

ESSAY ON CHOICE OF INVESTMENT AVENUE AND HEDGE IN CALLIBER: EVIDENCE FROM ICONIC INDICES IN INDIA

ABDUL SALEEM C, MEENU ANNA GEORGE and NEENU ELSA GEORGE

*MCOM- BUSINESS FINANCE, DEPARTMENT OF COMMERCE,
PONDICHERRY UNIVERSITY*

ABSTRACT

This paper attempts to identify the explanatory power of different investment classes over commodity index. It also studies the hedging opportunity if certain asset classes are added with commodity index in a single portfolio. This paper takes into account the indices such as MCX COMDEX, NIFTY 50 index that represents the equity market in India, gold and USD indices. The period of study is from 2015 to 2019. The tools used for the study includes normal regression and ARCH family model. The result of the study shows that while investing in a portfolio, these asset classes are not best hedgers. Thus, these asset classes are not supposed to be comprised in a single portfolio together. The findings of the study will be helpful for investors to plan their investment avenues.

INTRODUCTION

Over the years, commodities have been developed as a separate asset class just like stocks and bonds. After the year 2000 the trading in commodities have been intensified, with increasing role of financial motives, financial markets and financial actors in operation of commodity markets which is often referred as “financialization of commodities” (UNCTAD, 2011). Most of the developing countries like India need investment in commodities like steel, copper and oil to improve their infrastructure. There is also an increasing demand for investment in metals like aluminium and agricultural commodities like cotton to meet the demand of increasing demand from middle class populations. This has created higher demand and price for commodities.

The study attempts to identify the explanatory power of different investment classes over commodity index. This Paper takes into account the indices such as MCX COMDEX, NIFTY 50 index that represents the equity market in India, gold and USD indices. The relationship between commodity and other indices are examined using various econometric tools. It also studies the hedging opportunity if certain asset classes are added with commodity index in a single portfolio. If the relationship between the commodity index and other asset classes are inverse, it act as a hedger. And if the relationship is positive, then we cannot use commodity index and other asset classes together in a single portfolio.

The findings of the study will be helpful for investors to plan their investment avenues. The study will be helpful for policy makers to strengthen the stock and commodity markets.

LITERATURE REVIEW

(Ms. Gursimran Kaur, 2017) This paper examines the dynamic linkage between the MCX metal commodity index and CNX metal index. The result shows the absence of long run integration between MCX metal commodity index and CNX metal index during the study period. The result implies that metal stock return has very less negative impact on metal commodity return.

(Yamori, Nobuyoshi, 2010) This study reveals that the correlation between equity market and commodity market used to be negative or almost zero before 2006 and it has increased significantly after the global financial crisis in 2008. In this sense, the commodity market lost its character as an alternate asset.

(Samih Antoine Azar, Nazo Assadour Chopurian, 2018) The purpose of this study is to delineate empirically the nexus between GCC stock market and commodity indexes. The result shows that commodity indexes are in effect strong diversifiers and safe havens for GCC stock markets. One can improve the performance of a stock portfolio in GCC market by including commodity indexes or, by extension, their derivatives.

(Dr. S. Nirmala, Deepthy.K, 2018) This paper attempt to find the relationship between commodity market and equity market in India. For this, MCX AGRI, MCX METAL, MCX ENERGY, MCX COMDEX are taken into account. This study revealed that nifty leads and comdex and metal indices lags. All other indices are found to have no lead lag relationship between each other.

(Marco Lombardi, Francesco Ravazzolo, 2013) This paper examines the correlation between equity and commodity market using various measures of correlation and then assessed the implication of higher correlation between oil and equity prices for asset allocation. This study concludes that commodities are to be included in one's portfolio as a hedging device is not grounded.

RESEARCH METHODOLOGY

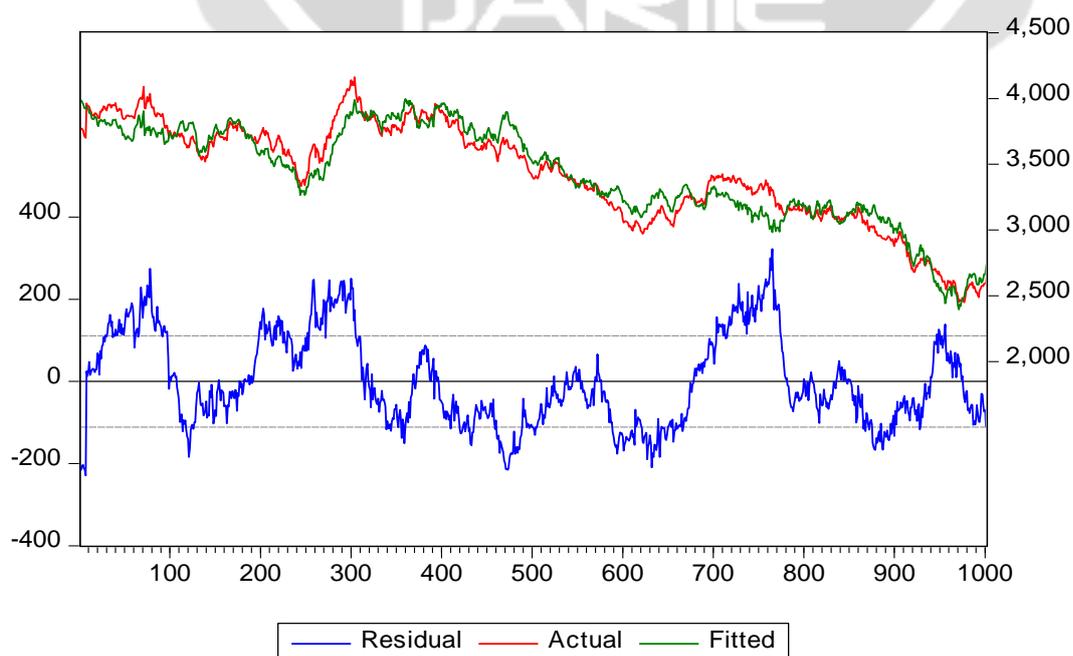
The present study is analytical in nature. And the study is based on secondary data. The study was done by the help of E-views software. For this purpose, the price data is collected from BLOOMBERG database and various concerned websites. The relevant data has been collected for 4 years from 2015 to 2019 and analysed. Analysis is done in EViews for calculation of normal regression and ARCH family models are used to deal with the arch effect. We used MCX COMDEX, Nifty50, and assets risk classes such as gold and USD. In this study MCX COMDEX is the dependent variable and study was conducted to find out whether the independent variables can be used for hedge purpose.

EMPIRICAL RESULT

The study uses the MCX COMDEX as dependent variable and NIFTY 50, Gold and USD as independent variable. The regression model used to fit the present study is:

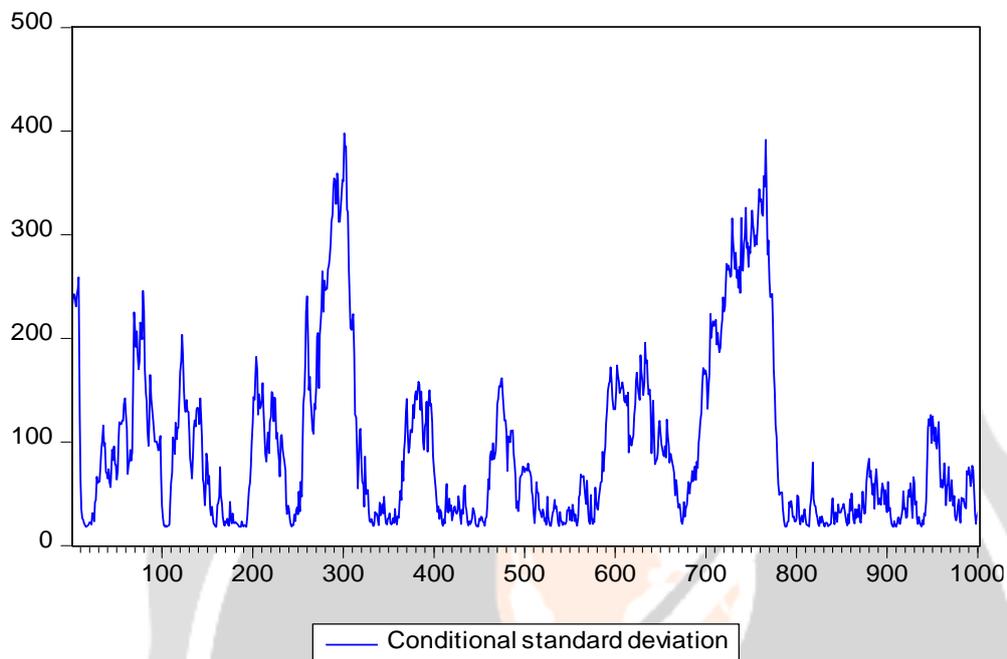
$$\text{COMDEX} = \alpha_t + \beta_{1t}(\text{Equity}) + \beta_{2t}(\text{USD}) + \beta_{3t}(\text{Gold}) + \varepsilon_t$$

The figure below represents the actual and fitted values:



It shows a residual value, which is the difference between actual and fitted model. So, we found that there is heteroscedasticity, ie, the variance from the mean are unequal.

To check whether there is a pattern followed in heteroscedasticity, we statistically plotted the series and we recognized a pattern there. The pattern followed is ARCH effect, ie, short term volatility is followed by short term volatility and long-term volatility is followed by long term volatility. The figure below represents the pattern followed in the series:



In order to ensure the same, we also conducted ARCH LM test, which is used to check whether there is any ARCH effect in the series. The null hypothesis for the test is that there is no ARCH effect.

Heteroskedasticity Test: ARCH

F-statistic	3795.515	Prob. F(1,999)	0.0000
Obs*R-squared	792.4285	Prob. Chi-Square(1)	0.0000

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 03/04/20 Time: 12:36

Sample (adjusted): 2 1002

Included observations: 1001 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1357.964	270.8079	5.014490	0.0000
RESID^2(-1)	0.887109	0.014399	61.60775	0.0000

R-squared	0.791637	Mean dependent var	12309.47
Adjusted R-squared	0.791428	S.D. dependent var	14153.16
S.E. of regression	6463.700	Akaike info criterion	20.38779
Sum squared resid	4.17E+10	Schwarz criterion	20.39760
Log likelihood	-10202.09	Hannan-Quinn criter.	20.39151
F-statistic	3795.515	Durbin-Watson stat	2.392626
Prob(F-statistic)	0.000000		

This test shows that the model is significant. As the test is significant the null hypothesis is rejected and we arrived at a conclusion that there is ARCH effect, ie, a pattern is followed.

In order to remove the ARCH effect, we use different ARCH Family Models such as ARCH (1,1), EGARCH (1,1), PARCH and Component ARCH. We also used Normal regression as a tool to study the relationship. The below table represents the result of Normal regression as well as the ARCH family model analysis:

	Normal Regression	ARCH (1,1)	EGARCH (1,1)	PARCH	COMPONENT ARCH
EQUITY	0.088409*** (0.004440)	0.131545*** (0.001719)	0.135079*** (0.001439)	0.131770*** (0.001661)	0.128891*** (0.001341)
USD	24.58932*** (0.548862)	17.83492*** (0.229657)	17.31194*** (0.217274)	17.78481*** (0.225903)	18.85471*** (0.208412)
GOLD	0.826529*** (0.048171)	0.911235*** (0.019451)	0.841916*** (0.017016)	0.901749*** (0.019141)	0.825089*** (0.007378)
R Squared	0.919627	0.897382	0.897957	0.897542	0.903097
Adjusted R squared	0.919386	0.897073	0.897651	0.897234	0.902806
F Statistic	3806.391***				
AIC	12.26678	11.24961 (lowest)	11.28140	11.25295	11.27393

After these ARCH Family Model analysis, the ARCH LM test shows following result:

	Observed R squared
Normal Regression	792.4285***
ARCH (1,1)	1.849317
EGARCH (1,1)	0.000144
PARCH	1.462733
COMPONENT ARCH	0.745881

Thus, by using the ARCH family models, heteroscedasticity in the series is being removed and it is clear from the probability Chi square being insignificant. Insignificant chi-square signifies that the null hypothesis is accepted, ie, no ARCH effect.

Of these ARCH models, the best model considered for the study is selected based on Akaike Info Criterion (AIC). The model which has lowest AIC is considered to be best for the study and is found to be ARCH (1,1) model.

The below figure shows the result of ARCH (1,1) model:

Dependent Variable: COMM
 Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)
 Date: 03/04/20 Time: 12:37
 Sample: 1 1002
 Included observations: 1002
 Convergence achieved after 50 iterations
 Coefficient covariance computed using outer product of gradients
 Presample variance: backcast (parameter = 0.7)
 GARCH = C(5) + C(6)*RESID(-1)^2 + C(7)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-96.65645	25.02270	-3.862751	0.0001
EQUITY	0.131545	0.001719	76.53748	0.0000
USD	17.83492	0.229657	77.65891	0.0000
GOLD	0.911235	0.019451	46.84843	0.0000
Variance Equation				
C	243.6192	54.25000	4.490677	0.0000
RESID(-1)^2	0.750801	0.135512	5.540473	0.0000
GARCH(-1)	0.226634	0.074580	3.038811	0.0024
R-squared	0.897382	Mean dependent var		3427.631
Adjusted R-squared	0.897073	S.D. dependent var		392.0936
S.E. of regression	125.7922	Akaike info criterion		11.24961
Sum squared resid	15792021	Schwarz criterion		11.28391
Log likelihood	-5629.053	Hannan-Quinn criter.		11.26264
Durbin-Watson stat	0.048897			

The above result shows a positive coefficient for all asset classes such as Equity, USD and Gold. As the coefficient shows positive relation between Commodity index and other asset classes, these asset classes cannot be used for hedging the risk.

FINDINGS AND CONCLUSION

The study attempts to identify the explanatory power of different investment classes over commodity index with reference to India. The coefficient shows positive value for all asset classes such as equity, USD and gold. So, it can be concluded that, while investing in a portfolio, these asset classes are not best hedgers. Thus, these asset classes are not supposed to be comprised in a single portfolio together. This finding will be helpful for investors to plan their investment avenues. The study will be helpful for policy makers to strengthen the stock and commodity markets.

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BLOOMBERG Database

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