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Performance of gold exchange traded funds (GETFs): Pre and post pandemic evidence from India

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Abstract
Gold exchange traded funds (GETFs) an alternative to physical gold, tracks the underlying asset (gold) and are traded like any other securities in the stock market, providing liquidity and diversification of funds and eliminating the cost of purchasing and storing of physical gold. Besides checking the compounded annual growth rate of the GETFs, the study analyses the performance of GETFs from 2018 to 2023 and also highlights the performance in pre and post pandemic period. Further, the research examined and commented on the causal relationship between Bombay Stock Exchange (BSE) index and GETFs.

Keyword: Sharpe ratio, Treynor ratio, Jensen alpha ratio, Wilcoxon signed rank test, augmented dickey fuller, granger causality

1. Introduction
Indian financial market offers various investment avenues of which mutual funds have shown steady growth and acceptance amongst the investors. Mutual funds offer various types of funds one of which is exchange traded funds (ETFs). An ETF is a security freely transacted on the stock exchange. Commodity-based ETFs track prices of a commodity or an index of the commodity.

Gold has always been amongst the top preferences of an investor. However, with rising gold prices, it is becoming challenging to invest in physical gold. Besides, purchase of physical gold also attracts some irrecoverable expenses like making charges in case of gold jewellery, dice charges in case of gold coins or bars, locker rent and gold insurance to safeguard the precious yellow metal, making gold investment costly.

This gives an opportunity to search and discuss a new investment avenue. Under the commodity exchange traded category of mutual funds exists, the Gold Exchange Traded Funds. An investment avenue which tracks gold price and reduces the heavy expense of investing in physical gold.

Gold ETFs are traded like the shares in the security market, the investors need a dematerialised account to deal in gold ETFs. The gold ETFs are available at much lower prices compared to physical gold. Additionally, Gold ETFs provide the similar liquidity which the real gold is famous for.

The study concentrates on commodity-based ETFs, specifically gold exchange traded funds (GETFs). GETF is the latest type of mutual funds in the market which are traded at the stock exchanges and trace the price of gold. GETFs are open-ended mutual fund schemes, traded like shares on stock exchanges and an investor must have a dematerialized account to be able to invest in this investment avenue.

2. Literature Review
Madhavi (2015) [3] studied performance of the five GETFs for the post-crash period (2010-14) listed on the National Stock Exchange (NSE). Further, this research evaluated the association between the spot price of gold and GETFs, NIFTY and gold price movements. The research reported the descriptive statistics for 05 gold exchange traded funds under study and the bullion.

The study also performed a correlation analysis between the GETFs and the spot gold price and concluded that the least positive correlation was observed between spot gold prices.

Sathish and Ram (2019) [5] conducted a study to measure the performance of GETFs. Simultaneously, the paper examined risk and return of the GETFs in India. This study considered 36-month period starting from 1st November 2015 to 31st October 2018 to conduct the study on selected gold ETFs. The study also collected daily price of gold from the World Gold Council. The study applied performance evaluation tools like Shape ratio, Treynor ratio, Sortino ratio, Jensen index, and Fama measure.

Rambabu and Rao (2020) [4] analysed the performance of GETFs and also the vulnerable behaviour of GETFs listed in the Bombay Stock Exchange from 2010 to 2019. Sharpe ratio, Treynor ratio, and Jensen ratio were performed to deduce that the GETFs reflected high returns. The standard deviation reported that all the ETF schemes were comparatively less risky than the market.

Vardhini and Reddy (2021) [6] studied the returns of GETFs listed on the National Stock Exchange (NSE) from 2019-2020. This paper applied performance evaluation tools like the Sharpe, Treynor, and Jensen Alpha ratio for performance evaluation of GETFs under study.

Alamelu and Goyal (2022) [1] evaluated performance of GETFs risk-return analysis, risk-adjusted performance measures, tracking error analysis, and multi-factor regression. This research also assessed ability of the ETFs under study to recreate benchmark indices. The research considered a sample of 27 ETFs listed on NSE during pre-pandemic (COVID-19) period.

Goverdhan and Jeyakumaran (2022) [2] conducted a study to explore the risk & return of GETFs, analysed the performance of GETFs and the association of gold price and GETFs in India. The study considered data during the period of December 2018 to November 2020 of the GETFs listed in NSE. The study used performance evaluation tools like Sharpe ratio, Treynor ratio, Jensen Index, Fame Measure, and Sortino Ratio to examine GETFs throughout COVID period.

3. Problem Statement

Physical gold has always been an attractive investment avenue. The liquidity offered by real gold has been one of the major reasons for investing in real gold. Generally, investors consider the price rise of real gold as a profit. But real gold comes with certain additional expenses, if gold is purchased in the form of jewellery, coins, or bars then the investors generally prefer bank lockers as a safe place to keep their valuable assets, thus the annual locker rent is an unrecoverable expense. On the other hand, if gold is purchased in the form of jewellery then the making charge on gold jewellery is an unrecoverable expense besides the taxes paid to the government.

Gold exchange-traded funds (GETFs) are the new investment avenues that are traded like normal shares on the stock exchanges which provide high liquidity to the instrument holders. This also eliminates the additional costs like locker rent and making charges. The study focuses on evaluating performance of GETFs listed on Bombay Stock Exchange (BSE). Further, this research digs into the performance of GETFs in the pre and post-COVID period. The research also checks if there is any causal relationship between returns from SENSEX and returns from GETFs

4. Objectives

The research focuses on the following objectives:

- To calculate the compounded annual growth of GETFs.
- To measure the performance of GETFs during the research period.
- To analyse the performance of GETFs before and after the COVID pandemic.
- To check the causality effect between returns from SENSEX and returns on GETFs.

5. Methodology

GETFs listed in Bombay Stock Exchange (BSE) have been selected for the study. The research considers the top 06 gold exchange-traded funds on the basis of their NAV on March 31, 2023. Table 01 highlights the GETFs selected for the study. The secondary data for the GETFs under study has been collected from the Advisorkhoj website. The study also collected the index, SENSEX daily data from BSE website for the financial years April 01, 2018 to March 31, 2023. The research considered the daily data for the period under study. SENSEX was considered as the GETFs selected for study are listed on BSE as of March 31, 2023. The SENSEX daily data is required for the calculation of market returns. The first objective applies to calculate the compounded annual growth (CAGR) for 05 years for each GETF under the study for the period 2018 (April 01)-2023 (March 31). The second objective aims at evaluating the performance of the GETFs under study for 05 years (April 01, 2018, to March 31, 2023) listed on BSE applying performance evaluation tools like Sharpe Ratio, Treynor Ratio, and Jensen Alpha. Under objective three, we examine the performance of GETFs in the pre-pandemic, and post-pandemic periods. The F.Y. 2018-19 and 2019-20 are considered as pre-pandemic period and the F.Y. 2021-22 and 2022-23 are considered for the post-pandemic period, whereas the financial year 2020-21 has been considered the year of severe pandemic. It should be noted that 2020-21 was the year of total lockdown beginning from March 24, 2020. Firstly, normality tests were performed, and based on the results of normality test appropriate non-non-parametric tests have been applied to measure the performance during the pre and post COVID period. For fourth and last objective, Granger causality test was performed. Granger causality test checked the causation effect between market returns (SENSEX) and returns from GETFs. The returns from SENSEX were considered as the independent variable and the returns from GETFs were considered as dependent variable. The optimal lag length was calculated using Vector Autoregression (VAR) for Granger Causality test. The pre-condition of Granger causality test i.e. stationarity of the series has also been tested using Augmented Dickey Fuller (ADF) Test.

Table 1: List of Gold Exchange Traded Funds (GETFs) listed in Bombay Stock Exchange (BSE) with the highest Net Asset Value (NAV)

Date	ETF Name	ETF Symbol & Code	NAV (In Rs.)	Underlying Asset
31-03-2023	IDBI GOLD ETF	IDBIGOLD | 533719 | INF397L01554	5500.0960	Gold
31-03-2023	Invesco India Gold Exchange Traded Fund	IVZINGOLD | 533172 | INF205K01361	5430.2135	Gold
31-03-2023	Birla Sun Life Gold ETF	BSLGOLDETF | 533408 | INF209KB18D3	54.0210	Gold
31-03-2023	SBI Gold Exchange Traded Scheme-Growth Option	SBIGETS | 590098 | INF200KA16D8	52.7136	Gold
31-03-2023	HDFC Gold Exchange Traded Fund	HDFCGOLD | 533230 | INF179KC1981	52.5088	Gold
31-03-2023	ICICI Prudential Gold ETF	ICICIGOLD | 533244 | INF109KC1NT3	52.3690	Gold

Source: Compiled by Authors from Advisorkhoj.com

5.1 Tools and Techniques

The study calculates CAGR for 05 years (April 01, 2018 to March 31, 2023) to achieve the first objective.

Compounded Annual Growth Rate Calculation: This reflects the growth in the NAV of gold exchange traded funds over the last 05 years.

$$\text{CAGR} = \{(\frac{Final\ Value}{Initial\ Value})^{\frac{1}{n}} - 1\} * 100$$

The portfolio return has been calculated using the formula given below:

Portfolio Return (Rp): = $(Y_t - Y_{t-1}) / Y_{t-1}$

Where,
Y_t represents the present day NAV,
Y_{t-1} represents the NAV on the previous day

The 10-year government bond yield was 7.40% or 0.074 as on March 28, 2018, which was considered a risk-free rate of return from countryeconomy.com (Vardhini and Reddy, 2021) [6]. For, calculating market return the research considers the data of SENSEX daily for the period April 01, 2018 to March 31, 2023.

Sharpe Ratio: The research calculates Sharpe ratio to measure risk-adjusted performance of a portfolio as the formula uses standard deviation to measure risk. Generally, a higher Sharpe ratio of an investment vehicle is considered better.

$$\text{Sharpe Ratio} = \frac{(Rp - Rf)}{\sigma p}$$

Where,
Rp: Return from Portfolio,
Rf: Risk-Free Rate,
σp : Standard Deviation of portfolio return

Treynor Ratio: This ratio considers the gap between return from portfolio and risk free rate i.e. excess returns to assess performance of the GETFs. This ratio uses beta of the portfolio to evaluate the performance. Generally, higher Treynor ratio of an investment vehicle is considered better.

$$\text{Treynor Ratio} = \frac{(Rp - Rf)}{\beta p}$$

The portfolio beta was calculated using both the formulae given below. In one formula we, calculate beta using the correlation of portfolio returns and market returns, standard deviation of portfolio returns, and standard deviation of market returns. Alternatively, beta can also be calculated slope function in MS-excel. The beta values obtained from both methods of beta calculation were identical and corroborated with the beta calculation methods discussed earlier

βp : Correlation of fund's returns and the market returns $(\frac{\sigma_p}{\sigma_m})$

βp : Slope (dependent variable, independent variable)

Where,
Rp: Return of Portfolio,
Rf: Risk-Free Rate,
βp : Portfolio Beta, dependent variable: returns from Gold ETFs, independent variable: Returns from BSE Sensex.

Jensen Alpha: This measure considers the risk adjustment concept. This measure also takes into consideration the market return or the benchmark return. Positive Jensen Alpha represents over performance of the investment avenue, negative Jensen Apha represents under performance of the investment avenue, and zero Jensen Alpha concludes that the funds track the benchmark.

$$\text{Jensen Alpha} = Rp - \{Rf + \beta p * (Rm - Rf)\}$$

Where,
Rp: Return from Portfolio
Rf: Risk-Free Rate
βp : Portfolio Beta,
Rm: Return on market index

Normality Test

The test of normality stands important to take decisions regarding the choice of tests to be applied for the research. Normality test results help to choose between the parametric and non-parametric tests. The hypothesis for this test has been presented in section 5.2 of the research paper.

Wilcoxon Signed Rank Test

This test helps the researchers to measure the performance of GETFs during pre-COVID, and post-COVID periods. Wilcoxon Signed Rank Test has been performed to satisfy the third objective of the research. The hypothesis for this

test has been presented in section 5.2 of the research paper.

5.2 Stationarity Test
Prior to Granger causality test, we test the stationarity of the series. Stationary series indicates that the mean and variance is constant during the research period and the auto covariance does not depend on time. We apply Augmented Dickey Fuller (ADF) test to check the stationarity.

Causation Test
The causation test has been performed to measure the causality effect between returns from SENSEX and returns from GETFs. Granger causality test has been applied for satisfying the fourth objective. The Granger causality test requires lag specification; hence optimal lag length using VAR was performed for lag selection criteria.

The study shall test the following hypotheses:

- **Hypothesis for Normality Test**
  H_0: The data is normally distributed
- **Hypothesis for Wilcoxon Signed Rank Test**
  H_0: There exists no significant change in the returns from gold exchange traded funds after the COVID period
- **Hypothesis for Augmented Dickey Fuller (ADF) te**st
  H_0: Series is not stationary
- **Hypothesis for Granger Causality Test**

  H_{01}: Returns from GETFs does not Granger Cause Return from SENSEX
  H_{02}: Returns from SENSEX does not Granger Cause Return from GETFs

6. Results
This section highlights the results of the test performed

Table 2: Compounded Annual Growth Rate (CAGR) for 05 years

Gold ETF Name	CAGR (05 Years)
IDBI	13.4957%
Invesco India	13.6167%
Birla Sun Life	13.5449%
SBI	13.4893%
HDFC	13.2740%
ICICI	13.0588%

Source: Computed by Authors using MS-Excel

Table 2 suggests that Invesco India Gold Exchange Traded Fund (13.6167%) had highest 05 year CAGR which was followed by the CAGR of Birla Sun Life Gold ETF (13.5449%), IDBI Gold ETF (13.4957%), and the lowest CAGR was recorded by ICICI Prudential Gold ETF (13.0588%). It should be noted that all the GETFs under study reported a 05-year CAGR between 13%-14%, which indicates that more or less all GETFs under study generated returns at the same rate.

Table 3: Descriptive Statistics

Gold ETF Name	Mean	Median	S.D.	SKEWNESS	Kurtosis	Obs.
IDBI	0.00054667	0.00060370	0.00821124	0.45755508	5.66644839	1235
Invesco India	0.00055295	0.00044868	0.00844983	0.53037224	5.57574120	1235
Birla Sun Life	0.00054969	0.00042484	0.00836627	0.50869018	5.61762575	1235
SBI	0.00054812	0.00044711	0.00841634	0.52774443	5.56062295	1235
HDFC	0.00054042	0.00044080	0.00841531	0.53011104	5.54369837	1235
ICICI	0.00053159	0.00054026	0.00828006	0.49099169	5.62075551	1235
SENSEX	0.00054205	0.00080646	0.01238787	-1.1149361	17.8526035	1235

Source: Computed by Authors using MS-Excel

Interpretation: Table 3 highlights the statistical characteristics of the 06 GETFs and market index (SENSEX) in the study. The table reports the descriptive statistics of 1235 daily observations. Mean and median measures the central tendency of the data set. Mean represents the average returns of the GETFs during the study period whereas median represents the middle most value of the data. Standard Deviation reflects the volatility of the GETF and the market index. It reflects the spread of returns of the GETFs. Highest S.D. was reported by Invesco India (0.00844983) whereas the lowest S.D. was reported by IDBI GOLD ETF (0.00821124) which concludes that the returns of Invesco India Gold ETF have more deviation compared to the returns of IDBI GOLD ETF. GETFs under study reported a positive SKEWNESS but the market index (SENSEX) reported a negative index. We have also applied normality tests to comment on the symmetry of the data set. The returns of gold ETFs and the market returns highlight leptokurtic (positive kurtosis) distribution. The kurtosis of returns from Gold ETFs and returns from the market index is greater than +2 which highlights that the data is peaked.

Table 4: Performance Evaluation Measures

Gold ETF Name	Sharpe	Treynor	Jensen Alpha	Beta
IDBI	-8.94546069	2.843449137	-0.07535093	-0.02583248
Invesco India	-8.69213672	3.30774948	-0.075078148	-0.02220454
Birla Sun Life	-8.779335969	-1.64167552	-0.07016372	0.04474106
SBI	-8.72729372	3.261905204	-0.07510601	-0.02251809
HDFC	-8.72928111	3.279483132	-0.07510502	-0.02239974
ICICI	-8.87292654	2.82354471	-0.07537978	-0.02601992

Source: Computed by Authors using MS-Excel

Interpretation: Table 4 highlights the various performance measures. As per the results of the Sharpe ratio, all the GETFs (gold exchange traded funds) under study reflect a negative Sharpe ratio which states that the risk-free rate is

more than the historical returns from GETFs. Among the negative Sharpe ratios, Invesco India Gold Exchange Traded Funds (-8.69213672) is ranked 1 as it reports highest Sharpe ratio compared to other funds under study, which indicates that Invesco India Gold Exchange Traded Funds have generated better returns against the risk-free rate, compared to all other GETFs under study. Sharpe and Treynor ratio measures the risk-return of the portfolio. Treynor ratio uses beta value to measure the historical performance of the gold ETFs. Birla Sun Life Gold ETF is the only fund that highlights a negative Treynor ratio and suggests that the instrument did not perform better than the risk-free instrument. The highest Treynor ratio has been reported by Invesco India Gold Exchange Traded Fund (3.30774948), thus concluding that Invesco India is the best GETF under study compared to all other gold ETFs as per Treynor ratio during the period of study. Jensen Alpha considers the market return for measuring the performance of an investment vehicle. Unlike, Sharpe and Treynor, the Jensen Alpha ratio considers the return of the market and the positive Jensen Alpha ratio signifies that the fund performs better than the market. However, in this research paper, we observe that all the funds under study report negative Jensen Alpha ratios which indicate that the gold exchange traded funds earned less than the market returns. The beta values are calculated using both the formulae discussed earlier, the results of which were identical. Beta Values help the researchers to comment on the volatility of the funds. It should be noted that the beta values of all gold exchange traded funds are reported negative i.e. less than 01 implying that the gold ETFs are less volatile. However, Birla Sun Life Gold ETF (0.04474106) reflects a positive beta indicating that Birla Sun Life Gold ETF is comparatively more volatile than other gold ETFs under study. A negative beta suggests that the returns from the gold ETFs increase when the general market returns drop.

The statistical characteristics from Table 3 have already hinted at non normality of the data related to the returns of the Gold ETFs, to confirm and comment on this we further perform normality tests. The hypothesis of these tests has been framed under section 5.2 of the research-hypothesis formulation section of this research paper.

Table 5: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	DF	Sig.	Statistic	DF	Sig.
Returns_IDBI	.070	1234	.000	.943	1234	.000
Returns_INVESCO	.067	1234	.000	.945	1234	.000
Returns_BIRLA	.069	1234	.000	.946	1234	.000
Returns_SBI	.067	1234	.000	.945	1234	.000
Returns_HDFC	.067	1234	.000	.946	1234	.000
Returns_ICICI	.068	1234	.000	.942	1234	.000

a. Lilliefors Significance Correction

Source: Computed by Authors using SPSS

Interpretation: A normality test was run to check whether the returns from the gold exchange traded fund follow normality or not. Table 05 highlights the results from Kolmogorov-Smirnov and Shapiro-Wilk test results, the outcome obtained from both tests suggests that the returns from gold exchange traded funds do not follow normality. The significance value as observed from both the test results in Table 05 for the GETFs is 0.000 which is less than 0.05, rejecting null hypothesis (H0), hence confirming that data does not follow normality. The outcome obtained from Table 05 corroborated with the skewness results obtained (refer to Table 3). The acceptance of the alternative hypothesis of the normality test opens up the scope to perform a nonparametric test-the Wilcoxon Signed Rank Test for the third objective, which concentrates on the performance of GETFs before and after the pandemic (COVID-19).

Table 6: Wilcoxon signed rank test of pre and Post-COVID Returns of GETFs under study

Hypothesis Test Summary					
SL. No.	Gold ETF Name	Sig	Null Hypothesis	Test	Decision
1.1	IDBI	.978	The median of differences between Pre-COVID Returns of a fund and post-COVID Returns Of A Fund Equals 0.	Related-Samples Wilcoxon Signed Rank Test	Retain the null hypothesis.
1.2	INVESCO	.934			
1.3	BIRLA	.923			
1.4	SBI	.950			
1.5	HDFC	.921			
1.6	ICICI	.953			

Asymptotic significances are displayed. The significance level is .05.

Source: Computed by Author using SPSS 20

Interpretation: The Wilcoxon signed rank test (refer to Table 06) was applied to check whether there exists any significant variation in the performance of GETFs in pre and post COVID-19 pandemic period. The p-values of all the gold exchange traded funds under study are more than 0.05 (Refer to Table 06). Thus, the null hypothesis has been accepted, declaring that there exists no significant change in returns from GETFs during pre and post-pandemic period. The test results for all the GETFs under study are presented in Figure 1.

VAR Lag Order Selection Criteria results (refer to Table 07) highlight that the LR test statistic, Final prediction error and AIC suggests optimal lag length as 8. However, SIC and HQ criteria highlighted different results and stated optimal lag to be 2 and 7 respectively. The researcher follow the AIC (Akaike information criterion) and proceed with lag 8 for granger causality test. The same lag has also been supported by majority criterions in Table 7.

Table 7: VAR Lag Order Selection Criteria

Endogenous variables: Returns_on_sensex returns_on_IDBI Returns_on_invesco returns_on_Birla Returns_on_SBI returns_on_HDFC returns_on_ICICI						
Exogenous variables: C						
Sample: 4/02/2018 3/31/2023						
Included observations: 1226						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	40306.25	NA	0.00	-65.74103	-65.71185	-65.73005
1	41826.14	3019.937	0.00	-68.14052	-67.90704	-68.05267
2	42215.69	769.5683	0.00	-68.69607	-68.25830*	-68.53134
3	42364.93	293.1321	0.00	-68.85960	-68.21753	-68.61799
4	42474.18	213.3295	0.00	-68.95788	-68.11152	-68.63940
5	42601.41	246.9872	0.00	-69.08550	-68.03485	-68.69015
6	42691.49	173.8450	0.00	-69.15252	-67.89757	-68.68029
7	42801.27	210.5885	0.00	-69.25166	-67.79242	-68.70255*
8	42858.11	108.3966*	0.00*	-69.26445*	-67.60091	-68.63847

* indicates lag order selected by the criterion
LR: Sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion
Source: Computed by Author using Eviews

Table 8: Stationarity Test

		Critical Value			**Order of Integration**	**Prob.***
Varibale	**ADF Test Statistic**	**1%**	**5%**	**10%**		
Returns_ BIRLA_GETF	-16.07999	-3.43546	-2.86369	-2.56796	at level, I(0)	0.00
Returns_HDFC_GETF	-11.76197	-3.43548	-2.86369	-2.56797	at level, I(0)	0.00
Returns_ICICI_GETF	-15.85542	-3.43546	-2.86369	-2.56796	at level, I(0)	0.00
Returns_IDBI_GETF	-15.82656	-3.43546	-2.86369	-2.56796	at level, I(0)	0.00
Returns_INVESCO_GETF	-16.19990	-3.43546	-2.86369	-2.56796	at level, I(0)	0.00
Returns_SBI_GETF	-11.76401	-3.43548	-2.86369	-2.56797	at level, I(0)	0.00
Returns_SENSEX	-12.30564	-3.43547	-2.86369	-2.56796	at level, I(0)	0.00

*MacKinnon (1996) one-sided p-values.
Source: Computed by Author using Eviews

Table 8 represents the stationarity test results. Here, we observe that the p-value (0.00) is less than significance value (0.05) (refer to Table 08) for all the GETF returns and market returns (SENSEX). Hence, we reject null and comment that series is stationary at level and satisfying the precondition of Granger causality test.

Table 9: Granger causality test results

	Returns from GETFs does not Granger Cause Return from SENSEX		**Returns from SENSEX does not Granger Cause Return from GETFs**	
	F-Statistic	**PROB**	**F-Statistic**	**PROB**
IDBI	2.69968	0.006	1.75802	0.0813
Invesco India	2.59135	0.0083	2.12796	0.0307
Birla Sun Life	1.30318	0.2376	2.29723	0.0192
SBI	2.58201	0.0085	2.20787	0.0246
HDFC	2.60103	0.008	2.2306	0.0231
ICICI	2.81288	0.0043	1.79325	0.0743

Source: Computed by Author using Eviews

IDBI GETF highlights the p-value (0.006) (refer Table 8) which is less than significance value (0.05), hence the null is rejected and we comment that returns from GETFs granger causes market returns. The p-value (0.0813) (refer Table 08), is greater than significance value (0.05), accepting null and stating that market returns does not granger cause returns from GETFs. Thus here we find a unidirectional granger causality.

For, Invesco India GETF, the p-values (0.0083 and 0.0307) (refer Table 08) are both less than 0.05, hence, we reject H01 and H02. This highlights a bidirectional causal relationship between market returns (SENSEX) and returns from Invesco India GETF. Birla Sun Life GETF reflects a unidirectional causal relationship, where market returns granger cause returns from GETFs as the p-value (0.0192) (refer Table 8) is less than 0.05 rejecting null. However, we accept null and comment that returns from Birla Sun Life do not granger cause market returns, as p-value (0.2376) (refer Table 08) is greater than 0.05.

For, SBI GETF, the p-values (0.0085 and 0.0246) (refer Table 08) are both less than 0.05, hence, we reject H01 and H02. This highlights a bidirectional causal relationship

between market returns (SENSEX) and returns from SBI GETF.

For, HDFC GETF, the p-values (0.008 and 0.0231) (refer Table 08) are both less than 0.05, hence, we reject H01 and H02. This highlights a bidirectional causal relationship between market returns (SENSEX) and returns from HDFC GETF.

ICICI GETF reflects a unidirectional causal relationship, where market returns does not granger cause returns from GETFs as the p-value (0.0743) (refer Table 8) is greater than 0.05 accepting null. However, we reject null and comment that returns from ICICI granger cause market returns, as p-value (0.0043) (refer Table 08) is less than 0.05.

5. Conclusion

The study focused on three objectives. As per the CAGR calculation, we observed that the CAGR for all the gold ETFs was between 13%-14%. The second objective was satisfied by using performance evaluation tools like Sharpe ratio, Treynor ratio, and Jensen Alpha ratio. Objective three was achieved by performing the Wilcoxon signed rank test which highlighted that there existed no difference in returns from GETFs in pre and post-COVID period. Most of the GETFs highlighted negative beta values which suggest that the returns from GETFs were comparatively more when the general market return dips. As per Sharpe ratio, GETFs performed lower than risk-free rate. However, Treynor ratio suggested all the GETFs performed better than the risk-free instrument except for Birla Sun Life Gold ETF which reported a negative Treynor ratio. Jensen Alpha ratio suggested that the GETFs earned less returns as compared to the market returns. The WS Rank test results concluded that there existed no significant change in returns from GETFs during the pre and post-COVID period.

References

1. Alamelu L, Goyal N. Investment performance and tracking efficiency of Indian equity exchange traded funds. Asia-Pac Financ Mark. 2022. DOI: 10.1007/s10690-022-09379-3
2. Goverdhan S, Jeyakumaran M. A study on performance evaluation of gold exchange traded funds in India: Pre and post COVID scenario. J Econ Finance Manag Stud. 2022;5(4):1053-9. DOI: 10.47191/jefms/v5-i4-14
3. Madhavi E. An empirical study on performance of gold ETFs in India, post crash period. Res J Finance Account. 2015;6(13):75-83. DOI: 10.7176/RJFA
4. Rambabu U, Rao SS. Performance evaluation of gold-ETFs in India. Int. J Bus Insights Transform. 2020;13(2):30-37.
5. Sathish KB, Ram RG. Gold vs gold exchange traded funds: An empirical study in India. Econ Aff. 2019;64(4):703-10. DOI: 10.30954/0424-2513.4.2019.4
6. Vardhini RN, Reddy KN. A study on best performing selected gold ETFs in India. Int. J Sci Dev Res. 2021;6(3):146-52. Available from: http://www.ijsdr.org/papers/IJSDR2103019.pdf
7. Countryeconomy.com. India government bonds [Internet]; 2023 [cited 2025 Sep 3]. Available from: https://countryeconomy.com/bonds/india