

# Comparative study on performance evaluation of selected Indian Index fund and Exchange Traded Fund (ETF)

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**ABSTRACT** - Both the exchange-traded fund and Index fund are classified under the head of 'indexing' as it involves making an investment in an underlying benchmark index. When compared to actively managed funds they have a low expense ratio. ETF is a security that tracks an index, commodity or basket of assets that are traded like a stock on an exchange. ETF bears the twin features of a stock and a mutual fund. Whereas Index fund is a type of mutual fund with a portfolio constructed to match or track the components of a market index. These funds are replicating the performance of a benchmark market index. The purpose of this study aims to cover the performance evaluation of selected Indian Index fund and ETF's which track the same benchmark. Four different index funds along with four different exchange-traded funds are considered in the study respectively tracking the same benchmark. This study is purely based on secondary data covers the period of five years i.e. from 2014-2018. For evaluating the performance of Index fund and ETF's, the parameters used are Return, Risk, Sharpe Ratio, Treynor's Ratio, and Jensen Alpha. This study will aid to identify the difference in the performance of two significant similar passive investment strategies.

**Keywords:** *ETF's, Index funds, NAV, Nifty 50, Performance, Return, Risk.*

## I. INTRODUCTION

An exchange-traded fund (ETF) is a speculation fund traded on stock exchanges, like stocks. An ETF holds assets such as commodities, or bonds, stocks, and generally drives with an arbitrage mechanism designed to keep it trading close to its net asset value (NAV), while deviations can rarely occur. Utmost ETFs track an index, such as a bond index or stock index. Because of the low costs, tax efficiency, and stock-like features ETFs may be attractive as investments. An exchange-traded fund is a type of fund, it owns assets (bonds, stocks, gold bars, etc.) and divides ownership of itself into shares that are held by shareholders. The details of the structure will vary by country (such as a corporation or trust), and even inside one nation, there might be various conceivable structures.

An ETF syndicates the valuation highlight of a mutual fund or unit investment trust, which can be purchased or sold toward the finish of every exchange day for its net asset value (NAV), with the tradability highlight of a closed-end fund, which trades during the course of the trading day at prices that may be more or less than its NAV. Closed-end funds are not reflected to be ETFs, even though they are funds and are traded on an exchange. ETFs have been existing in the US since 1993 and in Europe since 1999. These funds are traditionally have been index funds, but in 2008 the U.S. Securities and Exchange

Commission began to allow the production of effectively overseen ETFs.

Exchange traded funds are not as old as mutual funds they were originated by State Street Global Advisors in 1993, while the Standard & Poor's Depository Receipts (SPDRs) were introduced.

An Index fund is a mutual fund considered to pursue assured predetermined rules so that the fund can track a definite basket of underlying investments. Those rules may comprise tracking prominent indexes like the Dow Jones Industrial Average or the S&P 500 or operation rules, such as tax-management, tracking error minimization, large block trading or patient/flexible trading tactics that permits for greater tracking error, but lower market effect costs.

An index fund's rules of structure clearly recognize the type of companies that are suitable for the fund. The most commonly known index fund in the S&P 500 Index Fund, United States is based on the rules recognized by S&P Dow Jones Indices for their S&P 500 Index. Equity index funds would include groups of stocks with parallel features such as the size, value, profitability and/or the geographic location of the companies. A group of stocks may include companies from the Non-US Developed, United States, emerging markets or Frontier Market countries. The core benefit of index funds for stakeholders is they don't require a lot of time to manage as the investors don't have to spend

time examining various stocks or stock portfolios. Most of the investors also find it challenging to beat the performance of the S&P 500 Index due to their lack of skill in investing/experience.

ETFs are well thought-out more flexible and more suitable than index funds. ETFs can be traded more effortlessly than index funds and traditional mutual funds, parallel to how common stocks are traded on a stock exchange. In addition, investors can also buy ETFs in lesser sizes and with fewer stresses than index funds.

Compared to value investing, index fund investing is well-thought-out by financial specialists as a rather passive investment approach. Both of these types of investing are measured to be traditional, long-term strategies. Value investing frequently appeals to investors who are persistent and eager to wait for a bargain to come along.

## II. OBJECTIVES OF THE STUDY

1. To examine the performance of selected Index funds and ETF's on the basis of risk and return and compare the performance of selected funds with a benchmark index.
2. To study and analyze Risk>Returns relationship.
3. To evaluate the correlation between Index funds and ETF's.

## III. STATEMENT OF THE PROBLEM

ETFs and Index funds have been in presence in existence in for more than a decade at this moment but have not grown the kind of attractiveness that conventional mutual funds enjoy. Partial investors are aware of the idea of Index Fund and Exchange Traded Funds. Thus, in this study efforts have been made to investigate the performance of ETFs and Index Funds that track similar indices as it would enable us to know the difference in performance of two very similar passive investment strategies.

## IV. THE SCOPE OF THE STUDY

The study contains four different index funds along with four different exchange-traded funds respectively tracking the same benchmark. The NAV of the selected funds has been taken for five years with daily return i.e., 1<sup>st</sup> Jan 2014 to 31<sup>st</sup> December 2018. This study focuses on the comparison of risk and returns the relationship of selected index funds and exchange-traded funds. These funds have been equated with the benchmark return Nifty 50 to evaluate the performance of these funds.

## V. LITERATURE REVIEW

**Sharpe, William F. (1966)** suggested a measure for the assessment of portfolio performance. Drawing on results gained in the field of portfolio examination, economist

Jack L. Treynor has advised a new predictor of mutual fund performance, one that differs from virtually all those used previously by incorporating the volatility of a fund's return in a simple yet meaningful manner.

**Jensen Michael (1968)** built a composite portfolio assessment strategy concerning risk-adjusted returns. He assessed the ability of 115 fund managers in selecting securities during the period 1945-66. Investigation of net returns indicated that 39 funds had above-average returns, while 76 funds yielded peculiarly poor returns. Utilizing gross returns, 48 funds indicated above average results and 67 funds below average results. Jensen decided that there was very little evidence that funds were able to perform significantly better than expected as fund managers were not able to forecast securities price movements.

**Jonne M. Hill and Barbara Mueller (2001)** made research on ETFs and they concluded that Tracking errors and returns based on fund NAV relative to the index reflect features of the product structure. In addition, price-to-index yields and tracking error replicate ETF prices that are captured at a different time from the underlying index and the short-supply and demand factors relevant to the ETF, as well as the hedging instruments used by the market makers. NAV tracking error is much lower than price-to-index tracking error and is the most useful measure in assessing the long-term characteristics of an ETF relative to its underlying index.

**B Phaniswara Raju and K Mallikarjuna Rao (2009)** made a study on — Market Timing Ability of Selected Mutual Funds in India: A Comparative Study" and they analyzed the market timing ability of selected fund managers, which is a vital aspect in the success of a mutual fund. In order, to extent, the market timing ability of the fund managers, two significant models, namely, Treynor and Mazuy and Henriksson and Merton, have been used with BSE Sensex and NSE Nifty as market proxies.

**J.Gayathri and P.Bhuvanawari (2009)** paralleled the risk and return of ETFs with their index using Sharpe ratio and Treynor's ratio. The assessment was done for the period of three years i.e. from 2005 to 2007. This study revealed that general NIFTY BEES distributed enhanced returns than other option based alpha whereas in terms of active return ETFs have performed better.

**Debasish (2009)** studied the performance of selected schemes of mutual funds based on risk and return models and measures. The study covered the period from April 1996 to March 2005 (nine years). The study revealed that Franklin Templeton and UTI were the best players and Birla Sun life, HDFC and LIC mutual funds showed poor performance.

**A. Agapova (2011)** studied the effects of substitutability of two comparable investment vehicles i.e. conventional index mutual funds and exchange-traded funds. The author

tried to elucidate the co-occurrence of these vehicle types, which have distinctly different organizational structures but offer a right on the same underlying index return process. This study associated combined fund flows into conventional open-ended index funds to those into ETFs for various underlying indexes. The study revealed that conventional funds and ETFs are not perfect substitutes for one another.

**Prashanta Athma and Raj Kumar (2011)** tried to evaluate the performance of ETFs and Index Funds in India. The study was based on secondary data and covering a period of five years i.e. from 2005 to 2009. Net Asset Value, Risk, Return, Expenses Ratio, Tracking Error, Reward to Variability and Differential Return were used as a measure to evaluate performance. The statistical tools like Standard Deviation, Beta, Alpha, R-squared and Sharpe Ratio were used for data analysis. After data analysis it was established that ETFs have given a better opportunity for the small investors in terms of a spread portfolio with a small amount of money, low expense ratio, reduced tracking error, lower risk and volatility as compared to Index Funds. Thus, concluding that ETFs are a better form of investment when compared with index funds.

**Swati Garg and Y. P. Singh (2013)** associated the performance of ETFs and Index Funds. Five ETFs and Index Funds tracking the same benchmark indices has been analyzed in this study over a period of three years ranging from June 2006 to December 2009. The analysis exhibits that over long term investment horizon ETFs perform better in terms of their imitation strategy, tracking ability and performance effectiveness. However, it was evident from the study that short term investors face a disadvantage from investing in ETFs.

**P.Mishra and G.Singh (2016)** attempted to make an intra-class performance evaluation of some Indian index funds. Graphical interpretations were used along with statistical tools like R-square and tracking error values. Two models of tracking error have been working to test empirically the performance of the selected index funds. Empirical results revealed that out of selected index funds, SBI Nifty Index fund outperformed the other six index funds during the period under study. SBI Nifty Index fund was also able to limit the tracking error to an acceptable limit.

## VI. METHODOLOGY

This paper makes an attempt to comparative study and analyzes the performance evaluation of selected Indian index fund and ETF's. These funds were analyzed in detail from the period of January 2014 to December 2018 (daily return) and this study is based on the secondary data obtained from the various sources like NSE website, journals, magazines etc. For the performance of these funds, different statistical and financial tools are used. The

tools and techniques are alpha, beta, correlation, Sharpe, Treynor, and Jensen measure.

### List of ETF's:

1. ICICI Prudential Nifty ETF
2. Aditya Birla Sun Life Nifty ETF
3. Kotak Nifty ETF
4. Reliance ETF Nifty BeES

### List of Index funds:

1. HDFC Index Fund - Nifty 50 Plan
2. UTI Nifty Index Fund
3. IDBI Nifty Index Fund
4. SBI Nifty Index Fund

## Performance Evaluation Techniques

### Sharpe's Performance Index

The Sharpe ratio is most extensively used for the calculation of risk-adjusted return. This ratio is the average return earned in excess of the risk-free rate per unit of volatility or total risk. Sharpe ratio evaluates risk and returns together to help the investors to choose the investment that generates a higher return but the optimal risk is taken. Mathematically, shape ratio is represented as the difference between the average return of a portfolio and the risk of free invest divided by standard deviation.

$$S(P) = (R_p - R_f) / \sigma(p)$$

Where,  $R_p$  = Average return of the portfolio,  $R_f$  = Risk free rate and  $\sigma$  = Standard deviation of portfolio

### Treynor's Performance Index

The Treynor ratio has similarities with the Sharpe ratio. The Treynor ratio utilizes beta and the ratio is based on the principle that risk intrinsic to the entire market (represented by beta). Treynor ratio is the difference between the average return of a fund and the risk-free investment divided by the beta. The risk premium depends on the systematic risk assumed in a portfolio.

$$T_n(P) = (R_p - R_f) / \beta(p)$$

Where,  $R_p$  = Average return of the portfolio,  $R_f$  = Risk-free rate and  $\beta$  = Measure of systematic risk

### Jensen's Performance Index

The risk-adjusted performance measure known as the Jensen's measure, that denotes the average return portfolio or investment above or below that projected by CAPM (capital asset pricing model) given the portfolio's or investment's beta and the average market return. In this measure, a definite standard is set and against that the performance is measured, so it is mentioned as a measure of absolute performance. The standard is based on the manager's predictive ability. The basic model of Jensen is given below. This will helps to know the fund manager performance.

$$R_p = \alpha + \beta (R_m - R_f)$$

Where,  $R_p$  = Average return of portfolio,  $R_f$  = Risk free rate,  $\alpha$  = The intercept,  $\beta$  = Measure of systematic risk and  $R_m$  = average market return

### Correlation

The correlation analysis is the statistical tool that can use to describe the degree to which one variable is linearly related to another. Correlation indicates a predictive relationship that can be exploited in practice hence it is more useful. Correlations are useful because they can specify an analytical relationship that can be exploited in practice. This is used in advanced portfolio management, calculated as the correlation coefficient, which has a value that must fall between -1.0 and +1.0.

- If  $r$  lies between 0 to 1, that means positive correlation where  $r$  lies between 0 to 0.3 is weak positive correlation and  $r$  lies between 0.3 to 0.7 is moderate positive correlation and  $r$  lies between 0.7 to 1 is a strong positive correlation
- If  $r$  is exactly 1, the correlation is a perfect positive correlation
- If  $r$  lies between -1 to 0, that means negative correlation where  $r$  lies between 0 to -0.3 is weak negative correlation and  $r$  lies between -0.3 to -0.7 is moderate negative correlation and  $r$  lies between -0.7 to -1 is a strong negative correlation.
- If  $r$  is -1, that implies a perfect negative correlation.

## VII. DATA ANALYSIS AND INTERPRETATION

Table 1: correlation matrix for the selected Index fund and ETF's

	HDFC Index Fund - Nifty 50 Plan	UTI Nifty Index Fund	IDBI Nifty Index Fund	SBI Nifty Index Fund	ICICI Prudential Nifty ETF	Aditya Birla Sun Life Nifty ETF	Kotak Nifty ETF	Reliance ETF Nifty BeES
HDFC Index Fund - Nifty 50 Plan	1.000							
UTI Nifty Index Fund	1.000	1.000						
IDBI Nifty Index Fund	1.000	1.000	1.000					
SBI Nifty Index Fund	1.000	1.000	1.000	1.000				
ICICI Prudential Nifty ETF	0.028	0.028	0.028	0.027	1.000			
Aditya Birla Sun Life Nifty ETF	0.002	0.001	0.002	0.001	0.022	1.000		
Kotak Nifty ETF	0.012	0.011	0.012	0.012	-0.023	-0.003	1.000	
Reliance ETF Nifty BeES	-0.001	0.000	0.000	0.001	-0.023	0.072	0.250	1.000

Source: Author calculation

### Interpretation

This result shows that most of the index fund and ETF's funds are positively correlated except Kotak Nifty ETF is negatively correlated with ICICI Prudential Nifty ETF (-0.023) and Aditya Birla Sun Life Nifty ETF (-0.003). In same sense Reliance, ETF Nifty BeES is negatively correlated with HDFC Index Fund - Nifty 50 Plan

(-0.001) and ICICI Prudential Nifty ETF (-0.023). All four Index Fund is very strongly positively correlated with other index funds respectively. Whereas ICICI Prudential Nifty ETF, Aditya Birla Sun Life Nifty ETF, are weak positively correlated with all index and ETF's. And Reliance ETF Nifty BeES have zero correlation relationship with UTI Nifty Index Fund and IDBI Nifty Index Fund.

### Descriptive statistics

Table 2: Summary of basic descriptive statistics parameters for the selected Index fund and ETF's

	HDFC Index Fund - Nifty 50 Plan	UTI Nifty Index Fund	IDBI Nifty Index Fund	SBI Nifty Index Fund	ICICI Prudential Nifty ETF	Aditya Birla Sun Life Nifty ETF	Kotak Nifty ETF	Reliance ETF Nifty BeES	Nifty 50
Mean	0.05	0.05	0.05	0.05	0.06	0.09	-0.03	0.05	0.05
Standard Error	0.02	0.02	0.02	0.02	0.05	0.08	0.08	0.02	0.02
Median	0.06	0.06	0.06	0.06	0.05	0.00	0.07	0.07	0.06
Standard Deviation	0.84	0.84	0.84	0.85	1.77	2.67	2.68	0.81	0.85
Sample Variance	0.71	0.71	0.71	0.71	3.12	7.12	7.19	0.65	0.71
Minimum	-5.81	-5.88	-5.85	-5.91	-14.84	-13.90	-89.98	-5.76	-5.92
Maximum	3.34	3.32	3.35	3.35	16.52	13.26	2.85	3.66	3.37
Sum	62.93	62.66	56.05	61.62	76.04	103.93	-31.33	61.90	58.87

Source: Author calculation

**Interpretation:**

Descriptive statistics will give a summary of funds and the nature of funds. The above table depicts that all the Index funds have to mean return is equal to the market return (benchmark) Nifty 50 (0.05). Whereas ICICI Prudential Nifty ETF (0.06) and Aditya Birla Sun Life Nifty ETF (0.09) have a mean return more than the benchmark and Kotak Nifty ETF (-0.03) have a negative mean return. All four index fund and Reliance ETF Nifty BeES have equal standard error compared to Nifty 50 (0.02) and the rest ICICI Prudential Nifty ETF (0.05), Aditya Birla Sun Life Nifty ETF (0.08), Kotak Nifty ETF (0.08) has standard error more than the benchmark.

The risk (SD) of all for index funds and Reliance ETF Nifty BeES have equal and less risk as compared to benchmark Nifty 50 (0.85) whereas ICICI Prudential Nifty ETF (1.77), Aditya Birla Sun Life Nifty ETF (2.67) and Kotak Nifty ETF (2.68) have more risk when compared to benchmark Nifty 50. All the funds are in-line with market (Nifty 50) minimum returns and maximum returns. However, the risk of Index funds are comparatively less are equal to benchmark, on the other hand, ETF's has flexibility in their risk.

**Sharpe Performance Index**

**Table 3: Sharpe Performance Index for the selected Index fund and ETF's**

Funds	Sharpe	Rank	SD
Aditya Birla Sun Life Nifty ETF	0.0049	1	2.6685
ICICI Prudential Nifty ETF	-0.0087	2	1.7658
HDFC Index Fund - Nifty 50 Plan	-0.0340	3	0.840
UTI Nifty Index Fund	-0.0343	4	0.841
SBI Nifty Index Fund	-0.0351	5	0.845
Reliance ETF Nifty BeES	-0.0370	6	0.8051
Kotak Nifty ETF	-0.0393	7	2.6805
IDBI Nifty Index Fund	-0.0405	8	0.844

Source: Author calculation

**Interpretation:**

The above result shows the performance ranking of various funds under Sharpe performance index measures. As per the Sharpe, the top 3 performance of selected Index fund and ETF's are Aditya Birla Sun Life Nifty ETF (0.0049) has rank one, ICICI Prudential Nifty ETF (-0.0087) has rank 2 and HDFC Index Fund - Nifty 50 Plan (-0.0340) has rank 3. For the poor performance, Reliance ETF Nifty BeES (-0.0370) has rank 6, Kotak Nifty ETF (-0.0393) has rank 7, IDBI Nifty

**Interpretation**

The results show as per the Jensen measure shows the top 3 performance of selected Index fund and ETF's are Aditya Birla Sun Life Nifty ETF (0.0212) has rank 1, Reliance ETF Nifty BeES (-0.0001) has rank 2 and ICICI Prudential

Index Fund (-0.0405) has rank 8. Standard deviation (SD) will make us understand how much the returns deviate from each other. The better investment choice will be those which have a less variation and more of returns.

**Treynor Performance Index**

**Table 4: Treynor Performance Index for the selected Index fund and ETF's**

Funds	Treynor	Rank	Beta
ICICI Prudential Nifty ETF	0.300	1	0.0514
Aditya Birla Sun Life Nifty ETF	0.053	2	0.2473
Reliance ETF Nifty BeES	-0.032	3	0.9218
Kotak Nifty ETF	-0.127	4	0.8296
SBI Nifty Index Fund	-8.727	5	0.0034
UTI Nifty Index Fund	-11.001	6	0.0026
IDBI Nifty Index Fund	-11.893	7	0.0029
HDFC Index Fund - Nifty 50 Plan	-25.985	8	0.0011

Source: Author calculation

**Interpretation:**

The results show as per the Treynor measure shows the top 3 performance of selected Index fund and ETF's are ICICI Prudential Nifty ETF (0.300) has rank 1, Aditya Birla Sun Life Nifty ETF (0.053) has rank 2 and Reliance ETF Nifty BeES (-0.032) has rank 3. Contrary, the poor performance funds are UTI Nifty Index Fund (-11.001) has rank 6, IDBI Nifty Index Fund (-11.893) has rank 7 and HDFC Index Fund - Nifty 50 Plan (-25.985) has rank 8. Beta measures the sensitivity of a fund to the market index, higher the beta indicates the fund has risen more than the market's returns, lower the beta indicates the lesser the market return.

**Jensen Performance Index**

**Table 5: Jensen Performance Index for selected Index fund and ETF's**

Funds	Jenson	Rank	Beta
Aditya Birla Sun Life Nifty ETF	0.0212	1	0.2473
Reliance ETF Nifty BeES	-0.0001	2	0.9218
ICICI Prudential Nifty ETF	-0.0171	3	-0.0514
HDFC Index Fund - Nifty 50 Plan	-0.0285	4	0.0011
UTI Nifty Index Fund	-0.0287	5	0.0026
SBI Nifty Index Fund	-0.0296	6	0.0034
IDBI Nifty Index Fund	-0.0341	7	0.0029
Kotak Nifty ETF	-0.0787	8	0.8296

Source: Author calculation

Nifty ETF (-0.0171) has rank 3. For the poor performance, the SBI Nifty Index Fund (-0.0296) has rank 6, IDBI Nifty Index Fund (-0.0341) has rank 7 and Kotak Nifty ETF (-0.0787) has rank 8.

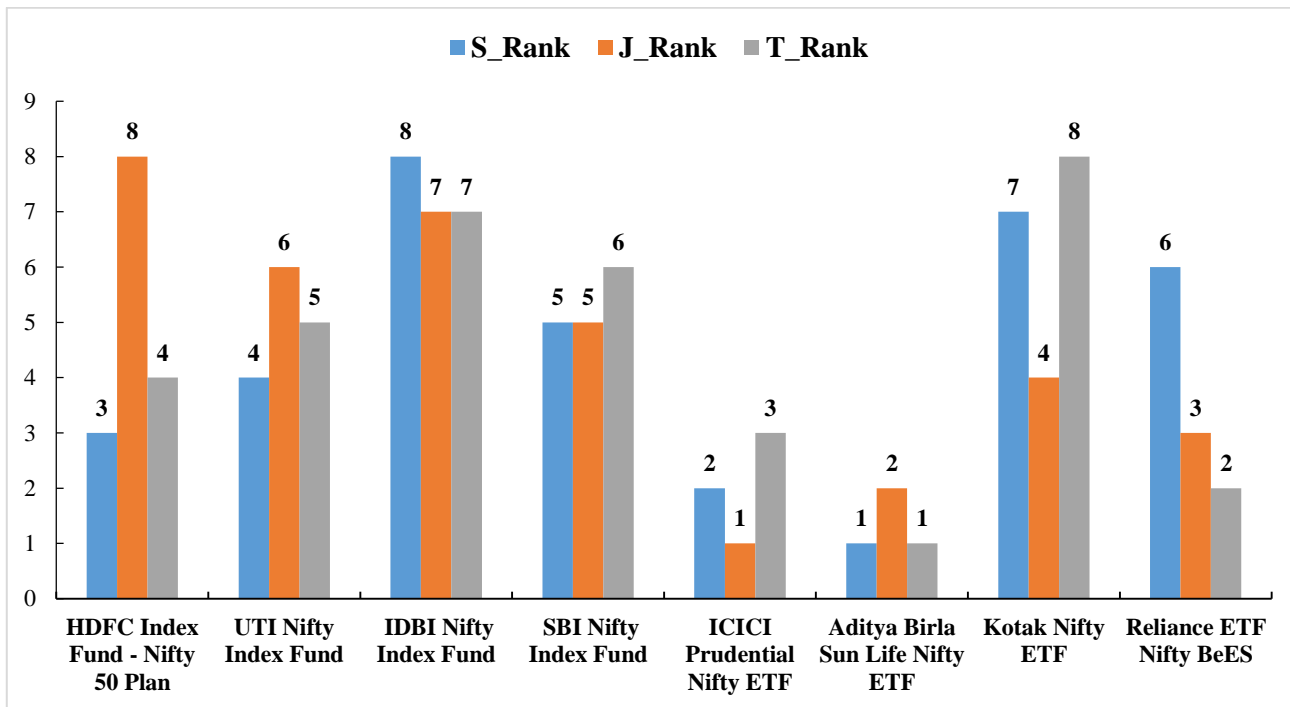
**Sharpe, Treynor and Jensen's performance measure**

**Table 6: Summary of Sharpe, Treynor and Jensen’s performance measure rank list for the selected index funds and ETF’s**

IDBI Nifty Index Fund	8	7	7
SBI Nifty Index Fund	5	5	6
ICICI Prudential Nifty ETF	2	1	3
Aditya Birla Sun Life Nifty ETF	1	2	1
Kotak Nifty ETF	7	4	8
Reliance ETF Nifty BeES	6	3	2

Source: Author calculation

Funds	S_Rank	J_Rank	T_Rank
HDFC Index Fund - Nifty 50 Plan	3	8	4
UTI Nifty Index Fund	4	6	5



Source: Excel extract

### VIII. CONCLUSION

In this study, four Index funds and four exchange-traded funds (ETF’s) were selected that tracked Nifty 50 for which risk and return were analyzed on the basis of data extracted from secondary sources. For the investment decision process, the portfolio performance measure should be a key aspect. These tools which are used for this study provide the necessary information for investors to assess how effectively their money has been invested. An investor cannot conceivably see the whole investment picture which may involuntarily lead to a clouded decision without evaluating risk-adjusted returns. This Analysis revealed that Index funds and exchange-traded funds are not have strongly positively correlated with each other funds. Only the Index funds are strongly correlated. In this study the risk was analyzed by using standard deviation, Sharpe ratio, Beta, and Jensen performance index, it was depicted that exchange-traded funds are riskier than the Index funds thus regenerating better return. Even though exchange-traded funds have more risk but it will give a higher return than the index funds.

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