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Gold ETFs in India:- a Descriptive and Parametric Evaluation

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Abstract

The present study looks at the benefits and drawbacks of the gold Exchange Traded Funds (ETFs), a newly invented autonomously tradable derivative tool built around gold, in the Indian context. The major concern over the initiation of the study is to assist a moderately risk seeking investor to have some guidelines to develop his investment portfolio. Investors nowadays are more rational, prudent, educated and hence rather selective in determining the mode of channelizing their funds. Rather they usually try to outperform the market both with respect to return and risk. In this context the researcher attempts to evaluate Gold ETF as an investment avenue from the point of view of a moderately risk seeking investor. The investigation additionally suggests a detailed and critical comparative evaluation of gold ETF effectiveness with the stock market in general in terms of risk and return from the perspective of a modestly risk seeking investor.

The study is conducted with two major objectives. The first is to review a critical and descriptive profile of gold Exchange Traded Funds (ETFs). The second is to make a cross sectional evaluation of funds along with a comparison of fund with the market from the point of view of a moderately risk seeking investor in a risk to reward phase. The study evaluated the funds through descriptive statistics in regard to mean daily log return, variability of return and normality of the series. A correlation analysis between and among the fund return and the market return has also been performed. Considering the independence of distribution of components in the dataset a paired sample t test has been conducted with respect to fund return and the market. The Johansen co-integration test was used to determine the long-term consistency of fund returns across time and in relation to the market. The study revealed that gold ETF is a lucrative derivative instrument for a moderately risk seeking investor. ETFs can also be used as an instrument for hedge. It is also found that the funds are capable of providing consistent return invariably providing the same return irrespective of the fund or the market. Based on the study, it is suggested that gold ETFs are a profitable credit default swap device for a tolerably risk-averse investor. ETFs are additionally useful as a hedge mechanism. It has also been discovered that investments are able to deliver regular income stream, undoubtedly supplying the very same return regardless of the fund or market.

Keywords: Gold ETF, Derivatives, Hedge, Speculation, Arbitrage, Financial engineering.

Introduction

The growth and development of an economy largely depend upon a strong and healthy financial system. The economic growth and development is emanated from the building up of infrastructure that can strongly support a rapid, stable and sustainable path of development. Such creation, maintenance and utilization of infrastructure heavily depend upon the mobilization of savings/surplus of individuals and institutions and the channelization of the same towards productive ventures in various sectors of the economy. This prominent catalytic function is performed by the financial system. The financial system performs its functions both visibly and invisibly encompassing and coordinating individuals, institutions (development, investment and financial service), intermediaries and instruments in an effective manner. Financial as well as financial service institutions input a good extent of efforts, abilities and traits in designing and developing new and innovative financial products through effective financial engineering with a glaring objective of providing the best suited products to cater to the vivid, myriad, pervasive and dynamic requirements of investors hailing from various segments of investment sphere. Attracting investors through suitably rewarding modes of investment avenues with optimum levels of risk has become a need of the hour in the activities of financial engineers. They engage in such activities of developing suitable financial products and nurturing and developing, promoting and maintaining investment cult among the saving/investing individuals/institutions of the country.

Personal investment, on the other hand, is becoming sophisticated though investor rationality and awareness in the risk-return tangle. Personal investment is really the backbone of the financial system in channelizing the resources in an effective and efficient manner. Investors are, rather more selective, discriminative and rational about their choice of investment edifice in a risk-return sphere, *inter alia*. Therefore, the financial system needs to place before the investors, a variety of financial instruments/products/derivatives for their choice *vis-à-vis* their respective risk return perceptions/preferences. There are several financial instruments (Debt, Equity and hybrid) and derivative assets (Financial, Commodity and hybrid) available for the investors/professional investors to select. They make a rational selection from among the myriad alternatives vis-à-vis their risk return preferences. Investors nowadays are more rational, prudent, educated and hence rather selective in determining the mode of channelizing their funds. Rather they usually try to outperform the market both with respect to return and risk. In this context the researcher attempts to evaluate Gold ETF as an investment avenue from the point of view of a moderately risk seeking investor.

The Research Problem

There are several conventional, modern and hybrid forms of investment avenues like real estates, business projects, gold, silver and other physical assets and capital market instruments like shares/debentures/ hybrid financial products and also multiple of speculative, hedging and arbitraging derivative products. In addition, insurance products, bank portfolios, provident fund, schemes of mutual funds etc. are available at the choice of the investors. The purpose of this article is to discuss the pros and cons of the recently developed independently tradable derivative instrument based on gold – the gold ETF. The study also proposes a critical and analytical comparison of the performance of gold ETF with the stock market in general in terms of return and risk from the angle of a moderately risk seeking investor. Hence, the paper is a semi- parametric one. It is supposed to be an alluring investment avenue with competitive risk return characteristics.

A brief review of Literature

The study conducted by (Anchalia, 2020) on exchange traded funds , compared the performance of four leading ETFs in the country in comparison with NIFTY 50 for a period of five years . The study used descriptive statistics,

Beta, Sharpe ratio, Treynor ratio, Jensen alpha, Sortino ratio and Information ratio as evaluation tools and found that the fund perform better than the index.

The precious metal gold is traditionally regarded as one of the investment options

open to the average individual investor. It is a time-tested investing strategy. It is also regarded as a commodity, a kind of cash, and a representation of beauty. India is one of the top consumers in the globe, and there is always a need for it. Economic uncertainty and worries that national currencies may lose value compel the investment in gold as the importance of gold investments increases as a result of unforeseen developments in the financial markets. This study sheds light on the many gold investment options available in the market and also assesses the performance of the return of Gold ETF, actual gold, and Nifty indexes. The study based on three years between March 2012 and March 2015 revealed that gold ETF outperformed the other two (Meenakshisundaram, 2016)

A study conducted in Himachal Pradesh(Verma et al., 2020) observes that in terms of investment alternatives in the state, gold ETF is quickly catching up to bank deposits, gold jewellery, and life insurance policies. The findings imply that families' investment preferences may alter in the long term toward Gold ETF due to its combination of security, stability, and simplicity of trading on stock markets. As a result of this change, there would be less demand for gold, which will boost the Indian economy by reducing imports. The survey shows a strong preference for gold jewellery and a concurrent rise in preference for gold exchange-traded funds (ETFs).

According to the study's findings,(Ram Raj, 2019), gold and Gold ETFs have both a significant positive short-run association and a long-run equilibrium relationship. It is unidirectional, and this study found few bidirectional causes and relationships. This study is suitable for GARCH analysis to estimate volatility in the returns on the gold price; it demonstrates the persistence of the volatility impact. Investors may choose better investing selections with the aid of this study.

A test of the gold ETF's volatility in India has been attempted in the study(SURESHA, 2013). To calculate the volatility, a sample of 14 Gold ETFs available on the NSE was used. Additionally, the study looks at the price risk brought on by unavoidable inter correlation elements. The volatility is calculated using the Annualized Actual Volatility (AAV) model, and the significance level is determined using the t test. When compared to its rivals, GOLDBEES, GOLDSHARE, KOTAKGOLD, RELGOLD, and SBIGETS have the largest price volatility (significant at 1%) and hence present a larger price risk to investors. At the 5% significance threshold, AXIS, HDFCMFGETF, IPGETF, QGOLDHALF, and RELIGAREGO show a moderate amount of price volatility. Of the sample ETFs, BSLGOLDETF, IDBIGOLD, MGOLD, and CRMFGETF have the least volatility and imply the lowest price risk. These samples' correlations are positive in all cases other than CRMEGETF.

Utilizing procedures like percentage analysis and the Chi-Square Test, the behaviour of investors on the GETF is examined(Amudha et al., 2015). Based on the Beta value and risk-measuring techniques such the Sharpe ratio, Treynor ratio, and Jensen-Alpha Measure, the study has also concentrated on the risk associated with return. According to the research, investors are only willing to buy gold from stores in the form of jewellery, gold bars, and other items, despite their lack of knowledge regarding the purity and other dangers associated with such purchases. Investors who buy gold in the form of jewellery or gold bars run the risk of losing their investment both at the time of purchase and during exchange. Gold ETF is an alternate to cover this pitfall.

It is observed in the study(Aarthi, 2020) that right from the inception of gold ETF there was an increase in the demand for gold. It is found that gold ETF is less risky than investment in equity market and many investors were attracted to it. Gold ETF is found to be the best suited financial asset in the case of investors intending to cover inflation in the long run and also with respect to lesser volatility.

The research conducted by (Anand, 2017) considered gold as an investment avenue and gold ETF as a new mode of investment in gold. The study found that in the case of retail investors in India gold ETF is a new investment opportunity in the securities market rather than the direct investment in gold /gold ornaments.

The study conducted by (Saji, 2015) examines the Indian gold ETF market's weak-form market efficiency from 2009 to 2013. Using both parametric and non-parametric market efficiency tests, daily returns for the top gold ETF assets are investigated for random walks. The findings indicate that the gold ETF market in India has been demonstrating poor form market efficiency from the very beginning, regardless of the measures taken. The overwhelming evidence in favour of weak form efficiency suggests that gold ETF returns in developing markets behave randomly, which disqualifies the use of technical trading tools to forecast asset returns in the gold markets.

Up until 2012, gold prices grew steadily before surging in recent years. However, the performance of Gold ETFs has seen many ups and downs as a result of the current Greek crisis and China's mass gold sales. In this regard, the paper's objectives are to assess the financial results of the chosen ETFs and examine how the sample funds relate to the BSE market index SENSEX. Additionally, it makes an attempt to forecast how much the Gold ETFs reflect the shift in market return, or Sensex.and found that gold ETF move is an out performer(Ghosh, 2015)

. (Esampally, 2015) evaluates the performance of the infrastructure and gold exchange-traded funds (ETFs) against the CNX Nifty market index. The return and risk of the Infrastructure ETF and the return and risk of the Gold ETF have been compared. For both of the schemes, monthly Net Asset Values (NAVs) from January 2011 to December 2014 are utilised. The CNX Nifty's closing prices are taken into account. According to the analysis, the Gold ETF has less fluctuation than the Infrastructure ETF. Infrastructure ETF underperformed the market index while Gold ETF outperformed the market index.

The study conducted (Eswara, 2015) uses regression and correlation approaches to examine the performance of gold exchange-traded funds during the previous five years of the year 2015 (the post-crash period) as well as the relationships between gold ETFs and spot gold prices and the Nifty. GOLDSHARE, followed by GOLDBEES, is determined to have the strongest correlation to the spot gold price out of the five gold ETFs included in the analysis. The analysis also reveals that gold ETFs and Nifty have an inverse connection, which means that when Nifty falls, gold ETFs outperform, a peculiar phenomena largely seen in India.

(Arumugam et al., 2020) utilised a variety of scenarios to show the potential for a sovereign gold bond scheme in this research study, which afterwards provides a practical view on the dynamics of financial modification. The examples provided show the need of financial reengineering in managing various types of risk, the need for risk accounting, and modifications to the methods used to carry out financial and business process reengineering. It looks for distinct sales patterns among the gold ETF companies. The time series analysis is carried out to comprehend the potential future orientations of Gold ETF sales. ANOVA is used to analyse the variation in Gold ETF sales levels across all firms. The diverse firms and its trend are displayed in the time series forecast analysis. Future sales trends for all businesses indicate low levels. The previous sales in the 2011–2012 year had a high level of sales. It started declining annually, and it is currently showing a pattern of lower sales. The state of the economy might be the cause.

Objectives

1. The first objective of the paper is to discuss the pros and cons of Gold ETF as an investment opportunity. This is set at an investor education mode to critically evaluate and discuss the salient features of this derivative product suitable for both investor and speculator from the critical outlook of a moderately risk seeking investor with perceptions towards modern investment avenues.

2. The second objective is to analyse and evaluate the performance of Gold ETF in comparison with the risk return characteristics of the market as a whole. Generally, it is perceived that, on an average, a return outperforming the market or at least equal to the market is a satisfactory return for a moderately risk seeking investor. Therefore, the suitability of Gold ETF is evaluated in comparison with the market.

3. Finally a bit more detailed difference and/or relationship analysis of Gold ETFs with other ETFs and market is proposed to have a more detailed comparative evaluation.

The Research Method

The study is both qualitative and quantitative in nature. It is organized in the order of the objectives specified for the study. In order to accomplish the first objective of the study, a descriptive evaluation of gold ETF using the past profile and critical evaluation of the product from the point of view of a rational investor. The second and third objectives require analysis of secondary data. Analysis of data using descriptive statistics including tests for normality, independent paired sample t test for analyzing the relationship of each fund with the market and finally to make an overall relationship analysis Johansen co integration test were the tools used for analysis.

The data

The data used for the study are panel data comprised of adjusted closing prices on each trading day of six randomly selected and consistently traded ETFs in the National stock exchange for a period from January 2017 to October 2022. These are Axis Gold ETF, Birla Gold ETF, HDFC Gold ETF, Kotak Gold ETF, IDBI Gold ETF and Quantum Gold ETF. The NSE Nifty values for the same period were also collected to represent the market. These data were obtained from the web site of Yahoo finance. The collected data were properly cleaned for temporal and cross sectional discrepancies. The absolute data collected were transformed to log return expressed as percentages to obtain normality/stationarity.

Results and Discussions

1. Gold ETF: a Descriptive Evaluation

In this section, a descriptive profile of Gold ETF in India from the point of view of a moderately risk seeking investor is attempted. The product is subjected to a critical and comparative evaluation as an instrument of investment for a short/medium and long term investment avenue.

Gold as an investment: a brief history.

Gold is considered as one of the precious metals, the prices of which have not much volatility and an increasing trend. Initially gold is used in India as a metal for ornament/wearing apparel along with an objective of investment with an assured capital gain despite a value negative variation on exchange of gold. It started different dimensions of an investment avenue since 1999 when the Government has first introduced the Gold Deposit Scheme (GDS). The scheme gave the investors an opportunity to deposit gold and earn interest. The scheme has provided the investors the facility of free safe custody along with an interest accruing there from.

This scheme was further reinstated as Gold Monetization Scheme (GMS) in the year 2015. Under this scheme the investor can deposit gold with banks as short term bank deposits or medium/long term government deposits. Short term deposits are accepted by banks on their own behalf for a period of one to three years. Medium term deposits are for 5-7 years and the tenure of long term deposits os 12-15 years. Both of these are accepted by banks on behalf of the Government of India. The minimum deposit is 30 grams of gold in the form of bar, coin or ornaments with no maximum limit. All designated commercial banks allow this facility with a minimum interest rate of 2.5% per annum. A premature withdrawal after a stipulated minimum lock in period is also allowed. The redemption of deposit is allowed either in the form of gold or in rupees at the prevailing rates on the date of redemption. This scheme is advantageous to the investor on account of lesser amount of investment, interest on idle asset and flexibility with respect to redemption. As for the economy, it provides the benefit of reduction in the import of gold and various advantages with respect to foreign exchange.

Gold ETF: is it a Bonanza for Investors?

Gold ETF or virtual gold with continuous liquidity through tradability in organized exchanges may be considered as a bonanza for small, medium and large investors. It actually combines the flexibility of stock investment with the simplicity of gold investment. It wipes out many disadvantages of direct investment in

gold with respect to issues of requirement of funds, return, risk in relation to volatility, safety, liquidity, cost of maintenance, transaction cost, tax implications etc. Gold ETF is a derivative instrument traded on the basis of NAV suitable both for investors and speculators. It is an instrument traded in dematerialized form having not much volatility as stock but with a stable increasing trend. It is a standardized derivative free from implications of GST, continuous monitoring and analysis of the market and can be used for hedging, speculation and arbitrage. All these turn gold ETF a bonanza for various categories of investors/speculators/hedgers.

2. Gold ETF: an analytical comparison

The analytical profile of inter ETF and each ETF with the market begins with tool of descriptive statistics. The results are arrayed in tables 1 and 2. The mean daily log return in the case of Quantum ETF is the highest which outperformed the market. The volatility with a very high low variance and high standard deviation is also depicted in the case of Quantum fund. In the case of all the other funds the mean daily log returns is a bit lesser than that of the market. However, when the standard deviation for the whole period is considered for individual funds, three funds viz., IDBI, Birla Gold and Quantum fund, have shown a variability above that of the market.

The skewness and kurtosis in the case of all funds other than Quantum fund signify normality. The normality of the market returns also not fair with respect to flatness of the distribution, however acceptable with respect to symmetry. *Prima facie*, all the return distributions are found to be normal except for Quantum ETF.

The normality of the data set with respect to similarity of continuous distribution is tested by using Kolmogorov-Smirnov and Sharpiro Wilk statistics as depicted in Table 3. The tests rejected the null hypothesis that the data sets hail from the same continuous distribution. Thus the data set is considered to be from different independent continuous distributions.

Table 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	
	Statistic	Statistic	Statistic	Statistic	Std. Error
Axis Gold ETF Log Return	1439	-4.6006641291	5.7539742545	.038083224689	.020604817257 2
IDBI log Return	1431	-15.5142744197	16.2323277855	.044085095195	.052862917105 7
KOTAK Log Return	1439	-4.0023955374	6.7946222493	.038341242764	.022652736671 6
HDFC Log Return	1439	-3.8696343261	6.0383063296	.036577713550	.021826830715 0
Quantum log Return	1435	-3.7787329482	70.8996287586	.084368529932	.053684865493 9
Birla Log Return	1439	-9.3984326463	11.0876249443	.036918797851	.042728531305 6
NSE log return	1431	-13.9037542277	8.4002905788	.053271335921	.030751768898 4
Valid N (listwise)	1423				

Table 2

Descriptive Statistics

	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Axis Gold ETF Log Return	.7816263001971	.611	.618	.065	6.087	.129
IDBI log Return	1.999728065275 8	3.999	-.058	.065	15.167	.129
KOTAK Log Return	.8593123895691	.738	.817	.065	7.314	.129
HDFC Log Return	.8279823462541	.686	.399	.065	5.047	.129
Quantum log Return	2.033657533547 2	4.136	29.492	.065	1026.765	.129
Birla Log Return	1.620870664383 7	2.627	.189	.065	7.482	.129
NSE log return	1.163295154520 5	1.353	-1.585	.065	22.333	.129
Valid N (listwise)						

Table 3

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Axis Gold ETF Log Return	.080	1428	.000	.930	1428	.000
IDBI log Return	.162	1428	.000	.771	1428	.000
KOTAK Log Return	.074	1428	.000	.923	1428	.000
HDFC Log Return	.066	1428	.000	.941	1428	.000
Birla Log Return	.140	1428	.000	.862	1428	.000
Quantum log Return	.246	1428	.000	.215	1428	.000

a. Lilliefors Significance Correction

The result of correlation analysis between and among returns of different ETFs and the market return is exhibited in table 5. A significantly high positive correlation is found among the returns of Axis gold ETF, Kotak ETF and HDFC ETF. Where IDBI returns, Quantum ETF returns and Birla gold ETF returns have not shown any significant positive relationship. It implies that there is some relationship is existed between the cross sections of ETFs. Another fascinating result obtained from the analysis is that the returns of ETFs show only a slight negative relationship with the market. It suggest that practically there is no co-movement of returns of ETFs with that of the market and if exists, it is a negative beta relationship and hence Gold ETF may be considered as a hedge against market volatility with almost a stable return though less than the market.

Table 4
Correlations

		Axis Gold ETF Log Return	IDBI log Return	KOTAK Log Return	HDFC Log Return	Quantum log Return	Birla Log Return	NSE log return
Axis Gold ETF Log Return	Pearson Correlation	1	.267**	.708**	.701**	.299**	.362**	-.069**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.009
	N	1439	1431	1439	1439	1435	1439	1431
IDBI log Return	Pearson Correlation	.267**	1	.287**	.267**	.134**	.244**	.069**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.010
	N	1431	1431	1431	1431	1427	1431	1427
KOTAK Log Return	Pearson Correlation	.708**	.287**	1	.789**	.348**	.375**	-.085**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.001
	N	1439	1431	1439	1439	1435	1439	1431
HDFC Log Return	Pearson Correlation	.701**	.267**	.789**	1	.341**	.411**	-.155**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
	N	1439	1431	1439	1439	1435	1439	1431
Quantum log Return	Pearson Correlation	.299**	.134**	.348**	.341**	1	.172**	-.007
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.796
	N	1435	1427	1435	1435	1435	1435	1427
Birla Log Return	Pearson Correlation	.362**	.244**	.375**	.411**	.172**	1	-.036
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.170
	N	1439	1431	1439	1439	1435	1439	1431
NSE log return	Pearson Correlation	-.069**	.069**	-.085**	-.155**	-.007	-.036	1
	Sig. (2-tailed)	.009	.010	.001	.000	.796	.170	
	N	1431	1427	1431	1431	1427	1431	1431

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Axis Gold ETF Log Return - NSE log return	-.01474	1.44508	.03819	-.08965	.06017	-.386	1431	.700
Pair 2	IDBI log Return - NSE log return	-.00666	2.24503	.05941	-.12320	.10988	-.112	1427	.911
Pair 3	KOTAK Log Return - NSE log return	-.01474	1.50405	.03975	-.09271	.06323	-.371	1431	.711
Pair 4	HDFC Log Return - NSE log return	-.01633	1.52898	.04040	-.09559	.06293	-.404	1431	.686
Pair 5	Quantum log Return - NSE log return	.03173	2.35388	.06229	-.09046	.15392	.509	1427	.611
Pair 6	Birla Log Return - NSE log return	-.01923	2.02793	.05359	-.12435	.08590	-.359	1431	.720

Considering the independence in the data set a paired sample t test is performed with respect to each ETF return paired with the market return. The results are shown in table 5. The purpose of analysis is to know whether the mean returns of ETFs are the same as that of the market for the population. The null hypotheses here are that the mean difference between each paired observations is zero implying the same mean for the pair concerned. In all the cases the null hypothesis is failed to be rejected as the p values are more than 0.05. It implies that there is no significant difference between mean return of ETFs and the average returns of the market.

The co integration relationship analysis is done to test whether a long term relationship among the returns of the ETFs and market returns existed despite short term frictions in prices. Johansen co-integration test is used for the purpose. The test is set against the null hypothesis that there is no co integrating equation in the set of series. The results are depicted in table 6. The test statistics of Johansen co-integration test are given as trace values and maximum Eigen values. The null hypothesis is rejected at 5% level of significance in the case of at most five series among the seven are co-integrated. It suggests that even if there shocks in the short run the series would converge with time in the long run. It may be deduced that Gold ETFs are capable of generating a return corresponding to market return in the long run. It also implies that though there are some frictions in the cross sectional returns of ETFs, all the ETFs, on an average, would provide same return in the long run.

Table 6

Co integration results

Date: 12/18/22 Time: 19:23
Sample (adjusted): 6 1440
Included observations: 1384 after adjustments
Trend assumption: Linear deterministic trend
Series: AXIS_GOLD_ETF_LOG_RETURN BIRLA_LOG_RETURN HDFC_LOG_RETURN IDBI_LOG_RETURN KOTAK_LOG_RETURN QUANTUM_GOLD_ETF_ADJ__CL NSE_LOG_RETURN
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.355240	2364.994	125.6154	1.0000
At most 1 *	0.312877	1757.588	95.75366	1.0000
At most 2 *	0.268963	1238.253	69.81889	1.0000
At most 3 *	0.230434	804.6584	47.85613	0.0001
At most 4 *	0.163753	442.1498	29.79707	0.0001

At most 5 *	0.131194	194.6466	15.49471	0.0001
At most 6	5.52E-06	0.007634	3.841466	0.9299

Trace test indicates 6 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.355240	607.4055	46.23142	0.0001
At most 1 *	0.312877	519.3349	40.07757	0.0001
At most 2 *	0.268963	433.5950	33.87687	0.0001
At most 3 *	0.230434	362.5086	27.58434	0.0001
At most 4 *	0.163753	247.5032	21.13162	0.0001
At most 5 *	0.131194	194.6390	14.26460	0.0001
At most 6	5.52E-06	0.007634	3.841466	0.9299

Max-eigenvalue test indicates 6 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Conclusion

Traditionally gold is used in India as an ornament come investment in spite of a negative cash flow on exchange from the point of view of a prudent investor. The Gold Deposit Scheme (GDS) started in 1999 and the transformed version of the scheme, Gold Monetization Scheme GMS) started in the year 2015 have paved the way for making the physical asset Gold as a basis of investment in a diversified manner. Now gold based derivative products are popular among investors in India with a variety of advantages plugging the disadvantages of investing in physical gold. Virtual gold has thus become a standardized derivative developed as a lucrative investment avenue in India.

Out of the six Gold ETFs used in the study for analysis only one - Quantum Gold ETF – has outperformed the market with respect to daily log return. As for variance, when considering individually three ETFs out of the six were found more variable than the market. By evaluating the skewness and kurtosis of the data set it is found that only Quantum fund ETF went out of normality. The Kolomogorov Smirnov and Sharpiro – Wilk statistics showed that the sample came from independent continuous distributions, though rejected normality.

The correlation matrix of the returns of six funds and the market showed that the returns of three funds have a high significantly positive correlation. The other three have positive correlation of returns but are not high. However, the fund returns showed a mild negative relationship with the market returns in all cases and hence, the funds can act as a tool for hedge to a limited extent. The paired sample t test conducted by considering independent distributions in the data set has shown that the mean return of the funds and that of the market are not significantly different from the population angle. It follows that investing in ETFs will provide a return surrogate with the market covering at least the market risk. The same is confirmed by the Johansen co-integration test which revealed that despite the short term shocks in the return, it may converge with time in the long run along with the market. Based on the study, it is suggested that gold ETFs are a profitable credit default swap device for a tolerably risk-averse investor. ETFs are additionally useful as a hedge mechanism. It has also been discovered that investments are able to deliver regular income stream, undoubtedly supplying the very same return regardless of the fund or market.

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