverse events take place every day in our country and abroad, which may have deeper consequences on our economy and investors' perception. A common man, who wants to earn profits by investing in the economy through stock markets, is often left helpless due to the sudden changes in the market behavior. This leads to suspicion and fear in the investors' mind. To avoid such traps, it becomes imperative to analyze the risks from investments beforehand. Since the common man is incompetent to do so, intermediaries like mutual funds are resorted to. However, the selection of the right asset management company and the right scheme is very important. In this study, 41 mutual funds were taken of which 14 were gold mutual funds, 12 were exchange traded funds, and 15 were energy mutual funds. We studied the performance of mutual funds using different portfolio measurement methods, models, and ratios. Capital asset pricing model was used for most of the interpretations. Various performance related facts were highlighted in this study. In general, it was found that the gold funds performed better than the energy funds and moved in tandem with their benchmark index.

Keywords : **gold mutual funds, energy mutual funds, Sharpe ratio, Treynor ratio, Jensen's alpha**

JEL Classification : G10, G11, G17, G23

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Investments are done with the motive of getting rewarded. This reward may be positive or negative, or it may be different from what is expected. The difference between the expected returns and the actual returns is known as risk. Past realized returns help an investor to get an idea of what the returns should be, but that returns may occur or may not occur. Actual returns may be completely different and shocking at times. Risk and returns are the two sides of the same coin. One cannot invest in a security just on the basis of its return profile. Risk consideration is equally important. When a mutual fund manager invests, he/she considers the entire portfolio or the "basket of investments". The manager has to consider two things, first is the market analysis and second is the optimal portfolio construction. The latter can be done only after a careful security analysis. Risk return analysis and the reward associated must be calculated to get an idea of the overall movement of mutual funds. In this study, we have tried to appraise some commodity mutual funds for their performance. In commodity funds, we have taken "gold" and "energy" mutual funds since they are the "most volatile" among all the others within the category. The benchmark indices were taken after careful inspection of literature and consultation with finance experts and professionals. An appropriate benchmark should match the investment objective and strategy for the particular asset class taking into consideration the acceptable risk and the desired returns from the investment. Gold mutual funds can be appraised only by comparing them to physical gold, and

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the commodity like energy can be appraised only by comparing it to commodity index of energy, which is the MCX Energy Index in India. They are broad and whenever any change happens in gold and energy performance, its smallest volatility is reflected in these. They represent a fair measure of how well the said mutual funds are performing and hence they have been taken as the benchmark indices. We next take a look into the previous studies related to performance appraisal of mutual funds.

Literature Review

It is a known fact that the market itself is unpredictable, yet an informed decision about investments can be made by analyzing the probable risks associated with various investments. This can be done if one is aware about security analysis and portfolio management methods or else one resorts to intermediaries to look after his/her investments. The wealth of contribution of researchers in the field of performance evaluation of mutual funds, selection ability of managers, and market timings (Appendix 1) have helped in gaining the knowledge of the concept and tools of analysis in a great way. The surveyed literature include diverse comparative samples like equity vs. debt funds, public vs. private funds, open ended vs. close ended schemes, growth vs. dividend schemes, etc. The risk return parameters, risk adjusted performance measures, diversification, and selection skill measurements, etc. can help to gain an insight into the trend of mutual fund returns over the years, the flaws in fund management, and the efficiency of fund manager's selection ability. In the current scenario, selection of the right mutual fund company and the right mutual fund scheme is crucial so as to avoid traps and lose one's hard-earned money.

Gupta and Kumar (2007) in their research appraised the Indian stock market using the Fama- French three factor model and the multi-factor model. The results highlighted that the Indian markets exhibited size and value effect, thus showing validity of the Fama-French three factor model and the generalized asset pricing model.

A relationship was established between returns of public mutual funds and private mutual funds and between the returns of different mutual fund schemes of respective category by Kumar and Devi (2011). The range of the Sharpe, Treynor, and Jensen's measures were wide for both public and private funds. All indicated superior performance of public funds. Bansal, Garg, and Saini (2012) evaluated the performance of selected mutual fund schemes using Sharpe model and Treynor model. It was found that when the average value of Sharpe and Treynor's ratio of the sample schemes was compared to market index, 82% schemes had performed better and showed good risk adjusted performance. The researchers finally concluded that most of the MF schemes were performing well, and the funds' forecast about future security prices was good enough to recover their expenses.

Goel, Sharma, and Mani (2012) performed their study with the objective to investigate the performance of open ended mutual funds on the basis of their characteristics. The return performance was measured against three fund characteristics that were performance persistence, expense ratio, and asset size and a multiple regression model was used for analysis. A bibliographic review was presented by Kumar and Kumar (2012), wherein they surveyed literature related to determinants of mutual funds' performance. Factors influencing performance were studied, which focused on manager's selection & predictive ability, stock market behavior, costs involved, liquidity, stability of funds, information flow towards customers, and information disclosure. Prajapati and Patel (2012) did a comparative evaluation of the performance of equity diversified mutual fund schemes of select companies and compared it with the market index. Risk, returns, Sharpe ratio, Treynor ratio, Jensen's alpha, and Fama values were used for analysis. It was found that though all the AMCs showed positive returns during the study period, the years 2008 & 2011 showed poor performance owing to their negative risk adjusted ratios.

The aim of the study done by Annapoorna and Gupta (2013) was to do a comparative analysis of the returns of mutual fund schemes ranked 1 by CRISIL (belonging to various categories) and also compare these average returns with SBI domestic term deposit rates. A comparative performance study was done for the selected growth scheme MFs and their returns and reward to risk & volatility ratios were examined by Narayanasamy and

Rathnamani (2013). A comparison with benchmark index was also done. Appraising public sector mutual funds on the basis of risk, returns, and risk adjusted performance measures (Sharpe, Treynor, & Jensen) was the main objective here (Karrupasamy & Vanaja, 2014). It was thus concluded that public sector funds performed well, and investors could opt for them with confidence. In their study, Krishna and Raju (2014) attempted a comparative performance evaluation of public sector mutual funds. A stunning fact that came to light was that all the schemes had similar investment portfolio and invested large amounts in banking stocks. Also, all the funds were managed by two fund managers only who did not diversify the investments.

Srivastava and Malhotra (2015) identified appropriate risk measuring techniques for mutual funds and analyzed risk - return relationship of selected funds. Future investment opportunities were explored and some recommendations for investing strategies were provided. An evaluation of performance of 24 open ended equity diversified Indian mutual funds (floated by 12 fund houses) was done on the basis of risk-return parameters, risk adjusted performance measures, diversification, and selectivity (Suvarna & Ishwara, 2015). The funds' sensitivity to market fluctuations was also examined.

Agarwal, Tandon, and Raychaudhuri (2015) attempted a comparison of select mutual funds to help investors in fund selection. They used various risk return parameters and risk adjusted performance measures. Gowri and Deo (2016) evaluated the performance of select equity fund of funds and found that they underperformed the benchmark market index. The negative Treynor, Sharpe, and Jensen's ratios highlighted the impact of double layer of fees. Mishra and Ahuja (2016) examined the timing skills and selectivity skills of mutual fund managers. It was found that the select funds performed poorly during the bear periods. Also, there was a lack of market timing ability among the fund managers despite having satisfactory selection skills.

Objective of the Study

The main aim of this research is to study the performance of select mutual funds and to conduct a comparative analysis.

Methodology

(1) Research Design : Here, descriptive study design is followed as we use financial tools to describe and explain the performance of select mutual funds. The study uses three years secondary data and thus performs longitudinal analysis.

(2) Research Hypotheses

- **H01 :** There is no significant difference in the performance of select mutual funds.
- **H02:** The mutual fund performance is different from benchmark index performance.

(3) Sample : 41 mutual funds were taken of which 14 were gold mutual funds (for convenience of analysis, all the funds were numbered from f_1 to f_14), 12 were exchange traded funds (numbered f_15 to f_26), and 15 were energy mutual funds (numbered f_27 to f_41).The monthly net asset values were taken from Bloomberg database and the entire data set was synchronized. The time period of the study is from January 2013 to January 2016. The benchmark index taken for gold funds was the price of physical gold (assimilated from Bloomberg database) and the benchmark index taken for energy funds was the closing price of MCX energy index (from MCX website). The energy mutual funds were selected on the basis of the percentage holdings in the energy sector. All the mutual funds having more than 10% holdings in the energy sector were taken.

The actual returns were calculated for both the security and the market index. Then we calculated the intercept using risk-free rate of return ; 91 day treasury bill yield was taken as the risk-free interest rate. All the calculations were done according to it. After the intercept, we calculated the systematic risk beta by taking the slope of the actual returns of the fund. Then we calculated the total risk by measuring standard deviation of actual returns. Expected returns were calculated using the CAPM model. After that, Sharpe ratio, Treynor ratio, and Jensen's ratio were computed. All the variables and ratios were then plotted on a graph to derive the interpretations.

Analysis and Results

The various ratios are presented in the Table 1 and Table 2 for each fund and graphs were plotted for gold funds and energy funds separately so as to distinguish and compare easily.

The beta (as seen in Figure 1) is found to be positive for all the funds, which means that there exists a positive relation between gold prices and the mutual fund returns. As the returns of physical gold increases or decreases, the mutual fund returns also change in tandem. It can be seen that the beta values for all the funds except Fund 12 and Fund 13 is less than 1. This shows that gold mutual funds are less volatile than the physical gold. In case of rise or fall of physical gold prices, they show fewer fluctuations than that in gold returns. As for Funds 12 and 13, they are world gold funds and show very high volatility due to some company specific risks. Their net asset value fluctuates more than smaller fluctuations in gold prices. Investing in these two funds can be very risky. One needs to think twice before investing in these. However, they can be very profitable in case of an upswing in gold prices. Starting from Fund 15, we have all the exchange traded funds. We can see that all the ETFs have equivalent systematic risk, with Fund 18 showing a little fluctuation.

As seen with beta, the total risk is high for Fund 12 and Fund 13. Investing in them should be done cautiously. Here, one thing that can be observed is that the pattern is similar to that of the beta graph. We can say that it is due to their high systematic risk that they have high total risk. Total risk (Figure 2) of all the other gold funds is almost comparable. Starting from Fund 15, we have all the exchange traded funds. They all show equivalent total risk.

From the Figure 3, it can be seen that the value of *R* squared varies from 50% to 70% which represents an appreciable amount of closeness to the physical gold prices. The chances of making huge loss is less and so are the chances of making huge profits.

All the exchange traded funds have a Jensen's alpha equal to zero (Figure 4). We can say that they have performed according to the expectations of the investor over the years. The gold mutual funds however have, on

Figure 1. Systematic Risk Presentation

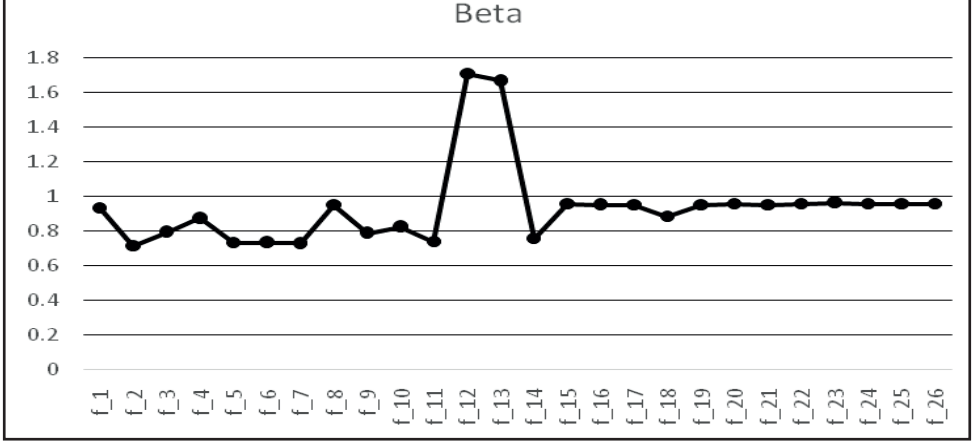


Table 1. Calculated Ratios (Gold Funds)

Gold Mutual Funds	Beta	Standard Deviation	*R* Squared	Jensen's Alpha	Treynor Ratio	Sharpe Ratio
f_1	0.932287	3.904768	0.662377	-0.228715518	-9.181066036	-2.192035012
f_2	0.714339	3.189947	0.582691	-2.3858862	-12.275732	-2.7489586
f_3	0.794106	3.746607	0.522008	-1.512242235	-10.84006578	-2.297589684
f_4	0.874669	4.060122	0.539269	-0.79028931	-9.83926762	-2.11966574
f_5	0.731776	3.207204	0.604923	-2.08506	-11.785	-2.68895
f_6	0.733085	3.348938	0.556789	-2.04966	-11.7317	-2.56807
f_7	0.729463	3.478718	0.510934	-2.28757	-12.0717	-2.53135
f_8	0.948527	3.866795	0.699187	-0.11484	-9.05681	-2.22164
f_9	0.788988	3.556464	0.571874	-1.59052	-10.9516	-2.42958
f_10	0.825232	3.687119	0.582069	-1.25607	-10.4578	-2.34061
f_11	0.735589	3.457894	0.525828	-2.0617	-11.7385	-2.49711
f_12	1.704386	7.33273	0.627771	5.992053	-5.42007	-1.25982
f_13	1.666186	7.64674	0.551684	5.58329	-5.5848	-1.2169
f_14	0.754454	3.284272	0.613173	-1.85822	-11.3987	-2.61849
f_15	0.956358	3.89542	0.700372	-0.00984	-8.94603	-2.19632
f_16	0.952493	3.87595	0.70172	-0.04715	-8.98524	-2.20807
f_17	0.949466	4.058353	0.635998	-0.06201	-9.00104	-2.10583
f_18	0.883115	3.933649	0.585652	-0.70096	-9.72948	-2.18429
f_19	0.950609	3.880503	0.697308	-0.05933	-8.99815	-2.20428
f_20	0.954413	3.888743	0.699924	-0.03307	-8.97038	-2.2016
f_21	0.948423	3.86953	0.698046	-0.07646	-9.01636	-2.20991
f_22	0.955372	3.894511	0.699255	-0.02041	-8.9571	-2.19729
f_23	0.964099	4.028778	0.665416	0.063525	-8.86985	-2.12258
f_24	0.956804	3.90029	0.699276	-0.01265	-8.94896	-2.19532
f_25	0.955998	3.891525	0.701246	-0.00864	-8.94478	-2.19739
f_26	0.956894	3.90423	0.697997	-0.00873	-8.94485	-2.19231

Figure 2. Total Risk Presentation

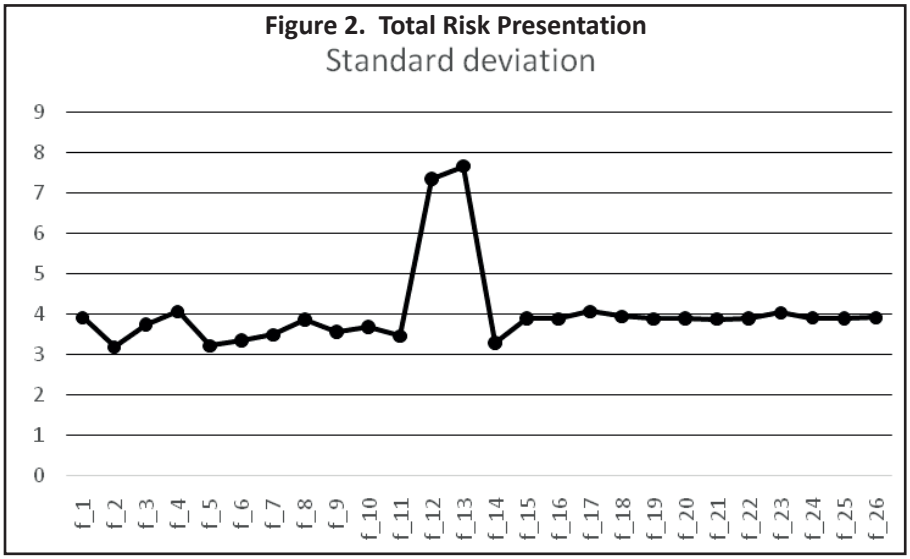


Figure 3. *R* Squared Presentation

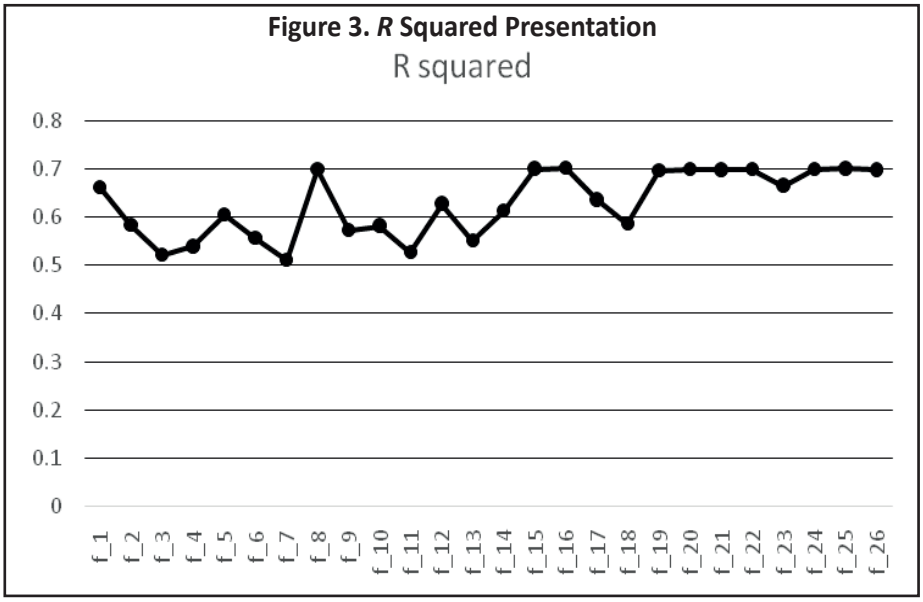
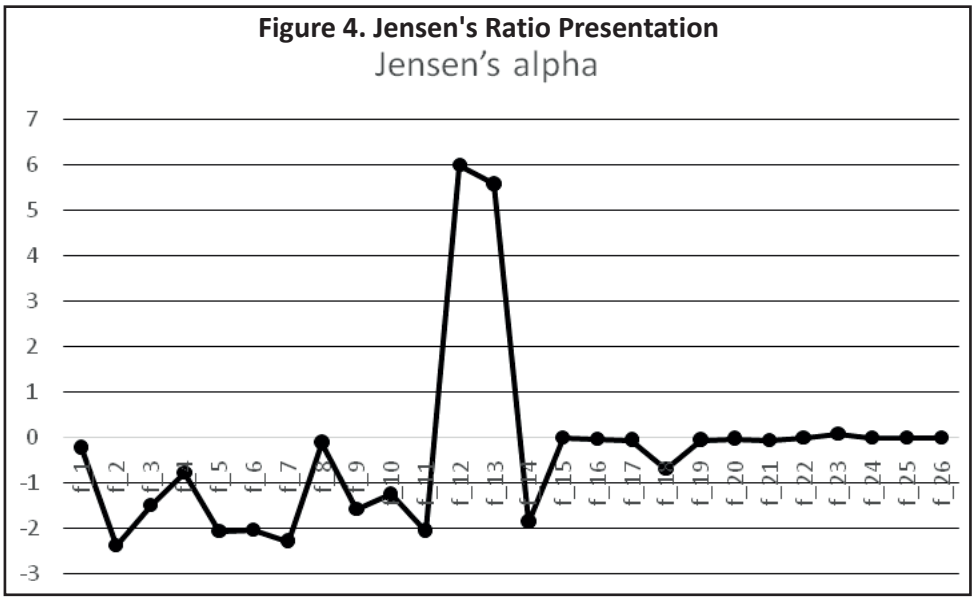


Figure 4. Jensen's Ratio Presentation



an average (excluding the World Gold Funds no. 12 and 13), underperformed the market. It is only the world gold funds that have out performed the market and the expectations of the investors.

All the gold funds have a negative Treynor ratio (Figure 5). They give negative reward per unit of systematic risk. All the exchange traded funds show equivalent values for the ratio. The ratio is high for the world gold funds, which shows that they are more rewarding than all the others in the sample taken. Gold mutual funds show varied ratios, all less than zero. They have underperformed.

The Figure 6 shows that all the exchange traded gold funds show equivalent Sharpe ratios, all of which are negative. Fund 12 and Fund 13 have less negative values. They have performed better in the group and give better reward per unit of total risk.

Next, we consider the energy mutual funds and find their ratios so as to draw an inference about them and compare them with the gold funds.

Figure 5. Treynor Ratio Presentation

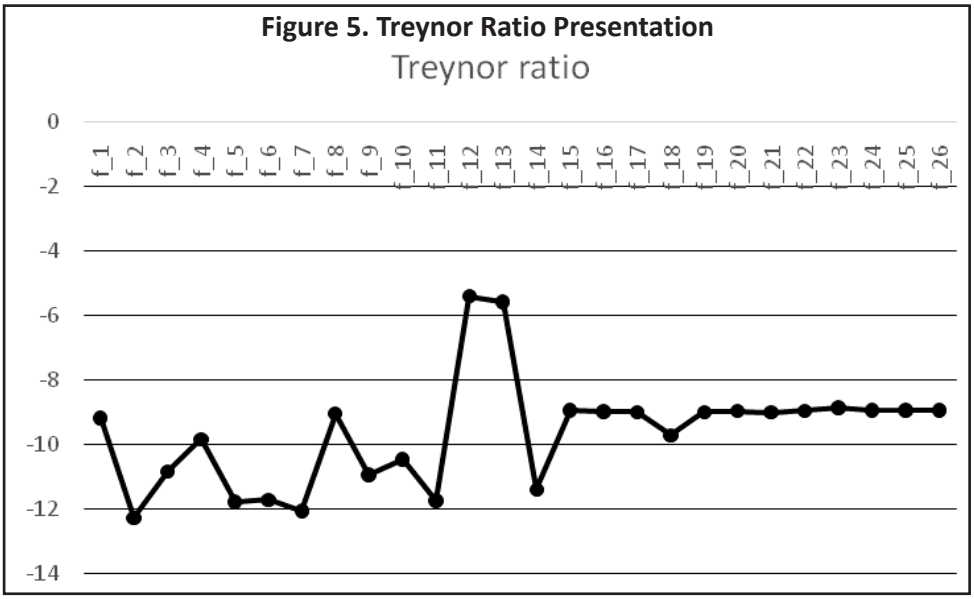
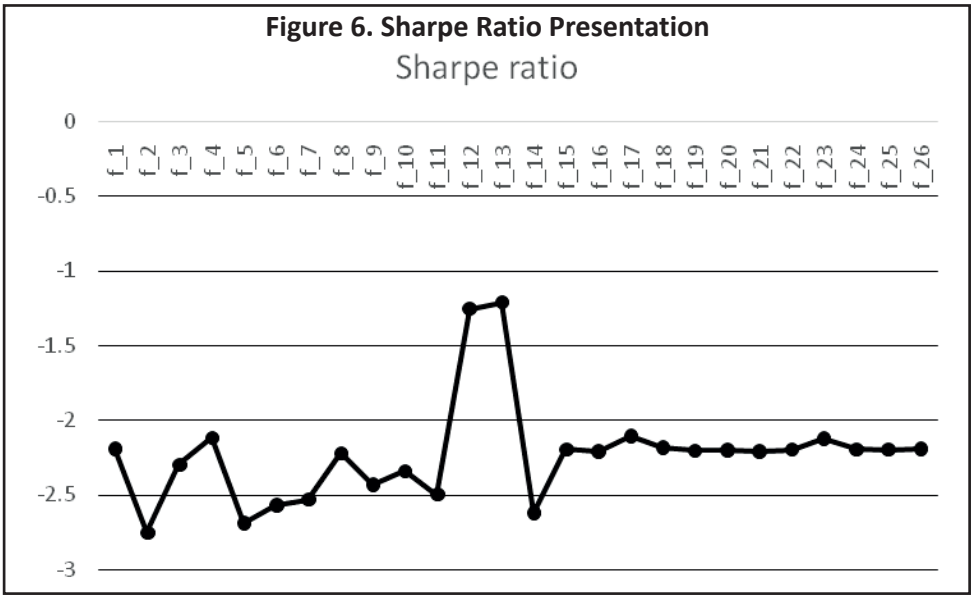


Figure 6. Sharpe Ratio Presentation



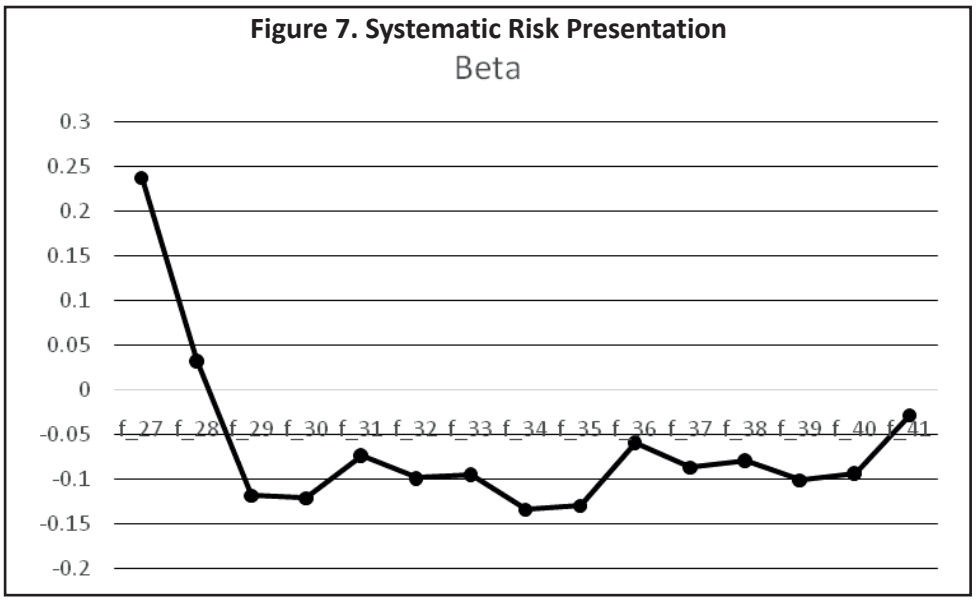
The Figure 7 shows that most of the energy funds have a negative beta value. This shows that they have negative relation with the MCX energy index. It indicates that if the index goes up, the net asset values of these funds will go down. Two funds, Fund 27 and Fund 28 show positive beta and hence they show a positive relation with the index. They will move in the same direction as the index. Infact, Fund 27 is much more volatile than the index (since it is a world energy fund and not a domestic fund) which can lead to good profits during upswing and huge losses during downswing. A remarkable thing to note (Figure 8) here is that Fund 27, which has a huge systematic risk, has the least total risk. This may be because the non diversifiable risk has a low impact on this fund. Rest all of the energy funds have appreciable and comparable total risks.

In general, all the energy funds show very less, to a maximum of 5%, closeness to the benchmark index (as seen in the Figure 9). Hence, they are a risky area to invest in. This may also be because of the inverse relation with the movement of the index. Fund 27 shows a little more closeness of upto 20%, showing (little) lesser risk as compared to other funds.

Table 2. Calculated Ratios (Energy Funds)

Energy Mutual Funds	Beta	Standard deviation	*R* squared	Jensen's alpha	Treynor ratio	Sharpe ratio
f_27	0.236953	3.49973	0.200689	-6.2468	-35.6194	-2.41165
f_28	0.032084	4.034455	0.002769	-7.41899	-240.491	-1.91252
f_29	-0.11853	5.110808	0.023546	-8.86414	65.53027	-1.51972
f_30	-0.12182	4.803354	0.028158	-8.59234	61.27817	-1.55407
f_31	-0.07376	4.453632	0.012009	-8.52925	106.3757	-1.76182
f_32	-0.09927	4.705366	0.019487	-8.67373	78.11738	-1.64809
f_33	-0.09522	4.497342	0.019626	-8.63423	81.41921	-1.72387
f_34	-0.1343	4.275246	0.043201	-8.65169	55.1644	-1.7329
f_35	-0.1307	4.63009	0.034884	-8.96044	59.30212	-1.67397
f_36	-0.05968	4.515857	0.007645	-8.24691	128.9389	-1.70388
f_37	-0.08737	5.039281	0.01316	-8.51247	88.17287	-1.52874
f_38	-0.07976	4.24546	0.015453	-8.58075	98.32188	-1.84726
f_39	-0.10154	4.569413	0.021619	-8.63458	75.77891	-1.68396
f_40	-0.09405	4.097724	0.023064	-8.21959	78.13697	-1.79344
f_41	-0.02847	4.349162	0.001876	-8.14108	276.6926	-1.81128

Figure 7. Systematic Risk Presentation



All the funds of energy in Figure 10 can be seen to underperform the market. It is only the world energy funds which have fared less worse than the others in the group. The energy funds are not very profitable a portfolio to invest in. The reason may be the negative systematic risk associated with most of them.

The energy funds (Figure 11) on an average show very good Treynor ratio. This shows that they have performed good and give good reward per unit of systematic risk. Only the Funds 27 and 28 have a negative Treynor ratio. The Fund 28 has a very high negative value ratio and has thus underperformed even our sample gold funds.

All the funds show negative Sharpe ratios (Figure 12) and thus highlight bad performance of the funds. They give negative rewards per unit of total risk. The Fund 27, which is world energy fund, has performed the worst. Rest all the funds have comparable ratios.

Figure 8. Total Risk Presentation

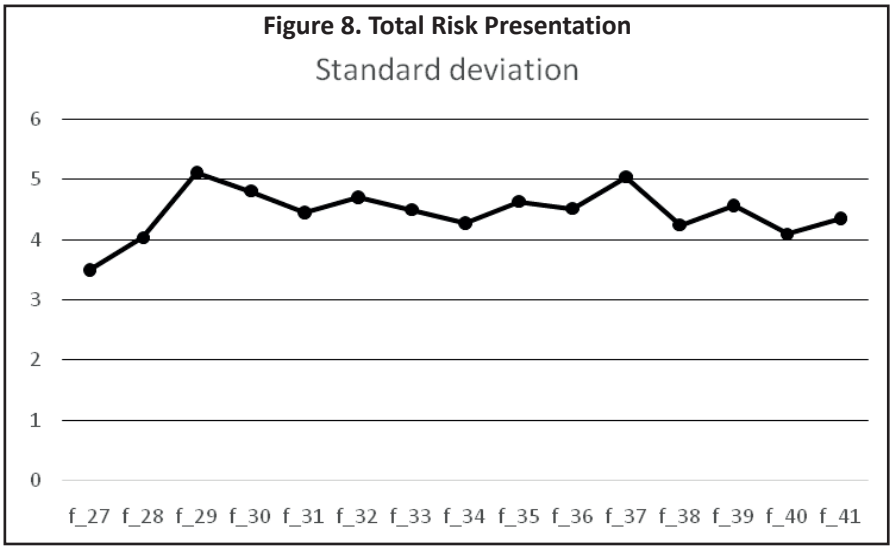


Figure 9. *R* Squared Presentation

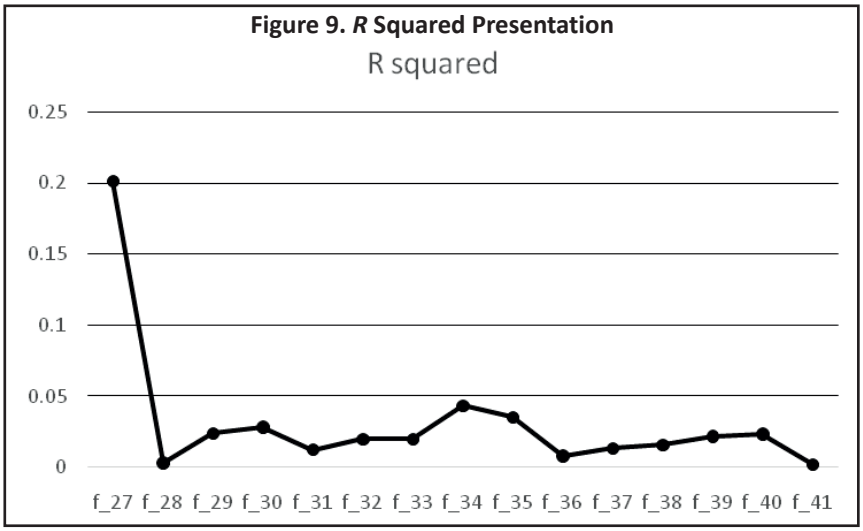


Figure 10. Jensen's Ratio Presentation

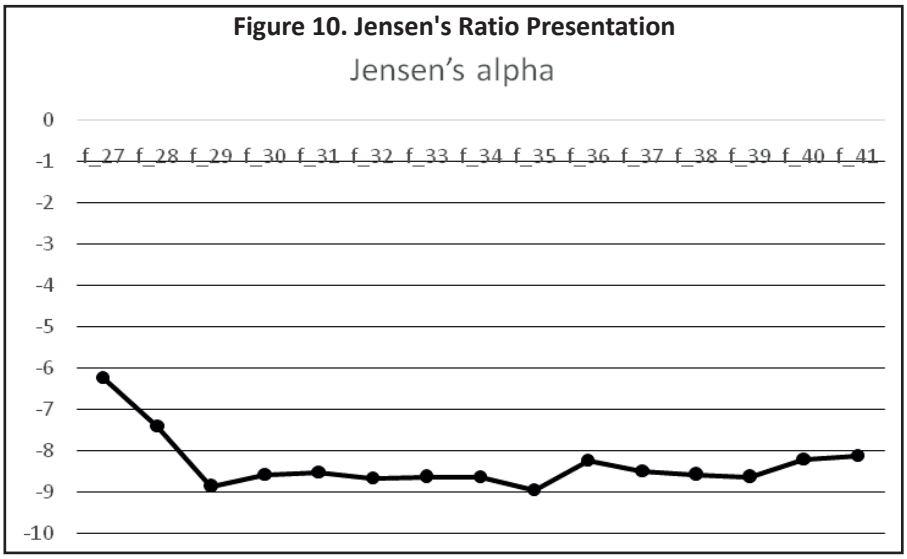


Figure 11. Treynor Ratio Presentation

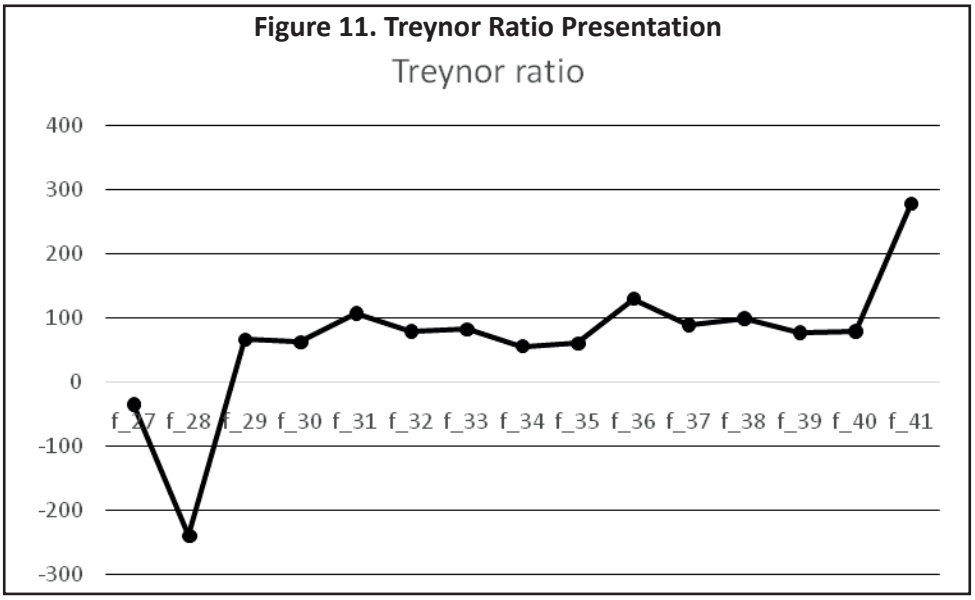
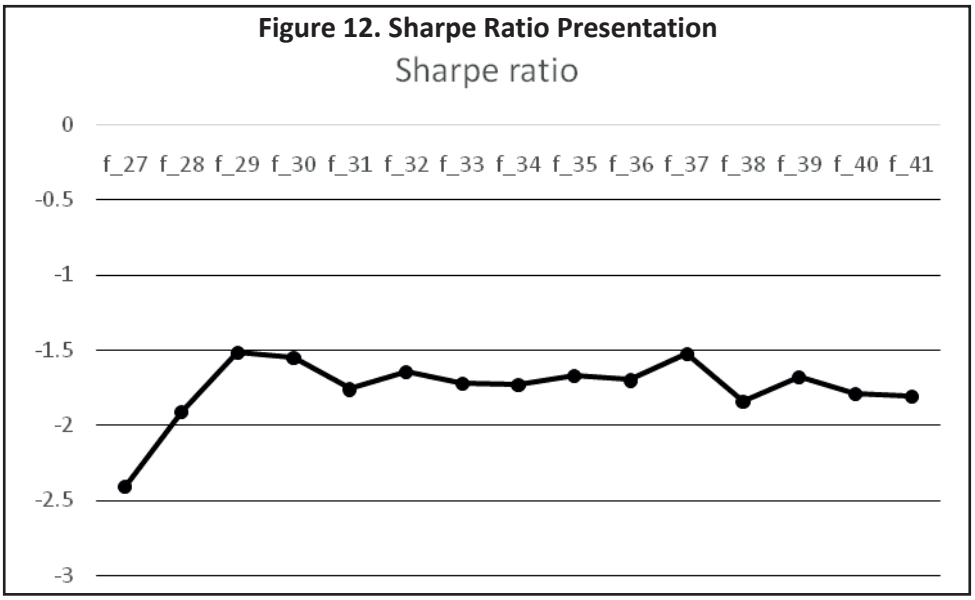


Figure 12. Sharpe Ratio Presentation



Conclusion with Recommendations for Investors

Gold funds are seen to behave more like physical gold than what the energy funds perform in comparison to their index. Fund 12 and Fund 13 show high risk, high differential return, more closeness to benchmark, and high rewards when gold funds sample is considered. Fund 27 and Fund 28 show high systematic risk, little or no closeness to benchmark index, and the reward per unit risk is low. However, they give good differential returns. On the whole, total risk is found to be equal for all the 41 funds, but the systematic risk of gold funds is high. This is the risk involved with the factors affecting all the firms. Differential returns are more in case of gold funds, and nothing can be said about rewards with firmness as Treynor ratio and Sharpe's ratios show different results in case of energy funds. Exchange traded funds perform well, which is justified by their Jensen's ratio. The general level of total risk is high in case of energy funds as compared to gold funds. Gold funds are found to be less risky.

Amongst the gold mutual funds, only world gold funds outperform and are good portfolios to invest in. Energy funds show unsatisfactory performance over the years and are not much attractive and profitable areas to invest in. World gold funds, that is, Funds 12 and 13 give better reward per unit systematic risk while all ETFs give average rewards. Energy funds are found to be much more rewarding than the gold funds. Only one of the energy funds show very negative Treynor ratio. The Sharpe ratio is found to be negative for all the 41 chosen funds, showing unsatisfactory performance. Of these, the energy funds fare better than the gold funds. Only world gold funds perform appreciably better when compared to all the funds. They are thus found to be good investment avenues.

The above findings are comparable with the findings of Gupta and Kumar (2009) wherein, as compared to market index, most of the schemes had performed better. Some strategies for investors to invest prudently have been suggested in this study the same way as had been suggested by Srivastava and Malhotra (2015). In a similar study on different sector mutual funds by Agarwal et al. (2015), the comparison revealed different performances for different funds.

The study, on the whole, is important and an eye opener for the investors who otherwise hesitate in investing in mutual funds. Gold and energy mutual funds are a good emerging option for investments where investors can make good profits. We reject H01 as significant difference is found in the performance of gold funds and energy funds. Even within each category, different performances exist. We accept H02 as our study provides evidence for performance of mutual funds differing from the benchmark index. It should also be noted that the exchange traded funds have almost similar performance to the benchmark index. An ideal investment would thus be advised to have both gold mutual funds and energy mutual funds in the broad portfolio of investments so that profits can be made both when the market goes up and also when the market goes down.

Research Implications

This study reveals that gold mutual funds and the energy mutual funds are the best places for hedging the investments and securing them as far as the current market state is taken into consideration. On appraising the two categories, it is found that the gold funds fared better than the energy funds. From all this, we infer that for investing in mutual funds, it is imperative that an investor is aware of the interplay between macroeconomic variables and their profound impact on the investments. What happens when the global stage is set on fire is indeed a million-dollar question. From our research, we have seen that the past records and trends can be studied to help facilitate this understanding and get an insight into the prevailing macroeconomic trends. The mutual fund managers can be of great help in this context. They can help in evaluating the mutual fund performance using various financial tools and ratios. The appraisal of various funds can help in directing the common investor towards profitable deals.

Limitations of the Study and Scope for Future Research

Though the research was done carefully taking all precautions, yet there are certain limitations and scope for further research. For checking the performance of mutual funds, we have used limited ratios. Other ratios like M squared, Fama French model, Roy's safety first ratio etc. can be used by researchers in future studies. This will give a better enhanced interpretation of the results.

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APPENDIX

Appendix Table 1. Coding

MUTUAL FUNDS	Code
R*Shares Gold ETF Dividend (NAV)	f_1
Axis Gold Fund RG(NAV)	f_2
Birla Sun Life Gold Fund RG(NAV)	f_3
Canara Robeco Gold Savings Fund RG (NAV)	f_4
HDFC Gold Fund (NAV)	f_5
ICICI Prudential Regular Gold Savings Fund RG(NAV)	f_6
IDBI Gold Fund RG(NAV)	f_8
Invesco India Gold Fund RG (NAV)	f_7
Kotak Gold Fund G (NAV)	f_9
Reliance Gold Savings Fund G (NAV)	f_10
SBI Gold Fund RG(NAV)	f_11
DSP BR World Gold Fund Regular G (NAV)	f_12
Kotak World Gold Fund std. g(NAV)	f_13
Quantum Gold Saving Fund g (NAV)	f_14
Quantum Gold Fund ETF (NAV)	f_15
Axis Gold ETF (NAV)	f_16
Birla Sun Life Gold ETF (NAV)	f_17
Canara Gold ETF(NAV)	f_18
GS Gold Bees(NAV)	f_19
HDFC Gold ETF(NAV)	f_20
ICICI Pru Gold Iwin ETF(NAV)	f_21
IDBI Gold ETF(NAV)	f_22
Invesco India Gold ETF (NAV)	f_23
Kotak Gold ETF(NAV)	f_24
SBI ETF Gold(NAV)	f_25
UTI Gold ETF (NAV)	f_26
UTI Growth Sectors - Energy Fund G (NAV)	f_27
DSP BR World Energy Fund RG(NAV)	f_28
DSP Black Rock Natural Resources and New Energy Fund RP-G (NAV)	f_29
Reliance Diversified Power Sector Fund-G(NAV)	f_30
Escorts Power and Energy Fund RG (NAV)	f_31
Sahara Power and Natural Resources G (NAV)	f_32
SBI Infrastructure Fund RG (NAV)	f_33
Sahara Infrastructure Fund varrg(NAV)	f_34
Canara Robeco Infrastructure Fund g(NAV)	f_35
Taurus Infrastructure Fund rg(NAV)	f_36
Baroda Pioneer Infrastructure Fund g (NAV)	f_37
Escorts Infrastructure Fund g (NAV)	f_38
IDFC Infrastructure Fund gr (NAV)	f_39
ICICI Prudential Infrastructure Fund g (NAV)	f_40
Invesco India Infrastructure Fund rg (NAV)	f_41