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MOMENTUM STRATEGIES OF CONVENTIONAL AND ISLAMIC FINANCE

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ABSTRACT

The foremost motivation of this study is to explore and compare the behavioral implications of momentum strategies on stock portfolios of conventional and faith-based Islamic finance. The principal asset pricing model is Carhart's four-factor model, accompanied by the CAPM and Fama & French three-factor models as a comparison base. The two broad categories of conventional and Islamic finance have been segregated into four comparable subgroups: Conventional vs. Islamic banks, Investment banks vs Modarabahs, Insurance vs. leasing, and Mutual funds vs. Islamic mutual funds. The descriptive features have identified the presence of momentum profits in both conventional and Islamic stock portfolios. However, Islamic stocks yielded higher returns than conventional compeers. Similar trends are observed by applying Carhart's four-factor model as well. A significant pre-recession momentum effect in mutual funds and modarabahs is overturned in the post-recession period. The time-variant volatility is modeled through the EGARCH-M based framework and has depicted sensitivity of returns θ due to omitted risk factors h_t. Further, Islamic stock portfolios are better shock absorbent and have greater receptivity to leverage effect than conventional peers.

Keywords: Investment decisions, Islamic Finance, Momentum factor, EGARCH-M

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1. INTRODUCTION

One of the important components of research in financial economics is based on the efficient market hypothesis tested by (E. F. Fama, 1970). However, EMH has ignored the behavioral impact of stock prices which was later incorporated by (DeBondt & Thaler, 1985, 1987) on the premise that individuals and markets tend to overreact. Therefore, this overreaction enables past losers (lowest return stocks) to surpass past winners (highest return stocks) in 3 to 5 years, which forms the basis of the Contrarian strategy (reversal of returns). According to this strategy, buying past losers and selling past winners can generate abnormal returns in the long run. However, it was argued that the presence of contrarian strategy in the short run is due to the absence of liquidity rather than overreaction (Jegadeesh, 1990; Lehmann, 1990). This proposition has been reiterated by (Lo & Mackinlay, 1990), who claimed that return reversals are due to lagged reaction instead of overreaction.

Before the contrarian strategy, many practitioners successfully applied the relative strength trading rules by buying past winners and selling past losers in 3 to 12 months (Jegadeesh & Titman, 1993). These results were later confirmed by (Grinblatt & Titman, 1989) on the performance of US mutual funds from 1974 to 1984. These relative strength trading rules gained academic fame when their outcomes were tested and verified by (Jegadeesh & Titman, 1993) on US stocks. This phenomenon of generating abnormal returns in the short run is the Momentum strategy/ factor. The momentum factor was later modeled by (Carhart, 1997), and this model has identified autocorrelation in the stock returns where future returns on stocks can be predicted based on past performances.

Momentum strategies are widely being used in the US market, especially for NYSE stocks; however, (Chan et al., 2000) witnessed the presence of momentum profits in indices of 23 countries and claimed that higher momentum is dependent on greater trading volumes. Conversely, (Hameed & Yuanto, 2002) has not found any evidence of price momentum in six emerging Asian markets. These findings are corroborated by (Chui et al., 2000) based on 6/6 months value-weighted portfolios and have concluded that weak momentum profits have persisted in eight Asian countries. Further, the volatility of momentum profits is associated with the financial crisis, and smaller and distressed firms are more receptive to momentum.

Another comprehensive study by (Griffin et al., 2003) on 6/6 value-weighted portfolios has observed momentum profits in 33 out of 40 countries. The emerging markets of China and Brazil demonstrated short-term contrarian and long-term momentum profits. Further, the impact of momentum profits is quite significant in the Indian stock market, unlike their Russian counterparts (Nnadi & Tanna, 2017). (Chiao et al., 2018) replicated the idea of residual momentum for the first time in four Asian countries of Hong Kong, Taiwan, Thailand, and Singapore. All the stocks are sorted based on residual returns and compared with price momentum. The impact of residual momentum is more consistent, coupled with greater profitability over price momentum.

Momentum strategies are also refined over time and (Kim, 2019) proposed a selective winner minus loser strategy (SWML). According to this approach, similar signs of actual and predicted returns in the holding period lead to investment in risk-free financial instruments. This strategy witnessed a rise in returns and enhanced high-order statistical moments. The comprehension of culture plays an essential role in developing profitable momentum strategies. Further, there is a strong correlation between cultural aspects, the uncertainty of economic policies, and momentum

strategies (Galariotis & Karagiannis, 2020). (Butt & Virk, 2020) identified a significant asymmetrical relationship between momentum profits and market liquidity. The receptivity of momentum returns is higher due to an increase in liquidity compared to a decrease.

Islamic stocks are expected to be different from conventional because Shariah principles disallow interest, and speculation, encourage equity rather than debt financing and permit sharing of risks/ rewards by lenders and borrowers (Aggarwal & Yousef, 2000; Ayub, 2007; Rudnycky, 2013). The Islamic financial system also precludes investment in tobacco, alcohol, arms, and similar harmful activities (Ahmed, 2010). Further, the financial screening process for Islamic stocks in Pakistan has also prescribed some limits, i.e. the interest-bearing debt to total assets (less than 37%), non-compliant investments to total assets (less than 33%), non-compliant income to total revenues (less than 5%), and Illiquid assets to total assets (must maintain at least 25%).

A recent bibliometric study on the performance of Islamic stocks during crisis identified three advantages over the conventional coequals. First, the risk-reward sharing contracts of Modarabah and musharakah provided financial stability because both parties were prone to risk. The shariah screening process excluded many highly leveraged firms. Thirdly, many derivative-based instruments were avoided to reduce systematic risk. Islamic contracts like salam (hedging instruments) and asset-backed sukuk came up as better alternatives during distressed periods (Farhat et al., 2025).

2. LITERATURE REVIEW

2.1 Existing Studies

Although many studies have been conducted on momentum strategies, this concept has gained limited attention from researchers of Islamic finance (Li et al., 2016). The analysis of around 532 stocks from the Dow Jones Islamic US index suggested that the momentum profits of Islamic stocks are greater than conventional but concluded that momentum profits are just a reward for risks and mostly affected by size and value factors (Narayan et al., 2017). The Indonesian Islamic stocks have also witnessed excess returns by applying a momentum strategy for one, three, and six months (Toro & Dewi, 2014). Another interesting study on momentum profits has been conducted by selecting 188 Islamic stocks from Dow Jones Islamic Market Asia-Pacific Index (DJIMAP). This study has confirmed the existence of the momentum factor and identified that the momentum strategy on low credit quality Islamic and conventional stocks yields more pronounced profitability than high credit quality stocks (Narayan et al., 2015). (Ejaz & Polak, 2015) evaluated seven middle eastern markets and observed a significant short-term momentum factor in all those markets. However, the CAPM cannot explain momentum profits in any of the chosen countries.

The impact of momentum profits on Malaysian markets (considered one of the pioneers of modern Islamic finance) has also been assessed. In one such study May, Cheng, & Hassan (2014) analyzed 700 Malaysian stocks and witnessed significant momentum profits during the economic boom and negative returns in the Asian financial crisis. The results of 24 Malaysian sector indices have reiterated the presence of momentum profits attributed to long positions of winners but highlighted that systematic risk could not explain the momentum effect (Elias et al., 2014). The Malaysian stocks have witnessed greater momentum profits over their conventional compeers. These strategies depend highly on the market state, and significant differences are observed in each state.

This paper reiterates that momentum profits only occur due to the mispricing of stocks rather than a reward for risk (Tee et al., 2019).

The existence of momentum profits has jeopardized the efficient market hypotheses because markets have been inefficient due to the predictability of future prices. Further, higher momentum profits are directly proportional to greater trading volumes and vice versa in the Malaysian stock market (Husni, 2006). All of the above studies have ignored the impact of the momentum factor specifically on Shariah-compliant Malaysian stocks, and the initial work on such stocks is performed by (Li et al., 2016). Based on their findings, momentum profits have prevailed in only Islamic stocks and continue to yield returns for a four-year holding period. Further, momentum profits are associated with investors' under-reaction due to anchoring bias.

Pakistan's position is unique in the Islamic finance industry, with Islamic assets accounting for nearly 23% of the country's total banking assets. Further, unlike Malaysia, Indonesia or GCC countries, where Islamic finance is a parallel financial system, the Shariah court of Pakistan made it mandatory to convert the entire financial system into Islamic. The shift from conventional to Islamic and the total asset-based benchmark is likely to produce a higher momentum effect compared to its more mature peers. The Pakistani market is also less liquid than Malaysian or similar economies due to high volatility, wider bid-ask spread, and lower trading volumes, which reduces information dispersion and extends the return continuation process, and eventually providing ground for momentum profit analysis. Finally, PSX witnessed a massive increase over the last decade from 40,471 in 2016 to 174,054 in 2025.

This study is one of the first attempts to collate and compare momentum strategies between two parallel financial systems in Pakistan. This holistic and segmental analysis initially includes overall Islamic (246 stocks) and conventional (300 stocks) in the Pakistan stock exchange (PSX). Each cohort has then sub-divided into four groups, namely, (a) Islamic vs. commercial banks, (b) Insurance vs. leasing, (c) Investment banks vs. Modarabah, and (d) Mutual funds vs. Islamic mutual funds, to ascertain sector-wise momentum trading strategies. Further, the overall timeline of this study ranges from 2002 to 2016, which is later segregated between pre-recession (2002-2008) and post-recession (2009-2016) timelines. This paper also contributes to validating the behavior underreaction because, after controlling for factors like value, size, etc., the persistence of momentum returns indicates a behavioral explanation.

Some of the latest studies highlighted the existence of firm-specific momentum due to risk and behavior-based models, but the existence of momentum due to systematic or industry risk is still debatable (Wiest, 2023). Ehsani & Linnainmaa, (2019) argued that factor-related momentum is a hybrid of stock and industry momentum and is distinct from short-term return reversals. However, these issues are likely to be addressed in our subsequent papers.

This study is divided into five sections. The contribution and hypotheses are provided in sub-sections 1.2. and 1.3. Further, the Methodology, results, and the impact of the financial crisis are presented in sections 2, 3, and 4, respectively. Finally, conclusions are drawn in section 5.

2.2 Contribution to Existing Literature

One of the foremost contributions of this study is the estimation of the cost of equity, and this required rate of return is calculated by combining the risk-free rate with the estimated factor loadings and their risk premia. Thereafter, as mentioned earlier that shariah-screening of Islamic products is different from conventional, and this paper compares the momentum exposure between Islamic and conventional stock portfolios. Another contribution is analyzing the time-varying risk premia and the impact of pre-and-post recession period differences mainly due to momentum between Islamic and conventional counterparts.

2.3 Hypotheses

The performance of Islamic and conventional portfolios, their comparative risk premia, and momentum profits have been evaluated based on the following hypotheses:

H1: There is a significant presence of momentum profits in the Pakistan stock market (PSX) which means that buying past winners and selling past losers can fetch higher returns in the short run.

H2: Several empirical studies in Malaysian and Middle Eastern markets established higher momentum profits for Islamic portfolios than conventional counterparts. This study is designed to empirically test these findings in the Pakistani context.

H3: Momentum profits are often attributed to a risk-reward relationship due to their exposure to systematic risk factors. The validity of these findings is being tested in the Pakistani stock market.

3. METHODOLOGY

3.1 The Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model (CAPM) presented by (Sharpe, 1964) is an ex-ante model for asset pricing, which proposes a linear relationship between systematic risk (denoted by parameter β) and expected rate of return (Finch et al., 2011). This risk-return relationship between Islamic and conventional portfolios has been compared using the following mathematical equation.

$$R_{it} - R_{ft} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + u_{it} \quad (1)$$

Where R_{it} is the return of portfolio i during time period t = 1,2,3,……T. The risk-free rate of return and market rate of return are denoted by R_{ft} and R_{mt}, respectively. Further, Jensen's alpha is represented by α_i, β_i is systematic risk of portfolio i. and the error term is denoted by u_t. Initially, two comparative groups of conventional and Islamic portfolios were created. After that, each group was divided into four subgroups, namely, (a) Islamic vs. commercial banks, (b) Insurance vs. leasing, (c) Investment banks vs. Modarabah, and (d) Mutual funds vs. Islamic mutual funds. Interestingly, a risk-free rate is precluded in Islamic finance, and it is based on the principle of profit and loss sharing (Usman & Khan, 2012). Further, establishing the global Sukuk market has revived the interest element, and the expected rate of profit on these bonds is linked with US

treasury bond yield. So, it can be inferred that Sukuks' yield rates have been substituted as a risk-free rate (Uppal & Mangla, 2017). However, in this paper, the 3-month T-bill rate issued by the State bank of Pakistan is taken as a risk-free rate (Nishat & Bhatti, 2002).

3.2 Fama and French Three-Factor Model

The foundation of modern theoretical finance is based on the efficient market hypothesis followed by the CAPM (Mehrling, 2007). However, some of the empirical inefficiency of the CAPM has been attributed to several obscure patterns in asset returns. These limitations have paved the way to consider additional risk factors in determining the sensitivity of asset returns to these risk factors. A new three-factor model was proposed by including two additional risk factors, namely, the size and value to CAPM (E. F. Fama & French, 1996; E. Fama & French, 1993). In this model (E. Fama & French, 1993) posited that expected incremental return over risk-free rate is dependent upon (a) excess market return, (b) additional return of smaller stocks over larger ones, and (c) variance between distressed and robust stocks. This model can be expressed as:

$$R_{it} - R_{ft} = \alpha_i + \beta_{1i} (R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_{3i} HML_t + u_{it} \quad (2)$$

Where R_{it} is the return of portfolio i during time period t = 1,2,3,……T. The risk-free rate of return and market rate of return are denoted by R_{ft} and R_{mt}, respectively. SMB is the difference between portfolio returns of small versus large stocks, and HML is the variance between portfolio returns of high BE/ME (distressed) stocks and low BE/ME (robust) stocks. The parameters β_{1i}, β_{2i} and β_{3i} are the slope coefficients of portfolio returns to market, size, and value-based risk factors.

3.3 Carhart's Four-Factor Model

The behavioral impact of stock prices in the short run has been incorporated through the momentum factor in Carhart's four-factor model. This model has identified serial correlation in the stock returns where future returns on stocks can be predicted on the basis of past performances (Carhart, 1997; Jegadeesh, 1990). This model is an extension of the CAPM and Fama and French Three-factor model to incorporate an additional factor of one-year momentum peculiarity identified by (Jegadeesh & Titman, 1993). This factor has been formed using value-weighted portfolios of highest average eleven-month returns lagged one month (winner stocks) subtracted by value-weighted portfolios of lowest average eleven-month returns lagged one month (loser stocks) (Carhart, 1997). This model has been estimated as:

$$R_{it} - R_{ft} = \alpha_i + \beta_{1i} (R_{mt} - R_{ft}) + \beta_{2i} SMB_t + \beta_{3i} HML_t + \beta_{4i} WML_t + u_{it} \quad (3)$$

Where R_{it} is the return of portfolio i during time period t = 1,2,3,……T. The risk-free rate of return and market rate of return are denoted by R_{ft} and R_{mt}, respectively. In this model, the risk-adjusted returns are dependent on four risk factors, namely, (1) High minus zero beta portfolios (1) Small minus large market capitalization portfolios, (3) Distressed minus robust portfolios & (4) Winner minus loser portfolios for one year. The parameters β_{1i}, β_{2i}, β_{3i} and β_{4i} are slope coefficients of portfolio returns to the market, size, value-based risk factors, and momentum.

3.4 Time-Varying Risk Premia

In the models mentioned above, it is assumed that the risk premia of Islamic and conventional portfolios are stationary, normally distributed, and serially uncorrelated, in which case the error process will be u_t~WN(0,σ^2). However, the returns of portfolios are the outcome of trade in financial markets. Therefore, the variance may not be constant over time but may follow the asymmetric behavior of various events, i.e., EGARCH or TGARCH models. Here, the empirical performance of the above models has been analyzed and tested for the time-varying volatility of the error term. The risk premia of Islamic and conventional stocks has been evaluated by estimating the following EGARCH-M model:

$$R_{it} - R_{ft} = \alpha_i + x_t' \beta_i + \theta_i h_{it}^{1/2} + u_{it} \quad (4)$$

$$u_{it} = \varepsilon_{it} + \phi \varepsilon_{i,t-1} \quad (5)$$

$$\varepsilon_{i,t} | \zeta_{i,t-1} \sim N(0, h_{it}) \quad (6)$$

where $R_{it} - R_{ft}$ is the excess return of the portfolio i at the time t, x_t is the vector risk factors, i.e., equal to ($R_{mt} - R_{ft}$) for CAPM, being (3×1) vector of [($R_{mt} - R_{ft}$), SMB_t, HML_t]' for Fama and French three-factor model and (4x1) vector of [($R_{mt} - R_{ft}$), SMB_t, HML_t, WML_t]'for Carhart's four-factor model. Whereas, β_i is the corresponding factor betas of portfolio i.

In the EGARCH-M model $\theta_i h_{it}^{1/2}$ is the mean constituent, where $h_{it}^{1/2}$ and θ_i present conditionality volatility, and pricing of volatility into returns, respectively. θ_i here is a crucial parameter demonstrating expectations of higher returns for exposure to increased volatility.

Moreover, the error term u_{it} is assumed to be MA (1) process. The distribution of volatility component, ε_{it}, given the information up to time t-1 (denoted by $|\zeta_{i,t-1}$) is assumed as $\varepsilon_{i,t} | \zeta_{i,t-1} \sim N(0, h_{it})$, where h_{it} follows the EGARCH specification, which is given by:

$$\log(h_{it}) = \gamma_{0i} + \gamma_{1i} \frac{\varepsilon_{i,t-1}}{\sqrt{h_{i,t-1}}} + \gamma_{2i} \log(h_{i,t-1}) + \psi_i \left(\left| \frac{\varepsilon_{i,t-1}}{\sqrt{h_{i,t-1}}} \right| - \mathbb{E}\left[\left| \frac{\varepsilon_{i,t-1}}{\sqrt{h_{i,t-1}}} \right| \right] \right) \quad (7)$$

where $E(|\varepsilon_{i,t-1}/\sqrt{(h_{i,t-1}|})$ is the expectation of the absolute value of a standard normally distributed random variable, which is equal to $\sqrt{(2/\pi)}$. This specification for variance dynamics enables the volatility component ε_{it}, in the above-mentioned three models to account for asymmetric response to positive and negative shocks.

γ_{0i} is benchmark volatility level when other terms are null. $\gamma_{1i} \frac{\varepsilon_{i,t-1}}{\sqrt{h_{i,t-1}}}$ is employed for asymmetric volatility effect, where $\frac{\varepsilon_{i,t-1}}{\sqrt{h_{i,t-1}}}$ captures the extent of prior period shock compared to its prospective size. A negative and significant γ_{1i} demonstrate that volatility is more responsive to negative shocks unlike the positive ones. The argument that bad news may create lower disruption to Islamic stocks stems from a smaller and insignificant γ_{1i}. The transmission of magnitude of prior period's volatility into the current one is known as volatility persistence and is measured through

$\gamma_{2i}\log(h_{i,t-1})$. A γ_{2i}that is closer to 1 depicts higher persistence and vice versa. A lower value of γ_{2i} means that shocks take a shorter time to perish. $\psi_i\left(\left|\frac{\varepsilon_{i,t-1}}{\sqrt{h_{i,t-1}}}\right| - \mathbb{E}\left[\left|\frac{\varepsilon_{i,t-1}}{\sqrt{h_{i,t-1}}}\right|\right]\right)$ presents how much volatility is effected due to the size of shock and the signs are irrelevant here. The components within the brackets capture the deviation from the magnitude of the prior shock with its expected value. The coefficient ψ_i overlooks the sign or direction and measures volatility due to massive shocks that asymmetry term remains unable to capture.

3.5 Choice of Models

CAPM is known as a fundamental model for systematic risk pricing. While the Fama and French three-factor model and Carhart's four-factor model gradually embed value, size and momentum factors into the baseline model. To incorporate the leverage effect and time-varying volatility, EGARCH-M is used for a volatile Pakistani market. Now the Shariah-screening process is rigorous and excludes high-leveraged firms and some sectors, including alcohol, tobacco and gambling, etc. so, a pertinent question is the relevance of these models for Islamic stocks. Therefore, the CAPM, and Fama-French three factor model are likely to help in establishing whether the returns are affected due to real alpha or beta, size, and value.

Since Pakistani shariah-compliant stocks are relatively illiquid compared to Malaysia, it is important to identify whether the longer return continuation process is due to momentum factor or other risk proxies. Finally, the Fama and French five-factor will be employed in subsequent studies. All tables and figures must be centred and title should be on top. Number all tables and figures with Arabic numerals in the order in which the tables are first mentioned in text. Use font size 9 pt for contents in tables and figures and 8pt for notes and source. All illustrations (charts, figures and graphs) in the text will be printed in black and white coloured.

3.6 Portfolios Construction

The factors used to construct portfolios include market capitalization and book to market ratio to present SMB and HML for Fama and French three-factor models. Further, the behavioral implications of stock performances have been captured through an additional "momentum factor", presented as WML for Carhart's four-factor model.

3.6.1 Size and Value Portfolios

Initially, all stocks were segregated into two cohorts based on market capitalization. The top and bottom 50% are considered big (B) and small (S) stocks, respectively. Afterward, tripartite segregation of all stocks was made using the book to market ratio. Top, middle, and bottom one-third of all these stocks are regarded as value/ distressed (V), median (M), and growing/ robust (G), respectively. Finally, six value-weighted portfolios have been constructed, i.e., Big growing (BG), Big median (BM), Big value (BV), Small growing (SG), Small median (SM), and Small value (SV). The SMB factor is calculated as the average of value-weighted returns of big portfolios minus small-sized portfolios i.e. (BG + BM + BV)/3 – (SG + SM + SV)/3. Further, the value-weighted average returns of growing/ robust portfolios are subtracted from value/ distressed portfolios to calculate HML i.e. (BV + SV)/2 – (BG + SG)/2.

3.6.2 Momentum Portfolios

The momentum strategy is used to predict future returns by incorporating the impact of the momentum factor. Initially, all stocks were sorted ascendingly into value-weighted average returns of the past eleven months (which is denoted as period t-12 to t-1) lagged one-month t. The advantage of skipping one-month t is to evade bid-ask spread, minimize lagged reactions, and avoid micro-market structural issues on portfolio returns (Jegadeesh, 1990; Lehmann, 1990). This process is repeated every month to predict returns of period t+1. After that, five quantiles of 20% each connoted as M1 (losers- lowest 11 months' average returns) to M5 (winners- highest 11 months' average returns) have been created. Finally, M1 stocks are subtracted from M5 stocks to calculate winners minus losers WML. The recognition of WML is the foundation of our strategy to buy winners and sell losers to fetch abnormal portfolio returns in the short run.

The number of dependent variables is ten (10) which are created by segregating all stocks into two comparative groups of conventional and Islamic portfolios. The Islamic cohort is formed based on the index of 246 shariah-compliant companies issued by the Pakistan stock exchange (PSX). Each group has been divided into four subgroups, namely, (a) Islamic vs. commercial banks, (b) Insurance vs. leasing, (c) Investment banks vs. Modarabah, and (d) Mutual funds vs. Islamic mutual funds. Afterward, value-weighted portfolios of all comparable stocks are formed to analyze their receptiveness to risk and compare risk premia between competing classes. The risk premia of every dependent variable are estimated by using the CAPM, Fama and French three-factor model, and Carhart's four-factor model.

Pakistan is employing two parallel financial systems simultaneously. So, comparing Modrabah and Investment banks is justifiable because both utilize excess funds into profitable ventures. However, they have divergent risk structures, where Modarabah is based on entrepreneurial risk-reward sharing, but investment banks incur fixed interest under credit and market risk. Similarly, both leasing and insurance are long-term and asset-intensive sectors, but lease uses rentals instead of interest; however, the substance of transactions is quite identical. Takaful could have been a better alternative to leasing, but there are no listed takaful companies in Pakistan.

4. RESULTS

The risk/return relationship and risk premia of Islamic versus conventional portfolios are being discussed in this quadruple section. The sample and data are presented in section 3.1. The summary statistics (including momentum strategies) and risk premia of Islamic and conventional cohorts are analyzed in sections 3.2 and 3.3. The outcome of time-varying risk premia and risk-return correlation of all portfolios are examined in section 3.4.

4.1 Sample and Data

The monthly data comprises 546 listed companies in the Pakistan stock exchange (PSX) from January 1st, 2002, to June 30th, 2016. Only ordinary shares/ stocks are used in this study, and other financial instruments, i.e., Preference stocks, bonus or right stocks, and debentures or bonds, are excluded. Further, stocks with negative book value are also ruled out. The average sample size is 438 stocks, whereas the largest and smallest sizes are 546 (2016) and 398 (2013), respectively.

The Pakistan stock exchange (PSX) and Bloomberg have been utilized to fetch daily data sets, later cleaned, processed, and converted into monthly series. Further, missing data is directly extracted from annual reports. The 3-month maturity T-bills have been used as risk-free rates and obtained from Pakistan's State bank (SBP).

4.2 Risk and Return of Islamic and Conventional Portfolios

The descriptive features highlighting the impact of the momentum factor on comparative Islamic and conventional portfolios are presented below. Further, the t-test and F-test are also used to test the null hypotheses of mean return and variance equality, respectively, regarding the momentum factor for all portfolios. This table is used to develop momentum strategies for buying winners and selling losers to generate higher returns.

Table 1: Summary statistics for Islamic, Conventional stock momentum & Mimicking (Momentum data only)

Panel 1: Descriptive statistics of Portfolios

	Mean	SD	Maximum	Minimum	Skewness	Kurtosis	ADF - Level	ADF - 1st difference	Q1	Q6	Q12
Conventional Fin	0.0253	0.1959	1.6516	-0.2681	6.5279	54.1653	-9.3672	-10.9798	30.6570	43.9610	46.6920
Islamic Fin	0.0084	0.1263	0.8126	-0.7339	0.3225	18.4813	-16.0478	-10.1166	7.3347	22.6900	27.6870
COM Bank	-0.0071	0.0784	0.2069	-0.3396	-0.7275	5.1622	-14.0480	-9.5696	0.4620	8.9344	13.6700
Insurance	-0.0001	0.1183	0.4532	-0.4308	-0.3085	5.7634	-14.5421	-13.1090	0.9012	4.0877	12.0330
INV Bank	0.1999	1.6391	15.8586	-0.7567	8.8299	81.0732	-4.6379	-9.2476	36.4430	38.6050	39.0130
Mutual Fund	-0.0064	0.0594	0.2289	-0.5902	-5.4942	57.4111	-5.2530	-21.5946	0.0148	30.3970	34.8390
ISL Bank	-0.0186	0.0729	0.1629	-0.4236	-1.3440	8.4797	-12.5524	-10.8891	0.2534	9.1423	19.2290
Leasing	0.0028	0.1044	0.3436	-0.3218	0.3090	4.6327	-11.2950	-8.8075	4.0219	9.9496	15.2490
Modarabah	13.6878	33.7823	169.0358	-47.1939	1.7042	7.7639	-6.4172	-11.1432	67.5310	167.1400	175.1400
ISL MF	-0.0052	0.0376	0.1571	-0.1544	-0.6700	9.5474	-5.1100	-18.8762	0.3252	22.0410	27.0790

Panel 2: t- and F-statistics for mean and variance equality respectively of Islamic versus Conventional Portfolios

	t-statistics (Mean Equality)	F-statistics (Variance Equality)
ISL Bank against COM Bank	-1.4103	1.1553
ISL MF against Mutual Fund	0.2282	2.491899***
Leasing against Insurance	0.234207	1.2849
Modarabah against INV Bank	5.227691***	422.7031***

Islamic Fin against Conventional Fin	-0.956586		2.405838***

Note: The table reports the descriptive features of the returns of the mimicking portfolios along with the Islamic and non-Islamic portfolios in panel 1, while panel 2 shows the t-test and F-test results of mean and variance equality of returns respectively of Islamic and conventional portfolios. The null hypothesis is that mean or variance of return of two competing portfolios is equal. All returns are daily percentages. The Islamic Portfolios are formed on the basis of SBP classification of Islamic banks, Leasing, Modarabah and Islamic mutual funds. The COM Bank is conventional banks, Mutual funds and Insurance are conventional mutual funds and insurance companies and INV Bank is the portfolio of conventional investment banks value weighted returns. The ISL Bank, Leasing, Modarabah and ISL MF are the portfolios of Islamic banks, leasing, Modarabah and Islamic mutual funds stocks respectively. The ADF-Level and ADF-1st Difference are the Augmented Dickey-Fuller test statistics at level and first difference respectively. The sample consists of 174 monthly observations of 546 stocks and the sample spans January 2002 to June 2016. The *** indicates significance at 1% level of significance.

Our momentum strategies and the impact of the momentum factor on Islamic and conventional stock portfolios have been evaluated from January 2002 to June 2016. The predictability of returns has been devised on one month lagged returns t by sorting all stocks ascendingly during the past eleven months (denoted as period t-12 to t-1). Afterward, returns of period t are used as a one-month lag. The benefit of hopping one-month t is to circumvent bid-ask spread, reduce the impact of lagged reactions, and avoid micro-market structural issues on portfolio returns (Jegadeesh, 1990; Lehmann, 1990). This process has been applied to predict returns of period t+1 and is replicated every month for subsequent periods.

Further, five quantiles of 20%, each denoted by M1 to M5, are used for portfolio formation, where M5 and M1 have the highest and lowest returns, respectively. On such basis, M5 has been identified as winners and M1 as losers, with the difference between the two being used to determine winners minus losers (WML). The recognition of WML is the foundation of our strategy to buy winners and sell losers to fetch abnormal portfolio returns in the short run.

However, there is an important differentiation between momentum profits from WML portfolios and WML risk proxies. The ranking of stocks is based on past performance, where the positive spread between buying past winners and selling past losers depicts momentum profits. Whereas WML risk proxies, as measured by Carhart's four-factor model, demonstrate the sensitivity of portfolio returns to the momentum factor.

The outcome of the t-test (for mean return equality) is insignificant, so the null hypothesis cannot be rejected. However, the f-test (for the variance of returns, i.e., risk equality) has been significant; particularly, the variance between overall Islamic/conventional and mutual funds/Islamic mutual funds have observed to be substantial.

Table 1A: Summary statistics for Islamic, Conventional stocks & Mimicking Portfolios

Panel 1: Descriptive statistics of Portfolios

	Mean	SD	Maximum	Minimum	Skewness	Kurtosis	ADF - Level	ADF - 1st difference	Q1	Q6	Q12
RM	0.0699	1.2612	3.1916	-4.9068	-0.6936	5.2892	-12.4594	-9.9125	0.4711	7.0480	11.09
SMB	-0.2604	1.1075	2.0744	-3.4296	-0.8301	3.8719	-11.4439	-10.8142	3.5800	7.9017	9.83
HML	0.0648	0.5189	1.3302	-0.8975	0.2950	2.5747	-12.6396	-9.4876	0.1814	1.8693	5.84
WML	0.0430	0.1637	0.9983	-0.3928	3.8602	24.3730	-9.6198	-11.1714	21.9850	30.4670	35.83
Conventional Fin	0.1091	1.4764	4.3067	-4.8046	-0.2932	4.1640	-12.6408	-13.0185	0.2099	7.2676	9.11
Islamic Fin	0.2068	1.2351	4.7572	-5.4990	-0.5765	8.6078	-13.7163	-15.2247	0.4036	6.0060	12.56
COM Bank	0.0936	1.6572	5.8193	-4.9496	-0.1029	4.7513	-13.2817	-12.6267	0.0415	5.7576	10.17
Insurance	-0.0598	1.3162	3.0882	-4.7547	-0.2746	4.2529	-10.8903	-11.0076	5.9349	17.0070	21.30
INV Bank	-0.1971	2.5702	12.6547	-6.0402	0.9372	8.4327	-12.2429	-10.8558	0.9508	7.8210	14.73
Mutual Fund	0.3150	1.9108	6.3624	-6.0803	-0.1131	5.3884	-12.8260	-8.6193	0.0680	5.2647	7.13
ISL Bank	0.2549	1.9752	5.8310	-5.2359	0.2453	3.8204	-12.8327	-11.5511	0.0598	4.7599	16.72
Leasing	0.3124	2.0970	7.8793	-5.1192	0.5703	5.1092	-11.5670	-13.2998	2.4265	19.8290	28.50
Modarabah	0.0417	1.4059	3.2237	-5.8907	-0.8470	5.8196	-13.0315	-11.8098	0.0033	0.9555	4.94
ISL MF	0.3818	3.2726	20.4313	-12.8815	1.9228	20.5025	-9.0023	-8.8330	0.3345	4.2235	10.31

Panel 2: t- and F-statistics for mean and variance equality respectively of Islamic versus Conventional Portfolios

	t-statistics (Mean Equality)		F-statistics (Variance Equality)
ISL Bank against COM Bank	0.3704		1.88614***
ISL MF against Mutual Fund	0.0616		2.950907***
Leasing against Insurance	0.461791		1.838357***
Modarabah against INV Bank	0.2075		3.224001***
Islamic Fin against Conventional Fin	-0.514369		1.499213***

Note: The table reports the descriptive features of the returns of the mimicking portfolios along with the Islamic and non-Islamic portfolios in panel 1, while panel 2 shows the t-test and F-test results of mean and variance equality of returns respectively of Islamic and conventional portfolios. The null hypothesis is that mean or variance of return of two competing portfolios is equal. All returns are daily percentages. The Islamic Portfolios are formed on the basis of SBP classification of Islamic banks, Leasing, Modarabah and Islamic mutual funds. The RM is the return on market portfolio, SMB, HML and WML are returns of mimicking portfolios of size, book to market ratio and winners minus losers. The COM Bank is conventional banks, Mutual funds and Insurance are conventional mutual funds and insurance companies and INV Bank is the portfolio of conventional investment banks value weighted returns. The ISL Bank, Leasing, Modarabah and ISL MF are the portfolios of Islamic banks, leasing, Modarabah and Islamic mutual funds stocks respectively. The ADF-Level and ADF-1st Difference are the Augmented Dickey-Fuller test statistics at level and first difference respectively. The sample consists of 174 monthly observations of 546 stocks and the sample spans January 2002 to June 2016. The *** indicates significance at 1% level of significance.

The descriptive features of comparative Islamic and conventional portfolios along with the effect of market beta, SMB, HML, and WML, are presented below. Further, t-tests and F-tests are also conducted for all portfolios. The inference from descriptive features of portfolios has marked the return dominance of overall Islamic stocks over conventional firms. Similar results have been replicated during the industry-wise analysis of both cohorts. However, the notion that higher volatility leads to greater return is nullified for overall Islamic industry and Modarabah firms are likely have slight advantage over their conventional counterparts. The overall and industry-wise comparison of Islamic and conventional stocks using t-tests has unfolded no significant difference between the means of both coequals. Therefore, the null hypothesis cannot be rejected. Contrarily, variances of all Islamic and conventional portfolios are significant, and in particular, f-tests have identified sizable variances in Islamic mutual funds and Modarabahs over their conventional counterparts.

4.3 Risk Premia of Islamic and Conventional Portfolios

The correlation of risk and return between comparative portfolios has been evaluated through the CAPM, Fama and French Three-factor model, and Carhart's Four-factor model. These findings are presented below.

Table 1A: Estimates of CAPM, FF Three-factor model & Momentum factor

	Conv. Fin	**Islamic Fin**	**Conventional stock Portfolios**				**Islamic stock Portfolios**			
			COM Bank	**Insurance**	**INV Bank**	**Mutual Fund**	**ISL Bank**	**Leasing**	**Modarabah**	**ISL MF**
CAPM										
α	0.1511***	0.154681**	0.0695	0.1330	-0.2229	0.1983	0.2289	0.2495*	-0.0712	0.3236
SE	0.0481	0.0628	0.0659	0.0828	0.1556	0.1227	0.1541	0.1320	0.0935	0.3220
β_1	0.9904***	0.612791***	1.094925***	0.639049***	0.949555***	0.865951***	0.775266***	0.4358***	0.3680***	0.830918***
SE	0.0396	0.0516	0.0542	0.0681	0.1279	0.1008	0.1247	0.1085	0.0769	0.2563
$\bar{R}^2$	0.7833	0.4471	0.7020	0.3350	0.2383	0.2960	0.1894	0.0804	0.1124	0.0928
DW	1.7256	2.0111	1.9198	1.5425	1.7338	1.9073	1.8878	1.7598	1.9538	1.7958
Log L	-164.7574	-211.0237	-219.4017	-259.1074	-368.8744	-327.4953	-336.6382	-340.2769	-280.3351	-239.2365
HET-F stat.	4.8582***	19.88138***	1.4620	1.4306	3.031654*	9.881096***	1.5053	0.2972	9.1992***	6.855391***
ARCH-F stat.	1.6706	0.0704	0.1180	6.374727***	1.4425	0.2488	0.2047	1.2039	0.0562	0.8583
NONLIN-F stat.	4.1961**	0.3156	6.454482**	0.0027	4.687641**	0.0751	0.2940	0.6039	3.1148*	0.7376
NORM	122.7842	141.4940	94.0973	298.6514	164.0205	94.9751	17.8217	75.6711	16.7908	681.5480
Fama & French Three-factor model										

α	0.1221**	0.148538**	0.036120	0.11109	-0.319612**	0.166117	0.217012	0.205706	-0.081897	0.206193
SE	0.04776	0.059707	0.065977	0.08369	0.150704	0.124839	0.156308	0.132808	0.095211	0.339761
β_1	0.9349***	0.822549***	1.037342***	0.678845***	1.022615***	0.788045***	0.89496***	0.4917***	0.4278***	0.515405
SE	0.056103	0.070141	0.077506	0.098314	0.177039	0.146654	0.181324	0.156015	0.111849	0.39558
SMB	-0.1695**	0.19479**	-0.188259**	-0.042829	-0.295741	-0.204804	0.065102	-0.110038	0.020926	-0.523628
SE	0.066766	0.083473	0.092238	0.117	0.210689	0.174528	0.217397	0.185669	0.133108	0.413972
HML	0.2026**	0.550954***	0.247248*	0.340416**	1.266849***	0.186981	0.447839	0.6258**	0.259179	0.046914
SE	0.094895	0.11864	0.131098	0.166293	0.299453	0.248057	0.309074	0.263892	0.189187	0.727068
$\bar{R}^2$	0.794053	0.517383	0.711523	0.343859	0.309848	0.295794	0.190518	0.101145	0.111894	0.088889
DW	1.658535	2.022959	1.936691	1.502508	1.736104	1.883099	1.904185	1.703905	1.965063	1.82219
Log L	-159.3134	-198.1711	-215.5458	-256.9238	-359.271	-326.5076	-335.511	-337.275	-279.367	-238.4052
HET-F stat.	2.628***	6.021686***	1.254449	0.60944	1.598585	3.493442***	1.514456	0.593750	6.6658***	4.323793***
ARCH-F stat.	2.7266*	0.500772	0.053584	7.230523***	1.478402	0.374603	0.147445	1.75857	0.0749	0.807247
NONLIN-F stat.	1.556698	1.156627	3.213734*	0.372699	0.436454	0.588715	0.571977	0.450579	4.4069**	0.621814
NORM	106.3561	162.889	82.16423	320.1177	206.8738	97.75699	19.51598	75.72264	16.60578	14.44666

Momentum Factor										
α	0.1152**	0.138484**	0.020905	0.136664*	-0.299145*	0.149565	0.209585	0.207678	-0.089621	0.012126
SE	0.048089	0.058387	0.065463	0.082231	0.151794	0.12553	0.15707	0.133102	0.0949	0.313625
β_1	0.9387***	0.85302***	1.059755***	0.647335***	1.004404***	0.812369***	0.936299***	0.5236***	0.4603***	0.673717*
SE	0.05662	0.068746	0.077077	0.09682	0.178724	0.147801	0.182414	0.156717	0.111737	0.363255
SMB	-0.1512**	0.275491***	-0.1174	-0.1487	-0.365297*	-0.1278	0.1651	-0.0440	0.1026	0.0528
SE	0.0698	0.0848	0.0951	0.1194	0.2204	0.1823	0.2286	0.1933	0.1378	0.4009
HML	0.1839**	0.531266***	0.2101	0.404698**	1.320454***	0.1466	0.4356	0.6414**	0.2469	-0.4107
SE	0.0961	0.1166	0.1308	0.1643	0.3033	0.2508	0.3130	0.2659	0.1896	0.6726
WML	0.382528	1.451766***	1.348827**	-2.046606***	-1.387103	1.465263	1.569029	1.071152	1.4414*	8.446057***
SE	0.381012	0.462612	0.518675	0.651526	1.202685	0.994593	1.238652	1.054589	0.751909	1.946952
$\bar{R}^2$	0.794628	0.545892	0.72099	0.377472	0.312216	0.300537	0.196917	0.105955	0.128399	0.239467
DW	1.654116	2.018348	1.967432	1.552694	1.733091	1.911606	1.902664	1.699186	1.986519	1.997716
Log L	-158.0228	-191.5945	-211.3839	-250.8347	-356.883	-324.0165	-332.374	-334.150	-275.625	-229.3898
HET-F stat.	1.9937**	4.448942***	1.031343	0.326473	1.252009	2.402537***	1.162693	0.447946	3.7021***	3.600547***
ARCH-F stat.	2.9763*	1.073589	0.090353	5.712242***	1.536978	0.324191	0.166788	1.91982	0.0023	2.336848
NONLIN-F stat.	1.445538	1.131942	2.446005	0.006836	0.858315	1.091863	0.369276	0.759233	7.273***	29.31899***
NORM	115.6962	152.1888	95.70475	345.5806	191.8173	87.15869	20.49771	83.86173	16.96176	179.0528

Note: The table reports the results of the CAPM, Fama and French three-factor model and Carhart's Four factor model. The symbols are as defined in table 1. Reported regression coefficients are the OLS estimates along with standard error in parenthesis. The $\bar{R}^2$ and Log L are the adjusted R-squared and Log Likelihood values. The ARCH is Autoregressive Conditional Heteroscedasticity Test F-statistic, while HET is the White Heteroscedasticity F-test statistic. The NOLIN and NORM are the Ramsey RESET test for functional form and Jarque-Bera test for normality respectively. The DW is the Durbin-Watson test statistic.

($p \leq 0.01$= ***), ($0.01 < p \leq 0.05$ = **), ($0.05 < p \leq 0.1$ = *)

The results of the CAPM, Fama & French three-factor model, and Carhart's four-factor model have implied that Jensen's alpha is positive in all stocks except conventional investment banks. This positive alpha indicates higher risk-adjusted returns over market expectations. The slope of market risk premium has flocked around one and can partially interpret the volatility of returns when regressed with SMB, HML, and WML. This slope is important in explaining excess return over risk-free rate and has been found to be positive and statistically significant. The conventional portfolios betas are closer to one, unlike their Islamic compeers, especially the exuberant returns of commercial and investment banks have surpassed the overall market.

The slope of the HML factor is higher for value stocks over growing ones both in Fama & French three-factor and Carhart four-factor models. This slope marks the supremacy of distressed portfolios against robust stocks. The HML of both Islamic and conventional stocks have been found to be similitude. However, a substantial positive risk premium of HML has been observed in conventional investment banks and Islamic leasing over their coequals. A negative SMB slope may reflect the systematic risk dimension related to the firm size because there is a likelihood that the sample may consist of relatively larger Islamic firms due to the strict screening process.

The behavioral impact of asset pricing was observed through the momentum factor in Carhart's model. This model is an extension of the concept of the efficient market hypothesis, where stock returns are predictable based on past performances. This serial correlation has been observed by forming portfolios based on one-month lagged returns. This correlation is greater in the Islamic finance industry and its subgroups, i.e., modarabah and Islamic mutual funds, over conventional compeers. A higher slope in these portfolios has identified that winner stocks will continue to outclass losers in the short run. However, insurance stocks have observed obverse trends due to their significantly negative WML slope.

4.4 Time-Varying Risk Premia

The models mentioned above assume that the risk premia of Islamic and conventional portfolios are stationary, normally distributed, and serially uncorrelated. However, in actuality, activities in financial markets generate portfolios returns. Therefore, the variance may fluctuate over time which could follow the asymmetric behavior of various events, i.e., EGARCH or TGARCH models. Here, the empirical performance of the above models has been evaluated for the time-varying volatility of the error term. The EGARCH-M based extended models are estimated with the maximum likelihood (ML) method, and the results are presented below.

Table 3: Estimates of Time-varying Risk Premium of CAPM

	Conven. Fin	**Islamic Fin**	**Conventional stock Portfolios**				**Islamic stock Portfolios**			
			COM Bank	**Insurance**	**INV Bank**	**Mutual Fund**	**ISL Bank**	**Leasing**	**Modaraba h**	**ISL MF**
CAPM										
α	-0.3430	-0.0774	0.1227	-1.336525**	182.6851	-0.4399	-2.52686***	-0.080***	0.6263	-0.1087
SE	0.3974	0.1897	0.5355	0.5841	5704.169	0.3327	0.2006	0.0294	0.3832	0.6653
β_1	1.0215***	0.613***	1.1202***	0.621906***	0.9556***	0.88868***	0.756964***	0.341***	0.471***	0.359941**
SE	0.0295	0.0258	0.0489	0.0473	0.1102	0.0908	0.0842	0.0632	0.0488	0.1664
θ	0.7977	0.2940	-0.0639	1.449503**	-90.9138	0.248527*	1.486486***	0.2247***	-0.5363	0.2291
SE	0.6769	0.2695	0.6526	0.6211	2836.20	0.1447	0.0271	0.0237	0.3681	0.3420
γ_0	-0.1981	-0.971***	-0.285*	-0.0091	1.1934	0.371496***	0.11152***	0.107***	-0.184***	2.233244***
SE	0.1557	0.1646	0.1479	0.0814	0.8496	0.1424	0.0214	0.0000	0.0692	0.1869
γ_1	0.2491**	-0.264***	0.269***	0.169369**	-0.0029	-0.0061	-0.19971***	-0.159***	0.0617	0.625329***
SE	0.0971	0.0674	0.0960	0.0791	0.0895	0.0443	0.0234	0.0419	0.0627	0.1702

γ_2	0.764881***	-0.858***	0.3862	0.796701***	0.1463	0.789985***	0.892981***	0.9890***	0.945***	-0.5065***
SE	0.1464	0.0536	0.2375	0.1208	0.6044	0.0966	0.0000	0.0055	0.0386	0.0990
ψ	-0.0687	-0.1434*	0.0891	0.0167	0.0005	-0.263246**	0.0078	-0.127***	0.276***	0.735633***
SE	0.0770	0.0824	0.1030	0.0982	0.0176	0.1031	0.0235	0.0003	0.0946	0.2069
Log L	-154.50	-197.72	-215.259	-247.4144	-366.62	-323.2322	-319.5279	-308.54	-266.17	-215.2274
Q(1) AC	0.0835	0.1882	0.4732	0.6430	0.4291	0.7558	9.7672***	0.2682	0.0126	1.9501
Q(6) AC	4.6111	2.0667	3.1020	2.9549	0.4702	9.8164	27.033***	4.5585	3.7415	6.9568
Q(12) AC	12.8280	3.9920	12.7230	6.5721	0.5161	18.672*	31.894***	10.0680	8.7385	10.2810
Q²(1) AC	0.2244	0.2242	1.6370	0.2667	0.0011	0.6726	17.607***	0.0484	16.043***	1.6037
Q²(6) AC	3.1265	24.232***	5.9109	14.872**	0.0011	5.7382	39.782***	2.1324	21.335***	2.9564
Q²(12) AC	11.5440	32.856***	17.5820	17.2510	0.0013	8.3801	43.133***	12.0110	76.018***	4.3597

Note: The table reports the results of CAPM model in EGARCH-M framework. The symbols are as defined in section 2.4. Reported regression coefficients are the MLE estimates along with standard error in parenthesis. The Log L is the Log Likelihood value. The $Q(.)$ and $Q^2(.)$ are the Box Pierce portmanteau test statistics at lag 1, 6 and 12 applied to residuals and squared residuals, respectively. Both test statistics have asymptotically chi-squared distribution under the null hypothesis that the residuals/squared residuals are uncorrelated.

($p \leq 0.01$= ***), ($0.01 < p \leq 0.05$ = **) , ($0.05 < p \leq 0.1$ = *)

Table 3A: Estimates of Time-varying Risk Premium of Fama and french three factor model

	Conven. Fin	**Islamic Fin**	**Conventional stock Portfolios**				**Islamic stock Portfolios**			
			COM Bank	**Insurance**	**INV Bank**	**Mutual Fund**	**ISL Bank**	**Leasing**	**Modarabah**	**ISL MF**
Fama & French Three-factor Model										
α	-4.5636	0.0388	-0.3833	-1.4284**	-1.0573	-0.4740	-0.9654	-0.1398	0.2847	-2.8336**
SE	3.8912	0.1441	0.4244	0.6287	0.6766	0.3398	0.9138	0.1264	0.2675	1.2240
β_1	0.946***	0.832***	1.0224***	0.6681***	1.005***	0.869***	0.790***	0.531***	0.664***	0.3132
SE	0.0685	0.0397	0.0773	0.0926	0.1743	0.1196	0.1698	0.1013	0.0686	0.1930
SMB	-0.168**	0.164***	-0.2612***	-0.0634	-0.449***	-0.0369	0.1069	0.1107	0.0167	-0.3736**
SE	0.0734	0.0567	0.0916	0.0987	0.1600	0.1315	0.1941	0.1242	0.1039	0.1578
HML	0.236**	0.428***	0.25553**	0.4636***	1.303***	0.0810	0.593*	0.498**	0.769***	0.2023
SE	0.0967	0.0930	0.1071	0.1747	0.2885	0.1910	0.3241	0.2232	0.1931	0.2411
θ	8.0137	0.1851	0.5025	1.56127**	0.3732	0.260*	0.6460	0.214*	-0.3241	1.31757**
SE	6.4651	0.2405	0.5382	0.6778	0.3737	0.1505	0.5153	0.1167	0.2725	0.6358
γ_0	-1.668***	-0.193***	0.0233	-0.0312	1.730***	0.372**	2.011***	0.082***	-0.130**	1.1676***
SE	0.1566	0.0656	0.0648	0.0691	0.3325	0.1522	0.2522	0.0020	0.0622	0.1744
γ_1	0.0341	-0.0580	0.1422***	0.17041**	0.428***	-0.0014	-0.132**	-0.152***	0.0074	0.6953***
SE	0.0309	0.0601	0.0547	0.0803	0.1154	0.0438	0.0592	0.0455	0.0720	0.1895

γ_2	-0.515***	0.976***	0.8959***	0.8306***	-0.35729*	0.795***	-0.807***	0.997***	0.986***	-0.1099**
SE	0.1131	0.0207	0.0740	0.1127	0.2061	0.1011	0.0665	0.0141	0.0202	0.0502
ψ	0.0574	0.243***	-0.1028	0.0355	-0.1363	-0.271**	0.179*	-0.103***	0.191**	1.0897***
SE	0.0408	0.0854	0.0730	0.0815	0.1722	0.1090	0.0937	0.0131	0.0815	0.2909
Log L	-153.7589	-181.8180	-209.3559	-242.4448	-351.7827	-323.068	-327.705	-306.804	-259.2819	-215.7481
Q(1) AC	13.589***	0.0028	0.0626	0.8786	0.8905	0.8458	0.9204		0.0931	5.1106**
Q(6) AC	23.418***	2.6473	1.1666	4.1831	4.1064	9.6954	6.0449		7.2990	8.5343
Q(12) AC	29.643***	5.5679	8.8760	12.6510	8.4112	17.8780	13.9210		12.4260	10.3700
Q²(1) AC	1.5168	2.0136	1.7596	0.1952	0.0298	0.6453	0.7103		22.951***	1.0601
Q²(6) AC	2.3744	31.616***	6.1358	14.357**	1.5438	5.8152	3.4665		31.696***	1.6902
Q²(12) AC	2.7909	42.279***	19.379*	16.8430	12.5710	8.5891	10.2220		99.952***	2.3292

Note: The table reports the results of Fama and French three factor model in EGARCH-M framework. The symbols are as defined in section 2.4. Reported regression coefficients are the MLE estimates along with standard error in parenthesis. The Log L is the Log Likelihood value. The $Q(.)$ and $Q^2(.)$ are the Box Pierce portmanteau test statistics at lag 1, 6 and 12 applied to residuals and squared residuals, respectively. Both test statistics have asymptotically chi-squared distribution under the null hypothesis that the residuals/squared residuals are uncorrelated.

($p \leq 0.01$= ***), ($0.01 < p \leq 0.05$ = **) , ($0.05 < p \leq 0.1$ = *)

Table 3B: Estimates of Time-varying Risk Premium of Carhart's four factor model

	Conven Fin	**Islamic Fin**	**Conventional stock Portfolios**				**Islamic stock Portfolios**			
			COM Bank	**Insurance**	**INV Bank**	**Mutual Fund**	**ISL Bank**	**Leasing**	**Modaraba h**	**ISL MF**
Carhart's four factor model										
α	-0.1076	0.2332	-0.798***	-1.085579**	-1.001*	-0.70453***	-0.7998	-0.1059	0.1743	-0.2164
SE	0.1043	0.2140	0.0156	0.5525	0.5580	0.1517	0.8754	0.2773	0.2327	NA
β_1	0.9159***	0.790***	1.145***	0.609962***	0.955***	0.925903***	0.855754***	0.58792***	0.684696***	0.3799
SE	0.0395	0.0397	0.0488	0.0840	0.1614	0.1115	0.1800	0.1046	0.0728	NA
SMB	-0.249***	0.225***	-0.0432	-0.1710	-0.590***	-0.0120	0.2121	0.1421	0.1063	0.0710
SE	0.0343	0.0697	0.0590	0.1071	0.1543	0.1372	0.2219	0.1296	0.1231	NA
HML	0.370***	0.454***	0.0277	0.492607***	1.408***	-0.1949	0.555565*	0.613215***	0.695581***	0.6060
SE	0.0687	0.1073	0.0750	0.1738	0.2693	0.1688	0.3155	0.2191	0.1729	NA
WML	-0.4591	1.422***	1.828***	-1.94808***	-2.3606	1.426299**	1.4607	1.520664*	1.363664***	0.5685
SE	0.3900	0.2887	0.2182	0.5752	1.4371	0.6517	0.9754	0.8358	0.3916	NA

θ	0.3781	-0.1312	1.052***	1.253838**	0.3558	0.374357***	0.5657	0.2010	-0.2169	0.1169
SE	0.2352	0.3456	0.0049	0.6039	0.3142	0.0776	0.4975	0.2470	0.2479	NA
γ_0	0.0075	-0.1231	-0.042***	-0.0079	1.647***	0.664044***	1.999171***	0.08884***	-0.21585***	1.0872
SE	0.1092	0.1118	0.0105	0.0730	0.3074	0.1228	0.2633	0.0024	0.0742	NA
γ_1	0.371***	-0.265***	-0.122***	0.185738**	0.493***	-0.0694	-0.104515*	-0.13041***	0.0233	0.2855
SE	0.0796	0.0784	0.0254	0.0725	0.1171	0.0692	0.0603	0.0458	0.0754	NA
γ_2	0.778***	0.871***	0.995***	0.873524***	-0.2987	0.707441***	-0.82055***	0.996273***	0.975178***	-0.7054
SE	0.0731	0.0667	0.0105	0.1060	0.1863	0.0885	0.0608	0.0094	0.0242	NA
ψ	-0.361***	0.0419	0.0416***	-0.0054	-0.1532	-0.57228***	0.18403**	-0.11449***	0.297151***	1.2635
SE	0.1080	0.1213	0.0158	0.0974	0.1810	0.0924	0.0924	0.0098	0.0972	NA
Log L	-141.0907	-178.86	-190.9148	-234.1019	-348.015	-314.4854	-324.5263	-301.6988	-254.8204	-190.8245
Q(1) AC	1.7871	0.2757	161.51***	0.9563	0.8479	1.0469	0.7429	1.7436	0.0353	
Q(6) AC	4.0775	2.9440	840.38***	4.2744	3.2892	5.4472	5.2986	7.5611	6.0829	
Q(12) AC	12.3880	6.9011	1407.6***	11.9800	8.9744	13.6180	12.9880	13.8600	11.1090	
Q²(1) AC	0.1638	0.8308	154.12***	0.0030	0.0298	1.0494	0.5125	0.0558	26.344***	

$Q^2(6)$ AC	2.1538	22.248***	716.01***	15.91**	1.7420	7.1063	2.5328	2.3102	35.883***	
$Q^2(12)$ AC	11.2900	27.164***	1052.9***	19.148*	12.1210	12.7460	9.1280	12.1590	105.73***	

Note: The table reports the results of Carhart's Four factor model in EGARCH-M framework. The symbols are as defined in section 2.4. Reported regression coefficients are the MLE estimates along with standard error in parenthesis. The Log L is the Log Likelihood value. The $Q(.)$ and $Q^2(.)$ are the Box Pierce portmanteau test statistics at lag 1, 6 and 12 applied to residuals and squared residuals, respectively. Both test statistics have asymptotically chi-squared distribution under the null hypothesis that the residuals/squared residuals are uncorrelated.

($p \leq 0.01$= ***), ($0.01 < p \leq 0.05$ = **) , ($0.05 < p \leq 0.1$ = *)

The volatility of omitted risk factors is denoted by h_t. Further, sign θ has been used to determine the sensitivity of stock returns due to h_t. The parameter θ is significant in portfolios of insurance and mutual funds in the conventional cohort. Similar results have been replicated in stocks of Islamic leasing and banks. Further, returns of Islamic banks and conventional insurance are highly receptive to h_t and their sensitivity has exceeded the market as well. The negative SMB slope in overall conventional portfolios and investment banks has increased the survival risk of smaller firms against bigger ones. A higher HMB could possibly suggest that returns move closer to value stocks because value stocks may be rewarded with greater risk of distress.

The volatility of omitted risk factors has been delved further to estimate the sensitivity of the external shock γ_1 and lag effect of volatility γ_2. This external shock γ_1 is significant for most of the Islamic and conventional portfolios. However, the Islamic portfolio and its components, i.e., banks and leasing stocks, have turned out to be better shock absorbents over their conventional compeers. The coefficient γ_2 is smaller for Islamic stocks except the Islamic mutual funds that demonstrate that they are less responsive to external shocks compared to conventional compeers. The lag effect of volatility γ_2 has prevailed in all portfolios, and the results are pretty homogeneous in Islamic and conventional cohorts. The enormity of persistence in volatility $\gamma_1 + \gamma_2$ is also evident in all portfolios. A greater coefficient γ_2 in Islamic stocks validates our findings that volatility is persistent or stabilized in these stocks which means it takes a longer time to fade away unlike the conventional stocks. The leverage effect ψ is significant in Islamic portfolios.

5. DOES THE 2008 FINANCIAL CRISES MATTER?

The financial crisis was initiated when banks mitigated risks by rebranding and shifting loans to other investors, mostly securities. This situation was aggravated due to the excessive dependence of financial institutions on short-term instruments to fund assets holding. Eventually, these corporations appeared to be borrowers and lenders simultaneously and had to maintain incremental funds due to their inability to netting-off credit risks (Brunnermeier, 2009). (Bourkhis & Nabi, 2013) assessed 34 Islamic & conventional banks from 16 countries and inferred that Islamic and conventional portfolios reciprocate identically to crisis because Islamic banks were merely copying the conventional banking framework rather than their own rules. (Siddiqi, 2006) also corroborated these inferences because the heavy reliance of Islamic banks on conventional interest-based mechanisms was masked as risk and return sharing mechanism simply by using Islamic jargon. Nevertheless, as mentioned by (Ho et al., 2014) Islamic indices, including Dow Jones, MCSI, FTSE, RBS, Kuala Lumpur, Jakarta, and Swiss transcended conventional portfolios during the credit crunch, in terms of both mean and variance as supported by Sharpe, Treynor ratios and strict investment preferences clinched lower risk propensity. (Sukmana & Hidayat, 2012) also confirmed these results by stating that Islamic indices are better shock absorbents than conventional portfolios during the crisis.

The timeline of the global financial crisis was from 2007-09, the peak was in late 2007, and early 2009 hit the bottom. Therefore, the appropriate cut-off in PSX was 2008.

5.1 Risk Premia of Islamic and Conventional Portfolios

Table 2A: Estimates of Carhart's Four factor model with DUMMIES (Pre and Post recession)

	Conventional Fin	**Islamic Fin**	**Conventional stock Portfolios**				**Islamic stock Portfolios**			
			COM Bank	**Insurance**	**INV Bank**	**Mutual Fund**	**ISL Bank**	**Leasing**	**Modarabah**	**ISL MF**
Carhart's four factor model										
α	0.246698***	1.05E-01	0.218258**	0.314986***	0.101891	0.028896	0.373313	0.086365	-0.076755	0.254
SE	0.068243	0.083317	0.093248	0.119268	0.21662	0.18234	0.237485	0.19641	0.132617	0.520
D1	-0.324385***	-0.036774	-0.44260***	-0.375255**	-0.9001***	0.227557	-0.396446	0.248922	-0.07142	-0.447
SE	0.096715	0.118078	0.132153	0.1690	0.3070	0.258415	0.32571	0.278356	0.187947	0.661
β_1	0.953666***	0.970798***	1.068382***	0.736003***	0.506074*	1.051839***	1.222451***	0.865914***	1.0274***	0.61369
SE	0.090706	0.110743	0.123943	0.158528	0.287926	0.242361	0.310949	0.261064	0.176271	0.5600
D1*β_1	0.0707	-0.1028	0.0561	-0.0200	1.07071***	-0.3137	-0.3904	-0.603249*	-0.8601***	-0.3086
SE	0.1211	0.1479	0.1655	0.2117	0.3845	0.3236	0.4060	0.3486	0.2354	0.8508
SMB	-0.0979	0.26614***	0.0364	-0.1665	-0.6508	-0.4602	-0.0132	0.0410	0.0704	0.0764
SE	0.1244	0.1519	0.1700	0.2174	0.3948	0.3324	0.4944	0.3580	0.2417	1.0303

D1*SMB	-0.0753	-0.0223	-0.2156	0.0248	0.5246	0.4180	0.0765	-0.1995	-0.0850	-0.2186
SE	0.1488	0.1817	0.2033	0.2601	0.4724	0.3976	0.5613	0.4283	0.2892	1.1378
HML	0.3139	1.1674***	0.1801	0.5300	0.6043	0.973796*	1.685031**	1.335141**	1.603929***	-0.1663
SE	0.2053	0.2506	0.2805	0.3588	0.6516	0.5485	0.8266	0.5908	0.3989	1.6338
D1*HML	-0.3028	-0.9173***	-0.1402	-0.1772	0.6223	-0.8279	-1.604766*	-0.7673	-1.6075***	-0.5624
SE	0.2337	0.2853	0.3193	0.4084	0.7417	0.6244	0.9028	0.6725	0.4541	1.8127
WML	-0.022259	0.673641	0.58099	-0.809453	-1.792759	3.493877**	-0.671998	1.554884	2.525091**	4.833
SE	0.566704	0.691884	0.774353	0.990433	1.798865	1.514193	2.002321	1.63104	1.101283	3.555
D1*WML	0.6405	1.4064	1.371289	-2.1561	-0.5030	-3.3445	3.9964	-0.1692	-0.8857	6.7233
SE	0.7625	0.9309	1.041875	1.3326	2.4203	2.0373	2.6005	2.1945	1.4818	4.5045
$\bar{R}^2$	0.808699	0.572304	0.738152	0.394257	0.352131	0.31738	0.209909	0.099542	0.212725	0.224782
DW	1.692891	2.004316	2.026318	1.613569	1.840567	1.879668	1.961750	1.656405	2.023908	1.915747
Log L	-149.2701	-183.7977	-203.2791	-245.8569	-349.098	-319.2946	-328.439	-332.155	-264.210	-227.5711
HET-F stat.	1.468231*	5.374191***	1.007174	0.325981	1.037661	1.969144***	2.078456***	0.791841	1.322168	2.244***
ARCH-F stat.	1.946811	1.082801	0.026177	3.99739**	0.683642	0.295754	0.028848	2.408443*	0.0293	2.169

NONLIN-F stat.	0.066432	3.170751*	0.021547	0.318303	1.0964	1.659384	0.570803	1.061688	2.629362	25.718***
NORM	92.92965	337.2092	101.1115	340.02	228.9774	60.7177	24.95877	78.08299	9.054569	176.3991

Note: The table reports the results of the Carhart's Four factor model. The symbols are as defined in table 1. Reported regression coefficients are the OLS estimates along with standard error in parenthesis. The $\bar{R}^2$ and Log L are the adjusted R-squared and Log Likelihood values. The ARCH is Autoregressive Conditional Heteroscedasticity Test F-statistic, while HET is the White Heteroscedasticity F-test statistic. The NOLIN and NORM are the Ramsey RESET test for functional form and Jarque-Bera test for normality respectively. The DW is the Durbin-Watson test statistic.

($p \leq 0.01$= ***), ($0.01 < p \leq 0.05$ = **), ($0.05 < p \leq 0.1$ = *

The pre-recession Jensen's alpha is significantly prevalent only in conventional portfolios when the CAPM, Fama and French three-factor model, and Carhart's four-factor model have been used to assess expected returns. This has shown excess returns over market expectations. However, the average returns of all conventional portfolios have been reversed (the coefficient of the dummy variable becomes negative) during the post-recession period. There is a greater reward for risk during the pre-recession period, as indicated by a higher slope of the market risk factor. After the recession, this premium is only significant in conventional investment banks, Islamic leasing, and modarabah stocks. Further, post-recession risk-taking has appeared detrimental to other portfolios except for investment banks.

The size effect of SMB is trivial during pre and post-recession periods for all portfolios. The pre-recession HML slope is statistically significant for Islamic portfolios, highlighting the dominance of distressed firms over robust by a margin. A negative HML slope for overall Islamic portfolios and subgroups, i.e., Islamic banks and Modarabahs, could exclude distressed firms from the market after the recession.

The predictable patterns of stock prices over past performance in the short run are covered through the inclusion of the momentum factor. So, pre-recession portfolios of only conventional mutual funds and Islamic Modarabahs have been receptive to yielding incremental returns for winners over loser stocks. These results have been overturned after the recession with a negative WML slope in conventional insurance and mutual funds' portfolios. These findings indicated that losers have managed to outclass winner portfolios. Finally, the overall post-recession performance of all portfolios is quite discouraging, which could predict a bleak economic outlook.

Considering the volatility of omitted risk factors in pre and post-financial crises, a GARCH in mean type equation (specified below) is estimated, and the results are tabulated in table 3C.

$$R_{it} - R_{ft} = \alpha_0 + \beta_1(R_{mt} - R_{ft}) + \gamma_0 D_1 + \gamma_1[D_1 \times (R_{mt} - R_{ft})] + u_{it} \quad (8)$$

$$R_{it} - R_{ft} = \alpha_0 + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \gamma_0 D_1 + \gamma_1[D_1 \times (R_{mt} - R_{ft})] + \gamma_2[D_1 \times SMB_t] + \gamma_3[D_1 \times HML_t] + u_{it} \quad (9)$$

$$R_{it} - R_{ft} = \alpha_0 + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 WML_t + \gamma_0 D_1 + \gamma_1[D_1 \times (R_{mt} - R_{ft})] + \gamma_2[D_1 \times SMB_t] + \gamma_3[D_1 \times HML_t] + \gamma_4[D_1 \times WML_t] + u_{it} \quad (10)$$

Where D_1= 1, if t=1/1/2009 to 30/6/2016 (post-recession) otherwise 0

5.2 Time-Varying Risk Premia

Table 3C: Estimates of Time-varying Risk Premium of Carhart's four factor model with DUMMIES (Pre and Post recession)

	Conventional Fin	**Islamic Fin**	**Conventional stock Portfolios**				**Islamic stock Portfolios**			
			COM Bank	**Insurance**	**INV Bank**	**Mutual Fund**	**ISL Bank**	**Leasing**	**Modarabah**	**ISL MF**
Carhart's four factor model										
α	-0.240193**	2.174682***	2.243206***	-0.8644	0.2486	-1.43351***	-0.0017	-0.0835	0.2560	-1.008***
SE	0.1091	0.0000	0.3172	0.6109	0.3124	0.0051	0.0672	0.1584	0.3112	0.3498
D1	-0.1433***	0.0010	-1.07697***	-0.0253	-1.08672***	0.479269***	-0.77734***	-0.462001*	0.0770	1.109***
SE	0.0489	0.1277	0.2171	0.2355	0.2768	0.1195	0.0665	0.2476	0.1882	0.1799
β_1	0.750014***	1.017639***	1.11765***	0.607787***	0.0453	1.106418***	0.9534***	0.79449***	0.927208***	0.0308
SE	0.0784	0.0026	0.1792	0.1532	0.2633	0.1657	0.1972	0.1031	0.1093	0.2102
D1*β_1	0.253331***	-0.1012	-0.0226	0.1040	1.519047***	-0.0418	-0.2740	-0.4292	-0.471849**	-0.1794
SE	0.0929	0.1556	0.2151	0.2309	0.3379	0.2287	0.2302	0.2836	0.1953	0.2904

SMB	-0.302357***	0.147166***	0.0774	-0.1672	-1.002798***	-0.24540***	0.4372	0.298966*	0.0919	-1.157***
SE	0.1089	0.0029	0.1156	0.2954	0.4307	0.0842	0.3259	0.1648	0.1827	0.2257
D1*SMB	0.0572	0.1153	-0.26663*	0.0074	0.829789*	0.478031***	-0.723447***	-0.3294	-0.0105	1.237***
SE	0.1072	0.1236	0.1608	0.3266	0.4667	0.1519	0.3389	0.3523	0.2638	0.2676
HML	0.393933***	1.38663***	0.1466	0.5103	0.2481	0.577983***	1.354905***	0.653326***	1.418891***	0.3746
SE	0.1499	0.0154	0.2950	0.4085	0.6288	0.1876	0.4493	0.2509	0.2547	0.4360
D1*HML	-0.372603**	-1.20835***	-0.0936	-0.0482	0.8401	-0.75532***	-1.28504***	-0.2716	-1.40294***	-0.1427
SE	0.1748	0.2141	0.3257	0.4424	0.6945	0.2704	0.4847	0.4594	0.3517	0.4272
WML	-0.894153*	0.779299***	-0.0019	-1.2265	-2.9394	3.667858***	-4.79017***	1.878159*	2.035669***	-5.165*
SE	0.4906	0.1418	1.7263	1.2676	2.1554	1.2147	1.0319	1.1373	0.5623	2.8991
D1*WML	1.176418*	1.837466**	2.1866	-1.8072	0.9451	-3.976845*	6.601054***	-0.6335	-0.7066	1.3709
SE	0.6057	0.8914	1.8654	1.9468	2.6204	2.0623	1.4359	2.0578	0.8866	3.0724
θ	0.722303***	-3.08078***	-2.24280***	1.033694*	0.0135	0.919028***	0.278834***	0.256321***	-0.3771	0.3882
SE	0.2536	0.0000	0.3259	0.6159	0.1816	0.0101	0.0543	0.0092	0.3878	0.2595

γ_0	0.135124*	-1.44926***	-0.04623***	-0.0103	1.084567***	0.713942***	0.726088***	0.0237	-0.19302***	0.2041
SE	0.0773	0.0396	0.0068	0.0767	0.2603	0.0211	0.0102	0.0677	0.0713	0.3499
γ_1	0.285231***	-0.05652***	0.066154**	0.195947***	0.460991***	-0.26397***	-0.49189***	-0.18802***	0.0691	0.766***
SE	0.0688	0.0030	0.0315	0.0780	0.1130	0.0513	0.0546	0.0601	0.0590	0.2011
γ_2	0.928311***	-0.93918***	0.979056***	0.865514***	0.367932**	0.648108***	0.736025***	1.013332***	0.969881***	-0.281***
SE	0.0431	0.0237	0.0145	0.1120	0.1789	0.0284	0.0075	0.0180	0.0313	0.1014
ψ	-0.294082***	0.089311***	0.033916***	-0.0069	-0.50020***	-0.60124***	-0.56422***	-0.035567	0.257616***	1.657***
SE	0.0917	0.0246	0.0107	0.1007	0.1699	0.0148	0.0000	0.0860	0.0900	0.2207
Log L	-129.1767	-176.0796	-196.6843	-232.5047	-339.1643	-307.0490	-306.4692	-302.5671	-243.7951	-184.781
Q(1) AC	1.3437	0.0002	171.37***	1.2782	1.0406	3.0254*	0.0129	3.2187*	149.9***	
Q(6) AC	6.5250	6.3977	973.28***	3.5509	6.7710	7.9586	3.9437	9.9489	793.26***	
Q(12) AC	18.774*	11.9110	1810.3***	10.5800	10.7080	15.9020	10.3910	17.1370	1355.7***	
Q²(1) AC	0.9981	6.001**	170.97***	0.0053	0.0880	0.5283	0.0676	0.0001	140.39***	

$Q^2(6)$ *AC*	6.7533	37.399***	964.81***	14.185**	1.8567	5.4375	2.7611	1.7322	669.7***	
$Q^2(12)$ *AC*	21.072**	47.505***	1782***	17.2180	8.8882	11.8890	9.3175	12.1060	1007.9***	

Note: The table reports the results of Carhart's Four factor model in EGARCH-M framework. The symbols are as defined in section 2.4. Reported regression coefficients are the MLE estimates along with standard error in parenthesis. The Log L is the Log Likelihood value. The $Q(.)$ and $Q^2(.)$ are the Box Pierce portmanteau test statistics at lag 1, 6 and 12 applied to residuals and squared residuals, respectively. Both test statistics have asymptotically chi-squared distribution under the null hypothesis that the residuals/squared residuals are uncorrelated.

($p \leq 0.01$= ***), ($0.01 < p \leq 0.05$ = **) , ($0.05 < p \leq 0.1$ = *)

The parameter θ is quite significant in most of the portfolios, which have demonstrated the stock returns are pretty sensitive to the volatility of omitted risk factors h_t.

The pre-recession size effect of SMB is significant in most of the portfolios; however, Islamic stocks have positive SMB, unlike their conventional compeers. So, smaller Islamic firms have continued to challenge their bigger rivals. Post-recession SMB is significant in banks and mutual funds of both Islamic and conventional portfolios. The HML slope is higher in all portfolios, but distressed Islamic firms have performed better than conventional comparative firms during the pre-recession timeline. A negative post-recession HML slope was evident in overall Islamic and conventional portfolios and their components, i.e., Modarabahs, Islamic banks, and mutual funds. These results demonstrated that post-recession distressed firms would find it challenging to remain competitive.

A significant pre-recession WML factor is evident in all Islamic portfolios; however, conventional portfolios except mutual funds have remained unaffected by the momentum factor. The post-recession momentum of WML is significant in conventional mutual funds and Islamic banks. Finally, conventional mutual funds and Islamic banks have been more receptive during the post-recession timeline than other portfolios.

6. CONCLUSION AND DISCUSSION

This study is designed to assess the interrelationship of returns /volatility, risk premia, and the time-varying conditional variance between comparative Islamic and conventional financial systems. The monthly data sets from Jan 2002 to June 2016 have been analyzed holistically and split between pre-recession (2002-2008) and post-recession (2009-2016) timelines. Further, the foremost motivation of this study is to assess the behavioral impact of momentum on Islamic stocks, which most researchers widely ignore. Our primary model is Carhart's Four Factor model, accompanied by the CAPM and Fama and French Three-Factor model as a comparison base.

The descriptive features (Table 1) for the formulation of momentum strategy have identified a significant existence of momentum factors in overall Islamic and conventional portfolios. In particular, buying winners and selling loser stocks of conventional investment banks and Islamic leasing can generate abnormal returns in the short run. Additional descriptive features (Table 1A) to compare risks and returns of comparative Islamic and conventional portfolios have marked the dominance of Islamic stocks over their conventional compeers. Further, Modarabah stocks have shown relatively higher returns against lower volatility, unlike their conventional compeer.

The slope of the market risk premium of conventional portfolios is higher than Islamic stocks during the entire period from 2002 to 2016. The HML is positive and similitude in both Islamic and conventional stocks. However, SMB has been observed to be positive in Islamic and negative in conventional portfolios. The impact of SMB means fund managers and investors in Islamic stocks may highlight a tilt towards small-cap companies, which might be problematic in gauging the performance of managers against the entire market indices. However, the benefit of stability and liquidity will prevail in bigger conventional stocks.

Further, the winner Islamic stocks, especially Modarabah and Islamic mutual funds, have generated a higher WML slope over conventional coequals. Fund managers of Modarabah and Islamic mutual funds can reap the benefits by buying recent winners and disposing off the loser stocks. However, there must be a strong mechanism to offload over steep momentum reversals. In conventional stocks, the reliance on fundamental risk-reward strategies is likely to be preferred over momentum strategies. The higher WML proxies for Islamic stocks may reflect market inefficiency for regulators, and steps may be required to improve information dissemination and market depth. Further, the shariah-screening mechanism may need to be validated.

The assessment of risk premia has been reassessed between pre and post-recession timelines. The pre-recession market risk premium attracts greater reward for risk-taking for all portfolios, which has reversed during the post-recession period. The pre-recession HML slope is significant and positive only for Islamic portfolios; however, obverse results have been obtained in the post-recession period. This trend could jeopardize the existence of distressed Islamic firms. A positively significant pre-recession WML slope in mutual funds and Modarabahs have overturned during the post-recession timeline. Altogether, a strong post-recession bearish trend is observed in all portfolios.

The E-GARCH model determines time-varying conditional variances based on historical data. The parameter θ significant in the conventional cohort of insurance and mutual funds and identical patterns have been observed in Islamic leasing and banks. The components of θ have depicted that Islamic portfolios are better shock absorbent γ_1 and more responsive to leverage effect ψ than conventional stocks. The tendency of Islamic stocks to absorb shocks may attract fund managers to increase their Islamic portfolios during turbulent times and macroeconomic uncertainty.

A significant pre-recession WML effect is evident in Islamic stocks and remains insignificant in conventional firms. Further, the post-recession WML factor is only significantly observed in conventional mutual funds and Islamic banks.

This paper observes the correlation of risks/ returns and risk premia of Islamic and conventional portfolios using the above-mentioned models. The scope of this study can be broadened in the future by including new factors, i.e., profitability and investment (based on the dividend discount model by Fama and French five-factor model) and idiosyncratic volatility-based modeling.

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