

# An Analytical Study on Exchange Traded Funds(EFT's) and Its Relationship With Market Movements

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**Abstract:** Exchange-traded funds (ETFs) can be a valuable component in any investor's portfolio, whether they are sophisticated institutional money managers or novice investors just starting out. Some investors make ETFs the sole focus of their portfolios, building a well-diversified portfolio with just a few ETFs. Others use ETFs to complement their existing portfolios, relying on them to implement sophisticated investment strategies. However, like any other investment vehicle, in order to truly benefit from ETFs, investors must understand and use them appropriately. It has been identified that Equity Exchange Traded Funds are riskier than Gold Exchange Traded Funds for both years. Among Equity Exchange Traded Funds, Bank-Equity Exchange Traded Funds exhibit less risk percentage change. It can be suggested that investors should avoid investing in any investment avenue, such as exchange-traded funds, that does not generate returns higher than the risk-free rate of return. It is important to analyse and assess the underlying asset of an exchange-traded fund before investing in it. Gold is considered a safe haven during economic crises, bringing stability to a portfolio during economic slowdowns and recessions. Exchange-traded funds represent a basket of securities traded on an exchange, much like stocks. They are listed on recognized stock exchanges, and their units are directly traded during regular trading hours. Exchange-traded funds have been developed to track various industrial sectors, investment styles, fixed income, global investments, commodities, and currencies

**Keywords:** *ETFs, Equity ETFs, Global Investments.*

## 1. Introduction

Exchange-traded funds can be a valuable component for any investor's portfolio, from the most sophisticated institutional money managers to a novice investor who is just getting started. Some investors use ETFs as the sole focus of their portfolios and are able to build a well-diversified portfolio with just a few ETFs. Others use ETFs to complement their existing portfolios and rely on ETFs to implement sophisticated investment strategies. But, as with any other investment vehicle, in order to truly benefit from ETFs, investors have to understand and use them appropriately.

Exchange-traded funds (ETFs) have been in existence for nearly two decades now, but it's only in recent years that they have entered the mainstream. ETFs have changed the way millions of people invest and where they invest. Commodities, swaps, and derivatives, for example, were once reserved for exclusive hedge funds and other institutional players.

## 2. Literature Review

Buetow and Henderson state that exchange-traded funds (ETFs) track specific benchmark indices, providing investors with passive exposure to those indices through a single tradable security. As evidence of the growing

importance of ETFs, Maxey (2010) reported in The Wall Street Journal that, as of December 2010, 894 ETFs were listed in the U.S., totaling \$887.2 billion in assets. The current ETF landscape is diverse. Equity ETFs track indices ranging from the most popular and widely followed, such as the S&P 500 Index and the Dow Jones Industrial Average, to more targeted indices, such as those tracking small-cap sectors in India, Korea, or Japan. Other ETFs track fixed income, real estate, preferred stock, currency, commodity, and derivative indices. For many of their ETF benchmark indices, index mutual funds and exchange-traded derivatives do not exist. Given the growing importance of ETFs, it is important to examine the extent to which these funds achieve their goal of replicating the returns of their benchmark indices (Buetow& Henderson, 2012)

Marko Svetina (2009) states that innovation in financial markets is critical to their well-being and continued development. Miller (1986) describes financial innovation between the 1960s and 1980s as revolutionary and argues that it is largely a reaction to regulations and taxes. Ross (1989) argues that it is newly created by the delegation of investment management. More recently, Tufan (2003) points out that innovation in financial products addresses issues of market completeness, agency problems, transaction/search costs minimization, and the avoidance of taxes and regulation (Svetina, 2009).

Exchange traded funds introduction and closed-end fund discounts and volume: authored by Scott W.Branhart (2010), Exchange traded funds (ETFs) like closed-end funds (CEFs),are individual stocks traded as managed portfolios. The introduction of ETF in an asset similar to an existing CEF results in substitution effect that reduces the value of the CEFs hares relative to that of its underlying assets. By introducing the similar ETFs, CEF discounts widen significantly and relative volume declaims significantly. Single equation and systems estimation models show that the widening in discount and reaction in volume are related to returns based measures of the substitutability of ETFs and CEFs. (Branhart, 2010)

A Primer on exchange traded funds: purpose, operation and risk: published by David E Stout and Hualyu(peter) chen(2016). The AICPA's core competency framework for entry into the profession requires that "individual preparing to enter the accounting profession must be convenient with the overall realities of the business environment" One of these realities is the increasing array of investment opportunities in the financed market place. It is Indeed a daunting task to stay informed of what must seem like a dizzying any of financial instruments. The authors present an overview of one such instrument share issued by exchange traded funds (ETF) (stout & chen, 2016)

Exchange traded funds, liquidity and volatility: published by Timothy Krause, SinaEhsani and Donald Lien (2014) exchange traded funds (ETFs) have become the investment vehicle for choice for investors and traders seeking rapid, low cost exposure to broad equity market indices, industry and individuals increasingly sectors and other asset classes. Hedge fund managers, institutional investors and individual increasingly turn to ETFs to implement their investment strategies. Thus, trading in these securities has become an important source of information flows among nine large sector ETFs and their largest component stocks. In the light of the exponential growth in these securities, regulators and market observers have raised concerns that ETFs may be related to stock market volatility and the volatility demonstrates spill overs among popular industry ETFs and their largest component stocks are economically significant and important to their volatility generating processes. The source of volatility spill over that is positively related to ETF trading activity. (krause, ehsani, & lien, 2014)

A new method measure the performance of leveraged exchange traded funds: authored by NarathChrupat (2014), it affects the daily return compounding, financing costs, and management factors on performance of leveraged exchange traded funds over various holding period. The new method to measure LETFs is by tracking the errors that allows us to disentangle these effects and the results shows that compounding effect generally has more influencing on tracking errors than other factors, especially for long holding periods and side-ways markets. (chrupat, 2014)

Implies volatility Dynamics among Exchange traded funds and their largest component stocks": published by Timothy A Kruas and Donald Lien (2014) states the presence of common factors in the evaluation of stock option implied volatilities. It analyse the implied volatilities of ETF options and their largest component stock,

and the results strongly suggest that the presence of both a market volatility factor and industry volatility factor. In nine popular industry ETFs, the average volatility “beats” for the industry factors are equal to about one third of the value of market factor beta. Its implied volatility revert more strongly to industry long term average than it does to make market measures of volatility. Traders, market makers and investors may reduce heading errors by using options on these industry related products in addition to market based volatility products. The drivers of implied volatility spill over from ETFs to component stock vary across industries, But the spill over are most strongly related to turnover in S&P 500 ETF options and those SPDR industry sector ETFs. (lean, 2014)

The Best ETFs for Investors: published by William Baldwin(2016), where the essence of ETF selection is finding what’s cheap in category whatever money is aimed at whether its exposure to domestic stock or foreign stock. The big established players will get into battles over basis point-that being \$1 of annual fees on a\$10000 account. (baldwin, 2016)

Exchange traded funds: authored by Morningstar Inc(2008) Exchange traded funds are bought and sold through brokers just like stocks. These are all the ETFs with a one year return. Special stands for hard to classify sector funds,and currency refers to funds that invest in foreign currency. One or two trades a years, invest a big chunk of cash and hold on for a long time. ETFs are typically lower expense than index funds, and have to pay commission when buy or sell them, so as to minimize trading costs. Commission ranges from \$5 to %25 per trade with a discount online broker. (morningstar, 2008)

“Exchange traded funds in bullish and bearish markets”: authored by Karen H.Y Wong and Wai Cheong Shum(2010) which states exchange traded funds aims to track the performance of market indices. This also examine the performance of 15 worldwide ETFs across bullish and bearish markets over period 1999 to 2007.The results indicate that ETFs always provide higher return in a bullish market than in bearish market by the sharpes ratio test that shows ETF return are not positive, proportional to the market volatility.

### **3. Methodology**

#### **3.1 Type of research**

The study is a descriptive research as it is carried out with specific objectives and hence it results in definite conclusions. The research will highlight the performance of different Exchange Traded Funds in the market. The performance is calculated by using the Net Asset Value of respective ETFs. Based on this Standard Deviation (Risk factor) is calculated and ultimately Sharpe Ratio is derived. The last calculation is the average market return. Sharpe’s Ratio and Average Market Return will help in the required analysis. The conclusion will be derived based on various analyses. It will also highlight the best performers of ETFs which in turn will be most suitable to the investors.

#### **3.2 Sources of data**

The sources of data comprises of secondary data. The data pertaining to Net Asset Value has been gathered from the website of Benchmark Funds, Kotak Mahindra Asset Management Company, Reliance Mutual Fund and Quantum Mutual Fund. For the calculation of market return secondary data has been gathered from NSE website. Multi Commodities Exchange has been referred to get details regarding domestic gold prices. The risk free rate for the computation of Sharpe Measure has been taken from the Reserve Bank of India Bulletin. 364 days Treasury bill rate has been taken as the risk free rate. Other websites like bluechipindia.com and reports have also been referred to for the purpose of study.

The different ETFs that have been taken into consideration are:

- Nifty BeES
- Bank BeES
- Junior BeES
- PSU Bank BeES
- Kotak PSU Bank ETF
- Reliance Bank ETF

- SUNDER
- QNIFTY
- Kotak Gold ETF
- Gold BeES
- Quantum Gold ETF
- Reliance Gold ETF

**3.3 Sampling:** The sampling technique used is systematic sampling as the first sample is selected randomly but the following samples selected follow a particular pattern. The sample size consists of 12 ETFs launched by National Stock Exchange for a period of two years starting from 1<sup>st</sup> April 2017 till 31<sup>st</sup> March 2019. Individual ETFs consists of 12 observations for a period of one year. The ETFs mentioned above have been taken as a proxy for all the existing Indian ETFs.

**3.4 Statistical tools:** The statistical tools used are descriptive statistics like Averages and Standard Deviation for the computation of risk involved in ETFs. For the purpose of calculations, Microsoft Excel has been used.

**3.5 Financial tools:** The study is based on the principles of Sharpe Measure. William Sharpe has attempted to derive a summary portfolio performance. Sharpe's index of performance provides an ordinal number that is determined by both the risk and return of the portfolio being assessed. It measures the total risk by standard deviation.

#### Step I: Monthly Return (R)

The first step consists of calculating the monthly return for all the Exchange Traded Funds. Monthly return is based on the following formula:

$$R = \frac{\text{Closing NAV} - \text{Beginning NAV}}{\text{Beginning NAV}} \times 100$$

Where,

R = Monthly Return

NAV = Net Asset Value of an ETF

Closing NAV = NAV as on 30<sup>th</sup> / 31<sup>st</sup> of a month

Beginning NAV = NAV as on 1<sup>st</sup> of a month

#### Step II: Average Return ( $\bar{R}_A$ )

The second step involves calculating the average return. The monthly return for a year are summed up and averaged. Average return is based on the following formula:

$$\bar{R}_A = \frac{\sum R}{N}$$

Where,

$\bar{R}_A$  = Average Return for a year

$\sum R$  = Summation of Monthly Returns for a year

N = Number of months, i.e. 12 months for a year

#### Step III: Standard Deviation

The third step is the calculation of standard deviation of respective Exchange Traded Funds for a period of two years. Standard Deviation can be calculated by the following formula:

$$\sigma = \sqrt{\sum (R - \bar{R}_A)^2 / (N-1)}$$

Where,

—  $\sigma$  = Standard deviation

$\sum (R - \bar{R}_A)^2$  = Summation of square difference between monthly return and monthly return

N = 12 Months

#### Step IV: Sharpe Measure

The fourth step consists of calculating the Sharpe Ratio. The greater a portfolio's Sharpe ratio, the better its risk-adjusted performance has been. A negative Sharpe ratio indicates that a risk-less asset would perform better than the security being analyzed. It calculated by subtracting the risk-free rate from the rate of return for a portfolio and dividing the result by the standard deviation of the portfolio returns. The Sharpe Measure will highlight the performance of different ETFs. The Sharpe ratio formula is:

$$S_p = (R_p - R_f) / \sigma_p$$

Where,

$S_p$  = Sharpe Ratio

$R_p$  = Average Return of the Portfolio

$R_f$  = Risk free Rate of Return

$\sigma_p$  = Total Risk of the Scheme Portfolio

#### 3.6 Statement of the Problem:

Exchange Traded Funds are predominantly a new instrument of trading. They are new investment vehicles which have not been received in totality by the investors. Moreover, the Indian economy was recovering from the recession. The receptiveness of the ETF will vary accordingly. The project is an analytical study on Exchange Traded Funds to understand ETFs better.

#### 3.7 Objectives of the study:

- To establish interaction between ETF and instinct value.
- To understand the relationship of Exchange Traded Fund with the market or not i.e. if it is in tandem with the economic recovery of the nation
- To analyse the ETF with respect to benchmark indices

#### 4. Analysis and Interpretation

Referring Table No. 4.1, the Equity ETFs and the Gold ETFs follow a trend of high standard deviation in the initial year. The standard deviation for a particular fund reduces in the following year. PSU BANK BeES (in case of Equity ETFs) is the only exception in which the standard deviation is less in the first year. But it can be also because of the lack of availability of data. Reliance Gold ETF (in case of Gold ETF) is the exception as above. It can be thus interpreted that the risk factor involved in an instrument was higher in 2017-2018. In a broader sense, the unsystematic risk was high because of unstable economic conditions in the same year.

In the year 2017-2018, the standard deviation of Equity ETFs ranged from 11.830 to 16.571. Out of four Bank-Equity ETFs, three of them had high standard deviation and were close to the higher ceiling limit. PSU Bank BeES was an exception. Similarly, the Equity ETFs showed comparatively lower risk with the exception of Junior BeES. In the Year 2018-2019, even though the risk reduced, all the Bank-Equity ETFs showed higher

risk when compared to other Equity ETFs. Moreover, the percentage change in the risk is less in Bank- Equity ETFs when compared to other Equity ETFs.

The Gold ETFs showcased low unsystematic risk when compared to its Equity counterparts in both the years. Moreover, the risk involved in Gold ETFs is less than half the risk faced by the Equity ETFs. Thus, the risk involved in Gold ETFs is comparatively lower than Equity ETFs. Even though there was a discrepancy in the risk level of Gold ETFs, the risk level reduced to same level in the following year. It can be deduced that various external factors had same impact on the ETFs in the second year.

Another factor that comes into play is the level of volatility of monthly returns for a particular year. Equity ETFs are more volatile in monthly returns when compared to Gold ETFs. The ETF with highest volatility is Kotak PSU Bank ETF (2017-2018) and the ETF with least volatility is Gold BeES (2018-2019). When compared the volatility of Bank-Equity ETF are more volatile when compared to other Equity ETF. The volatility depends on the performance of the underlying asset. It can be thus claimed that gold is a better asset classes when compared to the Equity. Moreover, it is more stable also.

**Table No. 4.1: Year on Year Comparison of Standard Deviation**

Sl. No.	Scheme Name	2017-2018	2018-2019
1	NIFTY BeES	12.106	8.779
2	JUNIOR BeES	16.386	11.393
3	BANK BeES	16.175	12.560
4	PSU BANK BeES	10.919	12.946
5	SUNDER	11.830	8.674
6	KOTAK PSU BANK ETF	16.571	14.388
7	RELIANCE BANK	15.112	12.474
8	QNIFTY	12.585	8.774
9	GOLD BeES	8.120	4.519
10	KOTAK GOLD	7.908	4.595
11	RELIANCE GOLD	3.443	4.521
12	QUANTUM GOLD	8.169	4.555

The Sharps Measure shows the performance of a portfolio. A negative Sharpe Ratio shows that the fund does not generate even the risk free rate of return. Thus investment in that avenue should be avoided. It can be noted that in the 2017-2018, all the funds Sharps Ratio are negative. Investment in these avenues should have been avoided in the initial year as the performance was poor. The performance ranges from -0.771 to -0.490 referring Table No.4.2. The performance of Bank-Equity ETFs was better than other Equity ETFs. Out of four Bank- Equity ETFs, three of them had higher performance and were close to the lower ceiling limit. PSU Bank BeES was again an exception. Similarly, the Equity ETFs showed comparatively lower performance.

In the year 2018-2019, the returns of Equity exchange traded fund are positive. Thus, it can be deduced that the return was higher than the risk free rate of return. All Equity ETFs have performed better in the previous year. The best performer of Equity ETF was Junior BeES with a Sharpe Ratio of 0.261. The worst performer of Equity ETF was Nifty BeES with a Sharpe Ratio of 0.003. The performance ranges from 0.261 to 0.003. Even as the performance of Equity ETFs improved in the following year, it can be noted that all the Bank- Equity

ETFs showed higher performance when compared to other Equity ETFs. Moreover, the percentage change in the performance is more in Bank- Equity ETFs when compared to other Equity ETFs except Junior BeES.

In the year 2018-2019, the returns of Gold ETF were negative. It was worse than the previous year as the Sharpe Ratio declined further. The returns generated were way below the risk free rate of return. The worst performer of Gold ETF was Reliance Gold ETF with a negative Sharpe Ratio of -0.774. The above table shows that the assumption of high risk yielding high performance exists for a particular year. The ETFs which enjoyed high risk in a particular year has resulted in better performance in the same year. This result is irrespective of the type of ETF that money is invested in. But the table also includes exception like Junior BeES which in spite of high risk do not perform well in the initial year.

Comparison of exchange traded fund is conducted year wise. It is based on Sharpe Measure. For the purpose of comparison, the ETFs have been divided into two categories.

- Equity Exchange Traded Funds
- Gold Exchange Traded Funds

**Table No.: 4.2 Year on Year Comparison of Sharpe's Measure**

Sl. No.	Scheme Name	2017-2018	2018-2019
1	NIFTY BeES	-0.766	0.003
2	JUNIOR BeES	-0.611	0.261
3	BANK BeES	-0.559	0.201
4	PSU BANK BeES	-0.773	0.166
5	SUNDER	-0.771	0.010
6	KOTAK PSU BANK ETF	-0.490	0.216
7	RELIANCE BANK	-0.538	0.211
8	QNIFTY	-0.703	0.007
9	GOLD BeES	-0.504	-0.770
10	KOTAK GOLD	-0.564	-0.761
11	RELIANCE GOLD	-1.220	-0.774
12	QUANTUM GOLD	-0.493	-0.757

#### 4.3 Intra Comparison of Exchange Traded Funds

The performance of Equity ETFs was better in year 2018-2019. They have positive Sharpe Ratio. On a similar note, the performance of Gold ETF was better in year 2017-2018. They have lower negative Sharpe Ratio.

#### Inter Comparison

The ETFs are compared and ranked based on their performance level.



**Table No.: 4.3.1 Inter- Comparison of Exchange Traded Funds**

Equity ETF (2017-2018)	Equity ETF (2018-2019)
<ol style="list-style-type: none"> <li>1. KOTAK PSU BANK ETF</li> <li>2. RELIANCE BANK</li> <li>3. BANK BeES</li> <li>4. JUNIOR BeES</li> <li>5. QNIFTY</li> <li>6. NIFTY BeES</li> <li>7. SUNDER</li> <li>8. PSU BANK BeES</li> </ol>	<ol style="list-style-type: none"> <li>1. JUNIOR BeES</li> <li>2. KOTAK PSU BANK ETF</li> <li>3. RELIANCE BANK</li> <li>4. BANK BeES</li> <li>5. PSU BANK BeES</li> <li>6. SUNDER</li> <li>7. QNIFTY</li> <li>8. NIFTY BeES</li> </ol>
Gold ETF (2017-2018)	Gold ETF (2018-2019)
<ol style="list-style-type: none"> <li>1. QUANTUM GOLD</li> <li>2. GOLD BeES</li> <li>3. KOTAK GOLD</li> <li>4. RELIANCE GOLD</li> </ol>	<ol style="list-style-type: none"> <li>1. RELIANCE GOLD</li> <li>2. KOTAK GOLD</li> <li>3. GOLD BeES</li> <li>4. RELIANCE GOLD</li> </ol>

#### 4.4 Investors Quotient

The investors can be divided into three categories. They are:

- High risk appetite investors
- Medium risk appetite investors
- Low risk appetite investors

Each category of investors needs to be dealt differently. Based on this differentiation the returns generated by them will also differ. Based on the study conducted the investors can take care of a few things while investing in Exchange Traded Funds. They are:

- Do not invest in those avenues which generate returns lesser than risk free rate of investment because the returns generated are not worth the money invested.
- The performance of the underlying asset should be checked before any investment is decided upon.
- When economic scenario is favourable, invest in Bank - Equity Exchange Traded Funds. But the risk associated with it is high. The second best option of investing is the other ETFs.
- Gold Exchange Traded Funds involves low risk and should be invested in at the time of an economic crisis as it is a good refuge.

In summary, the data analysis has been divided into several parts. Initially, Standard Deviation and Sharpe ratio were computed to assess the risk and performance of individual exchange-traded funds (ETFs). Comments were provided regarding the performance of ETFs in comparison to the previous year. It was observed that Equity ETFs performed better in the second year, while the opposite was true for Gold ETFs, as their performance weakened in the following year. Based on the data gathered related to risk and performance criteria, a mutual comparison was conducted among the ETFs.

#### 5. Conclusion

Exchange-Traded Funds (ETFs) represent a basket of securities that trade on an exchange, much like individual stocks. Unlike traditional mutual funds, ETFs are listed on recognized stock exchanges, and their units are traded directly during regular trading hours. In essence, an ETF operates similarly to a stock on a stock



exchange. It functions as an index fund, closely mirroring the performance of the index it tracks. Nevertheless, like a mutual fund, an ETF employs a structure that pools investors' assets and utilizes professional money managers for investments. ETFs have been developed to track various asset classes, including industrial sectors, investment styles, fixed income, global investments, commodities, and currencies. In fact, ETFs are now available to replicate nearly any index, provided there is sufficient investor interest to make them profitable.

An investor interested in buying Exchange Traded Funds (ETFs) has a wide array of options to choose from, including equities, foreign stocks, fixed income, and alternative investments. There are also various strategies that investors can employ when using ETFs. Like other investments, it is crucial for the investor to evaluate the different options to ensure the right ETF is chosen for their needs. ETFs are a relatively new and dynamic investment option for investors to consider. Globally, ETFs are recognized as efficient and transparent methods of gaining exposure to various asset classes. While ETFs have been in existence for nearly two decades, they have only recently entered the mainstream. When compared to traditional mutual funds, ETFs represent a newer investment model, typically operating on a fee-based advisory structure.

ETFs have transformed the way millions of people invest and where they invest. Previously, investment options like commodities, swaps, and derivatives were mainly accessible to exclusive hedge funds and other institutional players. ETFs offer several advantages over actively managed mutual funds, including lower average fees, intraday liquidity, transparency, and tax efficiency. They also enable average investors to participate in complex markets such as currencies and commodities from the comfort of their own homes. However, in India, the adoption of ETFs is still in its early stages. As it gains momentum, ETFs are expected to become a popular mode of investment in India as well.

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