Do Pakistani Open End Mutual Funds Provide Fair Return against Risks Taken? A Risk Adjusted Performance Evaluation of the Industry

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Abstract

This study evaluates the level of risk in the returns of Open-Ended mutual funds in Pakistan for the period 2008 to 2016. The assets under management of Open-Ended funds increased to Rs 380 billion in 2014.The increase in assets is not as much as the increase in the number of Asset Management Companies. About 150 new Open-Ended funds are introduced in the market from 2008 to 2014. This study analyzes mutual funds through traditional risk adjusted measures such as Sharpe ratio, Treynor ratio, Jensen alpha and M2 measure. The results of the risk evaluation metrics depict negative risk adjusted returns to per unit of risk taken by the investors. The underperformance is mainly due to the reason that funds managers were unable to provide better returns than risk free rate.

Keywords: *Mutual Funds; Open-Ended funds; Risk Adjusted Performance; Asset Management Companies.*

Introduction

Mutual funds (MFs) industry all over the world managed financial assets of more than 31trillion U.S dollars in 2014 ("Assets of global mutual funds", 2015).MFs have shown tremendous growth both in number of funds and assets (Keshwani, 2008).A mutual fund is an investment security that enables investors to pool their money into one professionally managed investment (Mahoney, 2004). Assets management companies (AMCs) invest these funds pooled from investors into diversified financial securities (such as equities, money market or fixed income instruments) that matches their investment objectives (Clair et al., 2014). Investors of MFs receive returns in the form of dividends, received by funds mangers from investing inequities or in the form of interest received by investing in fixed income securities.

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Investor can also earn from the price appreciation of the fund. AMCs share earnings to its unit holders in proportion to the number of units owned by them (Keshwani, 2008).

Mutual funds have mainly three benefits to their investors. First, they minimize the risk associated with the stock market investment by diversification; second, these investments in the stock market are thoroughly managed by the professional managers; and third, small investors are allowed to hold a diversified portfolio because of pooling of investment funds (Gruber, 1996).

Mutual fund industry has shown an incredible growth over the last few years throughout the world including Pakistan. MFs industry in Pakistan started with the NIT (National Investment Trust) as an open-end fund in 1962 (Nafees et al., 2011), followed by Investment Corporation of Pakistan (ICP) as a closed-end mutual fund in 1966. Despite the growth and popularity of MFs industry, it was unsuccessful in catching the attention of most of the investors and researchers in Pakistan, until recently when a number of financial institutions introduced MFs on a private level.

The regulator of MFs industry, Securities and Exchange Commission of Pakistan (SECP) is very stern in their decisions about issuing licenses to AMCs. The SECP continuously monitor MFs through financial reports submitted to SECP on regular intervals. SECP also conducts on-site inspections of the AMCs. One of the reasons for regularizing AMCs through monitoring is to minimize its risk and to ensure that investors are not expropriated of their funds.

All investment bears some level of risk and it is not guaranteed that you will receive more than you have invested. Risk is volatility in the market. Different securities have different level of risk. Investor's choice of investment depends upon investor personal risk tolerance (Rego, 2013).The risk level of mutual funds depends on their investment in other securities; for example, equity funds are riskier than income funds. Mutual funds try to minimize the associated risk with investment by diversification. However, they are not immune to risk. It is usually assumed that funds with higher risk have higher returns as well, but it is not always true. Investor should always closely scrutinize the determinants of risk and return of mutual funds before making their investment decisions.

MFs' performance cannot be evaluated only by their returns because of its associated risk (Sipra, 2006). MFs show development both in assets and funds they managed in the recent few years. MFs are considered less risky as compared to direct investment in capital market, because they diversify the risk well by investing in a number of different

stocks. For MFs investments, risk include variability, or period-by-period fluctuations in total return. Thus, this study evaluates the mutual funds' (open-end) performance on risk-adjusted basis. i.e. how much risk was taken for each unit of return. This study would be a valuable addition to the existing studies, as it examines more numbers as well as various types of mutual funds as compared to previous studies conducted in Pakistan about mutual funds. It will also benefit the investors in taking decision on risk-adjusted basis whether to invest directly in the market or to invest indirectly in mutual funds.

Literature Review

Survivorship Biasness is discussed in detail. Moreover, factors such as Expenses; Management style; funds turnover and Persistence in performance are reviewed and critically discussed.

Prior studies report different determinants of mutual funds' (MFs) performance. These factors include but are not limited to size of the fund, manager style, funds age, turnover and management fees, persistence in performance, economic growth, financial progress, role of regulatory authorities and law enforcement, structure of mutual fund industry and others (Chen et al.2004; Khorana etal.2009).Ferreira et al. (2009) study US market in comparison to international MFs market and report that both international and domestic funds show persistence in performance on a short run. However, the persistence in domestic funds outside USis much weaker than US domestic funds. Similar results and conclusions are also reported by Muga et al. (2007) and Noulas et al. (2005) for US market.

However, Tirapat (2004) reports opposite results for Thailand's market and concludes that there is no persistence in performance of MFs. Others report that managers' styles also effect MFs performance. For example, Cuthbertson and Nitzsche (2012) argue that poor performance of mutual funds in Germany is due to unskillful managers rather than being unlucky. Cortez et al. (2010) find that Portuguese MFs performance is reduced to large extent when returns are adjusted for risk. Thus, performance of mutual funds is mainly dependent on performance of mutual fund managers and their risk adjustment ability.

Factors Affecting Mutual Funds Performance

Prior research reports that performance of MFs is dependent upon multiple determinants. For example, Elton et al. (1993) report that US MFs are negatively related to expenses. Moreover, Droms and Walker (1995) present evidence that load and no load status of the funds using

unadjusted and risk adjusted returns have no difference in performance. All the above studies report evidence for developed countries.

Others study developing economies for small MFs industry and comparatively less regulated and weak enforcement markets (Shah &Hijazi, 2004). One such study is on Pakistan MFs market of Afza and Rauf (2009) who study determinants of MFs such as expenses, age, loads, liquidity and fund size. They find that lagged return: distribution fees and liquidity had significant impact on the performance of the fund.

Mutual fund performance can be affected by different factors. Carhart (1997) and Dellva and Olson (1998) study these factors and find that several cost associated factors like redemption fees, sales load, transaction costs and expense ratio affect the performance of MFs adversely. Others study factors such as growth of MFs, asset turnover; expenses, family proportion and management fees etc and report different conclusions. These studies report that performance of MFs are strongly affected by these factors along with others. Some of the factors are mentioned in the following paras along with empirical studies.

Survivorship Biasness

Survivorship Biasness is the misleading and exaggeration of results in the performance of MFs affected by the funds who did not survive for the period of observation (Elton et al.1996). Otten and Bams (2004) likewise report that oversight of MFs that do not survive in the period of evaluation from the sample results in exaggerated returns. Shah and Hijazi (2005) argue that MFs industry in Pakistan is in developmental phase. They evaluate equity and balance MFs in the span of seven years (1997 to 2004) after correcting for survivorship biasness. They find that some funds underperform and the reason is lack of diversification. They suggest the MFs managers to disclose the level of risk associated with return in their financial reports.

Funds Manager Style and Funds Turnover

Mutual fund managers play an important role in establishment and growth of the funds. Asebedo and Grable (2004) report that fund manager style, experience and turnover are important factor that affect the performance of MFs as all decisions regarding investment of the fund are regulated by fund manager. An experienced manager tends to react more efficiently and effectively to diverse market situations as compared to their fresh counterparts. For example, Golec (1996) finds evidence thatfunds manager style (experience) improves performance of MFs.

Persistence in Performance of Mutual Funds

Investors tend to invest in those funds, which show persistence in their superior performance. Carhart (1997) argues that a single year good performance of portfolio cannot be taken for granted as persistence

future good performance. Goetzmann and Ibbotson (1994) premise that future performance can be predicted from past performance. They find evidence to their theory and argue that funds that performed superior also perform in future. Wermers (2003) finds that persistence in MFs return persists over the years. However, Detzler (1999) claims that persistence in good performance of MFs does not exist in efficient market and the superior performance is simply because of luck.

Empirical Evidence for Mutual Funds Risk-Returns Relationship

An efficient fund's portfolio returns have a linear relation with its risk. This relationship is measured by their standard deviation, which is illustrated by Capital Market Line (CML).MFs performance is used to analyze the relationship of risk and returns. Sharpe (1966) analyzes fund's returns compared to unit of risk taken by MFs. Sharpe studied 34 MFs for the period of 1954 to 1963 for risk and return and argues that fund with higher risk will get higher returns. He finds results consistent with assumptions. Jensen (1969) studies the correlation between market sensitivity (Beta) and the expected returns of MFs and reports that higher return is linked to higher volatility.

Prior studies show how different factors affect the performance of MFs. The risk return analysis helps investors to make choices according to their risk tolerance ability. This is important from the investors' perspective to know whether funds mangers are investing in risky investment to boost their performance or expropriating investments. Pakistani MFs industry needs to be empirically analyzed for risk-adjusted basis. Most of the studies in Pakistani MFs industry analyze both the open-ended and close ended funds, even though open end funds follows index way better than close ended funds (Bekaert & Urias, 1998). Thus, this study focuses on open-ended MFs by using four well-known Risk Adjusted Measures i.e. Treynor Ratio, Sharpe ratio, Jensen Alpha, and Modigliani Measure.

Research Methodology

This study is using four risk-adjusted measures; they are Sharpe ratio (1966), Treynor index (1965), Jensen alpha (1967) and Modigliani measure (1997). The first three models are commonly used by Shah and Hijazi (2004), Sipra(2006), Panwar and Madhumati (2006), and Haslem et al. (2008). Modigliani measure is relatively new addition to risk adjusted performance model as earlier studies did not use this model to evaluate Pakistani MFs industry. The results attained from the application of the above risk-adjusted measures are used as a performance measure of the individual fund and as well as of the overall open end mutual fund industry. The following paras individually explains each measure along with its relative justification.

Treynor Ratio

Treynor ratio, also called the Treynor index, is a measure of risk premium per unit of systematic risk. In this ratio instead of total risk of the portfolio, systematic risk is used as a risk parameter. Portfolio diversification cannot results in elimination of systematic risk. Beta is the parameter used for measurement of systematic risk.TheTreynor Ratio is the excess return or risk premium of a portfolio, divided by the beta or can be expressed by the following equation

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

where Rp is the portfolio return, Rf is the risk free rate and бpis Beta of the portfolio.

Sharpe Ratio

Sharpe Ratio is the most commonly used risk-adjusted measure, also called return to variability ratio developed by William Sharpe. This ratio in contrast to systematic risk used in total risk; the total risk of the portfolio is measured by Standard Deviation. The numerator is the reward for investing in risky portfolio in excess to that of risk free rate while denominator shows the variability in returns of the portfolio.
The Sharpe Ratio is calculated by using the following Equation:

$$\textbf{Sharpe Ratio} = \frac{(\bar{R}p - Rf)}{Бp}$$

Where Rp is the portfolio return, Rf is the risk free rate and бpis Standard deviation of the portfolio. The higher the Sharpe ratio represents higher portfolio returns and better portfolio performance per unit of risk and vice versa.

Jensen's Alpha Measure

The Jensen's (1968) measure is absolute risk adjusted performance measure given by the average portfolio return minus the theoretical predicted return by Capital Asset Pricing Model (CAPM).The Jensen's Alpha is calculated by using following equation:

$$\alpha = \bar{R}p - [Rf + \beta p\,(Rm - Rf)]$$

Jensen's Alpha = Average Portfolio Return – CAPM
where Rp is the portfolio return, Rf is the risk free rate, βp is the Beta of the portfolio and Rm is market return.

Modigliani Risk Adjusted Performance Measure

Modigliani-Modigliani or M2 measure developed by Franco Modigliani, a winner of Nobel Memorial Prize in economics and his granddaughter

Leah Modigliani, an Investment banker in 1997.Modigliani Measure derived from Sharpe ratio is used in this study because the results are in percentage form, which helps in comparing the investments, whose Sharpe ratio results are negative. This measure is used to examine how much investors are rewarded for the amount of risk they have takenin comparison to market risk free rate and market benchmark portfolio. M2 is calculated by using following Equation:

$$\text{Modigliani Measure} = Rf + (Rp - Rf) \times \frac{\sigma m}{\sigma p}$$

where Rp is the portfolio return, Rf is the risk free rate, σm is Standard deviation of the market benchmark portfolio and σp Standard deviation of the portfolio. This study is using M2 for the first time to evaluate the risk adjusted performance of mutual funds in Pakistan.

Sample

A total of forty seven Open-ended conventional MFs are analyzed for risk adjusted based performance. The funds in the sample are categorized into Equity Funds, Income Funds, Aggressive Income Funds, Asset Allocation Funds, Balanced Funds, Funds of Funds, and Index Funds. These funds are selected because of the availability of data for the whole period of analysis.

Variables Used in Analysis

Treasury bills rate (T-bills) is used as risk free rate, which is determined by taking the Geometric mean of the 6 months t-bills auctions presented by the State Bank of Pakistan (SBP) from the year 2008 to 2016. T-bills rate is the best available Risk free rate as it is offered by the central bank and backed by the government. Average Portfolio returns are calculated from daily Net Asset Value of the individual funds. Daily KSE-100 index points data is used to measure market return. KSE-100 index, the most trusted proxy for the performance of overall Pakistan's stock market is used as a benchmark for Equity related Funds. Islamic Equity funds are not analyzed in this study because of the benchmark bias, as the Islamic funds are Sharia Compliant and their performance must not be compared with same set of benchmarks as conventional MFs. Pakistani Bond market is not mature enough to produce a Fixed Income Index that can be used as benchmark for Income Funds. Karachi Interbank Offer Rate (KIBOR) is used by majority of Asset Management Companies (AMC) as a benchmark for the performance of Income funds. This study has taken average of 6-months KIBOR rate and is used as a benchmark for Income Funds and Aggressive Income funds.Net Asset Values (NAV) for individual funds are collected from the Mutual Funds Association of Pakistan website for the period ranging from 2008 to

2016. KSE-100 index data has been collected from Yahoo Finance website. KIBOR and Treasury bills data are collected from the State Bank of Pakistan's website.

Methodology

The risk adjusted performance models require different inputs to evaluate the performance of MFs. The following paras illustrate the models and its measurements in details.

First of all Portfolio returns are calculated by using the following formula:

Rp= (Ending NAV / Beginning NAV)-1

Daily Net Asset Value of individual fund is taken from July 2008 to June 2016.The market return (Rm) is calculated by the same formula, but instead of NAV, KSE-100 index daily close price is taken.

The next input is the calculation of Standard Deviation of the portfolios. Standard Deviation shows the inconsistency in the returns of the funds. Standard Deviation tells us about the total risk and diversification capability of the fund.

Beta is measured as;

$$\beta_p = \frac{Covariance\ (Rp, Rm)}{Variance\ (Rm)}$$

Where βp is the portfolio Beta, Covariance (Rp , Rm) shows covariance between portfolio and market returns and Variance (Rm) is market's return Variance. All these inputs are calculated for the individual funds and are used for the above-referred four risks-adjusted metrics to evaluate the performance of Open-Ended MFs of Pakistan for the period July 2008 to June 2016.

Results

This section present analysis and results of the paper. This section is divided into two main sub-sections; the first sub-section is Equity Funds, Asset Allocation Funds, Balanced Funds, Fund of funds and Index Tracker funds with their Average Returns, Standard deviation, Beta and then analyzed on the four performance metrics while the second sub-section discusses Income Funds and Aggressive Income Funds.

Average Returns, Standard Deviation and Beta

Table 1 compares of the Average Returns for Equity Funds, Asset Allocation Funds, Balanced Funds, Fund of funds and Index Tracker funds with market. It also ranks the average returns of all the funds benchmarked with KSE-100 index. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents average returns measured as portfolio returns = (Ending NAV / Beginning NAV)-1 and then average of these returns are taken for each

fund. The table is ranked from high to low returns on the basis of column 3

Table 1

Rank	Mutual Fund	Average Returns
1	Akd Oppurtunity Fund	0.0084
2	Picic Energy Fund	0.0083
3	Faisal Asset Allocation Fund	0.0083
4	Akd Index Tracker	0.0083
5	Atlas Stock Market Fund	0.0080
6	Pakistan Strategic Allocation	0.0062
7	Hbl Multi Asset	0.0061
8	First Capital Mutual Fund	0.0060
9	Unit Trust Of Pakistan	0.0058
10	Nafa Multi Asset	0.0057
11	Nafa Stock Fund	0.0054
12	Js Large Cap Fund	0.0046
13	Alfalah Ghp Alpha Fund	0.0046
14	Js Growth Fund (A)	0.0044
15	National Investment Unit Trust	0.0038
16	Hbl Stock Fund	0.0035
17	Crosby Dragon Fund	0.0035
18	Js Funds Of Funds	0.0034
19	Pak Oman Advantage	0.0020
20	Alfalah Ghp Value	0.0019
21	Mcb Dynamic All	0.0016
22	Kasb Asset	0.0014
23	Pakistan Capital	0.0013
24	United Stock Advantage Fund	-0.0003
25	Askari Asset All	-0.0019
26	Faysal Balanced Growth	-0.0019
27	Js Value Fund (A)	-0.0020
28	Js Agressive Asset Allocation	-0.0184
	Average of Returns	**0.0031**
	Average Market Return	**0.0148**

Table 1 above shows that Average Returns are 0.31 % less than the average return of the market i.e.1.49%, which indicates the poor performance of the funds for the study period. AKD Opportunity Fund is top ranked in the table of average return with return of 0.84%, which is 0.65% less than the average market return while JS Aggressive Allocation Fund have the lowest among all with a return of -1.85%.

Table 2 compares of the standard deviation for Equity Funds, Asset Allocation Funds, Balanced Funds, Fund of funds and Index Tracker funds with market. It also ranks the standard deviation of all the funds benchmarked with KSE-100 index. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents standard deviation measured by using formula in excel. The table is ranked from high to low standard deviation on the basis of column 3.

Table 2

Rank	Mutual Fund	Standard Deviation
1	Js Agressive Asset Allocation	0.1237
2	United Stock Advantage Fund	0.1121
3	Js Large Cap Fund	0.0973
4	Atlas Stock Market Fund	0.0964
5	Akd Oppurtunity Fund	0.0881
6	Picic Energy Fund	0.0839
7	Nafa Stock Fund	0.0809
8	Js Growth Fund (A)	0.0789
9	Hbl Stock Fund	0.0779
10	Crosby Dragon Fund	0.0779
11	Pakistan Strategic Allocation	0.0772
12	National Investment Unit Trust	0.0742
13	Askari Asset All	0.0736
14	Faisal Asset Allocation Fund	0.0721
15	Akd Index Tracker	0.0721
16	First Capital Mutual Fund	0.0706
17	Alfalah Ghp Alpha Fund	0.0697
18	Js Value Fund (A)	0.0682
19	Faysal Balanced Growth	0.0612
20	Js Funds Of Funds	0.0582
21	Unit Trust Of Pakistan	0.0579
22	Pakistan Capital	0.0546
23	Hbl Multi Asset	0.0535
24	Nafa Multi Asset	0.0529
25	Alfalah Ghp Value	0.0520
26	Mcb Dynamic All	0.0502
27	Pak Oman Advantage	0.0430
28	Kasb Asset Allocation Fund	0.0419
	Average Бp of Funds	**0.0722**
	Average Бm of Market Benchmark	**0.0761**

Table 2 shows that Average Standard Deviation of the funds is 0.072 which is better than the market standard deviation of 0.076. JS Aggressive Asset Allocation Fund has the largest standard deviation of 0.124 and KASB Asset Allocation Fund has the lowest standard deviation of 0.042.

Table 3 presents the Beta of the individual funds, as Beta of the market is defined to be 1. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents Beta measured by Calculating covariance between portfolio and market returns and divided by the variance of market return. The table is ranked from high to low Beta on the basis of column 3.

Table 3

Rank	Mutual Fund	Beta
1	Nafa Stock Fund	0.9694
2	Js Growth Fund (A)	0.9501
3	Picic Energy Fund	0.9373
4	Pakistan Strategic Allocation	0.9023
5	Faisal Asset Allocation Fund	0.8908

6	Akd Index Tracker	0.8908
7	United Stock Advantage Fund	0.8820
8	First Capital Mutual Fund	0.8629
9	Js Large Cap Fund	0.8613
10	Akd Oppurtunity Fund	0.7938
11	Js Value Fund (A)	0.7028
12	Atlas Stock Market Fund	0.6640
13	Nafa Multi Asset	0.6087
14	National Investment Unit Trust	0.5804
15	Hbl Stock Fund	0.5776
16	Crosby Dragon Fund	0.5776
17	Askari Asset All	0.5645
18	Hbl Multi Asset	0.5237
19	Faysal Balanced Growth	0.5088
20	Alfalah Ghp Value	0.5003
21	Alfalah Ghp Alpha Fund	0.4800
22	Pakistan Capital	0.4393
23	Unit Trust Of Pakistan	0.4127
24	Kasb Asset Allocation Fund	0.3930
25	Js Funds Of Funds	0.3410
26	Js Agressive Asset Allocation	0.3410
27	Pak Oman Advantage	0.3315
28	Mcb Dynamic Allocation Fund	0.3018
	Averagebeta Of The Funds	**0.6353**

Table 3 shows that average Beta of the funds is 0.64, which means that the excess returns of these funds on average are expected to perform 36% worse than the market in bullish trend and 36% better in bearish market. The NAFA Stock Fund is top ranked on the table with Beta of 0.97indicating that fund is following market trend in performance. The MCB Dynamic Allocation Fund has the lowest Beta of all i.e. 0.30.

The results show that equity funds were not able to give higher returns than their market benchmark. The returns of MFs drop sharply from mid-2008 till end of 2010 and started recovery in early 2011.However, majority of the funds do not perform well in comparison to industry returns (or benchmark) during the full sample period of the study and are unable to recover their initial NAV.

Sharpe Ratio

As discussed above, Sharpe ratio is the excess returns an investor get from the portfolio with a higher value representing higher return and vice versa.

Table 4 compares the Sharpe ratio for Equity Funds, Asset Allocation Funds, Balanced Funds, Fund of funds and Index Tracker funds with market. It also ranks the ratio of all the funds benchmarked with KSE-100 index. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents Sharpe ratio measured by excess returns of funds divided by standard deviation of the funds. The

table is ranked from high to low Sharpe ratio on the basis of column 3.

Table 4

Rank	Mutual Fund	Sharpe Ratio
1	United Stock Advantage Fund	-1.0426
2	Js Agressive Asset Allocation	-1.0913
3	Atlas Stock Market Fund	-1.1246
4	Js Large Cap Fund	-1.1494
5	Akd Oppurtunity Fund	-1.2267
6	Picic Energy Fund	-1.2896
7	Nafa Stock Fund	-1.3723
8	Js Growth Fund (A)	-1.4201
9	Pakistan Strategic Allocation	-1.4281
10	Hbl Stock Fund	-1.4492
11	Crosby Dragon Fund	-1.4492
12	Faisal Asset Allocation Fund	-1.4997
13	Akd Index Tracker	-1.4997
14	National Investment Unit Trust	-1.5178
15	First Capital Mutual Fund	-1.5633
16	Alfalah Ghp Alpha Fund	-1.6062
17	Askari Asset All	-1.6081
18	Js Value Fund (A)	-1.7387
19	Unit Trust Of Pakistan	-1.9129
20	Faysal Balanced Growth	-1.9337
21	Js Funds Of Funds	-1.9424
22	Hbl Multi Asset	-2.0633
23	Nafa Multi Asset	-2.0929
24	Pakistan Capital	-2.1101
25	Alfalah Ghp Value	-2.2026
26	Mcb Dynamic All	-2.2892
27	Pak Oman Advantage	-2.6601
28	Kasb Asset	-2.7464
	Average Sharpe Ratio Of Equity Funds	**-1.6797**
	Sharpe Ratio Of Kse-100 Index	**-1.3359**

Table 4 shows that average Sharpe ratio of the funds is -1.68. All the funds have negative Sharpe Ratios with KASB Asset Allocation on the bottom of the table with ratio of -2.75 and United Stock advantage Fund on the top with -1.403.The results show funds under performance compared to market benchmark. Out of 28 funds none of the funds have positive Sharpe ratio. Negative Sharpe Ratio indicates that the mutual funds mangers are unable to earn returns more than that of the Risk free rate. The underperformance of equity funds are in line with the overall direction of the stock market, which remained bearish for most of period of evaluation. These results are in line with earlier study of Nazir and Nawaz (2010) who report that in bearish market trend MFs bear severe negative returns. The negative Sharpe ratio results are consistent with other studies such as Mahmud and Mirza (2010) and Nafees etal. (2011). Both these studies analysis include the recessive market period of 2008 and 2009.

Treynor Ratio

Higher Treynor ratio shows better performance funds with respect to adjusting systematic risks. If MFs are ranked same by Treynor and Sharpe ratio, it indicates that they are well diversified funds portfolios (Wolasmal, 2005). It means that a fund with a lower Sharpe ratio and higher Treynor ratio indicates portfolios are not being able to diversify their unsystematic risk or vice versa.

Table 5 compares the Treynor ratio for Equity Funds, Asset Allocation Funds, Balanced Funds, Fund of funds and Index Tracker funds with market. It also ranks the ratio of all the funds benchmarked with KSE-100 index. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents Treynor ratio measured by excess returns of funds divided by Beta of the funds. The table is ranked from high to low Treynor ratio on the basis of column 3.

Table 5

Rank	Mutual Fund	Treynor Ratio
1	Nafa Stock Fund	-0.1147
2	Picic Energy Fund	-0.1154
3	Js Growth Fund (A)	-0.1180
4	Faisal Asset Allocation Fund	-0.1215
5	Akd Index Tracker	-0.1215
6	Pakistan Strategic Allocation	-0.1223
7	First Capital Mutual Fund	-0.1281
8	Js Large Cap Fund	-0.1299
9	United Stock Advantage Fund	-0.1325
10	Akd Oppurtunity Fund	-0.1362
11	Atlas Stock Market Fund	-0.1634
12	Js Value Fund (A)	-0.1689
13	Nafa Multi Asset	-0.1821
14	National Investment Unit Trust	-0.1942
15	Hbl Stock Fund	-0.1957
16	Crosby Dragon Fund	-0.1957
17	Askari Asset All	-0.2099
18	Hbl Multi Asset	-0.2108
19	Alfalah Ghp Value	-0.2292
20	Faysal Balanced Growth	-0.2329
21	Alfalah Ghp Alpha Fund	-0.2332
22	Pakistan Capital	-0.2623
23	Unit Trust Of Pakistan	-0.2684
24	Kasb Asset	-0.2930
25	Js Funds Of Funds	-0.3317
26	Pak Oman Advantage	-0.3456
27	Mcb Dynamic All	-0.3808
28	Js Agressive Asset Allocation	-0.3961
	Average Treynor Ratio Of Equity Funds	**-0.2048**
	Treynor Ratio Of Kse-100 Index	-0.1147

Table 5 shows us that Average Treynor ratio of the funds is -0.204 as compared to market ratio which is -0.101. The Treynor ratio as expected

is also negative for all of the funds, as managers are not able to get higher excess returns.MFs are not ranked same by both the ratios, which indicates the lack of diversification of investment on behalf of funds' managers and also indicate that managers were unable adjust the risk of the portfolio. Treynor ratio results are also consistent with previous studies by Keshwani (2008), Khan (2008) and Nafees et al. (2011) who report a lack of diversification of MFs in Pakistan.

Jensen's Alpha

The Jensen's Alpha measures the fund manager's ability to outperform the market by providing higher risk-adjusted returns to investors. A positive alpha represents better performance while a negative alpha shows negative excess return of MFs.

Table 6 presents the Treynor ratio for Equity Funds, Asset Allocation Funds, Balanced Funds, Fund of funds and Index Tracker funds with market. It also ranks the ratio of all the funds. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents Jensen alpha ratio measured by portfolio return minus CAPM expected returns. The table is ranked from high to low Jensen alpha ratio on the basis of column 3

Table 6

Rank	Mutual Fund	Jensen's Alpha
1	Nafa Stock Fund	-0.0126
2	Picic Energy Fund	-0.0129
3	Js Growth Fund (A)	-0.0155
4	Pakistan Strategic Allocation	-0.0186
5	First Capital Mutual Fund	-0.0228
6	Js Large Cap Fund	-0.0243
7	United Stock Advantage Fund	-0.0272
8	Akd Oppurtunity Fund	-0.0274
9	Atlas Stock Market Fund	-0.0410
10	Js Value Fund (A)	-0.0472
11	National Investment Unit Trust	-0.0537
12	Hbl Stock Fund	-0.0543
13	Crosby Dragon Fund	-0.0543
14	Alfalah Ghp Alpha Fund	-0.0631
15	Unit Trust Of Pakistan	-0.0687
16	Js Funds Of Funds	-0.0783
17	Mcb Dynamic All	-0.3449
18	Pak Oman Advantage	-0.3672
19	Js Agressive Asset Allocation	-0.3949
20	Kasb Asset	-0.4146
21	Pakistan Capital	-0.4501
22	Alfalah Ghp Value	-0.4959
23	Faysal Balanced Growth	-0.5062
24	Hbl Multi Asset	-0.5095
25	Askari Asset All	-0.5486
26	Nafa Multi Asset	-0.5747

27	Faisal Asset Allocation Fund	-0.7870
28	Akd Index Tracker	-0.7870
	Average Jensen Alpha Of Equity Funds	**-0.2429**

Table 6 shows that average Jensen's alpha is -0.242, which shows underperformance of funds than market. Nafa Stock Fund is ranked on the top of the table with -0.0126, which is 1.26% less than the performance of fund expected by Capital Asset Pricing Model (CAPM) and AKD Index Tracker is ranked at the bottom with alpha -0.79, which is the worst performer in all the funds. These results show that funds were unable to generate excess returns resulting in negative alpha for all the funds. One of the reasons of such underperformance is an indication that funds managers in Pakistan are inexperienced and thus unable to diversify their portfolios. These results are also in line with prior research (Nafees et al., 2011; Iqbal &Qadir, 2012).

Modigliani-Modigliani Measure (M2 Measure)

This measure also compares portfolios with its benchmark. A higher value of M2 measure represents better risk-adjusted performance of MFs. Table 7 presents the Modigliani-Modigliani measure for Equity Funds, Asset Allocation Funds, Balanced Funds, Fund of funds and Index Tracker funds with market. It also ranks the ratio of all the funds. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents M2 measure calculated by using formula discussed in methodology chapter. The table is ranked from high to low M2 measure on the basis of column 3

Table 7

Rank	Mutual Fund	M2 Measure
1	United Stock Advantage Fund	3.7222 %
2	Js Agressive Asset Allocation	3.3513 %
3	Atlas Stock Market Fund	3.0974 %
4	Js Large Cap Fund	2.9089 %
5	Akd Oppurtunity Fund	2.3208 %
6	Picic Energy Fund	1.8415 %
7	Nafa Stock Fund	1.2117 %
8	Js Growth Fund (A)	0.8480 %
9	Pakistan Strategic Allocation	0.7868 %
10	Hbl Stock Fund	0.6264 %
11	Crosby Dragon Fund	0.6264 %
12	Faisal Asset Allocation Fund	0.2422 %
13	Akd Index Tracker	0.2422 %
14	National Investment Unit Trust	0.1041 %
15	First Capital Mutual Fund	-0.2422 %
16	Alfalah Ghp Alpha Fund	-0.5684 %
17	Askari Asset All	-0.5831 %
18	Js Value Fund (A)	-1.5770 %
19	Faysal Balanced Growth	-3.0621 %
20	Js Funds Of Funds	-3.1282 %
21	Hbl Multi Asset	-4.0485 %

22	Nafa Multi Asset	-4.2740 %
23	Pakistan Capital	-4.4052 %
24	Alfalah Ghp Value	-5.1090 %
25	Mcb Dynamic All	-5.7683 %
26	Pak Oman Advantage	-8.5918 %
27	Kasb Asset	-9.2494 %
28	Unit Trust Of Pakistan	-26.840%
	Averag M2 Measure Of Equity Funds	**-1.9827**

Table 7 show that United Stock Advantage Fund with 3.72 % is ranked on top of the table, which indicates that this fund has provided their investors with 3.72 % more returns on per unit of risk taken by the managers. Unit Trust of Pakistan has a negative value of -26.84 % showing a 26.84 % less returns per unit of risk. Overall, half of the funds have positive M2, which shows funds have performed better than the market benchmark. M2 measure is the modified form of the Sharpe ratio and is more significant than the Sharpe ratio, as it adjust the excess returns of fund portfolio compared to market benchmark after adjusting for difference in the total risk (Simons, 1999). M2 is directly interpreted for outperformance and underperformance in case of positive and negative M2 measures, respectively. M2 and Sharpe ratio ranks MFs in the same order (Modigliani & Modigliani, 1997).

Average Returns and Standard Deviation

This section discusses the results of Average Returns and Standard Deviation and two risk adjusted performance measures of Income Funds and Aggressive Income Funds. As Treynor and Jensen alpha measures are not used for Income Funds, only Sharpe and M2 measure are used for analysis.

Table 8 presents the Modigliani-Modigliani measure for Equity Funds, Asset Allocation Funds, Balanced Funds, Fund of funds and Index Tracker funds with market. It also ranks the ratio of all the funds. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents M2 measure calculated by using formula discussed in methodology chapter. The table is ranked from high to low M2 measure on the basis of column 3

Table 8 compares of the Average Returns for Income Funds and Aggressive Income funds with market. It also ranks the average returns of all the funds benchmarked with 6 month Kibor. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents average returns measured as portfolio returns= (Ending NAV / Beginning NAV)-1 and then average of these returns are taken for each fund. The table is ranked from high to low returns on the basis of column 3

Table 8

Rank	Mutual Fund	Average Returns

1	Mcb Pak Sovereign Fund	0.0033
2	Pakistan Income Fund	0.0010
3	Nafa Income Oppurtunity	0.0010
4	Faysal Income& Growth Fund	0.0010
5	Alfalah Ghp Income Fund	0.0006
6	Pakistan Income Enhancement	0.0006
7	Mcb Dcf Income Fund	0.0005
8	Hbl Income	0.0004
9	Faysal Savings Growth Funds	0.0003
10	Akd Aggressive Income	0.0002
11	Atlas Income	0.0001
12	First Habib Income	0.0001
13	Askari High Yield Scheme	-0.0002
14	Nafa Income Fund	-0.0004
15	Alfalah Ghp Income Multiplier	-0.0011
16	Bma Chundrigar Road Saving	-0.0018
17	Js Income	-0.0019
18	Kasb Income Oppurtunity Fund	-0.0025
19	United Growth Income Fund	-0.0026
	Total Average of Income Funds	**-0.0001**
	Average Benchmark Return	**-0.0058**

Table 8 shows the average returns of the funds, which are -0.0001 and the benchmark returns is -0.0058.The table indicates that majority of funds have very low but positive returns and MCB Pakistan Sovereign Fund outperform the market by 0.911%.

Table 9 compares of the standard deviation for Income funds and Aggressive income funds with market. It also ranks the standard deviation of all the funds benchmarked with 6 month Kibor rate. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents standard deviation measured by using formula in excel. The table is ranked from high to low standard deviation on the basis of column 3.

Table 9

Rank	Mutual Fund	Standard Deviation
1	Bma Chundrigar Road Saving	0.0594
2	Kasb Income Oppurtunity Fund	0.0510
3	Alfalah Ghp Income Multiplier	0.0288
4	Akd Aggressive Income	0.0266
5	Nafa Income Fund	0.0257
6	United Growth Income Fund	0.0252
7	Js Income	0.0220
8	Askari High Yield Scheme	0.0210
9	Mcb Pak Sovereign Fund	0.0182
10	Atlas Income	0.0173
11	Alfalah Ghp Income Fund	0.0169
12	Nafa Income Oppurtunity	0.0166
13	Hbl Income	0.0159
14	Pakistan Income Fund	0.0147
15	Faysal Income& Growth Fund	0.0142

16	Mcb Dcf Income Fund	0.0140
17	First Habib Income	0.0131
18	Faysal Savings Growth Funds	0.0130
19	Pakistan Income Enhancement	0.0063
	Average Standard Deviation Of Income Funds	**0.0221**
	Benchmark Standard Deviation	**0.0371**

Table 9 shows that average Standard Deviation of income funds is 0.022 which is lower than the market Standard Deviation of 0.037. BMA Chundrigar Road Saving Fund has the largest Standard Deviation of 5.9 % and Pakistan Income Enhancement with the smallest standard Deviation of 0.64 %.The results show poor performance of Income funds in terms of average returns, even the benchmark i.e. 6 month KIBOR also shows negative returns for the period of investigation. Kibor rate dropped from 13.48% to9.09% in the period from 2008 to 2016, resulting in the negative average return for benchmark. Standard deviation of income funds is very low as compared to equity funds. This shows conservative approach of funds managers towards risk.

Sharpe Ratio

Table 10 compares the Sharpe ratio for Income funds and Aggressive income funds with market. It also ranks the ratio of all the funds benchmarked with 6 month Kibor rate. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents Sharpe ratio measured by excess returns of funds divided by standard deviation of the funds. The table is ranked from high to low Sharpe ratio on the basis of column 3.

Table 10

Rank	Mutual Fund	Sharpe Ratio
1	Bma Chundrigar Road Saving	-1.991
2	Kasb Income Oppurtunity Fund	-2.334
3	Alfalah Ghp Income Multiplier	-4.084
4	Akd Aggressive Income	-4.365
5	Nafa Income Fund	-4.534
6	United Growth Income Fund	-4.717
7	Js Income	-5.381
8	Askari High Yield Scheme	-5.548
9	Mcb Pak Sovereign Fund	-6.207
10	Atlas Income	-6.702
11	Alfalah Ghp Income Fund	-6.836
12	Nafa Income Oppurtunity	-6.925
13	Hbl Income	-7.288
14	Pakistan Income Fund	-7.834
15	Faysal Income& Growth Fund	-8.128
16	Mcb Dcf Income Fund	-8.280
17	Faysal Savings Growth Funds	-8.877
18	First Habib Income	-8.879
19	Pakistan Income Enhancement	-18.254
	Average Sharpe Ratio Of The Funds	**-6.693**

Market Sharpe Ratio	**-3.293**

Table 10 shows that average Sharpe ratio is -6.69 and none of the funds are able to give excess returns to its investors. BMA Chundrigar Road Saving Fund have a Sharpe ratio of -1.99, which means that the top ranked fund in the table is providing negative return of 1.99% per unit of risk to its investor.

The Sharpe ratio result shows extremely poor risk-adjusted performance of income funds. The negative average returns and lower standard deviation triggers the Sharpe ratio to such a low level. The income funds are not included in many studies in performance evaluation of funds. These results are also consistent with the earlier study of Mahmud and Mirza (2010). They find that income funds are unable to yield positive excess returns for the period of 2006-09.

Modigliani-Modigliani Measure

Table 11 presents the Modigliani-Modigliani measure for Income funds and Aggressive income funds with market. It also ranks the ratio of all the funds. Column 1 is ranking of Mutual funds; column 2 presents Mutual funds and the last column presents M2 measure calculated by using formula discussed in methodology chapter. The table is ranked from high to low M2 measure on the basis of column 3

Table 11

S.NO	Mutual Fund	M2 measure
1	Bma Chundrigar Road Saving	4%
2	Kasb Income Oppurtunity Fund	3%
3	Alfalah Ghp Income Multiplier	-4%
4	Akd Aggressive Income	-5%
5	Nafa Income Fund	-5%
6	United Growth Income Fund	-6%
7	Js Income	-8%
8	Askari High Yield Scheme	-9%
9	Mcb Pak Sovereign Fund	-11%
10	Atlas Income	-13%
11	Alfalah Ghp Income Fund	-14%
12	Nafa Income Oppurtunity	-14%
13	Hbl Income	-15%
14	Pakistan Income Fund	-17%
15	Faysal Income& Growth Fund	-19%
16	Mcb Dcf Income Fund	-19%
17	Faysal Savings Growth Funds	-21%
18	First Habib Income	-21%
19	Pakistan Income Enhancement	-56%
	Average M2 of the Funds	**-13%**

Table 11 shows that on average funds returns underperform by 13.23 % on per unit of risk taken. Only two funds have positive M2 measure while the rest have negative measure with Pakistan Income Enhancement is the worst of all with negative returns of 56.22 %.Modigliani results of

Income funds show poor risk-adjusted performance as funds were unable to perform better in terms of average returns as shown in previous tables.These results of Equity Funds, Asset Allocation Funds, Balanced Funds, Fund of funds, Index Tracker funds, Income Funds and Aggressive Income fundin terms of Average Returns, Standard deviation, Beta and the risk adjusted performance metrics (Sharpe Ratio, Treynor Ratio, Jensen Alpha and M2 Measure) show that open-ended MFs performance in Pakistan are not risk-adjusted during the sample period.

One of the reasons of such underperformance of MFs is the diversification of the funds (Shah &Hijazi, 2004; Sipra, 2006; and Nafees et al., 2011). Most of the equity funds in Pakistan invest in large cap stocks only, rather than holding diversified portfolio of value stocks (Nazir&Nawaz, 2010). Similar results are also reported for other markets such as US (Haleem et al., 2008) who report that US MFs are also unable to outperform the market benchmark. Moreover, Mutual Funds Association of Pakistan have also reported such underperformance in their yearly performance and IGI investment bank monthly report.

Conclusion

This study analyzed the open-ended MFs performance by using risk-adjusted performance measures. Survivorship biasness controlled data of 47 open-ended MFs is used for analysis. Market and MFs returns are fluctuating and unable to provide excess returns enough to beat risk free rate. This results in negative performance on all risk metrics by majority of the MFs implying that fund managers are unable to diversify their investment in such a way to outperform the market. The results are consistent with prior literature, which also show negative performance of the MFs in Pakistan. Carhart (1997) argues that persistence in MFs performance is short term. The performance of MFs changes with market fluctuation (Khalid et al. 2010). Majority of equity funds outperformed the benchmark in 2014-15. The reason for this good performance is that this year the KSE 100 index post a rise of 15% on yearly basis. The stock market and MFs performance regain will definitely boost the investor confidence to invest in MFs and to attain risk-adjusted returns for the coming years. Shah and Hijazi (2004) suggest that MFs management must disclose the risk level associated with the investment, so investor can make an informed decision.

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