

## Islamic Versus Conventional Mutual Funds Performance in Pakistan; Comparative Analysis through Performance Measures and DEA Approach

Muhammad Arif<sup>1</sup>, Muhammad Mounas Samim<sup>1</sup>, Muhammad Kashif Khurshid<sup>1</sup>, Arfan Ali<sup>\*2</sup>

<sup>1</sup>National University of Modern Languages, Islamabad; <sup>2</sup>Department of Public Administration,  
Government College University, Faisalabad

\*Email: arfan\_ali64@yahoo.com

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### Abstract

Islamic mutual funds are different from conventional mutual funds because both have different characteristics. Islamic mutual funds act upon the Shariah guidelines and rules. This study investigates the performance of Islamic and conventional mutual funds for the period of 8 years from January 01, 2010 to December 2017. For the purpose of analysis 30 Islamic mutual funds and 30 conventional mutual funds are selected as sample of the study. Study evaluates the performance of Islamic and conventional mutual funds based on different ratios like Sharpe ratio, Treynor ratio and Jensen Alpha along with data envelopment analysis technique. Sharpe and Treynor ratios of Islamic mutual funds are higher than the conventional mutual funds which shows the better performance of Islamic mutual fund as compared to conventional mutual funds. Whereas the results of Jensen Alpha showed opposing results with Treynor and Sharpe ratios in which the value of Jensen Alpha of Islamic mutual fund is lower than conventional mutual funds. Results of data envelopment analysis showed higher efficiency of Islamic mutual funds as compared to conventional mutual funds. Ultimately, it is concluded that financial performance of Islamic mutual funds is superior as compared to conventional mutual funds in Pakistani mutual fund market for the period of 2010 to 2017.

**Keywords:** Islamic Mutual Funds; Conventional Mutual Funds; Sharpe Ratio; Treynor Ratio; Jensen Alpha; Data Envelopment Analysis (DEA)

### Introduction

A mutual fund is such scheme for making investment that having attraction to collect money from those investors who aim to invest in securities like money market instruments, stocks, bonds and related assets. Small investors also participate in the mutual funds through putting their money in diversified portfolios of equities and debt instruments (TFCs and Govt. securities) which are managed by experts. It is very difficult for small investors to invest in such instruments by them self. The income derived in the shape of return is distributed among the investors according to the number of units they possessed. By purchase and redemption of shares, it can be increased and decreased capital through investing in the mutual funds (Obaidullah, 2005).

Islamic mutual funds fulfil the requirements established by the Shariah compliance board. Shariah Compliance Board and Shariah advisors look after the funds on regular basis whether the fund is indulged in any illegal activity or not. Any activity from non-Islamic way is pointed out if any profit is produced. Amount taken from such activity is given away as a charity so that income of the funds can be purified.

Collection of the money from the different individuals, companies and organisations convincing to invest in the mutual funds for better investment opportunities and put their money on

tradable securities. It is unique choice for that person who has low amount for investment (small investors) and looking for liquidity, portfolio diversification and investment skills. Investment objectives vary from person to person with respect to return and risk tolerance. Every person prefers high return and less risk. This study aims to examine the risk and return of Islamic and non-Islamic mutual funds in Pakistan for better understanding of mutual fund's performance.

Mutual funds are there to attract the investors to invest their money in a diversified portfolio. This collected money is managed by the professional people to increase the investor's wealth. In this process, the management only receive their operating charges to run fund for providing Convenience, Variety, Diversification and Liquidity. Nafees, Shah, and Khan (2011) defined the **Liquidity** is the capability of a firm to pay its short-term obligations when they come due from its liquid assets. According to Nafees et al. (2011) **Diversification** is the investment in such manner where investors invest their money in different number of funds to minimize the risk. According to Avramov and Wermers (2006) **Variety** defined that investors has various opportunities to invest their money in various funds. According to the Nafees et al. (2011) **Convenience** defined that when you invest in the mutual funds like units or shares, the investors can buy and trade by way of agent, broker, investment bank, by internet through online and also buying and selling over telephone. Mutual funds are categorized into two kinds, which are as under:

#### ***Open-Ended Mutual Funds***

These funds constantly raise new units and issue again these units after purchase. The name of these units is Unit Trusts. The Unit trust holders can buy and sell these units with current Net Asset Value in the market through Asset Management Company that declares the daily sales price of these units (Revell, 1973).

#### ***Close-Ended Mutual Funds***

In this type, number of shares are fixed such as shares of Public Company that are issued in the market via Initial Public Offering (IPO). In the secondary market like Stock Exchange, these shares can purchase and sale (Revell, 1973; Yao, Xu, & Liu, 2010). The prices of shares are settled on daily basis. Unit price of mutual fund can be calculated as:

$$NAV = \frac{\text{Current Market Value of all the Assets} - \text{Liabilities}}{\text{Total Number of Units Outstanding}}$$

The Schemes of mutual funds classified by the Security Exchange Commission of Pakistan (SECP) are as under:

- **Equity Scheme** (the individuals invest in equities known as stocks).
- **Balanced Scheme** (Investors can invest in both debt and stocks instruments).
- **Asset Allocation Fund** (Investor may invest any time many type of securities in the market).
- **Shariah Compliance (Islamic) Scheme** (Investments are done according to the Islamic Shariah Compliance i.e. Ijara, Sukuks etc.).
- **Capital Protected Scheme** (The original amount is guaranteed return to the investors at time of redemption).
- **Index Tracker Scheme** (The investors can invest in securities for example the KSE-100 index).
- **Money Market Scheme** (For the safest and fastest of all different kinds of mutual funds, Money Market Scheme is most suitable).
- **Income Scheme** (Investors can earn fixed income through short and long-term investments like T-bill, PIBs and preference shares).

- **Scheme of Aggressive Fixed Income** (It is to create a huge profit through invest in fixed income instrument).

- **Commodity Scheme** (Small investors invest in this type of fund for getting benefits such as gold. About 70% of their assets are invested in this commodity).

Different studies like Hayat and Kraeussl (2011) and Abdullah, Hassan, and Mohamad (2007) found that during bullish time period the Non-Islamic mutual funds shown good performance than the Islamic portfolio. On the other hand, they concluded that the Islamic funds show superior performance as compared to non-Islamic mutual funds during the period of the bearish and financial crisis.

Mansor and Bhatti (2009) explored that at the same time two systems are running internationally, firstly Non-Islamic and secondly the Islamic finance system. In the Islamic finance system that are working according to the Islamic Law (Shariah Compliance Board) offers Islamic products while Non-Islamic finance system deals the products interest base system. In the bearish financial crisis period Abdullah et al. (2007); Hayat and Kraeussl (2011); Mansor and Bhatti (2009) described various results that the Non-Islamic finance system is underperformed than the Islamic finance system. It means that performance of the Islamic finance is superior then Non-Islamic finance system.

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### ***Problem Statement***

Investors know about only those stocks in which they invest, it may be an Islamic mutual fund or Non-Islamic mutual fund but they have not knowledge about overall performance of the Islamic and Non-Islamic mutual funds. Therefore, we need to evaluate that which fund is going better and giving better returns by taking less risk.

The evaluation and comparison determine how much return can be generated besides how much the risk has been taken for Islamic and Non-Islamic mutual fund return. The central concern of this study is to differentiate between Non-Islamic and Islamic mutual fund performance in Pakistan and evaluate how should investors invest in Non-Islamic or Islamic mutual fund.

### ***Research Objectives***

There are following major aims of the research.

- To measure the performance of mutual funds of Non-Islamic and Islamic with the help of three performance evaluation techniques (Sharpe Ratio, Treynor Ratio, Jensen Alpha).
- To analyse performance of the Non-Islamic and Islamic mutual funds in Pakistan through Data Envelopment Analysis (DEA) Approach.
- To make comparative analysis of the Non-Islamic and non-Non-Islamic mutual fund in Pakistan.
- To identify which mutual funds is better as compared to other for investment.

### ***Literature Review***

The literature consists of such studies which considering the Non-Islamic and Islamic financial system. Pakistani mutual funds industry is growing fast that shown growth rate 23.95% at the end of 2010-11 whereas last quarter shows 7.87% (Mutual Fund Association of Pakistan Report 2010-2011). Non-Islamic open-end fund having net asset value growth 8.94% and Islamic mutual

fund that consists of open ended funds increased by 14.52% according to MUFAP report 2010-2011.

Jawadi, Jawadi, and Louhichi (2014) studied the theoretical and practical issues that focused on two aspects: the sources and the consequences of the financial downturn. The framework of Islamic finance followed with ideology of Islamic laws, which offered oriented trade and a highly regulated finance system. The latter prohibited interest rates and did not allow interest during giving loan to householders or businessmen. There is no loan available for those persons that involved in any illegal activities such as alcohol.

Gohar, Ahmed, and Niazi (2011) concluded that to role reducing risk, mutual funds are stressing in the developed countries. Through the professional management of funds, it increased the return. Due to the investment in mutual funds, income of the small investors has increased and reduced the unsystematic risks. They also mentioned that funds got much popularity from the last 20 years. More than 80 million investors are invested in the mutual funds in United States. Many people just purchase the mutual fund and retain himself besides getting return with keeping with the bank.

The Wharton School of Finance and Commerce (1962) was the first who had carried detail study on the US mutual fund industry. That research particularly concerned to the performance of mutual fund regarding evaluation. Their study explored that the performance of half mutual funds showed superior but half display inferior performance and also described performance evaluation of mutual funds which was accepted by the Sharpe (1966). Despite of the strong management, if they select incorrect securities then there will be huge difference regarding the funds return. Some of the ideas from latest portfolio theory, Sharpe (1966) article included in those studies that are conducted initial research to assess mutual fund's performance. Sharpe (1966) suggested that if comprehensive mutual fund management selected wrong price securities, diversification and portfolio in each risk class, then there will be big difference with reference to returns.

To attain abnormal performance, Jensen (1968) described that mutual funds did not seem because the transactional costs take under consideration. He investigated effective market analysis for accessing effective portfolios performance. Fama and Miller (1972) established a methodology that return taking portfolio divided into two divisions that first part was to choose the security regarding to return and second part concern to risk for the security. According to Gupta, Kothari, Dhruva, and Bapna (1975) all mutual fund smaller divisions shown good performance in the market. Blake and Timmermann (1998) conducted a research work related to UK mutual funds on the performance evaluation. They concluded that UK equity has not shown good performance it has just shown 1.8 % growth which is based on a risk-adjusted.

Nawang, Rasyidah, and Bashir (2011) main focus on computing the whole efficiency of capital market particularly Non-Islamic and non-Non-Islamic funds, in relation of risk, return and diversification of particular unit trust in Malaysia in the period from 2002 to 2006. They have included the performance measures like Sharpe index, Treynor index, and Jensen index. It is also concluded by them that fund managers have very low timing ability and they have no ability to rightly recognise the superior stock and to predict the prices of the investment in the market.

Ho, Rahman, Yusuf, and Zamzamin (2014) compared the share indices of Non-Islamic and non-Non-Islamic market to measure the risk-adjusted performance. They presented that Islamic indices showed good performance but on the other side, the Non-Islamic indices showed lower performance in the market. Ho et al. (2014) described that both Non-Islamic and non-Non-Islamic investments are grown rapidly because these are the new investment instrument in last ten years in the

market. Giff (2012) has estimated that Global Islamic financial asset reached to USD 1.8 trillion in 2013.

Shah, Iqbal, and Malik (2012) investigated the performance of conventional and Islamic mutual funds in Pakistan. We investigate the performance based on risk and return, Risk Adjusted Performance, diversification, selectivity and timing of the both funds. In this study the data consists of 125 funds having 31 were the Islamic mutual funds whereas 94 were conventional funds. In this study investigate that Sharp ratio is better of Islamic mutual fund as compare to the conventional mutual fund. So Islamic mutual fund is better performed than conventional funds. Islamic mutual funds had good diversified. ( $R^2=0.99$ ) while conventional mutual fund is not good like diversified rate is  $R^2=0.48$ . The study shows the overall performance that Islamic mutual funds show the less risk rate but give the high return than the conventional mutual funds.

In the International, capital markets are providing the investment opportunities for Islamic and Non-Islamic assets. Maximum investors search for the most effective investment for better return with minimum risk. Investors preferred to invest in the Islamic indices with having lower risk. However, the financial philosophy players having mind of uncertainty about the performance of ability of Islamic indices as compare to Non-Islamic indices because of smaller size of investment than the Non-Islamic asset markets (Giff, 2012).

**Methodology**

In this study, 30 Islamic and 30 Non-Islamic mutual funds are taken for the analysis. Daily data of offered prices, repurchase prices and net asset value (NAV) of the selected mutual funds are collected for the period of seven years from January 2010 to June 2017.

**Sample Data**

Total 60 mutual funds are taken out of which 30 are Islamic mutual funds and 30 are Non-Islamic mutual funds. The data consisted of daily net asset values (NAVs), controlled, and managed by the Mutual Fund Association of Pakistan from January 2010 to June 2017 is collected.

**Sources of data**

The net asset values (NAVs) and other data of all the mutual funds (Islamic and Non-Islamic) is collected from the web site of Mutual Fund Associations of Pakistan (MUFAP) and other online resources.

**Performance Measures**

Three types of performance measuring techniques (Sharpe Ratio, Treynor Ratio and Jensen Alpha) along with the Data Envelopment Analysis Approach are used. Sharpe ratio is calculated through the following:

$$\text{Sharpe Ratio} = \frac{R_p - R_f}{\sigma_p} \dots\dots\dots (1)$$

Where,

$R_p$  = Portfolio expected return,

$R_f$  = Risk free rate,

$\sigma_p$  = Portfolio Standard deviation

Expected portfolio return and Standard deviation of a portfolio is calculated by using expected returns of each individual stock and their weights. Annual (12 months) risk free rate is taken from the online source of Economic Trading and Opendoors.pk which is around 6%. Whereas expected returns of mutual funds calculated in this study on the base of daily NAVs, so we need to convert the expected returns into annual returns to equalize the calculations. Individual returns of each mutual fund are calculated based on daily NAVs with the help of following formula:

$$R_{it} = \frac{NAV_{i,t} - NAV_{i,t-1} + D_{i,t}}{NAV_{i,t-1}} \dots\dots\dots (2)$$

Where,  $R_{it}$  = Total return of an individual fund 'i' at time 't',

$NAV_{i,t}$  = Net Asset Value of fund 'i' at time 't'.

$NAV_{i,t-1}$  = Net Asset Value of fund 'i' at time (t - 1).

$D_{i,t}$  = Dividend or cash disbursement for fund 'i' at time 't'.

**Individual Stock Weights**

Individual weights of each mutual fund are calculated with the help of following formula:

$$W_{it} = \frac{NAV_{i,t}}{TIP} \dots\dots\dots (3)$$

Where,

$W_{it}$  = Weight of mutual fund i at time t

$NAV_{i,t}$  = Net Asset value of mutual fund i at time t

$TIP$  = Total Investment in 30 stocks portfolio

**Expected Return**

After calculating the daily returns of selected 60 mutual funds (30 Islamic and 30 non-Islamic) for the period of January 2010 to June 2017, the average/expected returns of each mutual fund are calculated with the help of following formula:

$$ER_t = \sum_{i=1}^{nt} \frac{R_{i,t}}{n_t} \dots\dots\dots (4)$$

$ER_t$  = Expected Return at time (t) for the stock (Islamic or Non – Islamic)

$R_{i,t}$  = Sum of returns at time (t) of an individual fund (i) (Islamic or Non – Islamic).

$n_t$  = The number of individual fund under each category (Islamic or Non-Islamic) at time (t).

**Expected Portfolio Return**

Expected portfolio return is calculated on the basis of daily NAV by using all the individual stock returns and weights with the help of following formula:

$$R_{pt} = \sum_{i=1}^{nt} (ER)_i W_i \dots\dots\dots (5)$$

$$R_{Pt} = (ER)_1 W_1 + (ER)_2 W_2 + (ER)_3 W_3 + \dots + (ER)_n W_n \dots\dots\dots (5a)$$

**Portfolio Standard Deviation**

It is assumed that the portfolio selected in this study is the diversified portfolio in which un-systematic risk is eliminated and only systematic risk exist. Standard deviation of a diversified portfolio is equal to the systematic risk which is calculated as Portfolio Beta ( $\beta_p$ ).

**Treynor Ratio**

Treynor Ratio which depends on systematic risk is calculated as under:

$$TR = \frac{R_p - R_f}{\beta_p} \dots\dots\dots (6)$$

Where “TR” is Treynor ratio

$R_p = (ER)_1 W_1 + (ER)_2 W_2 + \dots + (ER)_n W_n$

$R_f$  = Risk free return

$\beta_p = (ER)_1 \beta_1 + (ER)_2 \beta_2 + \dots + (ER)_n \beta_n$

**Portfolio Beta**

Portfolio beta is required to calculate the Treynor ratio, therefore portfolio Beta can be calculated if individual stock betas are there. First of all, individual betas of each mutual fund are calculated with the help of following formula:

$$\beta_i = \frac{Cov_{im}}{Var_m} \dots \dots \dots (7)$$

Where,

$\beta_i$  = Individual stock beta

$Cov_{im}$  = Covariance of Mutual Fund i with m (Market)

$Var_m$  = Variance of Market

After calculating the individual stock betas, portfolio beta is calculated by multiplying each stock's expected return with each individual stock's beta, the formula of calculating the portfolio beta is as under:

$$\beta_p = \sum_{i=1}^{nt} (ER)_i \beta_i \dots \dots \dots (8)$$

$$\beta_p = (ER)_1 \beta_1 + (ER)_2 \beta_2 + (ER)_3 \beta_3 + \dots + (ER)_{30} \beta_{30} \dots \dots \dots (8a)$$

**Jenson Alpha**

Jenson alpha is computed as:

$$\alpha_p = R_p - R_f + \beta_p (R_m - R_f) \dots \dots \dots (9)$$

$\alpha_p$  = Jenson alpha

$R_p$  = Exptected Return of portfolio

$R_f$  = Risk Free Rate

$\beta_p$  = Beta of Portfolio

$R_m$  = Return of the Market.

Calculation methods of  $R_p$  (portfolio return),  $R_f$  (risk free rate) and  $\beta_p$  (Portfolio Beta) are already mentioned above whereas the  $R_m$  (Market Return) is calculated by using the daily volume of KSE-100 index. Daily market return is converted into annual return by using the following formula:

$$\text{Annual Return} = [(Daily\ return - 1)^{365} - 1] * 100 \dots \dots \dots (10)$$

**Data Envelopment Analysis**

In DEA approach, our main-focus to measure and related efficiency of organizational units and homogeneous set of units that generally measure the efficiency, i.e.:

$$Efficiency = \frac{Output}{Input} \dots \dots \dots (11)$$

Where, *Out Put* = Profit or Return of the Stock and *In Put* = Price of the Stock.

Due to the several inputs and outputs, it is not enough that concern to the various resources, activities. DEA model uses a formula to check the efficiency of several inputs and outputs. For the measurement of relative efficiency, we have to deal with numerous insufficient inputs and outputs was introduced by the Farrell and Fieldhouse (1962), focused on making an imaginary efficient unit, as a weighted average of efficient units, to act as a comparator for an inefficient unit. A common measure for relative efficiency a general measure is as under:

$$Efficiency = \frac{Weighted\ sum\ of\ outputs}{Weighted\ sum\ of\ Inputs} \dots \dots \dots (11a)$$

$$\text{Efficiency of unit } j = \frac{u_1 y_{1j} + u_2 y_{2j} + \dots}{v_1 x_{1j} + v_2 x_{2j} + \dots} \dots \dots \dots (11b)$$

Where;  
*u<sub>1</sub>* = the weight given to input  
*y<sub>1j</sub>* = amount of output 1 from unit *j*  
*v<sub>1</sub>* = weight given to input 1  
*x<sub>1j</sub>* = amount of input 1 to unit *j*.

The primary assumption is that this efficiency measures needs to assign the weight to all input and output units.

**Results and Discussion**

The results of four performance measures (Sharpe ratio, Treynor ratio, Jensen Alpha and DEA) are discussed in this section.

**Sharpe Ratio**

To find out the value of Sharpe ratio the expected returns and weights based on daily NAVs of each Islamic mutual fund are calculated which are as under:

**Table 1: Islamic Mutual Funds (Weights and ER)**

#	Fund Name	Weights	$ER_t = \sum_{i=1}^{n=t} \frac{R_{i,t}}{n_t}$	$(ER_i)W_i$
1	ABL Islamic Financial Planning Fund	0.03986130	0.09392560	0.00374400
2	ABL Islamic Income Fund	0.00361015	0.00137805	0.00000497
3	ABL Islamic Stock Fund	0.00460158	0.06614288	0.00030436
4	Al Meezan Mutual Fund	0.00516322	0.04575315	0.00023623
5	KSE Meezan Index Fund	0.02215600	0.04771169	0.00105710
6	Meezan Asset Allocation Fund	0.02037100	0.01405500	0.00028631
7	Meezan Balanced Fund	0.00495300	0.03771930	0.00018682
8	Meezan Cash Fund	0.01796500	0.00258867	0.00004651
9	Meezan Financial Planning Fund	0.02435100	0.05299907	0.00129058
10	Meezan Financial Planning Fund	0.01811000	0.00503665	0.00009121
11	Meezan Gold Fund Missing	0.01810700	0.00408520	0.00007397
12	Meezan Sovereign Fund	0.03617300	0.00068114	0.00002464
13	Alfalah GHP Islamic Income Fund	0.03983500	0.03842739	0.00153076
14	Alfalah GHP Islamic Property Planning	0.02172500	0.02061275	0.00044781
15	Alfalah GHP Islamic Stock Fund	0.03715800	0.01319893	0.00049045
16	Askari Islamic Allocation Fund	0.18094800	-0.0005690	-0.0001030
17	Askari Islamic Income Fund	0.03615700	0.00003322	0.00000120
18	Atlas Islamic Income Fund	0.06095400	0.07940798	0.00484023
19	Dawood Islamic Fund	0.03662000	0.00195488	0.00007159
20	Faysal Islamic Savings Growth Fund	0.03745100	0.00653013	0.00024456
21	First Habib Islamic Balanced Fund	0.03772200	0.01573955	0.00059373
22	HBL Islamic Asset Allocation Fund	0.03603200	0.00074341	0.00002679



	Fund Name	Weights	$ER_t = \sum_{i=1}^{n=t} \frac{R_{i,t}}{n_t}$	$(ER_i)W_i$
23	HBL Islamic Money Market Fund	0.04715800	0.02169768	0.00102322
24	HBL Islamic Stock Fund	0.02807700	0.05763796	0.00161830
25	PICIC Islamic Income Fund	0.03595200	0.00185622	0.00006673
26	PICIC Islamic Stock Fund	0.04719400	0.02615400	0.00123431
27	JS Islamic Fund	0.02807700	0.05763800	0.00161830
28	JS Islamic Government Securities Fund	0.03595300	0.00175678	0.00006316
29	Lakson Islamic Tactical Fund	0.03756300	0.00223600	0.00008399

$$R_{Pt} = ER_1W_1 + ER_2W_2 + ER_3W_3 + \dots + ER_{29}W_{29}$$

$$R_{Pt} = 0.021199$$

In the above table 1, weights and expected returns are mentioned against each Islamic mutual fund for the calculation of Portfolio return. Portfolio expected rate of return based on daily returns of Islamic mutual fund is 0.021199. To convert this daily return into annual return the following formula is used:

$$\text{Annual Return} = [( \text{Daily return} - 1 )^{365} - 1] * 100$$

By putting the value of portfolio daily return in above equation;

$$\text{Annual Return} = [(0.021199 + 1)^{365} - 1] * 100$$

Daily return is divided by 100 to convert it into decimal which is 0.00021199, so:

$$\text{Annual Return} = [(0.00021199 + 1)^{365} - 1] * 100$$

$$\text{Annual Return} = [1.0804 - 1] * 100$$

$$\text{Annual Return} = 8.04 \%$$

**Table 2: Non-Islamic Mutual Funds (Weights and ER)**

#	Fund Name	Weights	$ER_t = \sum_{i=1}^{nt} \frac{R_{i,t}}{n_t}$	$(ER_i)W_i$
1	ABL Cash Fund	0.00284	0.00439	0.000012
2	ABL Government Securities Fund	0.00287	0.00116	0.000003
3	ABL Income Fund	0.00286	0.00101	0.000003
4	ABL Stock Fund	0.00372	0.03484	0.000130
5	AKD Aggressive Income Fund	0.0139	0.01008	0.000140
6	AKD Cash Fund	0.01424	0.00093	0.000013
7	AKD Index Tracker Fund	0.00324	0.05023	0.000163
8	AKD Opportunity Fund	0.01588	0.06717	0.001067
9	Alfalah GHP Alpha Fund	0.01784	0.03458	0.000617
10	Alfalah GHP Cash Fund	0.14165	0.00312	0.000442
11	Alfalah GHP Income Fund	0.02934	0.00537	0.000157
12	Alfalah GHP Income Multiplier Fund	0.01394	0.00401	0.000056
13	Alfalah GHP Money Market Fund	0.02844	-0.001	-0.000029

	Fund Name	Weights	$ER_t = \sum_{i=1}^{nt} \frac{R_{i,t}}{n_t}$	$(ER_i)W_i$
14	Alfalah GHP Sovereign Fund	0.03001	0.0151	0.000453
16	Alfalah GHP Stock Fund	0.03567	0.02314	0.000826
17	Alfalah GHP Value Fund	0.01645	0.02027	0.000333
18	Askari Asset Allocation Fund	0.01358	0.00399	0.000054
19	Askari Equity Fund	0.0322	0.03521	0.001134
20	Askari High Yield Scheme	0.02838	0.00137	0.000039
21	Askari Sovereign Cash Fund	0.02861	0.00281	0.000080
22	Askari Sovereign Yield Enhancer	0.02875	0.00516	0.000148
23	Atlas Gold Fund	0.02797	0.00843	0.000236
24	Atlas Income Fund	0.14417	0.00798	0.001150
25	Atlas Money Market Fund	0.14263	0.00343	0.000489
26	Atlas Sovereign Liquid Fund	0.02861	0.00774	0.000221
27	Atlas Stock Market Fund	0.13116	0.04737	0.006214
28	Dawood Income Fund	0.02108	0.00332	0.000070

$$R_{Pt} = ER_1W_1 + ER_2W_2 + ER_3W_3 + \dots + ER_{28}W_{28}$$

$$Rp = 0.014221$$

In the above table 2, weights and expected returns are mentioned against each Non-Islamic mutual fund for the calculation of Portfolio return. So, portfolio expected rate of return based on daily returns of Non-Islamic mutual fund is 0.014221. To convert this daily return into annual return the following formula is used:

$$\text{Annual Return} = [( \text{Daily return} - 1 )^{365} - 1] * 100$$

$$\text{Annual Return} = [(0.014221 + 1)^{365} - 1] * 100$$

Daily return is divided by 100 to convert it into decimal which becomes 0.00014221, so:

$$\text{Annual Return} = [(0.00014221 + 1)^{365} - 1] * 100$$

$$\text{Annual Return} = [1.0533 - 1] * 100$$

$$\text{Annual Return} = 5.32 \%$$

**Table 3: Sharpe Ratio**

Fund Type	$R_p$	$R_f$	$\sigma_p$	$SR = \frac{R_p - R_f}{\sigma_p}$
Islamic Mutual Funds	8.04 %	6.00 %	0.7843	0.026009
Non-Islamic Mutual Funds	5.32 %	6.00 %	1.9393	-0.003506

### Treynor Ratio

To compute the Treynor ratio there is need to compute the  $R_p$ ,  $R_f$ , and  $\beta_p$ . Portfolio betas for Islamic and non-Islamic mutual funds are calculated by using individual Betas and individual expected returns, for this purpose Covariance (Individual stock with market) and Variance of market are computed so that individual betas can be found. Covariance, Variance and Beta of Islamic and Non-Islamic mutual funds are computed in table 4 and table 5 respectively.

**Table 4: Islamic Mutual Funds (Covariance, Variance and Beta)**

#	Fund Name	$Cov_{im}$	$Var_m$	$\beta_i = \frac{Cov_{im}}{Var_m}$
1	ABL Islamic Income Fund	-0.00002921	0.00007229	-0.40406695
2	ABL Islamic Stock Fund	-0.00058167	0.00007229	-8.04634113
3	Al Meezan Mutual Fund	0.00183486	0.00007229	25.38193388
4	KSE Meezan Index Fund	0.00003665	0.00007229	0.50698575
5	Meezan Balanced Fund	0.00030294	0.00007229	4.19062111
6	Meezan Cash Fund	-0.00001683	0.00007229	-0.23281228
7	Meezan Financial Planning Fund	-0.00030738	0.00007229	-4.25204039
8	Meezan Financial Planning Fund	0.00013583	0.00007229	1.87895975
9	Meezan Gold Fund Missing	0.00000148	0.00007229	0.02047309
10	Meezan Sovereign Fund	-0.00007657	0.00007229	-1.05920598
11	Alfalah GHP Islamic Property Planning	-0.00003126	0.00007229	-0.43242496
12	Alfalah GHP Islamic Stock Fund	0.00015005	0.00007229	2.07566745
13	Askari Islamic Allocation Fund	0.00007566	0.00007229	1.04661779
14	Askari Islamic Income Fund	0.00000041	0.00007229	0.00567160
15	Atlas Islamic Income Fund	0.00019515	0.00007229	2.69954351
16	Dawood Islamic Fund	-0.00005487	0.00007229	-0.75902614
17	Faysal Islamic Savings Growth Fund	0.00046205	0.00007229	6.39161710
18	HBL Islamic Asset Allocation Fund	0.00005926	0.00007229	0.81975377
19	HBL Islamic Money Market Fund	0.00019018	0.00007229	2.63079264
20	HBL Islamic Stock Fund	-0.00011223	0.00007229	-1.55249689
21	PICIC Islamic Income Fund	-0.00003267	0.00007229	-0.45192973
22	PICIC Islamic Stock Fund	0.00012652	0.00007229	1.75017291
23	JS Islamic Fund	-0.00011223	0.00007229	-1.55249689
24	JS Islamic Government Securities Fund	-0.00003452	0.00007229	-0.47752110
25	Lakson Islamic Tactical Fund	-0.00015012	0.00007229	-2.07663577

**Table 5: Non-Islamic Mutual Funds (Covariance, Variance and Betas)**

#	Fund Name	$Cov_{im}$	$Var_m$	$\beta_i = \frac{Cov_{im}}{Var_m}$
1	ABL Cash Fund	0.00003578	0.00007229	0.494951
2	ABL Government Securities Fund	-0.00004028	0.00007229	-0.557200
3	ABL Income Fund	0.00012746	0.00007229	1.763176
4	ABL Stock Fund	-0.00026645	0.00007229	-3.685849
5	AKD Aggressive Income Fund	0.00020562	0.00007229	2.844377
7	AKD Index Tracker Fund	0.00003290	0.00007229	0.455111
8	AKD Opportunity Fund	0.00048363	0.00007229	6.690137
9	Alfalah GHP Alpha Fund	0.00033283	0.00007229	4.604095
10	Alfalah GHP Cash Fund	-0.00006122	0.00007229	-0.846867
11	Alfalah GHP Income Fund	-0.00003521	0.00007229	-0.487066
12	Alfalah GHP Income Multiplier Fund	-0.00010807	0.00007229	-1.494951
13	Alfalah GHP Money Market Fund	-0.00003875	0.00007229	-0.536035
14	Alfalah GHP Sovereign Fund	-0.00016890	0.00007229	-2.336423

	<b>Fund Name</b>	$Cov_{im}$	$Var_m$	$\beta_i = \frac{Cov_{im}}{Var_m}$
16	Alfalah GHP Stock Fund	0.00031804	0.00007229	4.399502
17	Alfalah GHP Value Fund	0.00026579	0.00007229	3.676719
18	Askari Asset Allocation Fund	0.00004717	0.00007229	0.652511
19	Askari Equity Fund	0.00047090	0.00007229	6.514041
20	Askari High Yield Scheme	-0.00003558	0.00007229	-0.492184
21	Askari Sovereign Cash Fund	0.00008500	0.00007229	1.175820
22	Askari Sovereign Yield Enhancer	0.00005717	0.00007229	0.790842
23	Atlas Gold Fund	-0.00027201	0.00007229	-3.762761
24	Atlas Income Fund	-0.00006412	0.00007229	-0.886983
25	Atlas Money Market Fund	-0.00002966	0.00007229	-0.410292
26	Atlas Sovereign Liquid Fund	-0.00004723	0.00007229	-0.653341
27	Atlas Stock Market Fund	0.00164132	0.00007229	22.704662
28	Dawood Income Fund	0.00010861	0.00007229	1.502421

In table 6 and 7 individual expected return and Betas are multiplied to compute the portfolio beta of Islamic and Non-Islamic mutual funds respectively.

**Table 6: Expected Return and Betas of Islamic Mutual Funds**

#	<b>Fund Name</b>	<b>Beta</b>	$ER_t = \sum_{i=1}^{n=t} \frac{R_{i,t}}{n_t}$	$(ER_i)\beta_i$
1	ABL Islamic Income Fund	-0.40406695	0.00137805	-0.00056
2	ABL Islamic Stock Fund	-8.04634113	0.06614288	-0.53221
3	Al Meezan Mutual Fund	25.38193388	0.04575315	1.161303
4	KSE Meezan Index Fund	0.50698575	0.04771169	0.024189
5	Meezan Balanced Fund	4.19062111	0.03771930	0.158067
6	Meezan Cash Fund	-0.23281228	0.00258867	-0.0006
7	Meezan Financial Planning Fund	-4.25204039	0.05299907	-0.22535
8	Meezan Gold Fund Missing	1.87895975	0.00503665	0.009464
9	Meezan Sovereign Fund	0.02047309	0.00408520	8.36E-05
10	Alfalah GHP Islamic Income Fund	-1.05920598	0.00068114	-0.00072
11	Alfalah GHP Islamic Stock Fund	-0.43242496	0.02061275	-0.00891
12	Askari Islamic Allocation Fund	2.07566745	0.01319893	0.027397
13	Askari Islamic Income Fund	1.04661779	-0.00056897	-0.0006
14	Atlas Islamic Income Fund	0.00567160	0.00003322	1.88E-07
15	Faysal Islamic Savings Growth Fund	2.69954351	0.07940798	0.214365
16	First Habib Islamic Balanced Fund	-0.75902614	0.00195488	-0.00148
17	HBL Islamic Money Market Fund	6.39161710	0.00653013	0.041738
18	HBL Islamic Stock Fund	0.81975377	0.00074341	0.000609
19	JS Islamic Fund	2.63079264	0.02169768	0.057082
20	JS Islamic Government Securities Fund	-1.55249689	0.05763796	-0.08948
21	Lakson Islamic Tactical Fund	-0.45192973	0.00185622	-0.00084

In the above table 6 individual betas ( $\beta$ ) and individual expected returns (ER) of Islamic mutual funds are mentioned against each mutual fund. Portfolio beta is calculated by using following formula:

$$\beta_p = ER_1\beta_1 + ER_2\beta_2 + ER_3\beta_3 + \dots + ER_{28}\beta_{28}$$

$$\beta_p = 0.78435$$

**Table 7: Expected Returns and Betas of Non-Islamic Mutual Funds**

#	Fund Name	Beta	$ER_t = \sum_{i=1}^{nt} \frac{R_{i,t}}{n_t}$	$(ER_i)\beta_i$
1	ABL Cash Fund	0.494951	0.004391	0.002173
2	ABL Government Securities Fund	-0.557200	0.001164	-0.00065
3	ABL Income Fund	1.763176	0.00101	0.001781
4	ABL Stock Fund	-3.685849	0.034841	-0.12842
5	AKD Index Tracker Fund	2.844377	0.010076	0.028659
6	AKD Opportunity Fund	0.455111	0.050234	0.022862
7	Alfalah GHP Alpha Fund	6.690137	0.06717	0.449377
8	Alfalah GHP Cash Fund	4.604095	0.034584	0.159229
9	Alfalah GHP Income Fund	-0.846867	0.003121	-0.00264
10	Alfalah GHP Income Multiplier Fund	-0.487066	0.005368	-0.00261
11	Alfalah GHP Money Market Fund	-1.494951	0.004014	-0.006
12	Alfalah GHP Sovereign Fund	-0.536035	-0.00103	0.000551
13	Alfalah GHP Stock Fund	-2.336423	0.015098	-0.03528
14	Alfalah GHP Value Fund	4.399502	0.023143	0.101818
15	Askari Asset Allocation Fund	3.676719	0.020266	0.074512
16	Askari Equity Fund	0.652511	0.003992	0.002605
17	Askari High Yield Scheme	6.514041	0.035206	0.22933
18	Askari Sovereign Cash Fund	-0.492184	0.001372	-0.00068
19	Askari Sovereign Yield Enhancer	1.175820	0.002811	0.003306
20	Atlas Gold Fund	0.790842	0.005156	0.004078
21	Atlas Income Fund	-3.762761	0.008431	-0.03172
22	Atlas Money Market Fund	-0.886983	0.00798	-0.00708
23	Atlas Sovereign Liquid Fund	-0.410292	0.003432	-0.00141
24	Atlas Stock Market Fund	-0.653341	0.007741	-0.00506
25	Dawood Income Fund	22.704662	0.047374	1.075614
26	AKD Cash Fund	1.502421	0.003323	0.004993

In the above table 7 individual betas ( $\beta$ ) and individual expected returns (ER) of Non-Islamic mutual funds are mentioned against each mutual fund. Portfolio beta is calculated by using following formula:

$$\beta_p = ER_1\beta_1 + ER_2\beta_2 + ER_3\beta_3 + \dots + ER_{28}\beta_{28}$$

$$\beta_p = 1.9393$$

**Table 8: Treynor Ratio**

Fund Type	$R_p$	$R_f$	$\beta_p$	$TR = \frac{R_p - R_f}{\beta_p}$
Islamic Mutual Fund	8.04 %	6.00 %	0.7843	0.0260
Non-Islamic Mutual Fund	5.32 %	6.00 %	1.9393	-0.0035

Treynor ratios of Islamic (TR=0.026) and Non-Islamic (TR= -0.0035) mutual funds are computed in table 8, positive value of TR of Islamic mutual funds shows the better performance as compared to the Non-Islamic mutual fund which is having negative value of TR. Higher the value of Treynor ratio means greater the performance of the mutual fund.

#### **Jenson Alpha**

Jenson's measure is a technique to find out the right return for its risk level of the portfolio. If portfolios value having the positive value, then the portfolio earns the extra returns. A positive value of Jenson's alpha means a fund manager can "beat the market". To compute the value of Jenson Alpha, daily average market return is calculated by using daily volume of KSE-100 index which is equal to 0.026267. This daily return is converted into annual return by using following formula:

$$\text{Annual Market Return} = [( \text{Daily return} - 1 )^{365} - 1] * 100$$

By putting the value of daily return in above equation, we have:

$$\text{Annual Market Return} = [(0.026267 - 1)^{365} - 1] * 100$$

Daily return is divided by 100 to convert it into decimal, then daily percentage return becomes 0.00026267, so:

$$\text{Annual Market Return} = [(0.00026267 + 1)^{365} - 1] * 100$$

$$\text{Annual Market Return} = [1.1006 - 1] * 100$$

$$\text{Annual Market Return} = 10.06 \%$$

Jenson alpha computed as:

$$\alpha_p = R_p - R_f + \beta_p (R_m - R_f)$$

Where

$\alpha_p$  = Jenson alpha,

$R_p$  = return of portfolio,

$R_f$  = risk free rate,

$\beta_p$  = beta of portfolio,

$R_m$  = return of the market.

**Table 9: Jensen Alpha**

Fund Type	$R_p$	$R_f$	$R_m$	$\beta_p$	Jensen Alpha
Islamic Fund	8.04 %	6.00 %	10.06	0.78435	0.051774
Non-Islamic Fund	5.32 %	6.00 %	10.06	1.9393	0.070772

The values of Jensen Alpha of Islamic (JA=0.051774) and Non-Islamic (JA= 0.070772) mutual funds are computed in table 9, higher value of Jensen Alpha of Islamic mutual funds shows the better performance as compared to the Non-Islamic mutual fund which is having lower value. Higher the value of Jensen Alpha greater the performance of the mutual fund.

#### **Data Envelopment Analysis (DEA) Approach**

In table 10 the inputs and outputs are computed by using the weights and amounts of all the Islamic mutual funds.

**Table 10: Data Envelopment Analysis (DEA)**

#	Islamic Mutual Funds						
	Funds	Input			Output		
		(v)	(x)	v*x	(u)	(y)	u*y
		Weight	Amount		Weight	Amount	
1	ABL Islamic Financial Planning	0.0399	112.8596	4.4987	0.0399	9.3926	0.3744
2	ABL Islamic Income	0.0036	10.2215	0.0369	0.0036	0.1378	0.0005
3	ABL Islamic Stock	0.0046	13.0285	0.0600	0.0046	6.6143	0.0304
4	Al Meezan Mutual	0.0052	14.6187	0.0755	0.0052	4.5753	0.0236
5	KSE Meezan Index	0.0222	62.7309	1.3899	0.0222	4.7712	0.1057
6	Meezan Asset Allocation	0.0204	57.6775	1.1749	0.0204	1.4055	0.0286
7	Meezan Balanced	0.0050	14.0230	0.0695	0.0050	3.7719	0.0187
8	Meezan Cash	0.0180	50.8648	0.9138	0.0180	0.2589	0.0047
9	Meezan Financial Planning	0.0244	68.9463	1.6789	0.0244	5.2999	0.1291
10	Meezan Gold Fund Missing	0.0181	51.2756	0.9284	0.0181	0.4085	0.0074
11	Meezan Sovereign	0.0362	51.2663	1.8545	0.0362	0.0681	0.0025
12	Alfalah GHP Islamic Income	0.0398	102.4160	4.0797	0.0398	3.8427	0.1531
13	Alfalah GHP Islamic Property Planning	0.0217	112.7867	2.4503	0.0217	2.0613	0.0448
14	Alfalah GHP Islamic Stock	0.0372	61.5099	2.2856	0.0372	1.3199	0.0490
15	Askari Islamic Allocation	0.1809	105.2051	19.037	0.1809	-0.0569	-0.0103
16	Askari Islamic Income	0.0362	102.3718	3.7015	0.0362	0.0033	0.0001
17	Atlas Islamic Income	0.0610	512.3211	31.228	0.0610	7.9408	0.4840
18	Dawood Islamic	0.0366	172.5806	6.3199	0.0366	0.1955	0.0072
19	Faysal Asset Mgt Ltd	0.0375	103.6840	3.8831	0.0375	0.6530	0.0245
20	First Habib Islamic Balance	0.0377	106.0354	3.9999	0.0377	1.5740	0.0594
21	HBL Islamic Asset Allocation	0.0360	106.8030	3.8483	0.0360	0.0743	0.0027
22	HBL Islamic Money Market	0.0472	102.0174	4.8109	0.0472	2.1698	0.1023
23	HBL Islamic Stock	0.0281	133.5184	3.7488	0.0281	5.7638	0.1618
24	PICIC Islamic Income	0.0360	133.6205	4.8039	0.0360	0.1856	0.0067
25	PICIC Islamic Stock	0.0472	79.4951	3.7517	0.0472	2.6154	0.1234
26	JS Islamic	0.0281	79.4951	2.2320	0.0281	5.7638	0.1618
27	JS Islamic Government Securities	0.0360	101.7924	3.6597	0.0360	0.1757	0.0063
28	Lakson Islamic Tactical	0.0376	106.3522	3.9949	0.0376	0.2236	0.0084
<b>Weighted Sum of Input / Output</b>				<b>120.52</b>	<b>2.1108</b>		

In table 11 the inputs and outputs are computed by using the weights and amounts of all Non-Islamic mutual funds.

**Table 11: Data Envelopment Analysis (DEA)**

#	Non-Islamic Mutual Funds						
	Funds	Input			Output		
		(v)	(x)	v*x	(u)	(y)	u*y
		Weight	Amount		Weight	Amount	
1	ABL Cash	0.0028	10.1992	0.0290	0.0028	0.4390	0.0012
2	ABL Government Securities	0.0029	10.3174	0.0296	0.0029	0.1160	0.0003
3	ABL Income	0.0029	10.2623	0.0294	0.0029	0.1010	0.0003
4	ABL Stock	0.0037	13.3387	0.0496	0.0037	3.4840	0.0130
5	AKD Aggressive Income	0.0139	49.8679	0.6932	0.0139	1.0080	0.0140
6	AKD Cash	0.0142	51.1022	0.7277	0.0142	0.0930	0.0013
7	AKD Index Tracker	0.0032	11.6268	0.0377	0.0032	5.0230	0.0163
8	AKD Opportunity	0.0159	56.9836	0.9049	0.0159	6.7170	0.1067
9	Alfalah GHP Alpha	0.0178	63.9996	1.1418	0.0178	3.4580	0.0617
10	Alfalah GHP Cash	0.1417	508.2870	71.9989	0.1417	0.3120	0.0442
11	Alfalah GHP Income	0.0293	105.2736	3.0887	0.0293	0.5370	0.0158
12	Alfalah GHP Income Multiplier	0.0139	50.0071	0.6971	0.0139	0.4010	0.0056
13	Alfalah GHP Money Market	0.0284	102.0386	2.9020	0.0284	-0.1000	-0.0028
14	Alfalah GHP Sovereign	0.0300	107.6783	3.2314	0.0300	1.5100	0.0453
15	Alfalah GHP Stock	0.0357	127.9980	4.5657	0.0357	2.3140	0.0825
16	Alfalah GHP Value	0.0165	59.0363	0.9711	0.0165	2.0270	0.0333
17	Askari Asset Allocation	0.0136	48.7368	0.6618	0.0136	0.3990	0.0054
18	Askari Equity	0.0322	115.5395	3.7204	0.0322	3.5210	0.1134
19	Askari High Yield Scheme	0.0284	101.8316	2.8900	0.0284	0.1370	0.0039
20	Askari Sovereign Cash	0.0286	102.6738	2.9375	0.0286	0.2810	0.0080
21	Askari Sovereign Yield Enhancer	0.0288	103.3337	2.9708	0.0288	0.5160	0.0148
22	Atlas Gold	0.0280	100.3475	2.8067	0.0280	0.8430	0.0236
23	Atlas Income	0.1442	517.3218	74.5823	0.1442	0.7980	0.1150
24	Atlas Money Market	0.1426	511.7944	72.9972	0.1426	0.3430	0.0489
25	Atlas Sovereign Liquid	0.0286	102.6719	2.9374	0.0286	0.7740	0.0221
26	Atlas Stock Market Fund	0.1312	470.6648	61.7324	0.1312	4.7370	0.6213
27	Dawood Income	0.0211	75.6369	1.5944	0.0211	0.3320	0.0070
<b>Weighted sum of Inputs / Outputs</b>				<b>320.928</b>			<b>1.4222</b>



By using the following formula Efficiency of Islamic and Non-Islamic mutual fund is measured:

$$\text{Efficiency} = \frac{\sum u_r y_{rj}}{\sum v_i x_{ij}} \leq 1 \text{ for each unit } j.$$

$$\text{Efficiency} = \frac{\text{Weighted sum of outputs}}{\text{Weighted sum of Inputs}}$$

**Table 12: Data Envelopment Analysis**

Fund Type	Weighted sum of output	Weighted sum of Input	$\text{Efficiency} = \frac{\text{weighted sum of outputs}}{\text{Weighted sum of inputs}}$
Islamic Mutual Fund	2.1108	120.5158	0.017514
Non-Islamic Mutual Fund	1.4222	320.9287	0.004432

In table 12 the results of Data Envelopment Analysis (DEA) approach are given, where the value of efficiency of Islamic (0.017514) mutual fund is higher as compared to the Non-Islamic (0.004432) mutual fund which shows that the Islamic mutual fund is more efficient than the Non-Islamic funds.

**Conclusion**

This study evaluated risk adjusted performance of portfolio of Islamic and Non-Islamic mutual funds taking the 30 funds in each portfolio. The eight years’ data of daily returns of all these 60 funds (30-Islamic and 30-non-Islamic) from January 2010 to January 2017 is used to analyse the performance of both funds. Four number of performance measuring techniques which are Sharpe ratio, Treynor ratio, Jensen alpha and Data Envelopment Analysis (DEA) are used to analyse the performance of both the portfolios.

Daily Net Asset Values (NAV) of selected funds were taken from the online source of Mutual Fund Association of Pakistan (MUFAP). Daily returns and weights of each fund are calculated based on NAV. By using these returns and weights, expected portfolio returns of both Islamic and non-Islamic mutual funds are calculated. Covariance of each mutual fund with the market ( $Cov_{im}$ ), variance of market ( $Var_m$ ) are calculated to compute the Beta ( $\beta_i = \frac{Cov_{im}}{Var_m}$ ) of each mutual fund in both portfolios. These individual betas and weights are used to calculate the Portfolio Systematic risk ( $\beta p$ ) of Islamic and non-Islamic mutual fund portfolios. Daily market rate of return ( $R_m$ ) is calculated by using the volume of KSE-100 index whereas the rate of 6 months Govt. Treasury bill is used as risk free return ( $R_f$ ). All these daily returns are then converted into annual return to streamline the final calculations of three performance measures (Sharpe ratio, Treynor ratio, Jensen alpha). For the calculations of the data envelopment analysis approach the NAVs are considered as inputs and returns are considered as outputs.

The Sharpe ratio of Islamic mutual fund (SR=0.026) is higher than the Non-Islamic mutual fund (SR=0.003506) which shows the better performance of Islamic mutual fund. Portfolio return of Islamic mutual fund ( $Islamic R_p = 8.04\%$ ,  $Non - Islamic R_p = 5.32\%$ ) is higher than the non-Islamic mutual fund and risk-free rate ( $R_f = 6.25\%$ ) which is also shows that the Islamic mutual funds are giving better return as compare to the non-Islamic mutual fund. These both portfolios are considered as diversified portfolios so that there is only systematic risk exist so that the risk of these portfolios are to be evaluated on the basis of systematic risk only. So that the Systematic risk ( $\beta p = 0.784$ ) of Islamic portfolio is less than the non-Islamic portfolio ( $\beta p = 1.9393$ ) which

means that Islamic mutual funds not only giving the better returns but also with bearing the minimum risk level. The results of the Teynor ratio shows the same findings as Sharpe ratio in which Islamic mutual funds are shown better performance as compare to the non-Islamic mutual funds. The results of the Sharpe ratio and Treynor ratio is aligned with the studies of Sipra (2006), Ali and Qudous (2012), Arslan, Nawaz, and BASHIR (2015), Arora (2016); Arora (2016); Al-Khazali, Leduc, and Alsayed (2016).

Whereas the results of Jenson alpha are showing the opposite results with Treynor and Sharpe ratio in which value of Jenson Alpha of Islamic mutual fund ( $JA=0.051774$ ) is lower as compare to non-Islamic mutual fund ( $JA=0.070772$ ). According to Jenson alpha the non-Islamic mutual funds showing better performance and the relationship of risk and return becomes true that "higher the risk, higher the return". The results of Jensen Alpha ratio is aligned with the studies of Arslan et al. (2015); Ahmad, Roomi, Ramzan, Zia-ur-Rehman, and Baig (2015); Al-Khazali et al. (2016); Sipra (2006).

Data envelopment analysis results shown the higher efficiency of Islamic mutual fund having the higher value of Efficiency (0.017514) whereas in case of non-Islamic mutual funds the value of Efficiency (0.00443) is lower shown the low efficiency of non-Islamic mutual funds. After the evaluating the results of four performance measuring techniques it is come to know that there are three techniques showing the results in the favour of Islamic mutual funds and only one technique showing the results in the favour of non-Islamic mutual fund performance. Ultimately, we can say that Islamic mutual funds giving better results and showing better performance as compare to the non-Islamic mutual funds.

### References

- Abdullah, F., Hassan, T., & Mohamad, S. (2007). Investigation of performance of Malaysian Islamic unit trust funds: Comparison with conventional unit trust funds. *Managerial Finance*, 33(2), 142-153.
- Ahmad, W., Roomi, M. S., Ramzan, M., Zia-ur-Rehman, M., & Baig, S. A. (2015). A Comparative Study on Performance of Open and Close-ended Mutual Funds in Pakistan. *International Journal of Accounting and Financial Reporting*, 5(1), 300-314.
- Al-Khazali, O. M., Leduc, G., & Alsayed, M. S. (2016). A market efficiency comparison of Islamic and non-Islamic stock indices. *Emerging Markets Finance and Trade*, 52(7), 1587-1605.
- Ali, R., & Qudous, R. A. (2012). Performance Evaluation of Mutual Funds in Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, 3(9), 1076-1083.
- Arora, K. (2016). An Empirical Investigation into Market Risk and Investment Performance of Mutual Funds in India. *BVIMSR's Journal of Management Research*, 8(2), 95.
- Arslan, S. N. A. U. M., Nawaz, M. S., & BASHIR, D. T. (2015). Risk Adjusted Performance Evaluation of Balanced Mutual Fund Schemes in Pakistan. *Risk*, 7(1).
- Avramov, D., & Wermers, R. (2006). Investing in mutual funds when returns are predictable. *Journal of Financial Economics*, 81(2), 339-377.
- Blake, D., & Timmermann, A. (1998). Mutual fund performance: evidence from the UK. *Review of Finance*, 2(1), 57-77.
- Fama, E. F., & Miller, M. H. (1972). *The theory of finance*: Holt Rinehart & Winston.
- Farrell, M. J., & Fieldhouse, M. (1962). Estimating efficient production functions under increasing returns to scale. *Journal of the Royal Statistical Society. Series A (General)*, 252-267.
- Giff, P. R. (2012). *All the way home*: Yearling.

- Gohar, R., Ahmed, S., & Niazi, U. (2011). Performance Comparison of mutual funds in Pakistan. *African Journal of Business Management*, 5(14), 5583.
- Gupta, A., Kothari, L., Dhruva, A., & Bapna, R. (1975). Surgical sterilization by vasectomy and its effect on the structure and function of the testis in man. *British Journal of Surgery*, 62(1), 59-63.
- Hayat, R., & Kraeussl, R. (2011). Risk and return characteristics of Islamic equity funds. *Emerging Markets Review*, 12(2), 189-203.
- Ho, C. S. F., Rahman, N. A. A., Yusuf, N. H. M., & Zamzamin, Z. (2014). Performance of global Islamic versus conventional share indices: International evidence. *Pacific-Basin Finance Journal*, 28, 110-121.
- Jawadi, F., Jawadi, N., & Louhichi, W. (2014). Conventional and Islamic stock price performance: An empirical investigation. *International Economics*, 137, 73-87.
- Jensen, M. C. (1968). The performance of mutual funds in the period 1945–1964. *The Journal of finance*, 23(2), 389-416.
- Mansor, F., & Bhatti, M. (2009). The Performance of Islamic mutual funds: The Malaysian Case. Paper presented at the 14th Annual Banking and Finance Conference, Melbourne University, September.
- Nafees, B., Shah, S. M. A., & Khan, S. (2011). Performance evaluation of open end and close end mutual funds in Pakistan. *African Journal of Business Management*, 5(28), 11425.
- Nawang, W., Rasyidah, W., & Bashir, M. S. (2011). Islamic and Conventional Unit Trusts in Malaysia: A Performance Comparison. *Journal of Islamic Economics, Banking and Finance*, 7(4), 9-24.
- Obaidullah, M. (2005). Islamic financial services.
- Revell, J. (1973). Investment Trust Companies and Unit Trusts *The British Financial System* (pp. 444-484): Springer.
- Shah, I. U., Iqbal, J., & Malik, M. F. (2012). Comparative valuation between Islamic and conventional mutual fund. *International Research Journal of Finance and Economics*, 96, 29-33.
- Sharpe, W. F. (1966). Mutual fund performance. *The Journal of business*, 39(1), 119-138.
- Sipra, N. (2006). Mutual fund performance in Pakistan, 1995-2004. *Centre for Management and Economic Research (CMER)*, 1-14.
- Yao, Y., Xu, L., & Liu, Z. (2010). Taking away the voting powers from controlling shareholders: evidence from the Chinese securities market. *Journal of International Financial Management & Accounting*, 21(3), 187-219.