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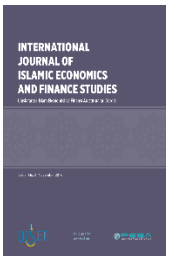

Comparative Risk and Return Analysis of Islamic and Conventional Financial Institutions in Pakistan

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ABSTRACT

This paper aims to investigate whether the Islamic financial institutions perform better in terms of risk and return as compared to conventional financial institutions. To make an appropriate comparative study comprises banks, mutual funds, and Modaraba companies from 2006 to 2012. The risk and return series are oriented from stylized GARCH models and average return to risk ratio is used for potential comparison. This paper finds no difference in the performance of Islamic and conventional banks. However, large banks performed better than small banks on the basis of an average return to risk ratio. Islamic mutual funds are found riskier and provide fewer returns as compared to conventional mutual funds. Further, the performance of most Modaraba companies is found unsatisfactory. The study suggests that Islamic financial institutions need to resolve their liquidity problems, sort out new investment avenues and focus on developing short financing instruments. Islamic banks are also required to finance in risk sharing products other than fixed income.

1. Introduction

Islamic financial institutions offer a unique set of financial products that are distinct in theory and practice from conventional finance. Each Islamic financial product is backed by a particular real asset. One may consider that Islamic financial products are less risky and robust to risky conditions. It is evident from recent global financial crises that Islamic financial institutions performed better than their conventional counterparts. According to International Monetary Fund's study, Islamic financial institutions performed better than conventional counterparts in 2008 in profitability, credit and asset production while the financial industry was shattering. The Islamic Financial Institution's (IFIs) profitability crisis was minimum 10 percent, while the conventional Financial Institution's (CFIs) profitability dropped down by 35 percent in 2008 (Dridi J. and Maher H. 2010). Sharia'h-compliant assets worldwide approaching $1.6 trillion and have grown at a rate of 20.4 percent per year between 2008 and 2012 (Grewal, B. K. 2013).

Islamic finance encourages active participation of financial institutions and investors in achieving the goals and objectives of growing economy. The Islamic stock market has been established based on five main principles of operations; preventing any practice of usury, sharing risks, preventing widespread speculation, compliance with the stated contracts and the activity implemented must be legal in the Sharia'h aspect (Bacha, 2002). The conventional financial system is based on speculative contracts and these contracts lead to the inefficiency. The recent credit crunch of 2007-08 is a recent example of the inefficiency of the speculative system. The Islamic financial contracts are backed by real assets. In the case of any default, underlying asset acts as lender of last resort. Profit or loss is dependent on the underlying asset. A loss could occur when the market price of an asset devaluates, but usually, prices show an upward trend. IFI's are safer, as principal plus profit is conditional in Islamic financial contracts. Depositors or investors are obliged to share losses with IFI's. Therefore, it is expected that risk of Islamic financial industry may be lower (particularly in crisis period) than conventional financial industry. Some studies analyzed that screening criteria provide low diversification, which may lead IFI's to lower returns for given portfolio risk. Raditya and Kholid (2011) suggested that the Shariah screening process is important not only it eliminates the Non-Sharia'h stocks but also it provides less risky kind of investment, which is in line with the nature of Islamic value of small uncertainty (Gharar saghir).

Most studies documented different results on the performance of Islamic and conventional stocks. Some studies found that Islamic stocks performed better than conventional stocks, gave higher returns and well diversified (Hussein, 2004; Hussein and Omran, 2005). On the other hand, findings of Francisca et al (2011) show that Islamic fund has higher volatility than the market portfolio. A rational investor invests in those stocks, which give higher possible returns and less risk. In last two decades, volatility in stock prices has increased due to Asian and global financial crises. Therefore, most investors are concerned with return and risk in stocks. The studies in Pakistan usually consider the only risk of both types of stocks, ignoring the returns, which also play very important role in investment decisions. This highlights the need to estimate risk and return of both types of stocks simultaneously. Simultaneous comparison of risk and return of both Islamic and conventional financial institutions may guide investors to invest in less volatile and higher returns generating stocks. This study adds to existing literature in more comprehensive way because most studies focus only one type of institution e.g. banks. However, our study is more comprehensive covering all Islamic and conventional banks, Islamic and conventional mutual funds and Modaraba companies in Pakistan. This study helps individual and Institutional Investors to choose best-performing stocks and policy makers to stabilize the financial industry.

2. Literature Review

Islamic investments being screened faced a lot of criticism that stem from the modern portfolio theory or efficient portfolio theory of Markowitz (1952). According to Kettell (2001), an efficient portfolio comprises a small component of risk for a given expected returns or the maximum returns at a given risk level. D'Antonio, Johnsen, and Hutton (1997) argued that the main objective of the investor is to seek maximum expected returns with minimum risk. The minimization of risk is achieved by investing in a group of assets rather than a single asset which is commonly known as diversification. The process of diversification is a traditional mechanism that produces the desired risk-return tradeoff. The lower correlation among the securities is the key for a well-diversified portfolio (Hickman, Teets & Kohls, 1999, p. 73). Even a well-diversified portfolio is also affected by market risks or economy-wide risks. However, the existing empirical literature has not been able to draw a distinct line between screened and non-screened investment portfolio.

Numerous studies have compared the risk and return behavior of Islamic and conventional funds by using various econometric techniques in

different regions. However, the literature can be categorized with respect to different outcomes. One stream of literature suggests that Islamic investments are more stable, generate greater returns bearing less risk, hence well diversified. The second stream of the literature concludes that Islamic investments are less stable, generate lower returns, bear more risks and Islamic screens affected their range of diversification. The third section of literate indicates that there is no significant difference in the performance of both investments. The last section of literature deals with Modaraba companies. The outcomes of some of these studies are presented below.

Boumediene and Caby (2009) employed GARCH model and resulted that Islamic banks are more stable than conventional banks, which may be due to their links with the real economy. Further, they revealed that the Islamic banks are not subject to same risks as conventional banks. Similarly, Hakim and Rashidian (2002) employed co-integration and causality analysis to examine the risk and returns of Islamic stock market index in the US. They suggested that Islamic index exhibit unique risk-return characteristics, which are known as unsystematic risks.

Sukmana and Kholid (2013), investigated that Islamic stock index is less risky than the conventional index in Indonesia. Irfan Ullah et al (2012) empirically analyzed the comparative performance of Islamic and Conventional Mutual Funds in Pakistan. The results indicate that Islamic mutual funds performed better, well diversified and gave higher average returns than conventional mutual funds. Salah and Fouzia (2012) compared Islamic and conventional indices in Morocco using GARCH models. The results reveal that volatility persistence of both indices is very significant and Islamic index remained less volatile than conventional index at a long run and it presents less risk at crisis period. Statman (2000) analyzed the performance mutual funds of the Domini social index (DSI) against the performance of S&P500 companies in the US for the period of 1990-98. He concluded that the raw returns and risk for DSI were higher than S&P500 and vice versa for the returns adjusted risk. On the other hand, social funds found to be less risky and to have lower returns than the DSI and the S&P500.

Hussein and Omran (2005) analyzed the performance of the Islamic index in the Dow Jones against the Dow Jones index for the period of 1995-2003. The results suggested that the Islamic index outperformed the conventional index both in the entire and bull periods. Another study by Hussein (2005) investigated the effect of screening on the performance of FTSE Global Islamic Index and DJIMI in both the short and long-run

against the Dow Jones World Index and FTSE All-World Index. His study shows that the Islamic index tends to outperform against its all counterpart during the entire period. Moreover, the Islamic index earns significant positive returns in the bull period. Therefore, he concludes that the Islamic screening does not have unfavorable effects on the performance index. Elfakhani, Hasan, and Sidani (2005) suggest that screening criteria do not affect the performance of Islamic investments.

Annuar, Shamsher and Ngu (1997), Shamsher et al. (2001), Hanafi (2002) and Mahreen &Nawazish (2011) reported that Islamic funds performed better than the market and risk-free investments, but failed to provide diversification in investment. On the other hand, Mueller (1994), Zaidi et al. (2003), Abdullah et al. (2006) and Nik Muhammad & Mokhtar (2008) found that Islamic funds were not only underperformed the market but also showed a low level of diversification and lack of stock selection skills. Hoepner et al. (2009) used data set of 262 Islamic equity funds from 20 countries and concludes that Islamic funds significantly underperformed in eight western economies and over performed their respective market benchmarks in only three economies. Likewise, Adam (2012) also found that Islamic banks are riskier than conventional banks in Kenya. Also, Islamic banks face losses during the study period and negative returns lead them to higher risk.

Elfakhani, Hasan, and Sidani (2005) investigated the performance of the Islamic mutual funds in several emerging countries. They find that there is no statistically significant difference between Islamic and conventional funds. Therefore, the screening mechanism does not affect the performance of Islamic investments. Similarly, Albaity and Ahmad (2008) analyzed the performance of Kuala Lumpur Shariah Index (KLSI) and the Kuala Lumpur Composite Index (KLCI) on the basis of risk and return for the period of 1995-2005. Their results provide that there is no statistically significant difference in risk-adjusted returns between conventional and Islamic indices.

Some empirical studies reported the efficiency of Modaraba companies in Pakistan. Khan (1996) analyzed the efficiency of Modaraba companies during the period of 1991-1994 by using Sharpe and Treynor ratios. The results reveal that Modaraba companies underperformed average KSE returns and failed to reward higher return to investors as compared to banks. On the other hand, Jam-e-Kausar et al. (2013) investigated that Modaraba companies remained cost efficient than leasing companies during

the period 2005-2010. Leasing companies remained technically more efficient than Modaraba companies.

Conclusively, there is no clear evidence that screened investments tend to under or over-perform than conventional investments, particularly in Pakistan. This study may be a gateway for investors who are willing to invest in the financial sector of Pakistan.

3. Data and Methodology

The following categories of active Islamic and conventional financial institutions listed at Karachi Stock Exchange (KSE100 index) are taken; Islamic and conventional banks, Islamic and conventional mutual funds and Modaraba companies. The data of daily stock prices and Net Asset Values (NAVs) are taken from Karachi Stock Exchange (KSE) and Mutual Funds Association of Pakistan (MUFAP) for the period of 2006-2012. The data set includes the period of global financial crises of 2007, national political changes through general elections of 2008, national unrest (assassination Benazir Bhutto), high inflation and uncertainty in the stock market.

ARMA-GARCH-in-Mean model is employed to determine the risk of financial time series, which are subject to ARCH effect. There are many univariate GARCH type models we employed GARCH in Mean model to capture risk premium if exists. Then the average Return on Risk Ratio (RRR) is calculated to evaluate the performance of Islamic and Conventional financial institutions.

3.1 Descriptive Statistics and Pre-Estimation Test for Model Specification

Empirically it is found that asset or stock prices are non-stationary but their log differences are stationary. The series at the level are transformed into the rate of return series.

$$x_t = \log P_t - \log P_{t-1}$$

Where P_t is stock/asset price at the end of day 't' and X_t returns series.

Descriptive statistics of return series revealed stylized properties of financial time series (see Table 2&3 in the appendix). Higher positive excess kurtosis indicates a leptokurtic property of financial return series; which reveals distinct responses of market players for same information. Jarque-Bera test indicates non-normality, which is due to the higher probabilities of extreme values. KPSS test shows the stationarity of return series. The LM-ARCH test and Q-stat of squared return series clearly indicate the presence

of ARCH effect. GARCH-type models are considered to best estimate risk and return in the presence of ARCH effect. There are various GRACH-type models, we employed GARCH-in-Mean model to capture any risk premium.

3.2 Mean Equation

The first step in modeling is to select an appropriate mean equation to estimate return. The equation can take the form of an Autoregressive (AR) or/and Moving Average (MA). Following are some of the ARMA (p, q) equations1;

$$x_t = u + \varepsilon_t \tag{4.1}$$

Here x_t is return series, u is a constant and ε_t is error series. This is ARMA (0,0) equation.

General model of ARMA (p, q) is presented below;

$$x_t = U + \sum_{i=1}^{p} x_{t-i} + \sum_{j=1}^{q} \varepsilon_{t-j} + \varepsilon_t \tag{4.2}$$

The results of mean equations are shown in Table 4 (Appendix). The specified model is then tested for autocorrelation employing Q-statistics on raw series. The evidence of autocorrelation is removed by adding different lags of the dependent variable on the right-hand side of equation (4.1). The best model is considered best fitted if it eliminates serial autocorrelation.

3.3 Univariate GARCH-M

It is assumed that the greater returns are associated with risky assets as compared to less risky assets (Brooks, 2002). Engle, Lilien, and Robins (1987) suggested the use of the ARCH-M specification in which conditional variance of asset return enters into the conditional mean equation it let the return of the security be partly determined by its risk. An example of a GARCH-M model is given by the following specification.

$$x_t = \mu + \delta\sigma_{t-1}^2 + \varepsilon_t \tag{4.3}$$

[1] As will be seen in Chapter 5, the mean equation with an AR (0,1,2) component and MA (0,1,2) components were found to be most appropriate.

$$\sigma_t^2 = \alpha_\circ + \alpha_1 \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2 \quad (4.4)$$

The above-illustrated equation is GARCH-M (1,1) where α_1 is the coefficient of lagged squared residuals, ε_{t-1}^2 is the lagged squared residual from the mean equation and β is the coefficient of the lagged conditional variance. It is important to note that α + β < 1 ensures the stationarity of conditional variance.

The coefficient δ is interpreted as time varying risk premium. The GARCH-M model relaxes the basic assumption of constant risk premium over sample period to allow the effect of volatility (Brooks, 2002). If the coefficient δ is found positive (negative) and significant, then increased risk presented by conditional variance leads to high (low) mean returns. The positive and significant relationship implies that investor on the Karachi Stock Exchange (KSE) is compensated for considering greater risk.

3.4 Post-Estimation Tests

After specifying the model and distributional assumption, diagnostic tests are necessary to confirm that the model is correctly specified. Three tests are employed in the residuals of estimated model. Namely, Lagrange Multiplier (LM-ARCH) test, Ljung-Box on squared and Ljung-Box on raw residuals2. These tests are used to check any leftover ARCH effect and autocorrelation in residuals respectively.

3.5 Return to Risk Ratio

After calculating conditional risk and the conditional return of each firm, return/risk ratio is calculated by dividing returns over the risk of the entire period. After that average of RRR is taken for the analysis.

$$RRR_i = \sum \frac{r_{it}}{\sigma_{it}^2} / n \quad (4.5)$$

Where I denote it's firm. The firm with a higher return to risk ratio (RRR) is considered as performing better.

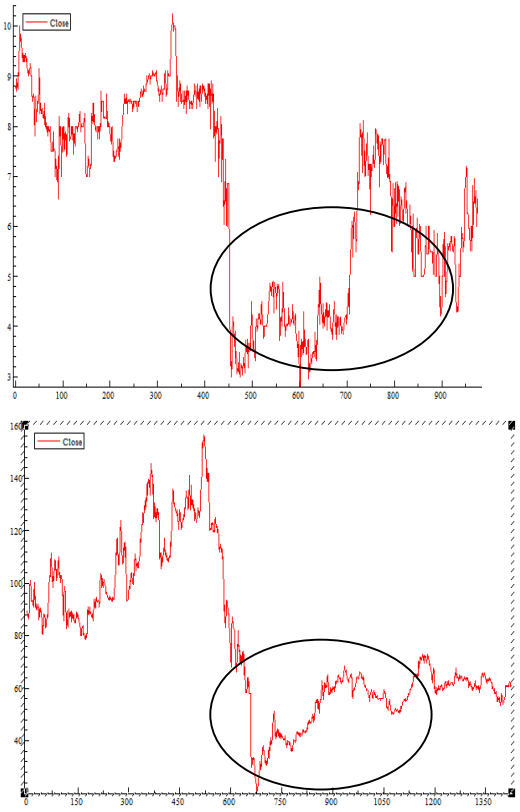
[2]Q-Stat: $H_\circ = noautocorrelationinrawseries, H_1 = thereisautocorrelation$
Q^2-Stat: $H_\circ = noautocorrelationinsquaredseries, H_1 = thereisautocorrelation$
This implies that no ARCH effect left in residuals.

4. Empirical Analysis

4.1 Descriptive Statistics and Pre-Estimation Tests

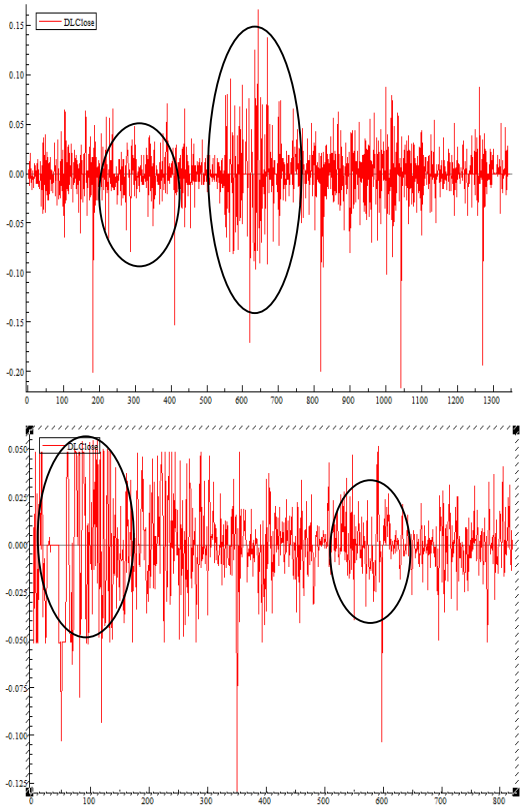
Table 2 (Appendix) provides the basis for our analysis as it contains the descriptive statistics and stationary tests for specified data used in the study. The KPSS test is employed to test the presence of stationary.

The graphical plots of raw series indicate that financial sector marked its highest level in 2006-07. The financial crises of 2007 affected the financial industry of Pakistan at the end of 2008 and start of 2009 (in a circle). The financial industry is still at growing stage but not reached at its highest level as it was in 2006-07.



Level series of FNB Modaraba and NBP

Graphical plots of return series do not exhibit trend as it is eliminated by taking log difference to execute the deterministic assumption of "no trend". The return series below are showing volatility clustering and ARCH effect (in a circle).



Return series of Standard Chartered Modaraba and UBL

KPSS test is used to check the stationary of the data. The rejection of null suggests that series is non-stationary. KPSS results as reported in Table 2 (Appendix) indicate that return series are stationary at its usual level of significance.

The descriptive statistics (Appendix, Table 2) permit to analyze the theoretical relationship that highest returns to be coordinated with the highest standard deviation (risk or volatility). With the exception of Muslim Commercial Bank (MCB), First UDL Modaraba, IGI stock fund and HBL Money Market Fund, it is found that mean returns are negative. The volatility estimates of standard deviation range between 2-4% for Islamic and conventional banks. It shows a higher trend in Modarabas from 2-18%, in which Crescent Standard Modaraba contain highest value (0.1881) and Standard Chartered Modaraba with the lowest value (0.028957). But, its value is very high in Islamic mutual funds such as Al-Meezan Islamic equity fund up to 64%. In Mutual Funds, volatility estimates prevail from 0.5-64%, in which Al-Meezan Equity Fund (Islamic Fund) indicates the highest volatility

(0.64213). Volatility estimates of standard deviation tell that volatility in Islamic and conventional banks is low and comparatively similar as compared to other financial industry. It is found higher in Modaraba companies but Islamic Mutual Funds are most volatile among all Mutual Funds and other financial industry.

If we apply volatility as common price factor, we can expect that higher standard deviation is to be coordinated with higher mean returns. This relationship is not apparent from descriptive statistics. It is evident that highest positive mean returns are in First UDL Modaraba (0.00010977) and lowest in Al-Meezan Equity Fund (-0.63583). Conversely, the highest standard deviation is present in Al-Meezan Equity Fund (0.64213) and lowest in HBL Money Market Fund (0.0058527). These casual statistics show a negative relationship between risk and return. It is evident that Islamic Mutual funds bear highest risk and lowest returns, while Conventional Mutual Funds bear the lowest risk in the financial industry.

The descriptive statistics exhibit common financial characteristics like fat tails. The descriptive statistics indicate that mean returns are non-normal. We reject the null hypothesis of Jarque-Bera test for normality at its usual significance level. The descriptive statistics of kurtosis and skewness also indicate non-normality of data. The excess kurtosis ranges from (2.0845) to (609.82). Excess Kurtosis of all firms is greater than zero. The statistics of skewness indicate that 3 firms are positively skewed and other 28 firms are negatively skewed. The negative skewness of majority returns directly that the probability of losses is greater than gains.

The Ljung-Box statistics of raw series (Q-stat) and Ljung-Box statistics of squared (Q2-stat) of return series are statistically significant (Appendix, Table 3). Therefore, we reject the null hypothesis of no autocorrelation in returns and squared returns. The LM-ARCH is found significant as it rejects the null hypothesis of no ARCH effect. The significance of Q-stat (5) indicates that investors would rely strongly on historical data to earn gains. The Q2-stat also validates the presence of ARCH effect. Thus, it confirms the use of GARCH type model with ARMA specifications of the mean equation.

A simple comparison of standard deviation and mean returns does not specify the clear relationship between risk and returns. So, we proceed to proper modeling risk and returns by employing GARCH model.

4.2 Model Specification Analysis

Having confirmed the presence of ARCH effect in each return series, now we specify the ARMA and GARCH models to estimate mean and variance respectively by adding lag on right side of equations as appeared in Chapter 4. Diagnostic testing helps in choosing an appropriate model. Table 5 (Appendix) presents diagnostic tests of the fitted model indicate that all the lag and estimation models are correctly specified.

The univariate GARCH model is estimated. The values of ARCH ($\alpha 1$ and $\alpha 2$) and GARCH ($\beta 1$) terms (Appendix, Table 4) recognize the volatility persistence, which is significant in determining the relationship between returns and volatility because it justifies the alteration in risk premium (Devaney 2001). The summation of α and β ($\alpha+\beta<1$) in the GARCH model is generally less than one which shows that returns generating process are featured by the high level of persistence of shock. Therefore, as the value becomes closer to one, a shock will persist for a longer period. A high value of β suggests that any shock to conditional variance takes a long time to vanish, so volatility is persistent. A small value of α indicates that large market shocks induce comparatively small revision in future volatility. Results of Table 4 (Appendix) report that one Islamic bank, three conventional banks, one Modaraba and one conventional Mutual Fund show α and β less than one. The summation of α and β greater than one show that a new shock will effect on returns and will endlessly grow into the future.

According to finance theory, conditional expected returns should be positively and statistically significant in relation to conditional variance (Campbell and Hentschell 1993). In this regard, the coefficient δ or ARCH-in-Mean determines the risk and return premium. Table 4 (Appendix) reports eight companies with the negative and insignificant relationship; this includes two conventional banks, four Modaraba, and two conventional Mutual Funds. Out of these, one conventional Mutual Fund and one conventional bank show negative and significant relation which means that return decreases with increasing risk. Contrary, seventeen companies, in which one Islamic bank, five conventional banks, seven Modaraba, one Islamic Mutual Fund and three conventional Mutual Funds, exhibit a positive and insignificant relation between risk and return. Remaining four companies, in which Bank Islami, MODAM Modaraba, and First Capital Modaraba Fund & IGI conventional Mutual Fund, showed the positive and significant relation between risk and returns, it indicates higher risk leads to a higher return. The coefficient δ insignificant means that time-varying risk does not directly affect the returns.

4.3 Analysis of Return to Risk Ratio

As reported in Chapter 4, this ratio suggests the relationship between returns to risk (Appendix, Table 6). Banking sector results suggest that only three conventional banks; which are ABL (0.56194419), UBL (0.63945534) and MCB (1.499549893), present positive ratio, which means that average returns are positive and higher as compared to risk. Above mentioned banks are enjoying positive returns after absorbing all systematic and unsystematic risks. Bank Islami Ltd (-2.42896278) is facing highest negative returns to risk ratio on the average in the banking sector.

In the financial sector of Modaraba, the return series of 12 companies are estimated using GARCH modeling. It is found that five companies indicate a positive return to risk ratio. First National Bank Modaraba possess highest positive ratio (0.455446885). Other seven Modaraba companies show average negative ratio. Out of these, First Equity Modaraba shows highest negative returns, which means that its returns are negative and risk is high.

Mutual Funds indicated the best performance amongst financial industry, all firms show positive ratio. HBL Money Market Fund (27.55667033) suggest the highest ratio, which means that it contain highest positive returns and lowest risk. Al-Meezan Equity Fund as an Islamic Fund has second last lowest mutual fund (0.103610807). While IGI Stock Fund (0.023430625) is the lowest positive return's earning mutual fund. This demonstrates that conventional Mutual Funds performed better holding highest positive returns and bearing lower risk.

5. Summary and Conclusions

This study analyzed the risk-return relationship between Islamic and Conventional financial institutions listed at Karachi Stock Exchange (KSE). The daily data of 10 banks, 12 Modaraba companies and 9 mutual funds including Islamic and conventional funds has been used from 2006-2012. The GARCH-M model was estimated under the assumption of student-t distribution.

The prime step in our analysis was to review the theoretical and empirical literature, aiming to analyze relevant models on the risk-return relationship. The empirical literature proved that GARCH family models performed better in analyzing risk and return. But, none of the studies were found to compare the performance with respect to risk and return of Islamic and conventional financial institutions as a whole.

5.1 Islamic and Conventional Banks

In order to address our objectives, we employed GARCH-M model with the assumption of student-t distribution. The descriptive statistics analysis described that the Islamic and conventional banks showed almost similar pattern regarding standard deviation and kurtosis. The GARCH model specifications indicated the summation of α and β of few banks is less but close to one, which means the volatility, was persistent or long memory is present in its conditional variance (risk) except JASBL. The return to risk ratio (RRR) of Islamic and conventional banks is mostly negative except for Allied Bank, United Bank, and Muslim Commercial Bank. Only one conventional bank is containing positive RRR i.e. Muslim Commercial which suggests that bank returns are higher than its risk and other two banks contain high risk as compared to their returns. The RRR of Islamic banks is negative which means that their returns are negative on the average.

5.2 Modaraba Companies

The descriptive statistics Modaraba companies exhibited that standard deviation, mean and kurtosis was found higher as compared to the banking sector. The GARCH model specifications indicated that the summation of α and β is mostly greater than one, which means that the effect of a new shock on returns would continue to grow into the future except for First Prudential Modaraba. The statistics of RRR indicated that five firms contain positive ratio and seven firms with a negative ratio. In most cases, the RRR is found negative which suggested that at average risk is higher as compared to returns of Modaraba companies. It was also found that investors do not assume the risk as common price factor (higher risk leads to higher returns).

5.3 Islamic and Conventional Mutual Funds

The descriptive statistics indicated that Islamic mutual funds possess highest standard deviation (highest risk) and lowest mean (lowest returns) as compared to conventional mutual funds and other financial sectors. This suggested that risk was not common price factor as higher risk leads to lower returns. The GARCH model specifications suggested that the summation of α and β was mostly greater than one, which means that the volatility is persistent, and the effect of a new shock on returns would continue to grow into the future in all-Islamic and conventional mutual funds except for HBL money market fund. The RRR of conventional mutual funds was found positive which means that on average returns were positive and higher than risk except for IGI Stock Fund. The RRR of Islamic Mutual Funds was found

almost less than conventional Mutual Funds, which suggest that risk was higher than returns. These analyses suggested that conventional Mutual Funds were performing better than Islamic Mutual Fund regarding risk and return.

In conclusion, the financial crises of 2007 approached the financial industry of Pakistan in 2008-2009 and it was still at growing stage but not reached at its highest level as it was in 2006-07. Volatility is persistent in both Islamic and conventional financial institutions. The performance of banking (Islamic and conventional) and Modaraba sector was not satisfactory except few large conventional banks and firms with respect to their risk and return. The study revealed that Islamic banks did not differ in risk and return from conventional banks as it was expected due to their unique features. This may be possible that Islamic banks were exposed to dual risks, lack of investment opportunities etc. Large banks fared better than small ones. In most cases, risk cannot be considered as common price factor in banks, Modaraba companies, and mutual funds. The performance of Mutual Funds was comparatively better amongst the financial industry. However, Islamic mutual funds were exposed to highest risk and lower returns as compared to conventional mutual funds.

6. Policy Recommendations

The conclusive points of this study have important investment implications and policy recommendations.

The financial crisis of 2007 had led to the greater identification of the importance of liquidity risk and the need for well-organized bank resolution framework as weak risk management practices had led to a greater decline in profitability. Hence, building an able functioning liquidity management framework is priority key. Large banks have fared better than small ones. This might be attributed to economies of scale, better diversification, and good reputation. This suggests that development in industry through increasing competition should be achieved through establishing large and well managed Islamic banks that can compete with existing conventional banks.

Three factors are primarily responsible for the bad performance of weak Modaraba companies. Low level of equity makes it difficult for Modaraba managers to enter in large businesses. Secondly, high operating cost and expensive borrowing yield lower profits. The later factor challenges the performance of efficient Modaraba companies. This problem could be overcome by injecting foreign investments or foreign credit line. The Islamic

Development Bank (IDB) can also be requested to issue grants for Modaraba business. New Modaraba certificates should be launched, so that, Modaraba companies could raise funds from domestic markets. Modaraba companies should extend their business beyond financial products (Ijarah& Diminishing Musharaka). There is also need to extend branch network and invest in Shariah compliant manufacturing and small trading businesses. Lastly, Modaraba companies invested in conventional leasing instead of Islamic leasing which established a bad image for Islamic stock investors.

Islamic and conventional mutual funds though operating in similar economic conditions but Islamic funds held higher risk and lower returns than conventional funds. Lower returns reflect that investment portfolio of Islamic funds generated low yield and contained higher risk that is crucial for their sustainability. The Islamic funds already have limited investment portfolio due to screening criteria, therefore investment skills of fund managers and quality of individual stocks are crucial factors that are required to be reviewed.

It is also pertinent to mention that Islamic financial institutions should hold awareness seminars to neutralize the understanding of general public and the corporate functionaries against Islamic finance. More particularly, the prevalent misconceptions are addressed to enhance the reputation of Islamic financial institutions. There is also need to subside the Modaraba scandal, which, in fact, has no relation to the operations Modaraba companies. In this respect, the Modaraba companies and Registrar's office can extend coordinated efforts to achieve the desired results.

Islamic banks, in general, experience short to medium term excess liquidity. Over the past years, a substantial part of this liquidity was being parked in commodity Murabaha, a synthetic transaction that invited Sharia'h objections from various quants. In response, the banks have decreased their investments in commodity Murabaha and holding liquidity reserves. It is advisable if financial institutions, with patronization of State Bank of Pakistan (SBP), develop Shariah-compliant instruments to enhance the productivity of their investments, enabling to raise profitability.

In general, the volatility showed increasing trend in almost entire financial sectors. The policy makers and investors are required to be aware of. For investors, it would be useful to invest in large banks and less volatile stocks. The policy makers should seriously consider the persistent increase in volatility, which would be problematic, it may cause an outflow of capital. Hence, it could lead to financial instability and might shake the roots of the economy as a whole. Greater Sharia'h convergence and efficient management

of products as well as efficient regulation are required to facilitate the competent and sustainable growth of the industry.

Appendix:

Table 1: List of Institutions

List of Institutions
Islamic Banks:
1. Meezan Bank Limited
2. Bank Islami Limited
Conventional Banks:
1. Allied Bank Limited
2. United Bank Limited
3. Habib Bank Limited
4. Bank of Punjab Limited
5. Bank of Khyber Limited
6. Muslim Commercial Bank
7. Bank Al-Falah Limited
8. JASBL
Modaraba's:
1. Crescent Standard Modaraba (CSM)
2. First Elite Capital Modaraba (FECM)
3. First Equity Modaraba (FEM)
4. First Fidelity Leasing Modaraba (FFLM)
5. First Habib Bank Modaraba (FHBM)
6. First Punjab Modaraba (FPJM)
7. First UDL Modaraba (FUDLM)
8. Modaraba Al - Mali (MODAM)
9. First Pakistan Modaraba (PAKMI)

10. First Prudential Modaraba (PMI)
11. Standard Chartered Modaraba (SCM)
12. First National Bank Modaraba (FNBM)

Islamic Mutual Funds:

1. Al-Meezan Islamic Equity

Conventional Mutual Funds:

1. PICIC Growth Fund
2. Atlas Fund of Funds
3. First Capital Modaraba Fund
4. Pakistan Strategic Allocation
5. Askari Asset Allocation Fund
6. Crosby Dragon Fund
7. IGI Stock Fund
8. HBL Money Market Fund

Table 2: Descriptive Statistics and Pre-Estimation Tests

	Companies	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	KPSS	JB	CV	Observations
Islamic Banks:											
1.	Meezan Bank Limited	-0.00007575	0.095278	-0.25738	0.026435	-0.91379	8.4023	0.110515	4414.8	-348.97	1434
2.	Bank Islami Limited	-0.0010271	0.19283	-0.14551	0.034339	0.48585	3.1391	0.12047	619.08	-33.433	1377
Conventional Banks:											
1.	Allied Bank Limited (ABL)	-0.00026732	0.095203	-0.40959	0.027338	-2.8906	38.126	0.0825434	88292	-102.27	1426
2.	United Bank Limited (UBL)	-0.00032974	0.055241	-0.12938	0.023509	-0.44747	2.234	0.156682	197.88	-71.296	821
3.	National Bank Limited (NBP)	-0.0010192	0.095303	-0.28292	0.027749	-1.6848	13.732	0.0887755	12054	-27.226	1448
4.	Habib Bank Limited (HBL)	-0.0010187	0.09531	-0.20915	0.025401	-1.4214	11.248	0.315408	6006.4	-24.935	1072

5. Bank of Punjab Limited (BOP)	-0.0018606	0.17746	-0.32914	0.034312	-0.87402	9.6269	0.127893	5759.9	-18.441	1445
6. Bank of Khyber Limited (BOK)	-0.0012807	0.33142	-0.23484	0.0389	1.0071	10.021	0.285034	6028.8	-30.374	1386
7. Muslim Commercial Bank (MCB)	0.000053176	0.09531	-0.15382	0.026909	-0.49006	2.0845	0.113654	318.35	506.037	1441
8. Bank Al Falah Limited (BAFL)	-0.0012262	0.09531	-0.28811	0.028682	-1.0813	10.502	0.184424	6898.7	-23.391	1441
9. JASBL	-0.0013614	0.31113	-0.28768	0.042931	0.53125	7.8994	0.135824	3049.4	-31.534	1153
Modaraba's:										
1. Crescent Standard Modaraba (CSM)	-0.0016064	1.273	-1.6614	0.1881	-0.78641	19.83	0.0285495	18037	-117.09	1095
2. First Elite Capital Modaraba (FECM)	-0.00040558	0.57982	-0.67513	0.09831	-0.44547	6.3049	0.0095825	1822.8	-242.39	1080
3. First Equity Modarba (FEM)	-0.0018339	0.35534	-0.66498	0.074648	-0.23933	8.7037	0.0714882	4438.7	-40.705	1403

4. First Fidelity Leasing Modaraba (FFLM)	-0.0011398	0.35055	-0.4385	0.073796	-0.33979	4.7013	0.0238356	1171.5	-64.745	1247
5. First Habib Bank Modaraba (FHBM)	-0.0002301	0.25131	-0.28768	0.041783	-0.042479	5.2404	0.108093	1443.3	-181.59	1262
6. First Punjab Modarba (FPJM)	-0.002349	0.63488	-0.69315	0.1002	-0.38853	9.9145	0.021462	4471.2	-42.656	1086
7. First UDL Modarba (FUDLM)	0.00010977	0.21869	-0.30874	0.052309	-0.67461	5.1325	0.0641578	1202.8	476.533	1026
8. Modaraba Al - Mali (MODAM)	-0.0021172	0.65743	-0.74444	0.12237	-0.41622	5.3969	0.0180267	1348.1	-57.798	1086
9. First Pakistan Modarba (PAKMI)	-0.0005071	0.70272	-1.0658	0.14736	-0.42441	6.5535	0.24843	4002.1	-290.59	1023
10. First Prudential Modarba (PMI)	-0.0007246	0.35667	-0.49784	0.06646	-0.50314	6.8516	0.0590825	2721.6	-91.72	1363
11. Standard Chartered Modaraba (SCM)	-0.00050444	0.16551	-0.21585	0.028957	-1.016	9.9146	0.133516	5731.7	-57.404	1344
12. First National Bank Modaraba (FNBM)	-0.00030286	0.21958	-0.25453	0.057649	-0.19308	2.5895	0.0543933	278.47	-190.35	1035

Islamic Mutual Funds:										
1. Al-Meezan Islamic Equity	-0.63583	0.64213	-0.63583	0.64213	-0.2948	181.57	0.0946406	1549500	-1.0099	1129
Conventional Mutual Funds:										
1. PICIC Gowth Fund	-0.00049336	0.97148	-0.98042	0.049813	-0.27961	335.68	0.0241376	8145900	-100.97	1736
2. Atlas Fund of Funds	-0.00018822	0.08769	-0.15221	0.014213	-2.7329	28.616	0.23864	51773	-75.513	1466
3. First Capital Modaraba Fund	-0.0002095	1.2721	-1.2822	0.049401	-0.29154	609.82	0.0278176	22592000	-235.8	1459
4. Pakistan Strategic Allocation	-0.00010255	0.14354	-0.19906	0.015905	-3.0332	39.456	0.104739	117530	-155.1	1771
5. Askari Asset Allocation Fund	-0.00074585	0.9772	-0.9738	0.044084	-0.94202	415.53	0.0337199	8482500	-59.106	1182
6. Crosby Dragon Fund	-0.00012887	0.31041	-0.30468	0.023893	-3.7935	76.75	0.077848	400760	-185.4	1788
7. IGI Stock Fund	0.000069421	0.32057	-0.30191	0.023201	-2.9982	117.96	0.129695	469070	334.207	1725

8. HBL Money Market Fund	0.000043041	0.040379	-0.039111	0.0058527	-1.0463	24.288	0.0449218	8815.4	135.98	1144

Sources: Author's own estimates.

Note: KPSS test; H0: series is I(0), Asymptotic critical values of KPSS (1% , 5%, 10%) = (0.739, 0.463, 0.347).

JB (JarqueBera) test H0: series is normal.

Table 3: Descriptive Statistics and Pre-Estimation Tests

Companies	Q-Stat (5)	Q-Stat (10)	Q2-stat (5)	Q2-stat (10)	LM-ARCH(2)	LM-ARCH(5)
Islamic Banks:						
1. Meezan Bank Limited	21.1043 (0.0007	28.9722 (0.0012)	20.3615 (0.0010)	25.5352 (0.0044)	5.7456 (0.0033)	3.3721 (0.0049)
2. Bank Islami Limited	12.8874 (0.0244)	25.2543 (0.0048)	197.662 (0.0000)	259.537 (0.0000)	34.713 (0.0000)	29.92 (0.0000)
Conventional Banks:						
1. Allied Bank Limited (ABL)	47.6914 (0.0000)	56.2655 (0.0000)	14.5042 (0.0127)	16.4651 (0.0870)	6.3713 (0.0018)	2.5963 (0.0240)
2. United Bank Limited (UBL)	31.0852 (0.0000)	49.8274 (0.0000)	201.726 (0.0000)	342.895 (0.0000)	36.946 (0.0000)	24.916 (0.0000)
3. Habib Bank Limited (HBL)	29.6891 (0.0000)	33.6884 (0.0002)	47.4411 (0.0000)	61.4518 (0.0000)	8.526 (0.0002)	7.2015 (0.0000)

4. Bank of Punjab Limited (BOP)	21.2046 (0.0007)	34.8242 (0.0001)	12.234 (0.0317)	17.2663 (0.0686)	3.4877 (0.0308)	2.1312 (0.0593)
5. Bank of Khyber Limited (BOK)	6.44225 (0.2655	7.74746 (0.6534)	68.8384 (0.0000)	90.9815 (0.0000)	17.001 (0.0000)	10.194 (0.0000)
6. Muslim Commercial Bank (MCB)	79.0922 (0.0000)	88.2642 (0.0000)	547.553 (0.0000)	620.656 (0.0000)	179.86 (0.0000)	74.874 (0.0000)
7. Bank Al Falah Limited (BAFL)	32.3869 (0.0000)	41.9724 (0.0000)	12.7787 (0.0255)	21.7468 (0.0164)	3.2486 (0.0391)	2.1616 (0.0560)
8. JASBL	8.86824 (0.1144)	25.5218 (0.0044)	304.774 (0.0000)	369.222 (0.0000)	100.73 (0.0000)	69.931 (0.0000)
Modaraba's:						
1. Crescent Standard Modaraba (CSM)	123.234 (0.0000)	141.087 (0.0000)	294.862 (0.0000)	466.024 (0.0000)	84.943 (0.0000)	39.244 (0.0000)
2. First Elite Capital Modaraba (FECM)	182.168 (0.0000)	222.683 (0.0000)	167.712 (0.0000)	221.283 (0.0000)	83.468 (0.0000)	39.171 (0.0000)
3. First Equity Modarba (FEM)	96.9154 (0.0000)	123.88 (0.0000)	80.8002 (0.0000)	268.929 (0.0000)	16.041 (0.0000)	14.403 (0.0000)
4. First Fidelity Leasing Modaraba (FFLM)	168.696 (0.0000)	183.697 (0.0000)	226.169 (0.0000)	270.763 (0.0000)	46.071 (0.0000)	36.752 (0.0000)
5. First Habib Bank Modaraba (FHBM)	53.5309 (0.0000)	65.8267 (0.0000)	237.989 (0.0000)	355.191 (0.0000)	70.541 (0.0000)	32.627 (0.0000)

6. First Punjab Modarba (FPJM)	114.206 (0.0000)	129.129 (0.0000)	103.089 (0.0000)	267.091 (0.0000)	25.242 (0.0000)	16.95 (0.0000)
7. First UDL Modarba (FUDLM)	93.1607 (0.0000)	94.909 (0.0000)	98.4315 (0.0000)	112.164 (0.0000)	31.003 (0.0000)	13.809 (0.0000)
8. Modaraba Al - Mali (MODAM)	129.916 (0.0000)	143.69 (0.0000)	193.847 (0.0000)	208.881 (0.0000)	73.133 (0.0000)	34.614 (0.0000)
9. First Pakistan Modarba (PAKMI)	163.175 (0.0000)	175.076 (0.0000)	200.353 (0.0000)	314.033 (0.0000)	56.55 (0.0000)	28.69 (0.0000)
10. First Prudential Modarba (PMI)	49.7846 (0.0000)	55.2859 (0.0000)	211.694 (0.0000)	212.891 (0.0000)	116.32 (0.0000)	47.512 (0.0000)
11. Standard Chartered Modaraba (SCM)	62.2428 (0.0000)	68.7817 (0.0000)	23.6134 (0.0002)	48.1774 (0.0000)	5.7739 (0.0032)	3.8753 (0.0017)
12. First National Bank Modarba (FNBM)	49.2485 (0.0000)	57.2363 (0.0000)	116.537 (0.0000)	232.914 (0.0000)	38.811 (0.0000)	18.868 (0.0000)
Islamic Mutual Funds:						
1. Al-Meezan Islamic Equity	166.085 (0.0000)	166.443 (0.0000)	270.344 (0.0000)	2 (0.0000)	260.61 (0.0000)	138.96 (0.0000)
Conventional Mutual Funds:						
1. PICIC Gowth Fund	342.366 (0.0000)	344.17 (0.0000)	431.787 (0.0000)	431.827 (0.0000)	430.08 (0.0000)	243.84 (0.0000)
2. Atlas Fund of Funds	25.208 (0.0001)	26.6418 (0.0029)	46.2975 (0.0000)	72.6898 (0.0000)	14.049 (0.0000)	7.1397 (0.0000)

3. First Capital Modaraba Fund	294.644 (0.0000)	294.768 (0.0000)	364 (0.0000)	364.019 (0.0000)	362.45 (0.0000)	205.94 (0.0000)
4. Pakistan Strategic Allocation	20.7254 (0.0009)	24.8942 (0.0055)	21.458 (0.0006)	22.6503 (0.0121)	9.9239 (0.0001)	4.153 (0.0009)
5. Askari Asset Allocation Fund	180.456 (0.0000)	180.593 (0.0000)	278.572 (0.0000)	278.603 (0.0000)	262.9 (0.0000)	136.34 (0.0000)
6. Crosby Dragon Fund	25.7247 (0.0001)	32.3498 (0.0003)	83.7995 (0.0000)	83.81 (0.0000)	46.859 (0.0000)	18.763 (0.0000)
7. IGI Stock Fund	25.6488 (0.0001)	28.4269 (0.0015)	82.0526 (0.0000)	82.1154 (0.0000)	51.045 (0.0000)	20.539 (0.0000)
8. HBL Money Market Fund	49.5273 (0.0000)	58.0744 (0.0000)	53.7569 (0.0000)	58.7351 (0.0000)	39.178 (0.0000)	16.273 (0.0000)

Sources: Author's own estimates.

Note Q-stat (n) Ljung-Box statistics for up to nth order autocorrelation in residuals series H0: no serial correlation.

Q2-stat (Q-stat on Squared Residual series) H0: no serial correlation.

LM-ARCH (n) Lagrange multiplier test for ARCH effect up to order n, its H0: series is not subject to ARCH effect.

Table 4: GARCH Model Specifications

Companies	Model	Cst (M)	AR (1)	AR (2)	MA (1)	MA (2)	Cst (V)	ARCH (Alpha 1)	GARCH (Beta1)	α+β	Student (DF)	ARCH-in-mean(var)	Log Like-lihood
Islamic Banks:													
1.Meezan Bank Limited	ARMA(0,0)-GARCH(1,1)	-0.000098 (0.8787)	-	-	-	-	1.110141 (0.0004)	0.347338 (0.0000)	0.555944 (0.0000)	0.903324	4.238602 (0.0000)	0.175563 (0.8499)	3374.49
2.Bank Islami Limited	ARMA(0,0)-GARCH(1,1)	-0.001226 (0.1824)	-	-	-	-	0.405539 (0.0120)	0.207343 (0.0000)	0.799190 (0.0000)	1.006533	4.091515 (0.0000)	0.909973 (0.0000)	2882.24
Conventional Banks:													
1.Allied Bank Limited	ARMA(1,1)-GARCH(1,1)	0.000151 (0.7972)	0.333337 (0.0144)	-	-0.282246 (0.0333)	-	0.255557 (0.0953)	0.224951 (0.0057)	0.764218 (0.0000)	0.989169	4.98966 (0.0000)	0.217275 (0.7940)	3443.936

2.United Bank Limited	ARMA(0,0)-GARCH(1,1)	0.000362 (0.5354)	-	-	-	-	0.14811 (0.0273)	0.27346 (0.0001)	0.755706 (0.0000)	1.029166	4.300681 (0.0000)	-0.566292 (0.6902)	2060.896
4.Habib Bank Limited	ARMA(1,0)-GARCH(1,1)	-0.000102 (0.3698)	0.048458 (0.1871)	-	-	-	0.01463 (0.0000)	1.0000 (0.0000)	0.666637 (0.0000)	1.666637	2.493706 (0.0000)	-0.421562 (0.0945)	2732.35
5.Bank of Punjab Limited	ARMA(1,0)-GARCH(1,1)	-0.001781 (0.0078)	0.073974 (0.0157)	-	-	-	1.5281 (0.0094)	0.524136 (0.0000)	3.464877 (0.0000)	3.989013	3.464877 (0.0000)	0.492783 (0.2830)	3087.58
6.Bank of Khyber Limited	ARMA(1,1)-GARCH(1,1)	-0.002754 (0.0000)	0.340919 (0.0009)	-	-0.514412 (0.0000)	-	3.172329 (0.0058)	0.674767 (0.0011)	0.515788 (0.0000)	1.190555	2.581322 (0.0000)	0.087235 (0.7653)	2893.24
7. Muslim Commercial Bank	ARMA(1,0)-GARCH(1,1)	0.000409 (0.5143)	0.09979 (0.0013)	-	-	-	0.41594 (0.0117)	0.345536 (0.0000)	0.659154 (0.0000)	1.00469	5.423883 (0.0000)	0.613936 (0.5362)	3378.169

8. Bank Al Falah Limited	ARMA(2,2)-GARCH(1,1)	0.000463 (0.5579)	1.192344 (0.0000)	-0.7186 (0.0086)	-1.14927 (0.0000)	0.702733 (0.0474)	0.96551 (0.0396)	0.294615 (0.0006)	0.62384 (0.0000)	0.918455	4.986609 (0.0000)	-1.046321 (0.2945)	3275.99
9. JASBL	ARMA(2,0)-GARCH(1,1)	-0.002135 (0.1097)	-0.070728 (0.0402)	-0.064122 (0.0338)	-	-	1.23661 (0.0076)	0.249853 (0.0000)	0.231807 (0.0570)	0.48166	4.544434 (0.0000)	0.023073 (0.9810)	2210.29
Modaraba's:													
1. Crescent Standard Modaraba (CSM)	ARMA(1,1)-GARCH(1,1)	-0.001665 (0.2094)	0.223309 (0.0023)	-	0.632886 (0.0000)	-	0.000673 (0.0074)	0.211564 (0.0002)	0.796374 (0.0000)	1.007938	3.233976 (0.0000)	0.000170 (0.9978)	909.76
2. First Elite Capital Modaraba (FECM)	ARMA(1,1)-GARCH(1,1)	-0.000982 (0.1929)	0.229438 (0.0002)	-	-0.678092 (0.0000)	-	6.252123 (0.1402)	0.753035 (0.2157)	0.667029 (0.0000)	1.420064	2.442542 (0.0000)	0.177418 (0.1882)	1365.97
3.First Equity Modarba (FEM)	ARMA(1,1)-GARCH(1,1)	-0.004101 (0.0000)	0.231207 (0.0411)	-	-0.526413 (0.0000)	-	2.217267 (0.4376)	0.298952 (0.2016)	0.794983 (0.0000)	1.093935	2.745819 (0.0000)	0.235100 (0.1805)	1998.3

4. First Fidelity Leasing Modaraba (FFLM)	ARMA(1, 1)-GARCH(1,1)	-0.000469 (0.4980)	0.188837 (0.0018)	-	-0.584677 (0.0000)	-	2.353165 (0.1246)	0.555903 (0.1163)	0.754031 (0.0000)	1.309934	2.447537 (0.0000)	-0.066057 (0.5596)	1852.17
5. First Habib Bank Modaraba (FHBM)	ARMA(1, 0)-GARCH(1,1)	-0.000162 (0.8009)	-0.282083 (0.0000)	-	-	-	0.470432 (0.0460)	0.291613 (0.0004)	0.788334 (0.0000)	1.079947	3.032075 (0.0000)	-0.180550 (0.6889)	2529.31
6. First Punjab Modarba (FPJM)	ARMA(1, 1)-GARCH(1,1)	-0.000327 (0.4318)	0.206024 (0.0517)	-	-0.574879 (0.0000)	-	1.513594 (0.6858)	1.751739 (0.6736)	0.752582 (0.0000)	2.504321	2.128258 (0.0000)	-0.003026 (0.8830)	1619.91
7. First UDL Modarba (FUDLM)	ARMA(1, 1)-GARCH(1,1)	0.001476 (0.0518)	0.213741 (0.0518)	-	-0.491840 (0.0000)	-	3.881982 (0.3468)	0.613865 (0.1961)	0.699583 (0.0000)	1.313448	2.346672 (0.0000)	-0.000648 (0.9767)	1825.63
8. Modaraba Al - Mali (MODAM)	ARMA(1, 0)-GARCH(1,1)	-0.002146 (0.1052)	-0.301185 (0.0000)	-	-	-	0.000653 (0.1470)	1.000000 (0.0001)	0.651809 (0.0000)	1.651809	2.330920 (0.0000)	0.192519 (0.0129)	1164.28

9. First Pakistan Modarba (PAKMI)	ARMA(1, 1)-GARCH(1,1)	-0.000028 (0.9736)	0.037044 (0.5895)	-	-0.403742 0.0000	-	0.000465 (0.5495)	1.000000 (0.0410)	0.727823 (0.0000)	1.727823	2.239493 (0.0000)	0.039153 (0.2643)	944.479
10. First Prudential Modarba (PMI)	ARMA(2, 1)-GARCH(1,1)	-0.000416 (0.8448)	0.057264 (0.3016)	19.946577 (0.0935)	0.320457 (0.2371)	-	0.059911 (0.9026)	-0.000416 (0.8448)	0.057264 (0.3016)	0.056848	19.946577 (0.0935)	0.320457 (0.2371)	2055.86
11. Standard Chartered Modaraba (SCM)	ARMA(1, 0)-GARCH(1,1)	-0.000025 (0.9562)	-0.250586 (0.0000)	-	-	-	1.415506 (0.0235)	0.513122 (0.0056)	0.543566 (0.0000)	1.056688	2.857527 (0.0000)	0.067154 (0.8958)	3185.32
12. First National Bank Modarba(FNBM)	ARMA(1, 1)-GARCH(1,1)	0.000474 (0.4583)	0.211930 (0.1016)	-	-0.503814 (0.0000)	-	0.149725 (0.2742)	0.205177 (0.0011)	0.864962 (0.0000)	1.070139	3.019146 (0.0000)	0.025835 (0.9091)	1665.88
Islamic Mutual Funds:													
1.Al-Meezan Islamic Equity	ARMA(0, 0)-GARCH(1,1)	0.000642 (0.0109)	-	-	-	-	0.774275 (0.0559)	1.000000 (0.0000)	0.381125 (0.0062)	1.381125	2.430863 (0.0000)	0.526024 (0.4583)	3336.15

Conventinal Mutual Funds:													
1.PICIC Gowth Fund	ARMA(1,0)-GARCH(1,1)	0.000564 (0.0025)	0.054282 (0.0469)	-	-	-	0.393964 (0.3952)	1.000000 (0.0000)	0.484260 (0.0270)	10.48426	2.473764 (0.0000)	0.176483 0.3077	5107.56
2.Atlas Fund of Funds	ARMA(0,0)-GARCH(1,1)	0.000739 (0.0000)	-	-	-	-	0.116267 (0.1225)	0.852085 (0.1327)	0.666881 (0.0000)	1.518966	2.322498 (0.0000)	-0.303597 (0.4202)	4995.03
3.First Capital Modaraba Fund	ARMA(1,0)-GARCH(1,1)	0.000134 (0.2688)	0.093399 (0.0019)	-	-	-	0.030949 (0.0000)	1.000000 (0.0018)	0.658254 (0.0000)	1.658254	2.491540 (0.0000)	0.086912 (0.0038)	4485.02
4.Pakistan Strategic Allocation Fund	ARMA(1,1)-GARCH(1,1)	0.000934 (0.0000)	0.429479 (0.0710)	-	-0.333262 (0.1763)	-	0.086278 (0.0027)	0.490638 (0.0000)	0.650867 (0.0000)	1.141505	3.114163 (0.0000)	0.503153 (0.2696)	5602.05
5.Askari Asset Allocation Fund	ARMA(0,0)-GARCH(1,1)	0.000101 7 (0.1727)	-	-	-	-	0.040289 (0.0000)	1.000000 (0.0000)	0.593234 (0.0000)	1.593234	2.354413 (0.0000)	-0.118495 (0.0007)	4013.62

6.Crosby Dragon Fund	ARMA(1, 0)-GARCH(1,1)	0.000468 (0.0275)	0.025651 (0.2245)	-	-	-	0.011146 (0.8791)	1.000000 (0.0000)	0.834861 (0.0000)	1.834861	2.112459 (0.0000)	-0.037850 (0.4585)	4781.56
7. IGI Stock Fund	ARMA(1, 1)-GARCH(1,1)	-0.0000093 (0.7893)	-0.992517 (0.0000)	-	0.983188 (0.0000)	-	0.000000 (1.0000)	1.000000 (0.0000)	0.872702 (0.0000)	1.872702	2.088531 (0.0000)	0.082035 (0.0667)	2595.71
8.HBL Money Market Fund	ARMA(1, 0)-GARCH(1,1)	0.000292 (0.2070)	0.056425 (0.9277)	-	-	-	0.011028 (0.9292)	0.617423 (0.8713)	0.227436 (0.9432)	0.844859	2.001936 (0.0000)	2.359131 (0.8395)	2310.7

Sources: Author's own estimates.

Note: Q-stat (n) Ljung-Box statistics for up to nth order autocorrelation in residuals series H0: no serial correlation.

Q2-stat (Q-stat on Squared Residual series) H0: no serial correlation.

Table 5: Post-Estimation Tests through Residual Analysis

Companies	Q-Stat (5)	Q-Stat (10)	Q2-stat (5)	Q2-stat (10)	LM-ARCH(2)	LM-ARCH(5)
Islamic Banks:						
1. Meezan Bank Limited	2.47024 (0.7809)	5.75177 (0.8356)	0.839804 (0.8399)	1.21893 (0.9964)	0.22486 (0.7987)	0.17349 (0.9725)
2. Bank Islami Limited	6.18137 (0.2889)	16.0704 (0.0976)	3.22009 (0.3589)	10.5198 (0.2304)	0.06347 (0.9385)	0.64243 (0.6674)
Conventional Banks:						
1. Allied Bank Limited (ABL)	4.83084 (0.1846)	9.41293 (0.3086)	3.40224 (0.3336)	5.21645 (0.7342)	0.9131 (0.4015)	0.6726 (0.6443)
2. United Bank Limited (UBL)	6.65192 (0.2478)	8.69958 (0.5608)	1.71353 (0.6339)	3.29425 (0.9145)	0.20904 (0.8114)	0.34869 (0.8832)
3. Habib Bank Limited (HBL)	1.41359 (0.8418)	2.35113 (0.9846)	0.189914 (0.9792)	0.414216 (0.9999)	0.039464 (0.9613)	0.037432 (0.9992)
4. Bank of Punjab Limited (BOP)	4.51682 (0.3405)	9.62457 (0.3817)	0.95549 (0.8120)	1.30123 (0.9955)	0.27851 (0.7569)	0.19983 (0.9626)
5. Bank of Khyber Limited (BOK)	1.83355 (0.6076)	6.87807 (0.5498)	0.87315 (0.8319)	1.20251 (0.9966)	0.21023 (0.8104)	0.18131 (0.9697)
6. Muslim Commercial Bank (MCB)	9.27998 (0.0544)	11.5447 (0.2402)	1.96539 (0.5796)	3.83841 (0.8714)	0.2535 (0.7761)	0.40093 (0.8484)

7. Bank Al Falah Limited (BAFL)	4.47055 (0.0344)	9.48279 (0.1481)	1.80961 (0.6128)	2.49051 (0.9621)	0.56126 (0.5706)	0.38531 (0.8591)
8. JASBL	5.82397 (0.1204)	14.6232 (0.0669)	8.84966 (0.0313)	10.3444 (0.2416)	3.7037 (0.0249)	1.7315 (0.1245)
Modaraba's:						
1. Crescent Standard Modaraba (CSM)	3.70233 (0.2954)	7.31738 (0.5028)	2.25666 (0.5208)	3.52087 (0.8975)	0.52665 (0.5907)	0.43695 (0.8229)
2. First Elite Capital Modaraba (FECM)	5.00834 (0.1711)	13.6112 (0.0924)	5.45832 (0.1411)	6.52198 (0.5889)	1.6151 (0.1994)	1.1931 (0.3104)
3. First Equity Modarba (FEM)	4.21107 (0.2395)	11.8436 (0.1583)	0.693368 (0.8747)	2.1815 (0.9749)	0.15419 (0.8571)	0.14307 (0.9821)
4. First Fidelity Leasing Modaraba (FFLM)	5.91461 (0.1158)	13.6809 (0.0904)	6.90754 (0.0749)	10.9599 (0.2039)	1.7068 (0.1819)	1.4426 (0.2061)
5. First Habib Bank Modaraba (FHBM)	8.00779 (0.0912)	12.2352 (0.2003)	0.444727 (0.9308)	0.719136 (0.9994)	0.003572 (0.9964)	0.088744 (0.9940)
6. First Punjab Modarba (FPJM)	6.09298 (0.1071)	7.76936 (0.4563)	0.409606 (0.9382)	0.706462 (0.9995)	0.081095 (0.9221)	0.08215 (0.9950)
7. First UDL Modarba (FUDLM)	4.55249 (0.2076)	7.36496 (0.4978)	3.3254 (0.3441)	5.47049 (0.7063)	0.85906 (0.4239)	0.71389 (0.6131)
8. Modaraba Al - Mali (MODAM)	8.14691 (0.0863)	10.1936 (0.3350)	2.17676 (0.5365)	3.62138 (0.8895)	0.50835 (0.6016)	0.4473 (0.8154)

9. First Pakistan Modarba (PAKMI)	4.65447 (0.1989)	10.8896 (0.2080)	5.64428 (0.1302)	13.0968 (0.1085)	1.3115 (0.2699)	1.2841 (0.2684)
10. First Prudential Modarba (PMI)	4.32781 (0.1148)	7.12343 (0.4161)	1.61274 (0.6565)	2.33149 (0.9691)	0.38346 (0.6816)	0.32686 (0.8970)
11. Standard Chartered Modaraba (SCM)	5.18698 (0.2686)	10.0675 (0.3450)	1.58463 (0.6628)	3.9453 (0.8620)	0.37909 (0.6846)	0.32856 (0.8959)
12. First National Bank Modarba (FNBM)	2.1705 (0.5377)	5.30199 (0.7248)	2.69403 (0.4412)	4.62835 (0.7964)	0.19564 (0.8223)	0.54925 (0.7390)
Islamic Mutual Funds:						
1. Al-Meezan Islamic Equity	1.66837 (0.8928)	2.51609 (0.9906)	0.033633 (0.9983)	0.07213 (0.9999)	0.0072224 (0.9928)	0.0066924 (1.0000)
Conventional Mutual Funds:						
1. PICIC Gowth Fund	0.732999 (0.9471)	2.9019 (0.9680)	0.0292509 (0.9986)	0.0543021 (1.0000)	0.0047341 (0.9953)	0.0058444 (1.0000)
2. Atlas Fund of Funds	6.46039 (0.2639)	9.17479 (0.5155)	0.255471 (0.9681)	0.655089 (0.9996)	0.027575 (0.9728)	0.051268 (0.9984)
3. First Capital Modaraba Fund	0.51586 (0.9719)	0.667076 (0.9998)	0.00396 (0.9999)	0.008433 (1.0000)	0.00083 (0.9992)	0.000787 (1.0000)
4. Pakistan Strategic Allocation	3.28193 (0.3501)	7.45203 (0.4887)	0.204837 (0.9768)	0.411946 (0.9999)	0.030746 (0.9697)	0.041129 (0.9991)
5. Askari Asset Allocation Fund	0.219175 (0.9988)	0.227388 (0.9999)	0.005885 (0.9998)	0.0123919 (1.0000)	0.0010773 (0.9989)	0.0011676 (1.0000)

6. Crosby Dragon Fund	1.25405 (0.8691)	3.32168 (0.9501)	0.0140749 (0.9995)	0.0260466 (1.0000)	0.002696 (0.9973)	0.0028055 (1.0000)
7. IGI Stock Fund	0.77856 (0.8545)	1.90038 (0.9839)	0.154649 (0.9845)	0.263326 (0.9999)	0.028239 (0.9722)	0.031108 (0.9995)
8. HBL Money Market Fund	5.18266 (0.2690)	16.2744 (0.0613)	1.08557 (0.7805)	11.7045 (0.1648)	0.16124 (0.8512)	0.22823 (0.9501)

Sources: Author's own estimates.

Table 6: Statistics of Return to Risk Ratio (RRR)

List of Institutions	Return/Risk
Islamic Banks:	
1. Meezan Bank Limited	-0.01543402
2. Bank Islami Limited	-2.42896278
Conventional Banks:	
1. Allied Bank Limited	0.56194419
2. United Bank Limited	0.63945534
3. Habib Bank Limited	-0.987195399
4. Bank of Punjab Limited	-1.752583393
5. Bank of Khyber Limited	-1.904863717
6. Muslim Commercial Bank	1.499549893
7. Bank Al Falah Limited	-0.362255842
8. JASBL	-1.848990025
Modaraba's:	
1. Crescent Standard Modaraba (CSM)	-0.181580114
2. First Elite Capital Modaraba (FECM)	0.070356137
3. First Equity Modarba (FEM)	-0.683951194
4. First Fidelity Leasing Modaraba (FFLM)	-0.174941109
5. First Habib Bank Modaraba (FHBM)	-0.340246286
6. First Punjab Modarba (FPJM)	-0.033644304
7. First UDL Modarba (FUDLM)	0.433094149
8. Modaraba Al - Mali (MODAM)	-0.007973902
9. First Pakistan Modarba (PAKMI)	0.033306215
10. First Prudential Modarba (PMI)	-0.057815656

11. Standard Chartered Modaraba (SCM)	0.010722533
12. First National Bank Modarba (FNBM)	0.455446886
Islamic Mutual Funds:	
3. Al-Meezan Islamic Equity	0.103610807
Conventional Mutual Funds:	
1. PICIC Gowth Fund	2.847670111
2. Atlas Fund of Funds	6.20337721
3. First Capital Modaraba Fund	1.358936996
4. Pakistan Strategic Allocation	10.42218966
5. Askari Asset Allocation Fund	1.832831709
6. Crosby Dragon Fund	1.177338496
7. IGI Stock Fund	0.023430625
8. HBL Money Market Fund	27.55667033

References

Abdullah, F., Hassan, T. Mohamad, S. (2007). "Investigation of the performance of Malaysian Islamic Unit Trust Funds: Comparison with Conventional Unit Trust Funds". Managerial Finance, 33(2), 142-153.

Abdullah, M., Shahimi, S., & Ismail, A. G. (2011). Operational risk in Islamic bank: an examination of issues. Qualitative Research in Financial Markets, 3(2), 131-151.

Adam, D. B. (2012), A Comparative Analysis of the Risk in Islamic and Conventional Banks in Kenya, Master project submitted at School of Business, University Of Nairobi.

Albaity M. and Ahmad R. (2008), Performance of Sharia'h and Composite Indices: Evidence from Bursa Malaysia, Asian Academy of Management Journal of Accounting and Finance, Vol. 4, No. 1, 23–43.

Annuar, M. N., Shamsher M. and Ngu, M.H. (1997), Selectivity and Timing: Evidence from the performance of Malaysian Unit Trusts, Pertanika 5(1), 45-57.

Bacha, O.I. (2002), "New Issues in Islamic Capital Market Development: Risk Management and Islamic Capital Markets", Islamic Capital Markets Conference, Securities Commission, March 2002, Kuala Lumpur, Malaysia.

Bollerslev, T. 1986. Generalized Autoregressive Conditional Heteroskedasticity. *Journal of Econometrics*, 31, 307-327.

Bollerslev, T. 1990. Modeling the coherence in short-run nominal exchange rates: A multivariate generalized ARCH model. *Review of Economics and Statistics.*72, 498.

Boumediene, A. (2011). Is credit risk really higher in Islamic banks? The Journal of Credit Risk, 7(3), 97-129.

Brooks, C. (2002), Introductory Econometrics for Finance. Cambridge: Cambridge University Press.

Campbell, J. Y., and Hentschel, L. (1992). No News Is Good News: An Asymmetric Model of changing volatility in Stock Returns, Journal of Financial Economics, 31: 281–318.

D'Antonio, L., Johnsen, T., & Hutton, R. B. (1997). Expanding socially screened portfolios: An attribution analysis of bond performance. Journal of Investing, 6(4), 79–86.

Devaney, M. (2001), Time-varying Risk Premia for Real Estate Investment Trusts: A Garchm Model, the Quarterly review of Economics and Finance, 41- 335-346.

Dridi, J., and Maher, H. (2010), the Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study, IMF- WP/10/201.

Elfakhani, S., Hasan, M. K., & Sidani, Y. (2005). Comparative performance of Islamic versus secular mutual funds. Paper presented at the 12th Economic Research Forum, University of New Orleans, US.

Hakim, S., & Rashidian, M. (2002). Risk and return of Islamic stock market. Paper presented at the Presentation to Economic Research Forum Annual Meetings, Sharjah, UAE, 2005.

Hanafi, A. (2002), The Performance of Islamic Unit Trusts in Malaysia, Unpublished project paper, Serdang, Malaysia: Universiti Putra Malaysia.

Hassan, A., (2009). Risk management practices of Islamic banks of Brunei Darussalam, The Journal of Risk Finance, Vol. 10 No. 1, 2009 pp. 23-37.

HOEPNER, A. G. F. & MCMILLAN, D. G. 2009. Research on 'Responsible Investment': An Influential Literature Analysis comprising a rating, characterization, categorization & investigation. Available: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1454793 [Accessed 2009, September, 6].

Hickman, K. A., Teets, R., & Kohls, J. J. (1999). Social investing and modern portfolio theory. American Business Review, 17(3), 72–78.

Hussein, K. and Omran, M. (2005). "Ethical Investment revisited: Evidence from Dow Jones Islamic Indexes", The Journal of Investing, 105-124.

Hussein, K. (2005). Islamic investment: Evidence from Dow Jones and FTSE indices. Paper presented at the International Conferences on Islamic Economics and Finance, Indonesia. Retrieved on June 2006, from http://islamiccenter.kaau.edu.sa/arabic/

Ahdath/Con06/_pdf/Vol1/15%20Khaled%20A.%20Hussein%20Islamic%20Investment.pdf/.

Hussein, K. (2010). Bank-level stability factors and consumer confidence – A comparative study of Islamic and conventional banks' product mix. Journal of Financial Services Marketing, 15(3), 259-270.

Jam-e-Kausar, M. Asghar, A. and Afza, T. (2013), Efficiency of Modaraba and Leasing Companies in Pakistan, Middle-East Journal of Scientific Research 17 (3): 305-314, 2013, ISSN 1990-9233.

Kettell, B. (2001). Financial economics: Making sense of market information. London: Financial Times Prentice Hall.

Khan, S. A. (2013), Hedging, an Islamic approach, Thesis Submitted in partial fulfillment Ph.D. in Econometrics, International Islamic University, Islamabad.

Khan, T. (1996). Practices and Performance of Modaraba Companies: A Case Study of Pakistan's Experience, Working Paper, Islamic Research and Training Institute, Islamic Development Bank, Jeddah, Saudi Arabia.

Khan, T. (2003), Credit Risk Management: A Framework for Islamic Banking. Paper Presented at the Islamic Banking: Risk Management, Regulation, and Supervision, Jakarta, Indonesia.

Khan, T., & Ahmed, H. (2001), Risk Management: An Analysis of Issues in Islamic Financial Industry, occasional Paper Islamic Research, and Training Institute 5.

Markowitz, H. (1952). Portfolio selection. Journal of Finance, 7(1), 77–91.

Mueller, S. A. (1994), "Investment Returns on an Islamic-Principle Mutual Fund in the United States: Further evidence for the Cost-of-Discipleship Hypothesis". Sociology of Religion, 55(1), 85-87.

Muhammad, N.M.N. And Mokhtar M. (2008). "Islamic Equity Mutual Fund Performance in Malaysia: Risk and Return Analysis". Proceedings of the Malaysian Finance Association (MFA) Conference 2008.

Shamsher, M., Annuar, M. N. and Taufiq, H. (2001), "Investment in Unit Trusts: Performance of Active and Passive Funds". Proceedings of FEP Seminar 2001: Issues in Accounting, Finance, Management, and

Economics. Serdang, Malaysia: Universiti Putra Malaysia, 2001, pp. 155-174.

Statman, M. (2000). Socially responsible mutual funds. Financial Analysts Journal, 56(3), 30–39.

Sukmana R. and Kholid M. (2013), "An assessment of liquidity policies with respect to Islamic and conventional banks: A case study of Indonesia", Qualitative Research in Financial Markets 5(2).