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Evaluating the Riskiness of Islamic Bank Stocks in Bangladesh: An Empirical Study

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Abstract: The present study attempts to examine the riskiness of Islamic banks' stock return when compared to that of market indices. Based on the Capital Asset Pricing Model (CAPM), the excess returns of individual Islamic bank's stocks and that of market portfolio have been used for analysis. Moreover, the Fama-French (FF) three factor model has also been estimated incorporating both the size and value premium for stated stocks. Using the monthly stock prices of seven full-fledged Islamic banks for the period starting from July, 2014 to June, 2022, the paper aims to evaluate whether the stocks are defensive or aggressive than the market. The riskiness has been tested using both DSE broad index and DSE Shariah index as a measure of market portfolio returns. Findings suggest that stocks of each Islamic bank do behave differently; some are defensive, while others are as risky as the market with only one exception. Moreover, both CAPM and FF three factor model confirm that the Shariah based index outperform the conventional index in modeling the riskiness of stock returns. The results have been tested for presence of heteroskedasticity and serial correlation to validate the models.

Keywords: Islamic Banks; CAPM; Fama-French (FF) three factor model; Riskiness; DSE Shariah index; DSE broad index

1.0 Introduction

Islamic faith and Islamic finance came together in the Arabian headland; however, the modern Islamic finance is not so old having initiated with Dubai Islamic Bank in 1975 (El-Gamal, 2005). The Islamic finance industry experienced a wide reach by 2015 despite of geopolitical threats as well as economic unreliability in some of the major economies across the world (Sorwar et. al., 2016). Having its own unique model, Islamic finance is not much analogous with traditional finance. Regardless, it is successfully being operated in the major economies with increasing number of Islamic Financial Institutions (IFIs). In 2020, the number of total Islamic banks increased to 526, which are operating in 76 countries of the world (IFSI Stability Report, 2021). Moreover, the number of financial institutions listed with stock exchanges has also expanded globally.

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Bangladesh is one of the pioneering countries in Islamic banking, as the country demonstrated its fervor in Islamic Banking after joining the Islamic Development Bank's (IDB) forum as member in 1974 (Alam, 2000; Yousuf et. al., 2014). Afterwards, the establishment of the Islamic Economics Research Bureau and the Bangladesh Islamic Bankers Association advanced the implementation of Islamic banking system in the country (Alam, 2000; Alharbi, 2015). Later, Islami Bank Bangladesh Limited was established in 1984 as the first Islamic bank of the country. At present (as of March, 2022), 10 full-fledged Islamic Banks are operating in Bangladesh, whereas 23 conventional banks are providing Islamic banking services through either Islamic Banking branches or Islamic windows (Bangladesh Bank Report, 2022).

It is noteworthy that all of the Islamic banks of Bangladesh are listed in the stock market. In addition, all stocks included in the parent index (DSEX) that pass rules-based screening for Shariah compliance are also included in the DSE Shariah Index (DSES) which was introduced on 20 January, 2014 in the Dhaka Stock Exchange under DSE Broad Index (DSEX). So, in order to justify the market performance of Islamic banks operating in Bangladesh, the DSES can be considered as the standardized benchmark.

Based on this rationale, the objectives of the study are multifold. Firstly, the volatility of the stock return of the Islamic banks has been analyzed in accordance with the DSE Broad index (DSEX). Secondly, the sensitivity of the market return of Islamic banks has been tested using CAPM and FF three factor model considering the DSE Shariah index. Finally, the riskiness of these banks has been compared to the aftermaths of the models including DSEX and DSES indices.

The findings indicate that according to the CAPM model, under the DSE Broad Index, most of the Islamic banks' stock returns were aligning with the market risk, whereas some bank's stock price performance was aggressive as well. On the contrary, based on the Shariah Index, three banks' stock return volatility was as riskier as the market risk. On the same scale, three other banks' performance was defensive meaning that the stock price was less volatile compared to the Shariah Index and one bank's volatility was higher than the market risk.

According to the findings from the Fama French three-factor model, considering the DSE broad index, two banks' return was aggressive while other banks' return was either in line with or less than the market risk. Again, in case of DSE Shariah index, the return was less volatile in terms of market risk premium. So, both of the models have resulted in less volatility of the Islamic banks' stocks in accordance with the DSE Shariah Index.

The structure of the paper entails the background of stock market performance of Bangladeshi Islamic Banks in the very first part. Next, the review of the

literature on the volatility of stock performance of the Islamic banks has been presented to justify the literature gap. Further, the methodological aspects have been described. Finally, the empirical results have been demonstrated followed by the implications of the study.

2.0 Literature Review

In terms of volatility and risk estimation of the Islamic banking institutions, some researchers opined that Islamic banks are exposed to high level of intrinsic risks although there are no such empirical evidences in support. According to Čihák and Hesse (2008), the shareholders of Islamic banks require to control bank operations due to the absence of deposit insurance whereas the traditional banks are secured by the state deposit insurance schemes. Moreover, Islamic banks have specific characteristics that makes them less exposed to risks than that of conventional banks. For instance, in case of Mudarabah contracts, Islamic banks enjoy the provision to pass losses (if any) to the depositors (Chazi and Syed, 2010). In such case, the stock price volatility is recognized as a standardized test for measuring the performance of the financial institutions (Persson and Blavarg, 2003). Moreover, most of the studies on the stability of Islamic banks was compared to conventional banks in terms on stability (Čihák and Hesse, 2010; Beck et al., 2013; Abedifar et al., 2013; Ashraf et al., 2016; Yahya et. al., 2017), business strategy (Beck et al., 2013), efficiency (Saeed and Izzeldin, 2014; Alexakis et al., 2019), default risk (Abedifar et al., 2013; Saeed and Izzeldin, 2014), default rates (Baele et al., 2014), valuation (Elnahass et al., 2014) as well as earnings management (Abdelsalam et al., 2016). Several studies also demonstrated that the risk management capacity of Islamic banks is efficient and well-categorized than that of conventional banks (Rashwan, 2010; Abedifar et al., 2013; Azmat et al., 2014). Through event study, some other studies suggested that the market return of Islamic banks is less volatile (Białkowski et al., 2012; Alam et al. 2013).

Although Islamic banking system is focused on the principles of profit and loss sharing mechanism following the prohibition of interest (Riba) in Islam (Čihák and Hesse, 2010; Baele et. al., 2014), the market volatility of Islamic banks are often compared to the market risk and return. Importantly, it has proven in different studies that despite the complexities in earnings management, Islamic banks are much more stable in comparison with conventional banks with regard to operational efficiency (Saad et. al. 2010; Ahmed et. al., 2017), cost efficiency and profitability (Saeed and Izzeldin, 2016). So, the capacity in terms of return generation as well as the capability to cope up with the market risk can be considered as the key indicators of the stability of Islamic banks.

To justify the market risk-return relationship of stocks, securities, derivatives,

and/or other financial assets, Capital Asset Pricing Model (CAPM) is frequently used (Selvam and Jeyachitra, 2009). According to Jensen et al. (1972), the CAPM model expresses the relationship between the expected risk premium on an individual's assets and their systematic risk, with particular emphasis on the beta factor as a significant predictor of security returns. Amanulla and Kamaiah (1998) justified in their research that CAPM is a reliable tool for describing stock returns.

Rahman et al. (2006a.) examined the risk-return relationship in the context of CAPM and argued that beta represent in CAPM model does not represent only the stock's performance of the firm, rather it also affects the sale of the stock, book value/ market value of the firm etc. Rahman et al. (2006b.) also analyzed whether the Fama and French (1992) model and the CAPM model are relevant to the Bangladeshi stock market in a different study by analyzing four variables (i.e., beta, book to market value ratio, market capitalization, and sale of the stock) using a sample of 26 banks of Bangladesh. The findings of this study provide solid evidence that factors affecting stock returns are related to one another.

In order to explain the use of Islamic Shariah Indices in analyzing the market return of the companies, Rana and Akhter (2015) compared the use of Shariah Indices with the conventional indices and found out mixed results in the performance volatility. Analyses demonstrate that popular market index, Dow Jones Islamic Market World Index (DJIM) has outperformed the conventional index 'Dow Jones world index (DJW)' (Hakim and Rashidian, 2002; Hussein and Omran, 2005). Lean and Parsva (2012) examined how the Islamic Indices performed in comparison to other conventional market indices and risk-free rates and suggested that Islamic indices have not only outperformed the traditional indices but has also provided more returns than the risk-free rate. Hassan (2001) also observed similar findings by analyzing the performance of 6 Dow Jones Islamic indices in his study.

In Bangladesh, the financial stability of Islamic Banks (measured in terms of Z score, non-performing asset ratio, Liquidity ratio, and Investment to deposit ratio) has been studied and found stable in recent years (Islam et. al., 2019). Some other studies have also been conducted on the financial performance and stability of Bangladeshi Islamic Banks (Safiullah, 2010; Abduh et. al., 2013; Ahsan, 2016; Uddin et. al., 2017; Akber and Dey, 2020). But there is still a dearth of research on the volatility of returns of the Islamic banks in Bangladesh. Besides, hardly any research has been conducted on the stock market returns of Islamic banks of Bangladesh using CAPM and FF three factor model analysis. Again, the two indices (DSEX and DSES) of Bangladeshi capital market have not been considered synchronously in any study to analyze the performance of Islamic banks. Therefore, this study aims at modeling the riskiness of Islamic

banks when compared to the Dhaka Stock Exchange broad index (DSEX) and Shariah-based index (DSES).

3.0 Methodological Aspects

This study is based on the stock prices of Islamic Banks operating in Bangladesh as well as Dhaka Stock Exchange (DSEX) Broad Index and DSEX Shariah Index as the proxies of market portfolio returns. Moreover, the 91-day treasury bill rate has been used as the risk-free rate. Data have been collected from financial statements of selected banks and also from one of the top global financial websites, named as 'investing.com' that provides real-time data and their analysis of around 250 exchanges throughout the world.

3.1 Data: Out of ten (10) full-fledged Islamic banks, this article has used monthly stock prices (closing price) of seven (7) listed banks starting from July, 2014 to June, 2022. Number of studies have been conducted using the stock prices including dividends (Bartholdy and Peare, 2003; Bartholdy and Peare, 2005) following the assumption of CAPM regarding the inclusion of dividends in the world market portfolio (Bartholdy and Peare, 2005).

The rationales for choosing this time period are (1) the initiation of 'Islamic Shariah Index' in January, 2014 and (2) the availability of relevant data from the stated period. Moreover, use of monthly data is reasonable as it is standard in the academic literature to use such a dataset for estimating betas (β). Three (3) banks were excluded as they got the status of Shariah-based banks much later and hence, those banks do not meet the requirement of minimum 5 years data in CAPM estimation (Rahman et al., 2006; Shaikh, 2013; Khudoykulov et al., 2015; Mustafakulov and Khudoykulov, 2015).

In order to measure the return of the securities, FF three-factor model counts on the size risk premium and value risk premium in addition to the market risk premium considered under CAPM. Market capitalization has been taken into account to determine the size premium and the book to market value ratio has been considered to identify the value premium of the individual bank's stocks. Monthly data have been collected since July 2014 to June 2022 to conduct data analysis.

3.2 Research Hypotheses: To evaluate the riskiness of Islamic banks, the models has been used based on the following two alternative hypotheses:

H_1: $\beta_1 < 1$ Islamic bank's stock is less risky than the market. Or, the stock is defensive.

H_1: $\beta_1 > 1$ Islamic bank's stock is riskier than the market. Or, the stock is aggressive.

The hypotheses will be tested considering both DSE broad index (DSEX) and DSE shariah index (DSES) as the returns on market portfolio.

3.3 Model Specification: The CAPM model signifies that the expected return on a portfolio associated with the portfolio beta and a risk-free asset constructs the Securities Market Line (SML) which describes a linear relationship between the expected return and systematic risk calculated through beta (Odobašić et al., 2014). The SML equation is as follows:

$$r_t = rf_t + \beta(rm_t - rf_t)$$

Here, r_t is the return on a given security, rf_t is the risk-free rate, rm_t is the return on market portfolio and β is the security's "beta" value which indicates the sensitivity of a security return to changes in the whole market return.

In other ways, CAPM positions that the risk premium (or excess return over risk-free return) on a security is proportional to the risk premium on the market portfolio. Algebraically,

$$r_t - rf_t = \beta(rm_t - rf_t)$$

Based on this proposition, the following econometric model has been formulated for CAPM:

$$r_t - rf_t = \beta_0 + \beta_1(rm_t - rf_t) + \varepsilon_t$$

Furthermore, under the Fama French Three Factor Model, the return of the assets is calculated as follows:

$$r_{it} - r_{ft} = \alpha_{it} + \beta_1(r_{mt} - r_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_{it}$$

In addition to the variables used in the CAPM model, FF three factor model uses SMB_t (Small Minus Big) or the size premium and HML_t (High Minus Low) or the value premium.

Firstly, for each stock price series and market index series, the series has been transformed into continuously compounded returns because when the difference between P_t and P_{t-1} is small, then:

$$Simple\ returns = \frac{P_t - P_{t-1}}{P_{t-1}}.100 \approx continuously\ compounded\ returns = ln\left(\frac{P_t}{P_{t-1}}\right).100$$

Continuously compounded returns are also consistent with normal distribution provided that they can take any value (Zaimović, 2013). Secondly, these returns

have been converted into excess returns over the risk-free rate that is r_t - rf_t and $rm_t - rf_t$.

The sampled banks, the labels used for their returns and excess returns series are summarized in Table-1.

Table 1: Sample details

Bank name	Stock return (r_t)	Excess return ($r_t - rf_t$)
Al-Arfah Islami Bank Ltd.	raibl	eraibl
EXIM bank Ltd.	rexim	erexim
First Security Islami Bank Ltd.	rfsibl	erfsibl
Islami Bank Bangladesh Ltd.	ribbl	eribbl
ICB Islami Bank Ltd.	ricb	ericb
Social Islami Bank Ltd.	rsibl	ersibl
Shahjalal Islami Bank Ltd.	rsjibl	ersjibl
DSEX Broad	rdsex	erdsex
DSEX Shariah	rdses	erdses

Thirdly, Augmented Dickey Fuller (ADF) test has been conducted to check for stationarity. The presence of a unit root has been tested against the null hypothesis H_0: *$\theta = 1$, the process contains a unit root or the excess return series is non-stationary.* Next, the model is estimated and the t-test is calculated to check if the alternative hypothesis H_1: $\beta_1 < 1$ is statistically significant.

$$t = \frac{\hat{\beta}_1 - 1}{SE(\hat{\beta}1)}$$

3.4 Diagnostic tests

To identify the presence of heteroscedasticity, the Breusch-Pagan (1979)/Cook Weisberg (1983) test has been run based on the auxiliary regression as follows:

$$\hat{\varepsilon}^2_i = \alpha_0 + \alpha_1(rm_t - rf_t)_i + v_i$$

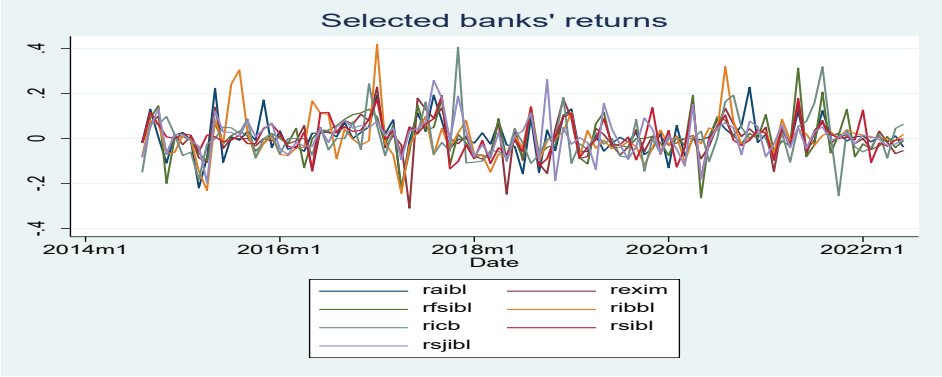
Also, the Breusch-Godfrey (1978) test has been conducted to test for serial correlation in the residuals.

4.0 Empirical Results And Discussion

This study has covered the riskiness of the Islamic banks of Bangladesh, measured in terms of excess return over market risk (measured in terms of DSEX and DSES Indices) under CAPM model. In addition, size risk and value risk have also been considered to identify the riskiness of the banks under Fama French Three Factor

Model. Monthly return of the stocks of selected seven Islamic banks has been used in order to find the excess return of individual bank's stocks. Additionally, return from DSEX and DSES over the risk-free rate has been considered to determine the market return. The following figure shows the return series of selected banks and the table represents the descriptive statistics of the both the banks and market return.

Table 2: Descriptive statistics of selected banks' return and the market return (measured in DSE Broad Index and DSE Shariah Index)



Variable	Mean	Standard Deviation	Minimum	Maximum
raibl	0.0071	0.0801	-0.2359	0.2275
rexim	0.0020	0.0852	-0.3095	0.2285
rfsibl	0.0054	0.0902	-0.2637	0.3130
ribbl	0.0029	0.0967	-0.2440	0.4177
ricb	-0.0002	0.0971	-0.2534	0.4054
rsibl	0.0057	0.0749	-0.1800	0.1907
rsjibl	0.0102	0.0816	-0.1965	0.2616
rdsex	0.0038	0.0466	-0.1127	0.1464
rdses	0.0033	0.0462	-0.1265	0.1485

According to the economic and finance theory, long-run equilibrium relationships may exist among non-stationary time series variables. Hence, the dataset must be stationary containing constant mean, variance and covariance at different lag periods over time. In this study, Augmented Dickey-Fuller (ADF) has been used to test whether the dataset contains a unit root. This test is used to check if time-series data needs to be differenced and how many times such differences should be considered. Table-3 summarizes the results of ADF test:

Table 3: Results of ADF test

Variables	ADF	Variables	ADF	Variables	ADF
eraibl	-9.491*** (0.000)	*eribbl*	-7.802*** (0.000)	*ersjibl*	-8.765*** (0.000)
erexim	-9.363 *** (0.000)	*ericb*	-8.805 *** (0.000)	*erdsex*	-6.792*** (0.000)
erfsibl	-10.056*** (0.000)	*ersibl*	-9.523*** (0.000)	*erdses*	-10.330*** (0.000)

Dickey-Fuller test for unit root Null hypothesis, H_0: The process is non-stationary.
*The symbol *** denote statistical significance at 1% level*

The table shows the z-test results along with their respective p-values for each of the variables. The null hypothesis of non-stationarity can be rejected at 1% level of significance and it can be presumed that the dataset is stationary and can be used for further analysis.

4.1 CAPM estimation

Model A: Based on CAPM, individual Islamic banks' excess returns ($r_t - rf_t$) were regressed on excess return over market (considering the DSE broad index). Table-4 shows that all the coefficient values are different from zero (0) and those are also statistically significant at 1% level of significance. However, while checking the riskiness of stocks (aggressive or defensive), it is evidenced that most of the Islamic banks are as risky as the market, meaning that the coefficient values are not statistically different from 1. Two banks' (Social Islami Bank Limited and Shahjalal Islami Bank Limited) stocks are found to be less risky than the market. However, the stocks of ICB Islamic bank are found to be much aggressive ($p<0.01$).

Table 4: Model outcomes based on DSE Broad Index

Dependent Variable ($r_t - rf_t$)	B_1	H_0: $B_1 = 0$ (t-statistics)	H_0: $B_1 = 1$ (t-statistics)	Findings
Eraibl	.9803839	7.51***	-.309	As risky as market
Erexim	.9861543	7.26***	-.145	As risky as market
Erfsibl	1.021358	6.98***	.145	As risky as market
Eribbl	1.149733	7.71***	1.003	As risky as market
Ericb	1.498025	10.58***	3.518***	Aggressive
Ersibl	.7587561	5.96***	-1.895**	Defensive
Ersjibl	.814717	5.88***	-1.336*	Defensive

Null hypothesis, H_0: $B_1 = 1$ The stock is as risky as market (DSEX)
*The symbols *, **and *** denote statistical significance at 10%, 5% and 1% levels respectively*

Diagnostics Test-Model A: If the error term (or 'noise in the relationship between dependent variable and independent variables) is not constant across all values of independent variables, the problem of heteroscedasticity arises. On the other hand, the relationship between a variable and its lagged value is measured by serial correlation. In time series, serially correlated variables may not be random.

Table 5: Outcomes of BP/CW test and B-Godfrey LM test (Model A)

Dependent Variable ($r_t - rf_t$)	H_0: Constant Variance (p-value)	Heteroskedasticity	H_0: No Serial Correlation (p-value)	Serial Correlation
eraibl	0.8028	No	0.0695*	Yes
erexim	0.4856	No	0.0938*	Yes
erfsibl	0.3613	No	0.0117**	Yes
eribbl	0.2197	No	0.2007	No
ericb	0.0678*	Yes	0.2459	No
ersibl	0.4055	No	0.0687*	Yes
ersjibl	0.9350	No	0.1269	No

Heteroskedasticity test results are based on Breusch-Pagan / Cook-Weisberg test
Breusch-Godfrey LM test for autocorrelation has been used to test serial correlation
*The symbols * and ** denote statistical significance at 10% and 5% levels respectively*

Regarding the first phase of analysis, one model was found to have the problem of heteroskedasticity while in case of serial correlation, variables of four models are serially correlated with their lagged values. Hence, the outcomes of these five models cannot be considered. However, based on the DSEX broad index excess returns, stocks of IBBL are found as risky as the market, whereas SIBL stocks are defensive.

Table 6: Model outcomes based on DSE Shariah Index

Dependent Variable ($r_t - rf_t$)	B_1	H_0: $B_1 = 0$ (t-statistics)	H_0: $B_1 = 1$ (t-statistics)	Findings
eraibl	.826271	5.82***	-1.229	As risky as market
erexim	.7987963	5.26***	-1.324*	Defensive
erfsibl	.7958568	4.81***	-1.234	As risky as market
eribbl	1.059995	6.56***	.371	As risky as market
ericb	1.435247	9.24***	2.803***	Aggressive
ersibl	.6157679	4.43***	-2.761***	Defensive
ersjibl	.7157587	4.82***	-1.912**	Defensive

Null hypothesis, H_0: $B_1 = 1$ The stock is as risky as market (DSE Shariah)
*The symbols *, ** and *** denote statistical significance at 10%, 5% and 1% levels respectively*

Model B: To contrast the previous results, the excess returns of Islamic banks are regressed on excess return on market portfolio considering DSE shariah index as proxy of DSE broad index. The results in table-6 indicate that most Islamic banks are either more or less risky than the market with coefficients significantly different than 1. Exim Bank Limited's stock is also found to be Defensive ($p<0.10$) along with SIBL stock ($p<0.01$)) and SJIBL stocks ($p<0.05$) when compared to the shariah-based market portfolio return. Also, ICB stocks are again found to be much riskier than the market ($p<0.01$).

Diagnostic tests- Model B: In the second phase, considering the DSE shariah index, all the models passed the test for heteroscedasticity as the null hypothesis of constant-variance was accepted in each case. Also, except for two models (AIBL and FSIBL), the problem of serial correlation does not exist.

Table 7: Outcomes of BP/CW test and B-Godfrey LM test (Model B)

Dependent Variable ($r_t - rf_t$)	H_0: Constant Variance (p-value)	Heteroscedasticity	H_0: No Serial Correlation (p-value)	Serial Correlation
eraibl	0.5388	No	0.0605*	Yes
erexim	0.3647	No	0.2026	No
erfsibl	0.3707	No	0.0392**	Yes
eribbl	0.3974	No	0.4133	No
ericb	0.1262	No	0.2446	No
ersibl	0.1913	No	0.1556	No
ersjibl	0.8956	No	0.1428	No

Heteroskedasticity test results are based on Breusch-Pagan / Cook-Weisberg test
Breusch-Godfrey LM test for autocorrelation has been used to test serial correlation
*The symbols * and ** denote statistical significance at 10% and 5% levels respectively*

Hence, based on the diagnostic test results in table-7, it can be surmised that stocks of EXIM, SIBL and SJIBL are defensive or less risky than the market. On the other hand, only the ICB stocks are found as riskier than the market ($p<0.01$). Moreover, the results also suggest that the DSE Shariah index is a more appropriate proxy for market portfolio returns for evaluating the riskiness of Islamic banks stocks.

4.2 Fama-French three factor model estimation

Model A: Table-8 shows that all the coefficient values have been calculated as non-zero (0) and are statistically significant at 1% significance level. In order to determine the riskiness of stocks (aggressive or defensive) in terms of market risk (measured in terms of DSE Broad Index), it is demonstrated from the table that the beta coefficients are mostly less than 1 implying that most of the Islamic banks' returns imply low risk (exception: Islami Bank Bangladesh Limited and

ICB Islamic Bank Limited) as compared to the market. In terms of size and value risk premiums, all of the selected banks' stocks are found to be less risky than the industry at 1% and 5% significance levels.

Table 8: Model outcomes based on DSE Broad Index (DSEX)

Dependent variable (r_t-$rf_{t)}$	B_1 (Market risk premium)	B_2 (Size premium	B_3 (Value premium)	H_0 = Constant variance (p-value)	H_0= No serial correlation (p-value)
eraibl	0.9154***	0.0055	0.1354*	0.2606	0.0332**
erexim	0.9003***	0.3196***	0.5336***	0.1307	0.8796
erfsibl	0.9732***	0.1704*	0.3003***	0.1602	0.0020***
eribbl	1.0698***	-0.6807***	-0.4109***	0.0097*	0.8911
ericb	1.0698***	0.3193***	-0.4109***	0.0097*	0.8911
ersibl	0.7163***	0.0469	0.1672**	0.4746	0.0130**
ersjibl	0.8203***	0.0504	0.0315	0.9429	0.1130

Null hypothesis, H_0: $B_1 B_2 B_3 = 0$

*The symbols *, ** and *** denote statistical significance at 10%, 5% and 1% levels respectively*

In the previous model, variables of five banks are serially correlated with their lagged values. Therefore, the following models have been redesigned on the basis of Autoregressive Distributed Lag (ARDL) models in order to ensure no serial correlation in the variables over time. The serial correlation in the excess return of Al-Arafah Islami Bank Ltd. is mitigated in the first phase of lagged values and in case of the returns of other banks, the variables required lagged values for the second time.

Table 9: Model outcomes for serial correlation based on ARDL model

Dependent variable (r_t-rf_t)	Suggested model	H_0 = Constant variance (p-value)	H_0= No serial correlation (p-value)
eraibl	ARDL(1,1)	0.2955	0.7613
erfsibl	ARDL(2,2)	0.5542	0.2413
eribbl	ARDL(2,2)	0.1017	0.4585
ericb	ARDL(2,2)	0.1017	0.4585
ersibl	ARDL(2,2)	0.1415	0.9679

Heteroskedasticity test results are based on Breusch-Pagan / Cook-Weisberg test
Breusch-Godfrey LM test for autocorrelation has been used to test serial correlation

Model B: In this model, the selected Islamic banks' excess returns (r_{it} - r_{ft}) were regressed on excess return over the market (considering the DSE Shariah Index), the size premium, and the value premium. The result in the following table shows

that in accordance with the market portfolio's risk, considered in terms of DSES, the beta coefficients (B_1) are less than 1 at 1% significance level, implying that no Islami banks' return are as risky as the market. It indicates that the return of the Islami banks' stocks is defensive in terms of the risk of Islamic Shariah Index. Moreover, in terms of the size and value risk premiums, the returns of each of the selected banks' is defensive in comparison to the market, as the values of size premium (B_2) and value premium (B_3) are less than 1 at 1% and 5% significance level.

Table 10: Model outcomes based on DSE Shariah Index (DSES)

Dependent variable (r_t-rf_t)	B_1 (Market risk premium)	B_2 (Size premium	B_3 (Value premium)	H_0 = Constant variance (p-value)	H_0= No serial correlation (p-value)
eraibl	0.7920***	0.0114	0.1752**	0.1441	0.0273**
erexim	0.7661***	0.3249***	0.5729***	0.0621*	0.8879
erfsibl	0.7703***	0.1733*	0.3436***	0.0754*	0.0090***
eribbl	0.9526***	-0.6725***	-0.3649***	0.1572	0.8705
ericb	0.9526***	0.3275***	-0.3649***	0.1572	0.8705
ersibl	0.5872***	0.0501	0.1987**	0.6285	0.0352**
ersjibl	0.7169***	0.0561	0.0669	0.8860	0.1119

Null hypothesis, H_0: $B_1, B_2, B_3 = 0$

*The symbols *, ** and *** denote statistical significance at 10%, 5% and 1% levels respectively*

However, variables of four banks are serially correlated with their lagged values. Hence, the following models on the basis of ARDL method have been conducted in order to check serial correlation in the variables over the selected period. The serial correlation in the excess return of Al-Arafah Islami Bank Ltd. and Social Islami Bank Ltd. is mitigated in the first phase of lagged values and in case of the returns of two other banks, the variables required lagged values for the second time.

Table 11: Model outcomes for serial correlation based on ARDL model

Dependent variable (r_t-rf_t)	Suggested model	H_0 = Constant variance (p-value)	H_0= No serial correlation (p-value)
eraibl	ARDL(1,1)	0.3250	0.6471
erexim	ARDL(2,2)	0.1074	0.8123
erfsibl	ARDL(2,2)	0.6815	0.4215
ersibl	ARDL(1,1)	0.1306	0.5661

Heteroskedasticity test results are based on Breusch-Pagan / Cook-Weisberg test
Breusch-Godfrey LM test for autocorrelation has been used to test serial correlation

The findings of the present study are consistent with that of Hakim and Rashidian (2002) who concluded that Dow Jones Islamic Market Index (DJIM) surpassed the Dow Jones World Index (DJW). Furthermore, Lean and Parsva (2012) also demonstrated that Islamic indices have lower risk considering the Malaysian Islamic indices (i.e., FTSE Bursa Malaysia EMAS Shariah Index and FTSE Bursa Malaysia Hijrah Shariah Index).

5.0 Conclusion

The excess return over the volatility of the stocks traded on the share market of individual banks demonstrates the stability of the bank's performance. This study aims at analyzing the stock price behavior of seven Islamic banks of Bangladesh through historical data analysis. The study is unique in the sense that it has demonstrated the sensitivity of the stock prices according to both the DSE Broad Index (Conventional Index) as well as the DSE Shariah Index. The findings of the study concert that the Shariah Index is a better reflection of the performance of the Islamic Banks' stocks. The results also suggest that some of the Islamic banks' stock performance was aligning to the market risk according to the DSE broad index. However, this study covered the historical data of DSE Indices from 2014 to 2022 since the DSES (DSE Shariah Index) was introduced in Bangladesh in the 1st quarter of 2014. Furthermore, as this study is focused on the CAPM and FF three factor model, there are scopes for further research on the same context using other models for measuring the riskiness of the stocks of Islamic Banks in Bangladesh.

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