

Conventional and Islamic Indices in
Bangladesh: A Comparison on
Performance and Volatility



Internship report on
" Conventional and Islamic Indices in Bangladesh: A
Comparison on Performance and Volatility"

Submitted To

The School of Business & Economics
United International University (UIU)

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Subject: Submission of the Internship Report.

Dear Madam,

With due respect, I would like to report you that you assigned me with an internship report on **“Conventional and Islamic Indices in Bangladesh: A Comparison on Performance and Volatility”** for completing my undergraduate degree of Bachelor of Business Administration from the School of Business & Economics, United International University. I have applied my best effort to make this report within your given guidelines. I have tried my best to work on it and to create a successful internship report.

I earnestly hope that this internship report will meet your specifications and satisfaction.

Sincerely yours,

Quazi Md. Ispar Fatha Deep

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Declaration

I, hereby, declare that the work that has been presented in this study has been completed by me and has not been submitted to any other institution or university. There is no breach of copyright protection and quotation from different articles and newspapers have been properly referenced.

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Supervisor's Certificate

This is to certify that the thesis paper regarding the topic “**Conventional and Islamic Indices in Bangladesh: A Comparison on Performance and Volatility**” has been submitted successfully by Quazi Md. Ispar Fatha Deep ID: 111161138 Major: Finance School of Business & Economics United International University

I found him sincere and hardworking regarding the study under my supervision. I wish him every success in all aspects.

Signature of Supervisor

Acknowledgment

First of all, I would like to express my gratitude to Almighty Allah for giving me the strength and patience to complete this study. Then I would like to especially thank my honorable supervisor, Nusrat Farzana, Assistant Professor, School of Business & Economics, United International University, for providing a helping hand in this sort of complex study. Her friendly behavior paved the way for making this study much easy. My endeavor will come true if the actual purpose of this study becomes fulfilled.

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Abbreviation

Shariah complaint stock	SCS
Shariah Index	SI
Islamic Equity Indices	IEIs
Dhaka Stock Exchange	DSE
DSE Broad Index	DSEX
DSE Shariah Index	DSES
DSE 30 Index	DS30
Capital Asset Pricing Model	CAPM

Executive Summary

The purpose of this study was to identify and compare the performance and volatility of Islamic and conventional stock indices of Bangladesh. The study adopts (1) Capital Asset Pricing Model (CAPM) to compare the performance of the DSE Shariah Index (DSES) to represent Islamic index and DS30 to represent the conventional, (2) beta calculation to measure volatility. The data coverage is from January 2015 to December 2020. The study finds that: (1) There is no significant difference in performance between DSES and DS30, (2) DSES is less volatile than DS30. Moreover, the result implies a challenge for the authorities to educate society, particularly those who concern with Shariah principles, with information that Islamic index performance is not much different from the conventional index and less volatile.

Chapter 1: Introduction

1.0 Background of the Study

After the Liberation war that in 1976 Dhaka Stock Exchange (DSE) has restarted. DSEX index incorporated in 1993 and DSES in 2014 (DSE, 2020). Shariah index is an index where all companies are shariah-compliant which means those companies don't do anything prohibited in Islam. For Bangladesh, the shariah index is new. But first shariah index was formed in the 1960s in Malaysia. Thus, the Islamic capital market becomes more popular after the subprime crisis. Because Islamic stock indices were less volatile and return was much consistent in the crisis period than the conventional indices. And gradually Islamic market has become more and more stable (O. Al-Khazali et al., 2014). Some researchers found that Islamic indices outperform conventional indices. Also, in Bangladesh researchers found the same outcome too (Aarif et al., 2020; Ho et al., 2014). But investor of Bangladesh is not much aware of shariah index but it would a great opportunity for them because all over the world shariah index is less volatile and return of shariah index is more stable.

In Bangladesh, the shariah index is a new concept. It was formed on 19 January 2014 (Dhaka Tribune, 2014). Bangladesh stock market faced multiple crises and the market did collapse in the past. But we cannot compare is shariah-compliant stock is less volatile than the others or not. Because we didn't have any shariah index. Now we are going through a crisis period which is the global pandemic covid19. So now we want to see that is Shariah-compliant indices are more stable or not, and also want to find is the performance is better than the conventional indices or not.

1.1 Objectives of the Study

The primary objective of this study is to find out, at crisis how resilient DSE shariah index is in compare to DS30 index. To achieve that we break down this into several minor objectives which are stated below:

- Performance comparison among indices.
- Volatility comparison among indices.

1.2 Rationales of the Study

DSES is a new index, it never faced any crisis or economic breakdown. Compare to other indices very little study has been done for the DSES index. The general people of Bangladesh do not know much about the IEIs of DSE. All around the world IEIs proves that it is more stable than the conventional index. And in crises, it is much more resilient. Also, the market efficiency of IEIs in Bangladesh is alike its conventional counterparts. Right now, the world is going through a pandemic call covid19. So, as DSES never went through any crises we want to see for the first time how this index reacts to the ongoing outbreak. Will it be resilient to the crises like other IEIs all over the world or not?

1.3 Limitations of the Study

As a human being, this study has some limitations. The main obstacle to this study was finding the data, especially the daily rate of 91 days T-bill. But we managed to collect this data from a third-party database. However, we can not collect monthly rate of 91 days T-bill from Bangladesh Bank website. But for our research purpose, we had to use third-party data. Then the second limitation was we only used secondary data sources. The final one was our crisis period was too short than our non-crisis period, and we only had one crisis period to compare with the non-crisis period. And for measure volatility, we only rely on beta calculation where other robust models could be used like ARCH and GARCH.

1.4 Structure of the Study

This study contains five chapters. The first chapter contains the background, objective, rationale, and limitation of the study. In chapter two we try to portray the literature briefly. Methodology and description of data are to be found in chapter three. Chapter four is the main part of the study, which is the factual result of the study. And finally, this entire study is summarized in chapter five.

Chapter 2: Literature Review and Organizational Profile

2.1 Literature Review

This chapter review previous literature on the impact of crises on Shariah Indices. And the performance comparison between conventional and Shariah Indices. Other than those some related key concepts are also described in this chapter. Like Islamic Finance, Islamic Bank and Sukuk.

2.1.1 Islamic Finance

Islamic financial system (IFS) is a system that complies with Shariah (Islamic religious law) laws. In IFS human activity is mandatory, and human activity must be productive. It prohibits some activity on the moral ground; like tobacco, alcohol, gambling, pork, speculation, pornography, destructive weapons. The primary source of shariah law is Quran and sunnah and the secondary source is ijma and qiyas; the secondary source take place when there is a need for an issue but the answer is not available in Quran and sunnah or not sufficient (Di Mauro et al., 2013; Hussain et al., 2016).

The concept of IFS has begun after world war II. In the second half of 20 century, many countries were created and colonization was beginning to be demolished. When many Muslim countries formed there was a need for a financial system and they came up with Islamic Banking. In the 1970s Islamic banking industry (IBI) came up to the global stage. Gulf states have supported the industry. From then IBI never looked back on their success. Industry became bigger day by day in terms of size and scope. In the 1990s it started operating in Western countries. It was also open for non-Muslims too, who are looking for ethical and less risky investments (Di Mauro et al., 2013; Hussain et al., 2016).

In Islamic finance interest is haram, haram means prohibited. There are three categories of financing in Islamic finance; which are profit and loss sharing (PLS), non-PLS contract, and fee-based instrument. In PLS there are Musharakah and Mudarabah where partners are liable for both losses and profit and distribution will be as per the previous contract. In non-PLS there are Murabahah, Ijarah, Salam and Istisna. Fee based have three types of service wakalah, kafalah, or ju'ala (Arsyadona et al., 2019; Mohd Nor & Ismail, 2020).

2.1.1.1 Islamic Banking (IB)

Theoretically, Islamic banking is different than conventional banking. Islamic banking (IB) lays into two-tier Musharakah and Mudarabah models. IB significantly advancing from last decade. Most of the IBs are from Iran, Saudi Arabia, UAE, Kuwait, Qatar, and some south Asian countries (ICMR, 2019).

Top Islamic Banking Markets 2017, By Country In USD Billion

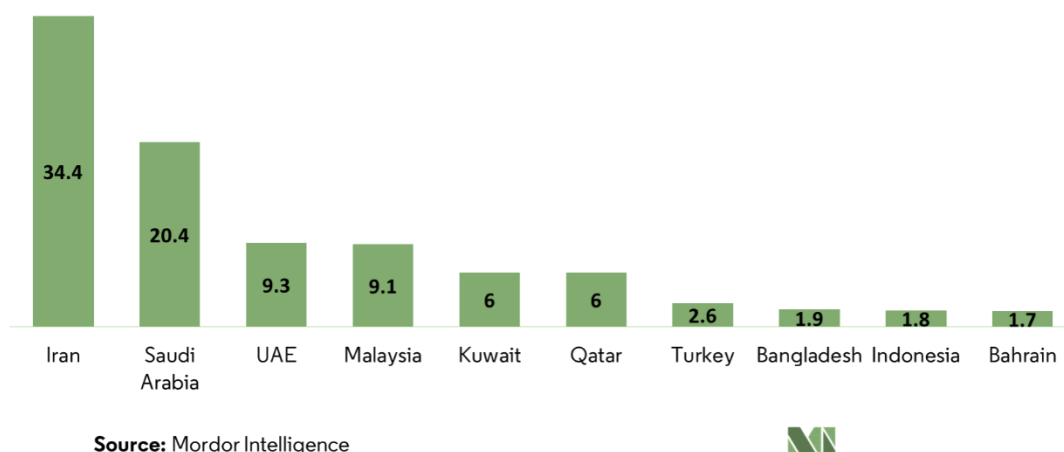


Figure 1: Islamic Banking Market (Mordor Intelligence, 2020)

IB market share in Bangladesh is around 25 percent, and it increasing day by day (Shaquib Ahmed, 2019; FE DESK, 2020). Globally, in the Islamic financial industry around 70 percent share is from IB (Mordor Intelligence, 2020).

Islamic Finance Market In the GCC, Assets Distribution In USD Billion

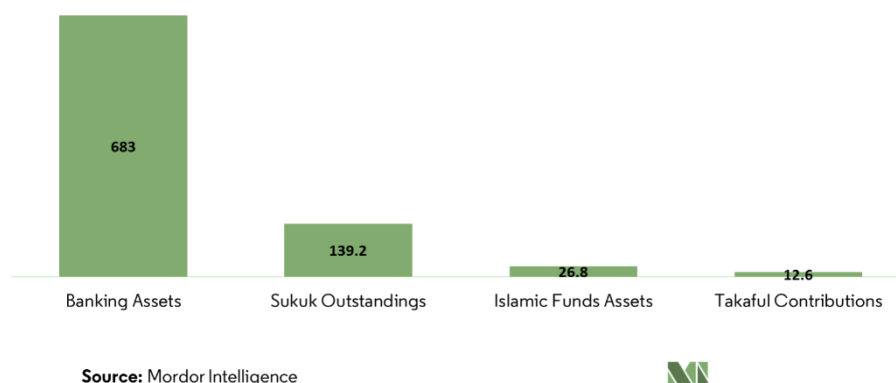


Figure 2: Islamic Finance Market (Mordor Intelligence, 2020)

IB has a positive relation with economic growth. Non-Islamic countries take some practice from IB to accelerate the growth of their banking industry (Imam & Kpodar,

2016). IB has less credit risk and insolvency risk. Due to that fact, IB is more stable than the conventional banking system (CBS). IB impose rent instate of interest rate; so that it is less responsive to the country’s interest rate, where conventional banks (CB) are more responsive (Abedifar et al., 2013; Hanif et al., 2011). IB outperform CB after crisis periods; and researcher found that inflation and non-performing finance are the primary variables which have significant effects on IB rather than other variables (Istan & Fahlevi, 2020; Setyawati et al., 2017). The first IB in Bangladesh is Islamic Bank Bangladesh Limited (IBBL), established in 1983 (IBBL, 2020). Dubai Islamic Bank was the first IB in the world, established in 1975 (World Finance, 2014).

2.1.1.2 Islamic Bond (Sukuk)

Islamic bond or Sariah compliant bond or Sukuk, all are same. All indicate a bond that is Sariah compliant, which means a bond that is structured as per Islamic laws. Sukuk contracted differently than the conventional bond. The main difference are: in Sukuk, there is no interest as payment as per interest is prohibited in Islam, investors are a partial owner of the asset, instate of interest payment issuer pays rent to the investors (CFI, 2020; Ganti, 2020).

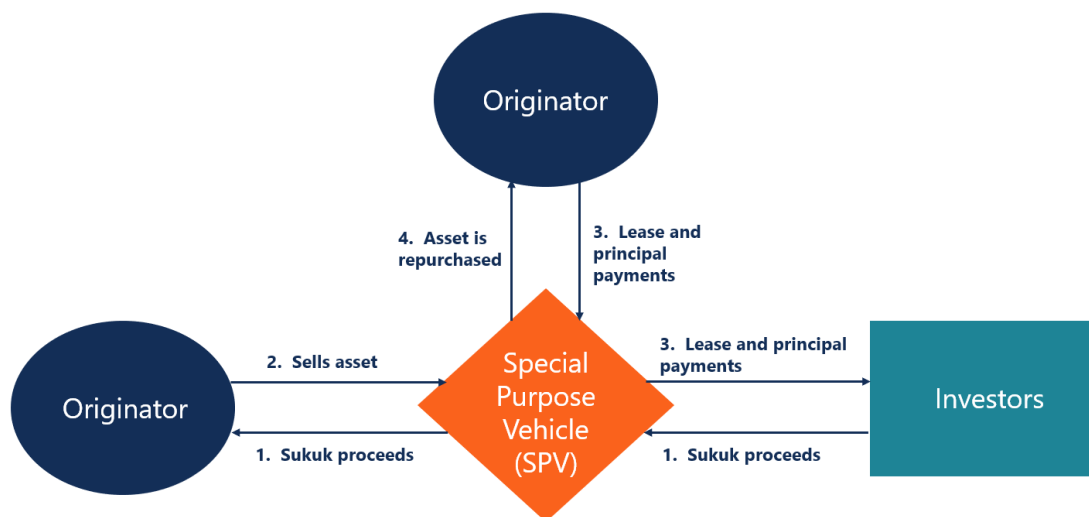


Figure 3: Issuing Process of Islamic Bonds (CFI, 2020)

Islamic banking has a large portion of market share where Sukuk is not in a leading position, but it has lots of potentials though there is some regulatory divergence. It is a very niche instrument for a niche investor group, who are whether Muslim or want an ethical investment (Jobst et al., 2008). According to market share, Sukuk is not the first choice to the investor groups though the issuance of the first Sukuk was back in 1990

in Malaysia (Hashim, 2018). Though Sukuk is not the bond market leader, it grown thirty-six percent in 2019 and twelve percent fell in 2020 due to covid19 (Ignacio, 2020).



Figure 4: Growth of Sukuk (ICMR, 2019)

2.1.1.3 Islamic Stock Indices

Before the 1970s there was no Shariah-Complaint Stock (SCSs) where Muslim investors can invest, but for the first time in 1983 Bank Islam Malaysia Berhad introduced a list of SCSs (Force & Commissions, 2004). Then Islamic Equity Index (IEIs) was constructed by those SCSs. For the first time in 1996 Islamic equity index is introduced by RHB Unit Trust Management Berhad (Aarif et al., 2020). After that, there are many equity indices are launched by many exchanges. The first global Islamic equity index is FTSE Global Islamic Index Series (GIIS) launched in 1998, then Dow Jones Islamic Market Index (DJIMI) in 1999 (Hussein, 2007).

A study on shariah screening was done by Ayedh et al., (2019) they said that there should be more research to investigate the shariah screening process. and researchers should use different techniques to shariah screening and compare among different shariah indices which are constructed in different screening methods. They also suggest that policymakers should standardize the shariah screening method.

To understand the performance of IEIs in London and NY, Kok et al., (2009) measure the performance by comparing two IEIs with two mainstream indices and two sustainability indices for the period of 2001 to 2007. They used the co-integration and

risk-adjusted method and found that there is significant performance improvement when IEIs are included in the portfolio. A study was conducted in the Malaysian stock market by Sadeghi, (2008). Using of event study author found that IEIs have a positive impact on the market. Another study was conducted by Ashraf & Mohammad, (2014) in a broader aspect to examine the performance of IEIs. Using a dataset of a decade from 2002 to 2012 of twelve IEIs and as a benchmark their conventional counterparts. Also, the LSTAR model was used to investigate. They concluded as IEIs were better performing than conventional ones in the down market. Globally there was no abnormal return of IEIs, but in Asia and Europe, there was an indication of positive abnormal return. And lastly, they exhibited that IEIs have lower systematic risk than the conventional one and any abnormal return comes from the systematic exposure.

To investigate the impact on a newly added stock into SI Lusyana & Sherif, (2017) did and research in the context of Indonesia. They used thirty-three stocks from Indonesia Islamic Shariah Index from 2010 to 2014. Using event study, CARs, Fama French, Sharpe, Treynor, and panel data they concluded that SI has an impact on newly added stock's financial performance. A similar kind of study was done in recent years by Saba et al., (2020) and they used data from 2000 to 2014 in the context of Malaysia. Using panel data their finding also was similar to the previous literature, that adding to the SI add value to the SCS's.

To compare the efficiency between Shariah and conventional indices, O. M. Al-Khazali et al., (2016) did and research by comparing nine SI to their conventional peers. The indices are from the US, UK, Asia Pacific, Canadian, Japanese, Global, European, Developed Country, and Emerging Market index. The period of those data was from 1997 to 2012 and divided into four sub-period. Using MDH and RDH the result was Islamic Indices are slightly more efficient than the conventional counterpart; they also added that, gradually SI is moving toward market efficiency. Another recent study in Turkey was conducted by Bayram & Abdullah Othman, (2019) using the Two-Sample Test and Granger Causality Test to identify the performance and efficiency between two indices; one is SI and another one is conventional. Data from 2015 to 2016 of KATILIM50 and BIST100 taken and the result was that market of Turkey was informational efficient and those indices didn't violate the EMH (Efficient-Market Hypothesis) theory.

To identify the driver-driven Soni & Roy, (2020) researched in the context of India and Indonesia. Two indices from each country were taken place in that study and the data period was 2013 to 2019. Using Granger Causality, they found that Indonesia indices have no interrelation where Indian indices have. And in the Indonesian market, JII is driven by IDX Shariah.

To investigate the better performer between IEs and conventional indices, Al-Khazali et al., (2014) conducted a study using stochastic dominance (SD) and comparing nine DJIIs to their conventional counterparts for a period of 1996 to 2012 which was divided into three sub-period. DJIIs are US, UK, Asia Pacific, Canadian, Japanese, Global, European, Developed Country, and Emerging Market index; so, it covers most of the world's scenario. The major outcome was IEs outperform their conventional peer before and after the financial crisis. Ho et al., (2014) are also found a similar result. Except they use CAPM with β , sharp ratio, Treynor, and Jensen alpha. And they used treasury bills as risk-free rates and the MSCI world index as the world benchmark. They took twelve indices from eight countries and the data period from 2000 to 2011. Habib & Ul Islam's, (2014) did an comparative research between Indian and Malaysian Islamic indices. They tool eleven years of data from 2003 to 2013 of MSCI Indian and MSCI Malaysian Islamic Indices. And for market benchmark MSCI world index was used. Using CAPM, β , standard deviation they found both indices are outperformed their conventionals in the crisis period. But in comparison with Indian and Malaysia, Malaysian indices did outperform the Indian indices. For market benchmark, Kabir Hassan et al., (2010) also used MSCI World Index

For performance comparison between KMI 30 (SI) and KSE 100 (Conventional index) in Pakistan Rana & Akhter, (2015) did a study using Sharp, Treynor, Jensen Alpha. The data period was from 2008 to 2013. As a Market benchmark, they used KSE all share. They found that SI outperforms the Conventional index. Pranata & Nurzanah, (2015) did and research in the context of Indonesia and to identify the performance, volatility, and external variables which affect the Shariah indices. Historical data of JII (Shariah) and LQ45 (conventional) for 2006 to 2015 was used to exploit the result. As a market benchmark, they used JCI. Using CAPM, β and ARDL they found that the Shariah index is less volatile and no notable performance difference. Also, the Shariah index is less affected by external variables. Finally, they added that it will be challenging for the market authorities to educate the general investors. Jabeen et al., (2018) also found the

same result in the Pakistan stock market. They used CAPM to understand performance and compared between KSE 30 and KMI 30.

To investigate the performance of SI in the Dhaka Stock Exchange (DSE), Aarif et al., (2020) conducted a study in recent years. Using monthly data from 2014 to 2018 of DSEX (DSE Broad Index) and DSES (DSE Shariah Index). They applied a handful of techniques to exploit the optimal finding. Using CAPM, Johansen's cointegration test, VER model, Granger causality test, impulse response functions techniques, and forecast error variance decomposition. And used 91 days treasury bill as the risk-free rate and DSEX as the market benchmark. After all that they concluded that two indices have no causal relation and these are only associated in the long run. In essence, DSES dominate DSEX. So, they also found that in the Bangladeshi stock market shariah index is outperformed its conventional peers.

2.1.2 Literature Gap

This literature did cover some key concepts of some branches of the Islamic financial system. Specifically, it covers Islamic Banking, Sukuk and Islamic-Equity index (IEIs). The main focus was on IEIs. The discussed subtopics of IEIs were screening method, market efficiency, performance, resilience in crisis, comparison with conventional indices. But unfortunately, there are very little work has been done in the context of Bangladeshi IEIs. So that we cannot share much literature in the context of Bangladesh. Since the Shariah index is new in the Bangladeshi equity market, so that in the field of the shariah index there is not much work has done before. Also, as this index is new it did not face any crisis before. As per our literature, we saw in different contexts that SCSs are much more stable in the previous crisis period. As covid19 is a pandemic, which causes a global crisis. We want to see how the DSES index performs in comparison to the DSEX index in the period of this global outbreak.

2.2 Organizational Profile

2.2.1 Economic Overview

The word “economy” is a Greek origin “oikonomos”, which means “one who manages a household.” Alfred Marshall is a great 19th-century economist, he wrote in his textbook, Principles of Economics “Economics is a study of mankind in the ordinary business of life”(Mankiw, 2014). Economics dealt with the allocation of scarce resources. There are two major types of economics which are microeconomics and macroeconomics. Bangladesh is fast growing country; it reduces poverty from 43.8% to 14.8% within just twenty-six years. Life expectancy and literacy rate also improved significantly. But still 39 million people are lives under the national poverty line. Due to COVID-19 private investment became much lower(UNICEF, 2020). The most used indicator of the economy are CPI, GDP, and Inflation. CPI is one of the popular method to measure the inflation of an economy (Boskin et al., 1998; Bryan & Cecchetti, 1993). Since 1993 CPI of Bangladesh never went down, rather it went up year by year which is not a good sign. Like every year it increased to 290.03 in January 2021 from 276.16 in January 2020. On the other hand, inflation in Bangladesh shows a sign of resilience. Since 2015 it was much more stable than before. In December 2020 inflation rate of Bangladesh was 5.52 percent (Trading Economics, 2020).

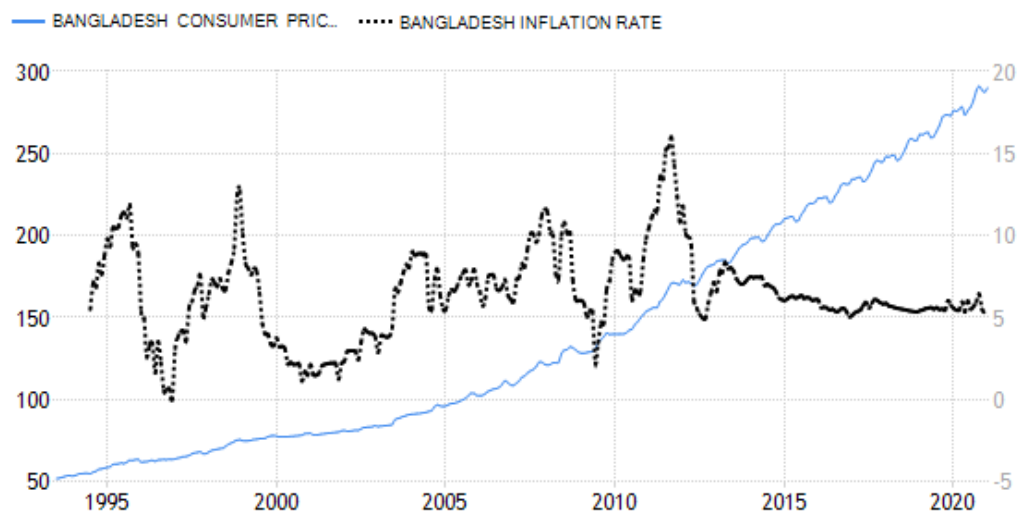


Figure 5: CPI and Inflation Rate in Bangladesh from 1993 to 2021 (Trading Economics, 2020)

And GDP indicates economic growth (Murry & Nan, 1994). Unlike CPI GDP of Bangladesh along with its annual growth rate grown positively. According to the World Bank, Bangladesh's GDP worth was 302.57 billion USD in 2019 and its annual growth

rate went to 8.2 percent. Without any doubt, it is a positive sign for a developing country like Bangladesh (Trading Economics, 2020).

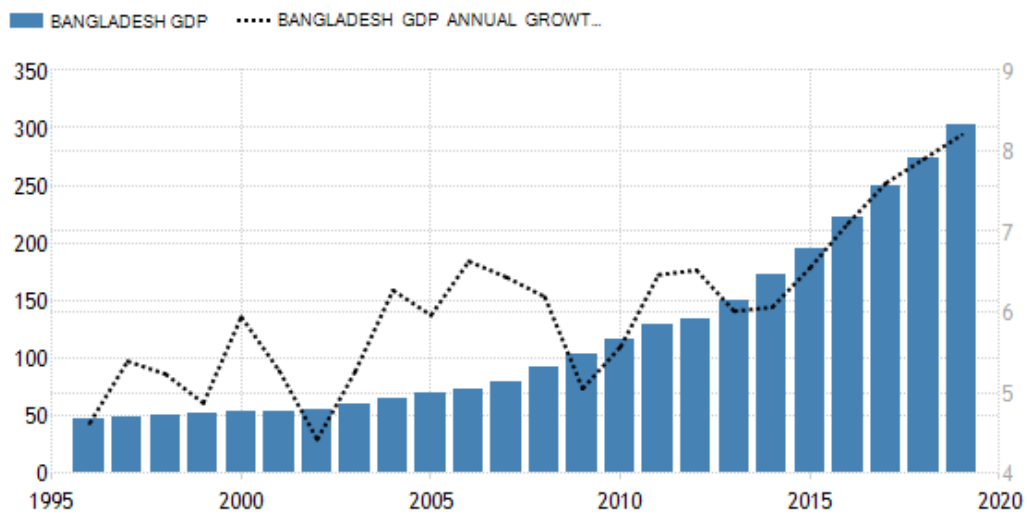


Figure 6: GDP and GDP Annual Growth Of Bangladesh (Trading Economics, 2020)

The most contributing sector in the Bangladeshi economy is RMG and remittance. Remittance is transferred money from other countries; usually, this money is sent by migrant workers. Workers' remittance is one of the significant contributors to economic growth. Most of the time this fact is proven by developing countries like Bangladesh. Remittance contributes to Bangladeshi Gross Domestic Product (GDP) is around 6.07 percent. Scholars found that countries that have the less developed financial system (FS) are having remittance as a boost in their economy (Economy, 2019; Fayissa & Nsiah, 2010). An article from 2014 mentioned that 35 percent of export earnings are contributed by remittance for the last two decades in Bangladesh. And also added that the contribution of remittance is greater than foreign aid and it is the second foreign exchange earning sector just after the garments sector. They also pointed that most of the workers are not skilled. So there is a great opportunity for the Bangladeshi government to deploy trained workers and achieve a significantly higher foreign remittance (Md Ashraf Ali, 2014). Foreign exchange reserve is the foreign currency that is held by a country's central bank. This holding could be a currency, T-bill, bond, and other government securities. At the end of December '20, FER was about 43 Billion USD in Bangladesh (Bangladesh Bank, 2020). Some scholar found that there is some excess reserve which could be used in some other sector for improvement (Khayer &

Nusrat Chowdhury, 2015). And also found that FER has a negative influence on DSE in long run (Golder et al., 2020)

2.2.2 Financial System in Bangladesh

Bangladeshi financial system is divided into three broad sectors; which are formal sector, semi-formal sector, and informal sector. The financial market in Bangladesh is mainly described in four types; those are money market, bond market, capital market and foreign exchange market (Bangladesh Bank, n.d.). Still, the financial sector is leading by banks in Bangladesh. And most of the bank is doing the conventional activity, like giving loan, taking deposit, etc. According to scholars, it will take time to convert the financial system to be led by the capital market (Mansur, 2015).

2.2.3 Bangladesh in Time of COVID-19

Bangladeshi health care system is not still sufficient for the people of the country. There is still a large gap in the population per health worker ratio. There is a large number of people are relying on alternative medicine like Ayurveda and Homeopathy. Choosing this alternate medicine is not because they want to but most of them cannot don't have access to the modern medical system. Because there is a lack of doctors, nurses, and technicians. On the other hand, most of the health workers are to be found in the urban area; Where around seventy percent of people in Bangladesh are lived in rural areas. Most of the scholars suggest building strong leadership and better management to overcome this crucial situation (Shakeel Ahmed & Mahmood, 2012; Islam, 2014; WHO, 2012).

COVID19 was first found in Wuhan, China in December '19. And Bangladesh first found covid19 case on 8th March 2020. Due to partial lock-down covid19 cases increased significantly and worsen the health care system. It not only affected the health care system but also the economy and GDP. Many garment factories are shut down due to covid19 and millions of dollars of shipments and orders have been canceled (Anwar et al., 2020; Bodrud-Doza et al., 2020; Mamun et al., 2020). Around two months Bangladeshi stock market was been closed. And all stock price was falling drastically. So the Bangladesh Securities and Exchange Commission had to assign a floor price for each stock to protect the investors' investment (Fardau, 2020).

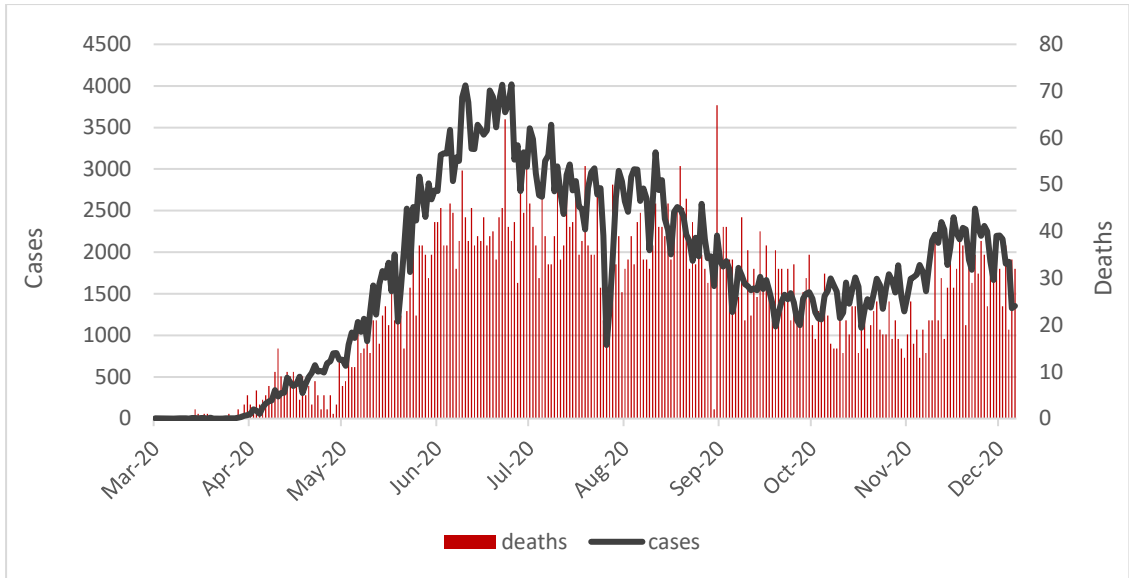


Figure 7: COVID19 Cases and Deaths

Chapter 3: Methodology of the Study

3.1 Research Design

How resilient is DSES to the covid19 can be measured based on a number and facts. This study has been designed according to the objectives mentioned earlier.

Research Type: Quantitative research was conducted here to analyze the performance and volatility of DSES in comparison with DS30. And how covid19 affects the IEs and the conventional indices. For this study, numerical data was collected from reliable sources.

Sampling: We used DSES index as SI and DS30 as the conventional index. DSEX was used as the market benchmark and proxy of the market return. 91-days Bangladeshi treasury bill as the risk-free rate.

Source of Data and duration: Data for the study was collected from secondary sources. As the type of research is quantitative, primary data collection was not required for this study. Six years of data were collected starting from 1 January 2015 to 31 December 2020. The frequency of the data was on daily basis.

3.2 Data Collection

For this study, numerical data was collected from DSE website and the Bangladesh Bank website. All DSEX, DS30, and DSES daily prices were gathered from DSE website; 91 days T-bill was collected from the Bangladesh Bank website. And all literature was collected from google scholar. Some information was also from:

- National newspapers like Dhaka Tribune
- Investing.com
- World Health Organization (WHO)
- World Bank

3.3 Data Analysis

To measure the performance we used the capital asset pricing model's (CAPM) Sharp, Treynor, Jensen Alpha (Pranata & Nurzanah, 2015). For volatility, we used beta calculation (Daly, 2008). As research tool, we used Microsoft Excel.

3.3.1 Capital Asset Pricing Model (CAPM)

To measure the performance of indices and portfolio Sharpe Ratio, Treynor Ratio and Jensen Alpha has become a standard method. It not only measures the performance but also considers the risk associate with the instruments. To comparing performance many studies used these methods (Aarif et al., 2020; O. Al-Khazali et al., 2014; Habib & Ul Islam, 2014; Ho et al., 2014; Lusyana & Sherif, 2017; Pranata & Nurzanah, 2015).

Moreover, below are the formulas of Sharpe, 1966 and Treynor, 1965 Ratio:

$$\text{Sharp Ratio} = S(i) = \frac{(R_i - R_f)}{\sigma(R_i)} \quad (1)$$

$$\text{Treynor Ratio} = T(i) = \frac{(R_i - R_f)}{\beta_i} \quad (2)$$

$$\text{Jensen Alpha} = \alpha = R_i - [R_f + \beta(R_m - R_f)] \quad (3)$$

Where R_i denotes as the return of index i , R_f denotes as the return of risk-free rate, $\sigma(R_i)$ is denotes as the standard deviation of index i . In Treynor, β_i denotes as the beta of indices or the volatility of the indices. And R_m represent the return of the market benchmark, which in this case is DSEX. All of these variables are for a specific period.

These three ratios represent the risk-adjusted performance of the instrument or indices. The higher the outcome from the ratios is the better the performance of the portfolio or indices.

3.3.2 Beta Calculation

To measure and compare the volatility of DSES and DS30 towards their benchmark, we used beta. The formula is following:

$$\text{Beta} = \beta_i = \frac{\text{Cov}(R_i, R_m)}{\text{Var}(R_m)} \quad (4)$$

Where R_i denotes as the return of index i , R_m represent the return of the market benchmark, which in this case is DSEX. And β_i denotes as the beta of indices or the volatility of the indices. All of these variables are for a specific period.

Chapter 4: Data Analysis and Findings

Table 1. Portfolio Performance and Volatility of DSES and DS30 Comparison

Year	DSES					DS30					DSES Outperform DS30	DSES less volatile than DS30
	Sharp Ratio	Treynor Ratio	Jensen Alpha	Annual Return	Beta	Sharp Ratio	Treynor Ratio	Jensen Alpha	Annual Return	Beta		
2015	-0.6584	-0.0653	-0.0449	-2.128%	1.0383	-0.6037	-0.0599	-0.0394	-1.588%	1.0405	No	Yes
2016	0.4204	0.0459	-0.0072	7.632%	0.9437	0.0395	0.0040	-0.0511	3.706%	1.0313	Yes	Yes
2017	1.1964	0.1808	-0.0040	15.709%	0.6875	1.9330	0.2468	0.0495	23.543%	0.8208	No	Yes
2018	-1.3365	-0.1740	-0.0083	-11.58%	0.7886	-2.0271	-0.2349	-0.0637	-18.844%	0.8937	Yes	Yes
2019	-2.5265	-0.2724	-0.0337	-20.273%	0.9382	-2.5928	-0.2802	-0.0411	-21.081%	0.9409	Yes	Yes
2020	1.8992	0.2062	0.0345	24.112%	0.9443	2.3215	0.2503	0.0769	28.525%	0.9543	No	Yes

4.1 Portfolio Performance

By computing the Sharpe ratio, Treynor ratio, and Jensen Alpha as the methodology to measuring and comparing the performance of DSES and DS30 index using daily data collected from DSE website, the data range is from January 2015 to December 2020, the result shows that neither DSES nor DS30 has better performance. In a range of six years, DSES outperform DS30 in 3 years: 2016, 2018, and 2019, whereas DS30 outperform DSES also in 3 years: 2015, 2017, and 2020. In essence, we could not confirm whether or not DSES outperforms DS30 in the economic crisis period because within the period of study it didn't experience any economic crisis. But it experienced only one global crisis which is the global pandemic covid19. Whatsoever DSES was not so resilient than DS30 at the time of covid19, rather DS30 perform better than DSES at the time of covid19. In addition, the result can be seen in Table 1.

4.2 Volatility

To calculate and compare the indices' volatility, we use the beta (β) coefficient by using DSEX as a benchmark. It is come by dividing the covariance of return of DSES or DS30 towards DSEX to standard deviation of DSEX. Simply it is a comparison of the volatility of DSES or DS30 to its benchmark, in this case, it is DSEX. If the beta is greater than 1, the indices are more likely to be much volatile than the benchmark. If the beta is equal to 1 then it indicates that DSES or DS30 is move along with the DSEX. This means the indices volatility is the same as the market volatility. Then if the beta is less than 1, it indicates that indices are less volatile than the market, where if the beta is greater than 1 then, it shows that indices are more volatile than the market (DSEX). Based on Table 1 we can see that DSES is less volatile than its counterpart DS30 in every year. So, we can say that IES's in DSE is less volatile than its conventional counterparts.

Chapter 5: Recommendations and Conclusion

In Bangladesh, the shariah index is a new concept. It was formed on 19 January 2014 (Dhaka Tribune, 2014). Bangladesh stock market faced multiple crises and the market did collapse in the past. But we cannot compare is shariah-compliant stock is less volatile than the others or not as there was no shariah index. And Compare to other indices very little study has been done for the DSES index. The general people of Bangladesh do not know much about the IEIs of DSE. All around the world IEIs proves that it is more stable than the conventional index. And in crisis, it is much more resilient (O. Al-Khazali et al., 2014). Also, the market efficiency of IEIs in Bangladesh is alike its conventional counterparts. Right now, the world is going through a pandemic call covid19. The rationale of this study was to find out how IEIs in Bangladesh perform in comparison to its conventional counterparts at the period of covid19.

For this study, we went through several previous studies. We found that all over the world IEIs outperform it conventional peer, and it is more stable at the period of crises. Also, IEIs portray almost the same level of efficiency as conventional indices. It also proved in the context of Bangladesh too (Aarif et al., 2020; O. Al-Khazali et al., 2014; Habib & Ul Islam, 2014; Ho et al., 2014; Lusyana & Sherif, 2017; Pranata & Nurzanah, 2015).

In summary, the factual result is using CAPM; we found neither the Islamic index (measured by DSES) nor its the convention peer (measured by DS30) performance better at the period of January 2015 - December 2020. Islamic index outperforms its conventional peers for three years and other three years it was the total opposite, where the conventional index outperforms the Islamic index. Compare to other countries like Malaysia IEIs in Bangladesh did not outperform its conventional peer, but it is also true that IEIs is also a new index in DSE. To calculate the volatility, we used beta calculation; we found that the Islamic index was more stable than the conventional index for the entire period.

In essence, though IEIs did not outperform its conventional counterparts. It has a positive aspect, which is, as a new index it outperforms its conventional peer for three

years, equal to the conventional index. Very few general investors of Bangladesh knew about the IEI and its mechanism. Information regarding IEIs is also not much available.

We only took one pair of indices; the future study should take more pairs of indices. And use different methods to measure the performance and volatility. Also, future studies could identify the determinants of those indices.

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