UNIVERSITY OF SOUTHERN QUEENSLAND

Investment Performance of Jakarta Islamic Index (JII) Stocks

Dissertation submitted by

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ABSTRACT

The objective of this study is to assess comprehensively the investment performance, trading activity and volatility of Jakarta Islamic Index (JII) stocks. JII is the index on the Indonesian Stock Exchange that is composed of *Sharia*-compliant stocks (stocks of companies whose methods and practices are in compliance with *Sharia* law). JII stocks have unique characteristics – other than those that set them apart because of their basis in Islamic principles.These stocks have high levels of market capitalisation and high liquidity. In the Indonesian context, JII stocks are liquid 'blue chip' stocks. Unlike other investments where ethical stocks are smaller, illiquid and volatile, Indonesian ethical investing via JII stocks is unlikely to hurt investment performance per se.

Current literature on *Sharia* investment has not included the liquidity issue in their model to assess stock performance. Therefore, in this study, a comprehensive study of this issue has been conducted using the extended model of the Capital Asset Pricing Model (CAPM) using the Fama and French three-factor model augmented with liquidity.

A second feature of this study is that the volatility of JII stocks as compared to other stocks was investigated. The impact of the Global Financial Crisis (GFC) on JII stocks was also examined. Finally, the effect of stocks entering and leaving the JII on return performance, trading activity and spread was assessed.

The empirical findings of this study provide some valuable insights for finance academics and practitioners, especially those with an interest in Islamic finance. First, it was found that there was no difference in performance between JII and non-JII (*Sharia* and non-*Sharia*) stocks. Second, weak empirical evidence was found indicating that JII stocks exhibit lower levels of volatility when compared to non-JII stocks. Third, it was found that during the GFC, after the announcement of the suspension of trading on the Indonesian Stock Exchange (IDX), Trading Volume Activity (TVA) of JII stocks experienced a decrease when compared to non-JII stocks. This finding is consistent with the view that in the wake of bad news, investors sell more of their holdings of risky stocks (non-*Sharia* stocks) in order to avoid losses. However, these effects were not statistically significant. Finally, the effect of stocks entering and leaving JII supported the price pressure hypothesis. Overall, the study reports evidence consistent with the view that investors' decisions to buy stocks has been driven more by the performance of stocks rather than by the extent of their ethical compliance.

CERTIFICATION OF DISSERTATION

I certify that the ideas, results, analyses, and conclusions reported in this dissertation are entirely my own effort, except where otherwise acknowledged. I also certify that the work is original and has not been previously submitted for any other award, except where otherwise acknowledged.

Erna Listyaningsih

_____ 31/03/2015

Signature of Candidate Date

ENDORSEMENT

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Signature of Supervisor/s Date

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Signature of Supervisor/s Date

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Glossary of Arabic terms

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***gharar*:** Literally, "deception, danger, risk, and excessive, unnecessary uncertainty (ambiguity), speculation." Technically, it means exposing one self to excessive risk and danger in a business transaction as a result of either having too little information or asymmetric information about price, quality and quantity of the counter-value, the date of delivery, the ability of either the buyer or the seller to fulfill their commitment, or ambiguity in the terms of deal-thereby, exposing either of the two parties to unnecessary risk.

M

maisir: Gambling or any game of chance

R

riba: Literally, "increase," "addition," or "growth." Technically, it refers to the "premium" that must be paid by the borrower to the lender along with the principal amount as a condition for the loan or an extension in its maturity. Interest, as commonly understood today, is regarded by a predominant majority of fuqaha' to be equivalent to riba.

ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AR	Abnormal Return
ARCH	Autoregressive ConditionalHeteroscedasticity
ATVA	Average Trading Volume Activity
ASPI	Advanced Sustainability Performance Eurozone *Index*
BAPEPAM-LK	Badan Pengawas Pasar Modal dan Lembaga Keuangan
BE/BM	Book to Market
CAPM	Capital Asset Pricing Model
CAR	Cumulative Abnormal Return
CRSP	Centre for Research in Security Prices
CSR	Corporate Social Responsibility
IDX	Indonesia Stock Exchange
DES	Daftar Efek Syariah
DJI	Dow Jones Index
DJII	Dow Jones Islamic Index
DJIMI	Dow Jones Islamic Malaysia Index
EGARCH	Exponential GARCH
FTSE	The London Financial Times Stock Exchange
GARCH	Generalized Autoregressive Conditional Heteroscedasticity
GCC	Gulf Cooperation Council
GFC	Global Finance Crisis
HML	High Minus Low
IBM	International Business Machines
IHSG	Index Harga Saham Gabungan
JATS	Jakarta Automated Trading System
JCI	Jakarta Composite Index
JII	Jakarta Islamic Index
KLCI	Kuala Lumpur Composite Index
KLSI	Kuala Lumpur Syariah Index
LM	Lagrange Multiplier
LMH	Low minus High
MCAR	Mean Cumulative Abnormal Return
ROA	Return on Assets
ROE	Return on Equity
SAC	Syariah Advisory Council
SBI	Sertifikat Bank Indonesia
SMB	Small Minus Big
SRO	Self-Regulatory Organizations
SRI	Socially Responsible Investment
SPSS	Statistical Package for the Social Sciences
TVA	Trading Volume Activity
US/USA	United States/United States of America
VAR	Value at risk

PUBLICATIONS

List of Publications during the PhD Study Period

List of Conference Papers

Listyaningsih, E,& Krishnamurti, C. (2014), How volatile are *Sharia* stocks relative to other stocks: evidence from Jakarta Islamic Index, paper presented at the 21st Annual of Global Finance Conference, Dubai, UAE, 30 March-2 April 2014

Listyaningsih, E,& Krishnamurti, C. (2014), Price, Volume and Liquidity Effect of Stocks Entering and Leaving Jakarta Islamic Index, paper presented at the Asian FA Conference, Bali, Indonesia, 24-27 June 2014

CHAPTER ONE

1. Introduction

1.1 Background to the Study

In the past several years, the world of finance has placed more emphasis on the importance of ethical investments. 'Ethical funds' are currently one of the fastest growing asset classes (Hussein & Omran 2005). In general, an ethical investment is normally thought to be based upon the avoidance of certain undesirable activities and the favouring of some other more desirable activities. With ethical investing,the investor includes moral issues in addition to the standard risk-return considerations when considering which stocks to purchase. Often-used terms to describe of ethical investments include Socially Responsible Investments (SRI) or Corporate Social Responsibility (CSR) (Nordin 2006). By screening potential investments, ethical investors ensure that the investments they select are consistent with their personal values, while also raising the awareness of firms that are not responsive to social concerns and put pressure on those firms to change (Sauer 1997).

In United States of America (USA), socially responsible funds flourished and almost doubled in total value from $1.185 trillion to $2.16 trillion USD between 1997 and 2000 (Hakim & Rashidian 2002). At the same time, during the early 1900s, socially responsible investors avoided companies that were involved in the production of alcohol, tobacco, and gambling (Sauer 1997). In addition, Hong and Kacperczyk (2009), who investigated the impact of social norms on markets, found that sin stocks' (alcohol, tobacco, and gaming) were less commonly held by norm-constrained institutions.

Bauer, Otten and Rad (2006) argue that ethical investing will under-perform over the long term because ethical investment portfolios are subsets of the market portfolio, and lack sufficient diversification. Ethical screening tends to eliminate large firms from the investment universe, and as a result, remaining firms tended to be smaller and have more volatile returns (Hassan, Antoniou & Paudyal 2005; Sauer 1997). However, Sauer (1997), who examined the potential impact of social screening on investment performance between the Domini 400 Social Index, the S&P 500 and Chicago Centre for Research in Security Prices (CRSP) Indices, found that there were no statistically significant differences between ethical and non-ethical portfolio returns in the USA. This result is consistent with the study by Bauer, Koedijk and Otten (2005) who found that there was no statistically significant difference between ethical and conventional mutual funds based on performance.

Islamic-based or *Sharia* investing has much in common with modern forms of investing known as "ethical investing", "green investing", "faith investing" and "socially responsible investing" (DeLorenzo 2002)**.** *Sharia*-compliant or socially responsible investors apply both *Sharia* and their own financial criteria when evaluating investments in order to ensure that the securities selected are consistent with their value system and beliefs (Hassan, Antoniou & Paudyal 2005; Sauer 1997). Until the 1970s, a great proportion of the Muslim community was not involved in any stock market investments because of the Islamic prohibition of certain business

activities. With changes in the 1990s in religious rulings related to equity investment, *Sharia*-based equity funds sprung up (Hussein & Omran 2005).

One of the most popular forms of investing that is in compliance with Islamic principles is the investments in *Sharia*-compliant stocks. A *Sharia*-compliant stock is a stock that represents a company whose practices are consistent with Islamic principles. Islamic principles in this context mean that the company does not conduct any business activities which conflict with Islamic principles such as: gambling (maisir), interest of bank or finance company (ribawi), speculation (gharar), producing, distributing and providing products or services that are forbidden (depraved, immoral, harmful). In addition, there are prohibitions on buying stocks in companies whose primary business involves alcohol, tobacco, pork processing, pornography, and armaments or weapon production (Bapepam ; Derbel, Bouraui & Dammak 2011; El-Gamal 2000; Hussein 2007; Iqbal 1997; Sadeghi 2008; Taqi Usmani 2004). In February 1999, the first Dow Jones Islamic Index (DJII) market was launched to track the performance of firms in 34 countries whose activities are consistent with Islamic principles (Hussein 2004). The assets of Islamic financial institutions increased spectacularly and grew 40 fold since 1982 to reach over $ 230 billion in 2002 (Hakim & Rashidian 2002).

Hassan, Antoniou and Paudyal (2005) who investigated the impact of *Sharia* screening on investment performance of DJII found that the DJII has a much higher raw return than the conventional stocks. The performance of stocks can also be seen from the perspective of volatility. Higher market volatility is less desirable from the perspective of investors. Islamic investing aims at generating returns with low volatility returns by focusing on low debt, non-financial, and social-ethical investments (DeLorenzo 2002). Charles, Darné and Pop (2011), who investigated whether Islamic index (DJII) is more or less affected by sudden changes in volatility regimes than the conventional counterparts (DJI), found that both indices have been affected to the same degree.

In the last few years, *Sharia* investment started growing rapidly in Indonesia (IDX). Indonesia as the biggest Muslim country in the world (see figure 1.1) is a huge market for the development of *Sharia* finance industry. *Sharia* capital market plays an important role in increasing market share of the finance industry in Indonesia. Therefore, it is expected to grow faster. In Indonesia *Sharia* capital markets began with the introduction of Islamic mutual funds on July 3rd, 1997, followed by the release of Jakarta Islamic Index (JII) on July 3rd, 2000 by Jakarta Stock Exchange, (now the Indonesia Stock Exchange (IDX)) in cooperation with PT Danareksa Investment Management (DIM) in order to develop the *Sharia* capital market in Indonesia (IDX). JII is the index that is composed of the Indonesian *Sharia* compliant stocks. JII consists of 30 liquid stocks that meet Islamic principles. The stocks that are included in the JII will be evaluated every six months. If a given stock does not meet the principles of *Sharia*, the authority will remove it and replace it with another compliant stock.

JII stocks have unique characteristics besides being based on Islamic principles. They have high market capitalisation and high liquidity. In the context of Indonesia, JII stocks are liquid blue chip stocks. Unlike other investments where ethical stocks are smaller, illiquid and volatile, Indonesian ethical investing via JII is unlikely to hurt investment performance. Because of their liquidity, it is expected that JII stocks will be more attractive to the investors.

The index value of JII during 2004 to 2008 increased. However, from 2008 till 2009 the index value of JII decreased because of the Global Financial Crisis, and

then subsequently from 2009 to 2011 experienced a sharp rise (see the graph in Figure 1.2). In general, the performance of JII stocks showed an increasing overall trend although it experienced a decrease in 2008 due to the Global Financial Crisis.

Based on literature cited above, there is mixed evidence on the impact of ethical investing on the performance of stocks. This study assesses several aspects of JII stocks such as return, volatility, trading volume activity (TVA) during the Global Financial Crisis (GFC) and the effect of stocks entering and leaving JII. Therefore, this study undertakes a comprehensive investigation of the Jakarta Islamic Index stocks during January 2005 to May 2012. To the best of the researcher's knowledge, there is no comprehensive study on JII stocks, or on the topic of *Sharia*-compliant investments.

1.2 Motivation to Study

The motivation for undertaking this research was driven by the study of Hong and Kacperczyk (2009) who found that investors shun 'sin stocks' because of social norms. However, this study examines the opposite effect studied by Hong and Kacperczyk. JII stocks are expected to be favoured by investors due to *Sharia* screening based on Islamic principles. Additionally, there is *Sharia* agreement that the buying and selling of corporate stocks do not violate Islamic norms because stocks represent real assets (Hassan, Antoniou & Paudyal 2005). Therefore, investors will be more willing to commit investment transactions in JII stocks and to support the process of *Sharia* compliant stocks.

The JII screening process for stocks is also based on high market capitalisation and high levels of liquidity. Thus, the stocks which are included in JII are blue chip stocks. This means that JII stocks have high levels in trading activity both in terms of frequency and volume. Therefore, it is expected that JII stocks would have a good rate of return. Therefore, this research is interesting because previous studies on the ethical investments were conducted on small stocks due to the screening process.

As there was previously a lack of comprehensive studies on Islamic investing in Indonesia, this study will extend the literature on several fronts. Besides comparing JII stocks with non-JII stocks, this study will compare non-JII *Sharia* stocks with non-*Sharia* stocks on various dimensions. It will also examine the impact of Global Financial Crisis on Islamic investing. Thus this study will be able to provide insights on whether *Sharia* restrictions have indirectly helped stocks to weather the adverse impacts of global shocks. Furthermore, this research studied comprehensively the effect of stocks entering and leaving the JII. These matters were not previously studied in Indonesia. Besides the performance of stocks, this research also studied the volatility and trading volume of JII stocks. A lack of prior research in this area has motivated this work.

1.3 Study Problem

Unscreened benchmarks may outperform ethical investment choices because of additional screening and monitoring costs, limiting the investment universe, and restricting the potential for diversification (Hussein & Omran 2005; Sauer 1997). However, the study that was conducted in Indonesia by Utami and Nugraha (2011) who investigated the performance of JII stocks during period December 2008 to November 2010 by using Treynor index, found that 16 of 17 of JII stocks had good performance and JII stocks had a significant impact on trading volume. It was not

clear whether or not the superior performance of JII stocks was due to ethical compliance or to the liquidity effect. This leads us to the following questions :

1. A. How does the investment performance of JII stocks compare to non *Sharia* stocks?
   B. How does investment performance of non JII-*Sharia* stocks compare to non *Sharia* stocks?
2. Do JII stock prices have a lower volatility than non JII stocks?
3. Was there a difference in trading volume activity (TVA) of JII and non JII before, during, and after Global Financial Crisis?
4. Is there an effect caused by stocks entering and leaving JII ?

1.4 Study Objectives

Assessing the comprehensive performance of JII stocks is the main objective of this study. To achieve this, several methodologies and models have been proposed. More specifically, the objectives of this study are as follows:

a) to assess the performance of JII stocks by using the three factor model of Fama and French and compare it with the performance of non-*Sharia*-compliant stocks; and to investigate the effect of JII selection restrictions on performance of stocks by using dummy variables;
b) to investigate the volatility of JII stocks by using the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model;
c) to investigate trading volume activity of JII stocks before and after the Global Financial Crisis by using a regression model and event study methodology; and finally
d) to investigate the effect of stocks entering and leaving JII by using regression model and event study methodology.

1.5 Significances of the Study

Price is a major factor in assessing the performance of a stock. The performance of stocks is useful for guiding investment decisions. The importance of assessing the performance of a stock lies in its usefulness to guide for investors who want to maximise their return on investment. Identifying the source of outperformance of the JII index is potentially useful to investors who want to invest in *Sharia* compliant stocks included in JII stocks.

The significance of this study is as follows. First, this study assessed performance of JII stocks to provide empirical evidence of investment performance of JII stocks through the use of several methodologies. In this study, JII stocks were compared with non-*Sharia* stocks using CAPM and the Fama and French three-factor model. Second, this study investigated the effect of JII selection restriction on the performance of stocks and the effect of stocks entering and leaving the JII. Lastly, this study assessed the volatility of JII stocks and the trading volume activity of JII stocks before and after Global Financial Crisis which would provide insights on behaviour of ethical investments in the wake of global shocks.

1.6 Contribution of the study

1.6.1 To knowledge and Theory

This study investigates the performance of JII stocks through the use of several methodologies. Specifically, the contribution of this study is to empirically assess the performance of JII stocks. The main model used in this study is the Fama and French three factor model with the addition of liquidity factor. The effect of JII selection restriction on performance, volatility, and trading volume is another feature of this study. The results of this study are expected to contribute to our understanding of how ethical screens impact the various parameters of interest for investors such as returns, risk and liquidity. A comprehensive study of this nature has not been conducted in the context of Islamic investing.

1.6.2 To the Investor

This study provides empirical findings for investors and can be expected to make a practical contribution for investors in aiding their decision making on their investments regarding *Sharia*-compliant stocks by using appropriate methods of investment performance in the analysis.

1.7 Outline of this Research

Chapter one provides the background to the study, the motivation to study and research questions, focus of the study, and an outline of the dissertation are presented.

Chapter two, the literature review and theoretical development section, provides an overview of JII, and a review of the existing literature on ethical and *Sharia* investment. It includes ethical investing, *Sharia*-compliant investments, volatility, trading volume, the effect of stocks entering and leaving JII, an overview of the existing literature in Indonesia and the identification of gaps through the literature review. This Chapter also includes the hypothesis and theoretical background.

Chapter three presents the details of the data and the methodology. It provides a review of how the investment performance of JII and non JII will be measured in this paper. It includes the past and the current research methodology, as well as modified model which will be used to measure investment performance of JII and non JII. This Chapter also describes how to asses volatility of JII stocks and to investigate the effect of stocks entering and leaving JII by using a regression model and event study methodology.

Chapter four presents the empirical results. Finally, Chapter Five offers the discussion of the results, conclusions and potential future extensions.

1.8 Summary of Chapter

This Chapter has briefly provided background information relevant to the study and has outlined the motivation for the study and the relevant research questions, study objectives, significance of the study, contribution of the study and an outline of the dissertation.

Figure 1-1: Muslim Population of Indonesia
Source: Pew Research Centre'sForum on Religion & Public Life.

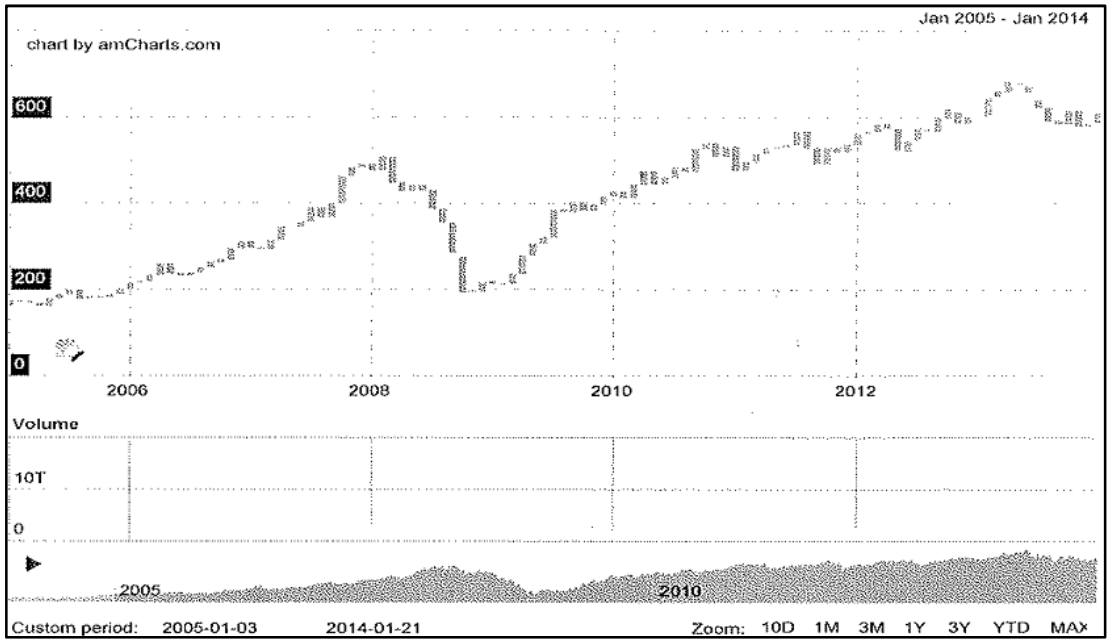

Figure 1-2: Jakarta Islamic Index (JII)
Source: IDX

CHAPTER TWO

2. Literature Review and Theoretical Development

2.1 Introduction

This Chapter reviews the existing literature and based on this review, the study develops theories and determines relevant hypotheses. In order to do so, this study identified the fundamental issues of the research - particularly assessment of JII stock performance, including the associated effects. Firstly, this study presents the trading mechanism utilised at IDX, followed by the characteristics of JII stocks which are the focus of this study. Furthermore, this study explores the main differences between JII stocks and other ethical investments as well as with other *Sharia*-compliant investments in the world. A summary of the literature is then presented in order to identify the research gaps, and to develop a testable hypothesis. Regarding the assessment of JII performance, this study employs a modified form of the three factor CAPM developed by Fama and French (1993). This study also examines the volatility and trading volume of JII stocks and compares them with other stocks. Finally, this study develops a testable hypothesis using pre-existing theory with respect to the effect of stocks entering and leaving JII.

2.2 Trading Mechanism within the Indonesia Stock Exchange (IDX)

All transactions in the IDX are processed in a facility known as the Jakarta Automated Trading System (JATS). The trading mechanism of stocks in the IDX is described in Appendix A (IDX 2012). The IDX market is segmented into the following subsections: regular market, cash market and negotiated market (see Appendix B for trading hours). Price discovery occurs in the regular market which uses an auction mechanism. JATS processes orders with consideration of both price and time priorities. The 'bid' transactions in the regular and cash market will be matched with 'ask' transactions by JATS. However, in negotiated market, prices of each security are negotiated between: exchange members; investor and one exchange member; and investor and exchange member. The result of the negotiation will be processed through the JATS. Before a transaction is matched, they are allowed to change or cancel their 'bids' and 'asks'. The transactions settlements between the sellers and buyers in regular market, cash market and negotiated market are described in Appendix C.

2.3 Jakarta Islamic Index

[1]In IDX, there are twenty five indices, namely: Agriculture; Mining; Basic-Ind; Miscellaneous Industry; Consumer; Property; Infrastructure; Finance; Trade; Manufacture; JCI; LQ45; JII; Main Board Index; Development Board Index;

[1]Source IDX, http://www.idx.co.id/en-us/home/marketinformation/marketindex.aspx (accessed on 20th of February 2015).

KOMPAS100; BISNIS-27; PEFINDO25; SRI-KEHATI; Indeks Saham Syariah Indonesia (ISSI); Infobank15; IDX30; Investor33; MNC36 and SMInfra 18. JII is the stock index of *Sharia*-compliant stocks in Indonesia. The objective of the JII is to provide a vehicle for investors to make investment in *Sharia*-compliant stocks. [2]Every period, 30 stocks which meet the Islamic criteria are included in JII. JII was launched on July 3rd, 2000. However, in order to generate longer historical data, the base date for the calculation of JII is set at January 2nd1995 with index base number of 100 (IDX).

The selection of shares that are to be included in the JII is done by the *Sharia* supervisory board of PT DIM. Stocks that enter JII should first pass the *Sharia* filter which has two screenings: core business criteria and financial ratios criteria. Furthermore, the JII selection process is performed by IDX based on the performance of *Sharia* shares trading (see Appendix F for JII screening process information). However, in terms of financial constraints, the Dow Jones Islamic Index (DJII) is the most conservative in this regard. Stocks included in DJII must not have debt ratio exceeding 33%, accounts receivables to total assets must remain below 45% and interest income should represent less than 5% of total revenue (Hakim & Rashidian 2002). The JII is less restrictive and requires upper limits of 45% and 10% respectively for debt ratio and interest income to revenue.

Figure 2.1 shows an overall increasing trend of market capitalisation of JII and JCI in spite of the drop in 2008 due to the Global Financial Crisis. Figure 2.2 shows the time series of stocks satisfying the *Sharia* criteria (it is called Daftar Efek Syariah (DES) and is published by Badan Pengawas Pasar Modal dan Lembaga Keuangan (BAPEPAM-LK)). DES is a collection of securities that does not conflict with *Sharia* principles in capital market, which is set by Bapepam-LK or parties approved by Bapepam-LK. The *Sharia* list (DES) is published on a regular basis namely on the end of May and November each year starting from November 30, 2007. IDX conducts reviews to update list of JII every six months, based upon the periodic DES issued by Bapepam-LK. After the selection of *Sharia* stocks by Bapepam-LK, which is released as DES, IDX continues the selection process based on its trading performance. The JII is published on regular basis on December and June each year. However, before November 2007, JII selection was conducted by IDX because DES which is *Sharia* list just published on November 30th 2007. Therefore, before November 2007, *Sharia* stocks were only 30 stocks which are incorporated in JII.

Additionally, Figure 2.2 shows that there is an increase in the number of *Sharia* stocks from period 1 to period 2 from 2007 up to 2012[3]. Thus, there is an increase in the number of firms which has characteristics satisfying the Islamic principles in IDX.

[2]One period is six months.

[3] Period 1 is a period from 30th of November up to 29th of May the following year and period 2 is a period from 30 May up to 29 November which is published by Bapepam-LK

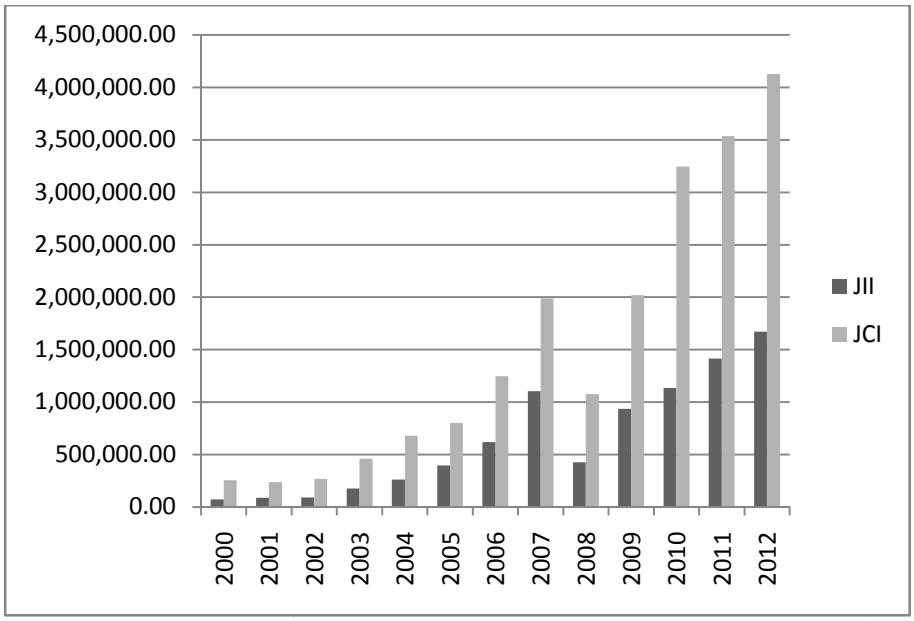

Figure 2-1: The Development of JII and JCI Market Capitalisation (Rupiah Billion)
Source: Extracted and reproduced from Statistik Perkembangan Pasar Modal Syariah, Bapepam. http://www.bapepam.go.id/syariah/statistik/saham (accessed on 22th of October 2012)

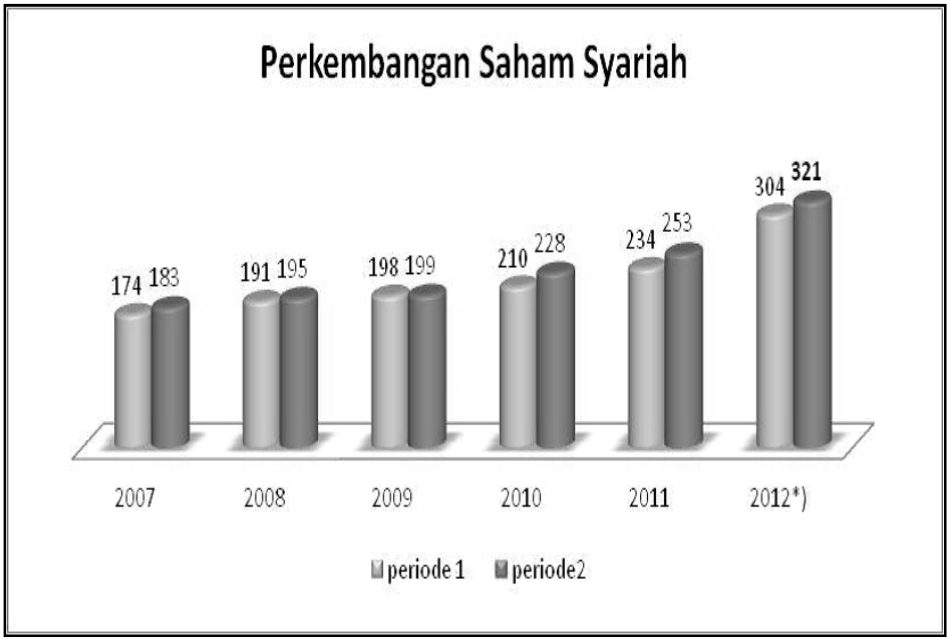

Figure 2-2:The Development of *Sharia* Stocks (DES)
Source: Statistik Perkembangan Pasar Modal Syariah, Bapepam. http://www.bapepam.go.id/syariah/statistik/pdf/2013/Statistik_Saham_Maret.pdf (Accessed on 16th of January 2014)

Furthermore from the distribution by period each year, Table 2.1 indicates that the number of *Sharia*-compliant stocks is increasing from 2005 up to 2012.

Table 2.1: Distribution by period each year

Year	All-Period 1	All-Period 2	*Sharia*-Period 1	*Sharia*-Period 2	JII	Non JII-*Sharia* Period 1	Non JII-*Sharia* Period 2	Non JII-Non *Sharia* Period 1	Non JII – Non *Sharia* Period 2
2005	336	-	-	-	30	-	-	306	-
2006	344	-	-	-	30	-	-	314	-
2007	383	-	-	164	30	-	134	353	219
2008	393	396	180	185	30	150	155	213	211
2009	397	398	181	186	30	151	156	216	212
2010	420	420	194	211	30	164	181	226	209
2011	428	440	217	238	30	187	208	211	190
2012	445	464	280	302	30	250	272	165	162

Source: Extracted and reproduced from IDX-Annually –Statistic and Bapepam-LK

2.4 Ethical Investment

Ethical investment is the exercise of ethical and social criteria to select and manage investment portfolios, while ethical funds are defined as those that exclude one or more company groups from their portfolio for non-financial reasons (Cowton 1994; Hussein 2004). In addition, ethical investors are not only concerned about the financial returns on their portfolios and the risk involved, but also with the characteristics of the companies in which their funds are placed (Wilson 1997).

Previous studies that investigated the impact of social screening on investment performance, found that there were statistically significant differences between ethical and non-ethical investment in performance (Bauer, Otten & Rad 2006; Capelle-Blancard & Couderc 2009; Mallin, Saadouni & Briston 1995). In addition, previous studies found that there was an impact of social norms on market performance (Hong & Kacperczyk 2009). However, some studies found that there were no significant differences between ethical and non-ethical investment (Bauer, Koedijk & Otten 2005; Sauer 1997) (see the Appendix E -Summary of Previous Studies on Ethical and Islamic Indices and Funds**).**

A more restrictive ethical investing scheme is Islamic investments (also known as *Sharia*-compliant investment) that must operate in accordance with the principles of *Sharia* (i.e., the Islamic law) governing all aspects of a Muslim's life (Al-Khazali, Lean & Samet 2014). The lack of comprehensive research on ethical investment in Indonesia motivates this study.

2.5 *Sharia* Investment

The most important difference between Islamic and other ethical investment principles is that besides excluding particular sectors, Islamic funds do not deal in the fixed-income market, and the receipt and payment of interest is not permitted (Hussein & Omran 2005). Additionally, unlike SRI, Islamic investment portfolios also exclude conventional financial sectors and impose additional financial screening to ensure that the level of conventional debt does not exceed the *Sharia* tolerated threshold (BinMahfouz & Hassan 2013). Thus additional selection criteria should be used when determining which companies are acceptable from the point of view of

Islamic investors (Wilson 1997). Hassan, Antoniou and Paudyal (2005) argue that it is not true that Islamic ethical criteria will be always lead to good performance, nor will it always lead to bad performance.

Previous studies that investigated the impact of *Sharia* screening on the investment performance, found that there were statistically significant differences between *Sharia* and conventional investments in the performance (Akhtar et al. 2011; Al-Zoubi, H.A. & Maghyereh, A.I. 2007; Hassan, Antoniou & Paudyal 2005; Hussein 2004; Hussein & Omran 2005; Hussein 2007; Sadeghi 2008; Yusof & AbdulMajid 2007). However, some studies found that there were no significant differences between *Sharia* and conventional investment (Albaity & Ahmad 2008; BinMahfouz & Hassan 2013; Charles, Darné & Pop 2011; Dharani & Natarajan 2008; Girard & Hassan 2008; Natarajan & Dharani 2012) (see the Appendix E Summary of Previous Studies on Ethical and Islamic Indices and Funds)**.**

Previous studies on this topic in Indonesia are scarce and have ignored the effect of JII selection on performance. Prior studies focussed on comparing JII stocks with other indices such as JCI or Index Harga Saham Gabungan (IHSG), LQ45 and Kompas 100. Valid conclusions cannot be drawn as most of the stocks belonging to JII are also included in the other indices. This study uses elaborate procedures for matching JII with non-JII stocks. This study also extends the study to compare *Sharia* (non-JII) stocks with non-*Sharia* stocks.

2.6 The Performance of Ethical and Sharia Investment

Previous studies of ethical and *Sharia* investments were conducted both in Indonesia and in other countries. Prior studies show that there is no conclusive evidence regarding the performance of ethical and *Sharia* investment and the debate is still ongoing. Some researchers found that in the US, Islamic indexes such as DJIMI shows better performance over the entire period and in bull market periods (Hussein 2004; Hussein & Omran 2005; Hussein 2007), but underperform in bear markets (Hussein 2004; Hussein & Omran 2005). However, some researchers found that Islamic funds show better performance in bear market (Abdullah, Hassan & Mohamad 2007). Additionally, some researchers also found that there was no significant difference between ethical or *Sharia* and non-ethical or conventional stocks in performance (Albaity & Ahmad 2008; Bauer, Koedijk & Otten 2005; BinMahfouz & Hassan 2013; Charles, Darné & Pop 2011; Dharani & Natarajan 2008; Girard & Hassan 2008; Natarajan & Dharani 2012). Thus, prior mixed results necessitate further investigation regarding this issue.

Mallin, Saadouni and Briston (1995) compared the performance of 29 ethical funds and non ethical ones with the same formation date and fund size, and found that beta is lower for ethical funds. This implies that the non-ethical trusts are riskier than the ethical trusts. However, Bauer, Otten and Rad (2006) who investigated ethical fund performance in Australia found that domestic ethical funds under-performed their conventional counterparts during 1992-1996.

Previous studies of *Sharia*-based investment were reviewed, including Al-Zoubi, H.A. and Maghyereh, A.I. (2007) who found that the Islamic index outperforms the Dow Jones WORLD index in term of risk[4]. In addition, Hussein (2004), who examined whether returns earned by investors who purchased shares in the Financial Times Stock Exchange (FTSE) Global Islamic Index were significantly

[4] They measured risk of Islamic investments represented by the DJII by using Value at Risk (Var) to examine how *Sharia* restriction affects the risk of Islamic investments

different from those of the FTSE All-World Index, which is well diversified index, both in the short run and the long run, and he also investigated the performance of Islamic index compared to the FTSE4 Good which is a socially responsible index. He found that the application of ethical screens does not have an adverse impact on the FTSE Global Islamic Index performance. Furthermore, Hussein (2007) examined the impact of *Sharia* screening on the performance of FTSE Global Islamic index and DJI Market index, and found strong evidence to reject the assumption that *Sharia* investing offered inferior investment performance when compared to unscreened portfolios.

However, Albaity and Ahmad (2008) who conducted study of Kuala Lumpur Syariah Index (KLSI) and Kuala Lumpur Composite Index (KLCI) found that there was no evidence of significant statistical difference in risk-adjusted returns between Islamic and conventional stock indices during 1999-2005. In addition, Girard and Hassan (2008) suggest that the difference in performance of Islamic indices when compared with conventional indices can be attributed to style differences between the two types of indices. However, after controlling for market risk, size, book-to-market, momentum, and local global factors, they find that the difference in return between Islamic and conventional indices is not significant. Furthermore, Dharani and Natarajan (2008) who compared the performance of Islamic index with the broad market common index in India by using Sharpe index, Treynor index and Jenson alpha to measure performance, found that the risk adjusted returns for the both indices were underperforming with respect to risk free rate of return. Their study concludes that both Islamic and conventional indices are performing in a similar manner.

According to Al-Khazali, Lean and Samet (2014) who examined the performance of nine indices of DJII compared to conventional indices from 1996-2012 found that conventional indices stochastically dominated Islamic indexes in all markets except the European market during the period reviewed. However, the global, European and the US Islamic indices dominate their conventional counterparts during 2007-2012. This finding indicates that during and after the financial crisis, Islamic indices stochastically dominated their conventional peers. Additionally, Ho et al. (2014) also found that Islamic indices outperformed their conventional counterparts during crisis periods but the results are inconclusive for the non-crisis periods. According to Ashraf and Mohammad (2014), the restriction on leverage and trading in financial assets may result in a very different risk-adjusted performance of Islamic equity investments compared to similar conventional investments during downturns. This is a reasonable conclusion, because *Sharia* stocks have low risk due to their low leverage and therefore performed better during crisis periods.

In Indonesia, Malini (2011) who analysed the performance of JII stocks from 2002 to 2004 found that a few of JII stocks have a good performance. However, Utami and Nugraha (2011) found that most of JII stocks have a good performance. Please see the Appendix E for a Summary of Previous Studies on Ethical and Islamic Indices and Funds.

In summary, screening stocks based on principles of ethical investment had mixed results on performance. Furthermore, it is argued that the performance of ethical investments depends on the screening criteria used and the methodology used to assess the performance of ethical investments.

Mackey, Mackey and Barney (2007) argue that if the demand for socially responsible investment opportunities generated by these investors is greater than the supply of these investment opportunities, then such investments can create economic value for firms. In this research, the supply of socially responsible investment is changing due to the changes in the number of *Sharia*-compliant firms, and the demand of JII stocks is changing due to changes in the market capitalisation of JII as a percentage of the total of stock market capitalisation (JCI). In the context of Indonesia, since 2007 up to 2012, changes in the number of *Sharia* stock act as a proxy for the supply of *Sharia* stocks and shows an increase trend (see Figure 2.3). From 2000 up to 2012, change in the market capitalisation of JII which is the proxy of demand shows an increasing trend as well (see Figure 2.4) except in 2008 due to the Global Financial Crisis.

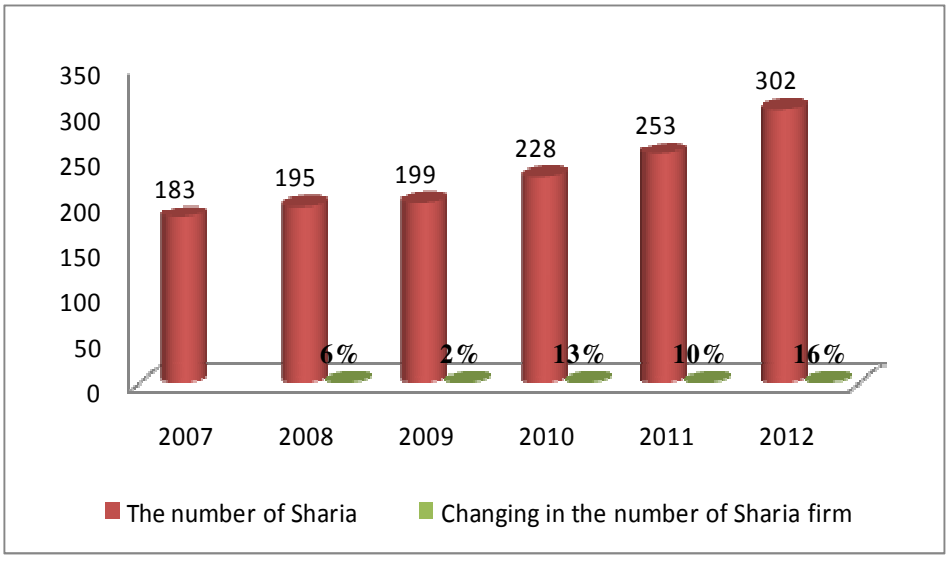

Figure 2-3: Changing in the number of *Sharia* firms in Indonesia (Rupiah Billion)
Source: Extracted and reproduced from Statistik Perkembangan Pasar Modal Syariah, Bapepam.http://www.bapepam.go.id/syariah/statistik/saham (accessed on 15th of February 2013)

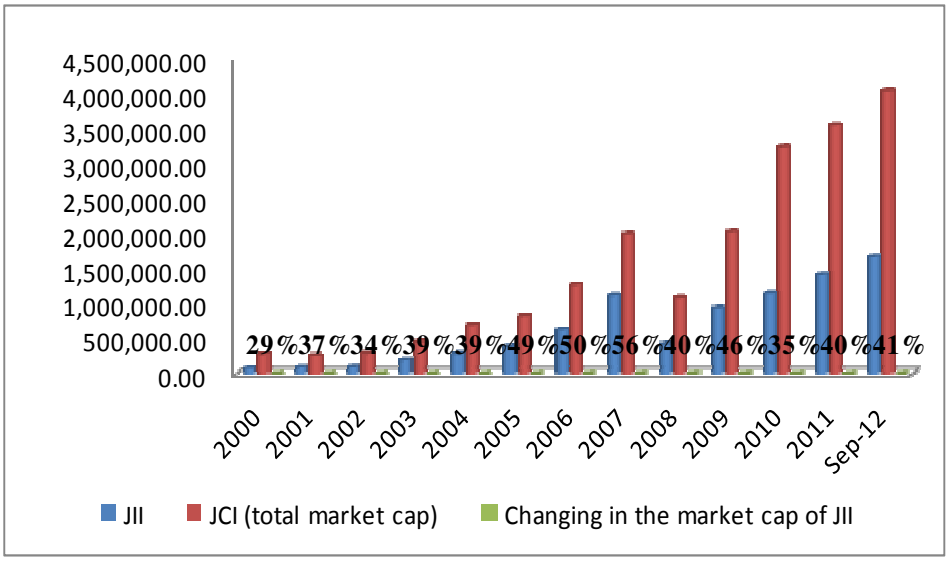

Figure 2-4: Changing in the market capitalisation of JII stocks in Indonesia (Rupiah Billion)
Source: Extracted and reproduced from Statistik Perkembangan Pasar Modal Syariah, Bapepam.http://www.bapepam.go.id/syariah/statistik/saham (accessed on 15th of February 2013)

Additionally, in the context of Indonesia, due to their characteristics based on Islamic principles such as being free from gambling, interest and speculation, the category of *Sharia*-compliant firms also include those with low leverage levels in which financial ratio restrictions exclude firms with a large amount of debt and interest income, maximum 45% and 10% respectively (see the Appendix F). From *Sharia*-compliant stocks, the IDX selects firms based on performance according to changes in market capitalisation and liquidity. If *Sharia*-compliant stocks do not have high levels of market capitalisation and high liquidity, then they are not included in JII list. Therefore, JII stocks will be different from a matched sample of non-JII (*Sharia* and non-*Sharia* stocks). In addition, a major distinction between Islamic and conventional stocks indices is that they reflect a different sample of industries and firms (Akhtar et al. 2011). This study therefore posits the following hypothesis:

H1. A. ***The investment performance of JII stocks will be substantially different from a matched sample of non-Sharia stocks.***

H1. B. ***The investment performance of non JII-Sharia stocks will be substantially different from a matched sample of non-Sharia stocks.***

In addition, current studies regarding screening process have not included liquidity in the screening process. In this study, JII stocks besides being based on Islamic principles are also screened on the basis of market capitalisation and liquidity. Furthermore, previous studies that used either CAPM (single model) or three factor model of Fama and French have also not included liquidity. Additionally, current studies in Indonesia have not used the extended CAPM model of Fama and French to measure the performance of JII stocks. In this study, Fama and French's three-factor model has been augmented with liquidity.

2.7 Volatility

Stocks market volatility is related to the general health of economy, and one interpretation of this evidence is that it is caused by financial leverage (Schwert 1989). During good times, funds that use more leverage have higher profit, however, if downward price fluctuations occur, higher leverage will cause substantial losses and this leads to higher levels of volatility in stock prices (Thurner, Farmer & Geanakoplos 2012). Ross (1989) argues that volatility can be regarded as a measure of information flow. Engle and Ng (1993) found that negative shocks introduce more volatility than positive shocks. In addition, Bekaert and Wu (2000) argue that volatility reduces in the aftermath of good news but increases in the case of bad news. On the other hand, Domowitz, Glen and Madhavan (2001) who have analysed the inter-relationships between liquidity, equity trading costs and volatility and then investigated the impact of these variables on equity returns found that increased volatility, acting through costs, reduces a portfolio's return. However, higher volatility reduces turnover as well, mitigating the impact of higher costs on returns. In general, volatility is a measure of the extent to which stock price can go up or down (fluctuating) quickly in a short span of time. The higher the volatility, the greater the stock price changes from day to day.

Previous studies linking leverage with volatility have found that high leverage will lead an increase in volatility (Schwert 1989; Thurner, Farmer & Geanakoplos 2012). In addition, decreasing leverage ratios lead to lower stock price

volatility (Guo, Wang & Wu 2011). Additionally, in previous studies linking liquidity with volatility: higher liquidity is generally associated with lower volatility and trading costs (Chordia, Roll & Subrahmanyam 2001; Domowitz, Glen & Madhavan 2001; Li & Wu 2006).

Additionally, previous studies that have investigated the relationship between volatility and excess returns of stocks have found that there is volatility clustering, persistence and predictability in conditional volatility (Baillie & DeGennaro 1990; De Santis 1997; French, Schwert & Stambaugh 1987). One of the approaches used for modelling volatility is the Autoregressive Conditional Heteroscedasticity (ARCH)/Generalized Autoregressive Conditional Heteroscedasticity (GARCH) framework developed by Bollerslev (1986).

Previous studies that investigated Islamic indices from the perspective of volatility are as follows. Dharani and Natarajan (2008) who investigated Islamic index in India found that Nifty *Sharia* stocks have low volatility compared to the broad Nifty Index. Miniaoui, Sayani and Chaibi (2014) who examine the performance of Islamic and conventional indices of the Gulf Cooperation Council (GCC) in the wake of financial crisis of 2008 found that the volatility estimates are not very different from that conventional indices. In fact, the results show that the GCC Islamic index has similar risk profile as its conventional counterparts. They used GARCH model to measure the volatility. This result is consistent with the findings of Charles, Darné and Pop (2011) in which they reported that the Dow Jones Islamic Index (DJII) and conventional ones have been equally affected by sudden changes in volatility.

Furthermore, Akhtar et al. (2011) argue that characteristics of Islamic financial markets reduce volatility linkages between Islamic and conventional stocks, bonds and bills. They found that volatility linkages were weaker in Islamic markets relative to non-Islamic markets, as there is a smaller set of common information and lower cross-market hedging activity in Islamic markets.

On the other hand, Yusof and AbdulMajid (2007) investigated the extent to which the conditional volatilities of both Islamic and conventional indices in Malaysia are affected by monetary policy during period January 1992 up to December 2000 and found that interest rate volatility affects conventional stocks but not the Islamic stocks' market volatility. Their finding concludes that interest rate is not a significant variable in explaining stock market volatility (Hakim & Rashidian 2002). They used the GARCH model together with Value At Risk (VAR) analysis conducted with monthly data during period January 1992 to December 2000.

Indonesian studies of JII stocks conducted from the volatility perspective (Kurniawan 2008; Maskur 2009) showed that JII stocks have high volatility comparable to the other indices in Indonesia such as LQ 45 and IHSG. However, prior studies focussed on comparing JII stock prices with other indices such as JCI or IHSG and LQ45. Therefore, a valid conclusion cannot be drawn as most of the stocks belonging to JII are also included in these indices. Previous studies did not conduct data matching of data to discern differences between *Sharia* stocks and non-*Sharia* stocks. Overlapping occurs without data matching because many JII stocks are also members of other indices. To avoid this, data matching should be done in order to distinguish which stocks are *Sharia*-compliant and non-*Sharia*-compliant during each period under study. Therefore, in this study, data matching needs to be conducted based on market capitalisation in order to clarify those distinctions.

In summary, there is no clear evidence regarding whether Islamic stocks are less or more volatile than conventional ones. Therefore, one cannot draw a final

conclusion about this issue. Nevertheless, *Sharia*-compliant stocks have unique characteristics based on *Sharia* selection restrictions, namely the leverage ratio, where in firms are not allowed to have debt ratio or total debt to total asset ratio more than 33% in DJII while JII uses 45%. Regarding the financial ratio, JII stocks are less restrictive than other markets such as USA, Malaysia and India. The bigger the ratio the greater is the dependence on debt. Nevertheless, zero debt or full compliance is not possible. According to Chapra (2008), Islamic finance has laid down certain conditions that would help prevent excessive expansion of debt, some of these are:

1. The asset which is being sold or leased must be real, and not imaginary or notional;
2. The seller must own and possess the goods being sold or leased;
3. The transaction must be a genuine trade transaction with full intention of giving and taking delivery; and
4. The debt cannot be sold and thus the risk associate with it cannot be transferred to someone else. It must be borne by the creditor himself.

These conditions will eliminate speculation and derivative transactions and also prevent excessive use of debt. In addition, Islamic equity funds possess some specific risks that are usually not present in conventional investments such as: changing *Sharia* rules, the lack of sufficient track record, high exposure to companies that might be sub-optimally levered, and companies with low working capital (Hayat & Kraeussl 2011). Additionally, Girard and Hassan (2008) argue that Islamic indices comprise smaller firms than conventional indices. In summary, Islamic indices are growth and small-cap oriented while conventional indices are relatively more value and mid-cap focused. However, Al-Zoubi, H.A. and Maghyereh, A.I. (2007) found that Islamic index presents unique risk characteristics, the examination reflects a risk level that is significantly less than the broad market basket of stocks. Furthermore, Hakim and Rashidian (2002) indicate that Islamic index is influenced by factors independent from the broad market or interest rates. This can be interpreted to mean that stocks on the Islamic index have lower levels of risk than their conventional counterparts due to their characteristics which are low debt, non-financial and social ethical index.

Therefore, this study is interesting because previous studies have delivered mixed results. In addition, JII stocks have unique characteristics besides being based on Islamic principles. They have high market capitalisation and high liquidity. This study split stocks listed in Indonesian stock exchange into two periods: 2005-2007 which consist of two groups: JII and non-JII and 2008-2012 which consist of three groups: JII, *Sharia* and non-*Sharia* based on industry sector. Due to IDX regulation in where before 2008, there was just 2 groups in IDX are the following: JII stocks that are *Sharia*-compliant and blue chips stocks; and non-JII – namely conventional stocks. At the start 2008, there were also *Sharia*-compliant stocks in IDX other than JII stocks. However, *Sharia* stocks in this context are *Sharia*-compliant stocks that are not included in JII stocks.

The contribution of this study is that it measures the volatility of JII stocks' returns and compares the returns with those of non-JII stocks (*Sharia* and non-*Sharia*). Also this study investigates which one has the lowest volatility from three groups, namely: JII, *Sharia* and non-*Sharia*. This study expects that JII stocks will have lower volatility when compared to *Sharia* and non-*Sharia* stocks due to their characteristics which are *Sharia* compliant (lower leverage than non-*Sharia*), high market capitalisation and high liquidity. This study also investigates the effect of leverage ratio and Return On Assets (ROA) on volatility. This study expects that JII

stocks will have the lowest leverage ratio and the highest ROA due to their high market capitalisation, high liquidity and low leverage. This study designed ARCH/GARCH model to capture these features. No previous studies have been conducted on this issue. Therefore this study will provide new insights.

Previous studies in Indonesia have compared the volatility of JII stock with those listed on other indices. However, by contrast this study investigates the volatility of JII and non JII stock returns (*Sharia*-compliant and non-*Sharia* or conventional) by using the GARCH model. Also the study links volatility to leverage and liquidity employing EGARCH[5] (Exponential GARCH) model[6]. To the best of the researcher's knowledge, this issue has not been previously studied. This study therefore expects to gain substantial insights by using amore sophisticated methodology in order to compare the volatility of JII with non-JII stocks.

In the Indonesian capital market context, the stocks that are included in JII besides being based on *Sharia-based* selection restrictions are also based on IDX performance processes. IDX selects 60 stocks based on the last year's market capitalisation and from these 60 top stocks by market capitalisation, IDX selects 30 top stocks based on their last year's level of liquidity.

Thus, it is expected that JII stocks will be less volatile than non JII stocks because JII stocks consist of blue chip stocks with high market capitalization and high liquidity and also have a lower leverage than non-JII. Therefore, it is expected that it will be less affected by sudden shocks compared to non JII stocks. This study examines the relation important of *Sharia* compliance which is ethical compliance and liquidity effect on volatility. This study therefore posits the following hypothesis:

H2. ***JII stocks will have lower volatility compared to non-Sharia stocks.***
H3. JII stocks will have lower volatility compared to Sharia stocks
H4. Sharia stocks will have lower volatility compared to non-Sharia

2.8 Trading Volume of JII in GFC

The previous studies regarding the reaction of trading volume to news announcements had mixed results. Additionally, no previous study has investigated the impact of GFC on trading volume activity in Indonesia even towards *Sharia* investment[7]. Therefore, this study investigates whether the news affects trading volume activity of JII stocks and non JII stocks equally. However, there are no previous studies of trading volume on JII stocks regarding to the Global Financial Crisis. It is expected that a study of this issue will provide new insights regarding the trading behaviour of ethical stocks in the wake of global shocks. This study therefore, surveys the literature to provide the groundwork for this study.

Chan, Chui and Kwok (2001) who investigated the impact of salient political and economic news in the Stock Exchange of Hong Kong, found that economic news and political news have impacts on return volatility, price volatility, trading volume and trading frequency. According to Engkuchik and Kaya (2012) who examined the impact of the 1997 Asian crisis on the liquidity levels in the Malaysian stock market

[5]A stochastic volatility GARCH – family model is adopted, the leverage parameter is simply treated as a coefficient to be estimated from the returns data (Figlewski & Wang 2000).

[6] Leverage effect is a negative correlation between past returns and the future volatility (Bouchaud, Matacz & Potters 2001).

[7] To researcher's knowledge, this is the first empirical study in the literature of Islamic investment, which emphasize the measurement of TVA in GFC of 2008 of Islamic index in Indonesia

found that the level of liquidity went up and the stock prices went down after the Asian crisis started. They argue that, in order to avoid further losses, the sellers dominated the market just after the crisis and caused the level of liquidity to go up. They used the turnover ratio and turnover volatility ratio as proxies for the level of liquidity.

According to Meidawati and Harimawan (2009) who examined capital market reaction to political events of legislative election on April 4th, 2004 in Indonesia, the event affected trading volume but not stock return. They used LQ 45 index stocks in their research. An interesting aspect of the public information arrival effect that has not been covered is the impact of economic news on trading activity namely trading volume of *Sharia* stock.

In addition, Copp, Kremmer and Roca (2010) who investigated SRI in GFC found that before the GFC, SRIs internationally yielded even higher risk-adjusted returns than conventional investments, although SRIs in Australia significantly under-performed compared with conventional investments in terms of risk-adjusted returns. Since the GFC, both in Australia and worldwide, SRIs have significantly underperformed against conventional investments in terms of risk adjusted returns.

In the context of Indonesian market, based on investor preferences, JII will be more preferred by investor due to their *Sharia* compliance.

After the collapse of the Lehman Brothers in September 2008, the contagion of financial crisis becomes global crisis. The Global Financial Crisis wreaked havoc on world markets and has led to major economic dislocation around the world (Dominguez, Hashimoto & Ito 2012). The impact of the Global Financial Crisis has spread to all around the world; the Indonesian capital market is no exception. In Indonesia, on October 8th, 2008, IDX suspended trading activity due to the sharp decrease in the value of JCI (see Figure 2.5) which was caused by Global Financial Crisis[8].

During the Global Financial Crisis, when the market fell, marginal investors or individual investors left the market to avoid loss. Since institutional investors generally possess more information than individual investors, they form their portfolios by direct transactions in individual firms' securities. Individual or marginal investors will conduct more selling activity than institutional investors. Nevertheless, in general, investors will sell risky stocks to avoid loss. In contrast to marginal investors, institutional investors can keep their stock positions and they wait what will happen due to they are professional institutions, and therefore, it is expected that they will be more willing than individual investors to hold JII stocks. In reality, institutional investors which follow screening rules tend to be much less risk averse than individual investors (Hong & Kacperczyk 2009).

Furthermore, GFC has affected IDX which is evidenced in the decreasing value of JCI which is a market index of IDX in October 2008. The price of most of equities at IDX fell. Regarding their characteristics, *Sharia*-compliant stocks exhibit high market capitalisation and high liquidity, while JII stocks behave differently when compared to non-JII stocks during the GFC. This study expects with respect to their characteristics, JII will have a lower trading volume activity during these events. No studies into this phenomenon have been conducted previously.

[8]After reaching the highest point of 2,830.26 on January 9, 2008, JCI dropped to 1,111.39 level on 28 October 2008 before it closed at 1,355.41 at the end of 2008. From 8th – 10th October 2008 trading was suspended on IDX and reopened on 13th October 2008 (IDX of Annual-Report_2010).

This study investigates whether JII stocks which are included in the category of ethical investment have the same trading activity comparing with *Sharia* and non-*Sharia* stocks from the perspective of TVA. The contribution of this study is the investigation into whether or not ethical investment in this case is JII, given their inherent internal characteristics might be of benefit to the stocks' TVA during the GFC.

Regarding to the impact of GFC towards ethical investment, no previous studies have been conducted in Indonesia or in the US market particularly in *Sharia* stocks. In this study, it employs elaborate procedures for matching JII with non-JII stocks. This study also extends to compare *Sharia* (non-JII) stocks with non-*Sharia* stocks.

With respect to GFC, the market has anticipated it because there was a dramatic decrease of JCI value in IDX. However, market participants disagree about the effects of surprises in announcements. Therefore, it is expected to increase in trading activity in the market soon after the announcements (Jain 1988).

Moreover, in order to avoid further losses, the sellers dominated the market just after the announcement and caused the level of liquidity to go up (Engkuchik & Kaya 2012). It will cause the price of stocks change. In this case, the researcher doesn't know yet whether JII stocks will experience greater or smaller trading volume activity than non JII stocks with respect to informational event. However, JII stocks consist of blue chip stocks in which have a lower volatility or less risky than non JII stocks. Therefore, logically, JII stocks will experience less trading volume activity than non JII stocks due to the sellers conducting more selling activity of risky stocks in order to avoid loss.

It is argued that there is a difference in trading activity between JII stocks and non JII before and after Global Financial Crisis due to the informational event (Karpoff 1986). Thus, it is expected that there is a difference in trading volume activity of JII and non-JII stocks before and after the suspend IDX. To the best the researcher's knowledge, trading volume response of *Sharia* stocks to economic news regarding to the Global Financial Crisis has not been examined before.

Based on theoretical background, where in market will react toward the informational event such as IDX suspended on October 8th, 2008, this study therefore posits the following hypothesis:

H5. ***Trading volume activity (TVA) of JII is less than non-JII after the Global Financial Crisis***

Figure 2-5: Jakarta Composite Index Milestones
Source: IDX

2.9 The Effect of Stocks Entering and Leaving the JII

Previous studies have documented that price and liquidity effects are associated with changes in the index (Chen, Noronha & Singal 2004; Elliott & Warr 2003; Erwin & Miller 1998; Harris & Gurel 1986; Hegde & McDermott 2003; Jain 1987). According to Harris and Gurel (1986) changes in the S&P 500 list are usually made when a listed company is involved in a bankruptcy, a merger, or a tender offer. The company is removed and is often replaced by the largest company in the same industry which is not yet on the list. Additionally, according to Jain (1987), S&P 500 has never disclosed any well specified decision model for including or excluding stocks in the index, but it has stated that composition of the index is changed to keep it representative of the market and of course, as necessitated by mergers, aquisitions or bankruptcies of included firms.

Furthermore, Jain (1987) who conducted the stock price effects of announcements by S&P to include stocks in its indexes argued that inclusion or exclusion of a stock creates price pressure. However, Jain (1987) provides strong evidence indicating that index changes have information content. Stocks added to S&P 500 experienced an excess return +3 % on the first trading day after the announcement, while stocks excluded from the index experienced a -1 % excess return. Chen, Noronha and Singal (2004) argue that if stocks have a short-term

downward sloping demand curve, the price impact should be momentary due to demand shocks, but should dissipate once the excess demand is satisfied consistent with the price pressure hypothesis (Harris & Gurel 1986). However, if stocks have a long-term downward sloping demand curve, then excess return should be permanent (Chen, Noronha & Singal 2004; Lynch & Mendenhall 1997).

Hegde and McDermott (2003) who examined the market liquidity effects of revision to the S&P 500 index found that there was a sustained increase in liquidity of the added stocks and that liquidity suffered over the three months after deletion. In addition, they found a decrease in the time-weighted quoted spread and an increase in the time-weighted quoted depth, up to 60 trading days in the post-addition period. [9]Additionally, Harris and Gurel (1986) found that on the first trading day after an addition to the S&P 500 list is announced, there is a large increase in volume of added stocks. Azevedo et al. (2014), who examine the stock price and volume effects associated with changes in the composition of FTSE and KLCI found evidence of price pressure hypothesis for both addition to and deletions from the KLCI. Further, they found significant changes in liquidity were associated with a reversal in stock prices to their original level before the index revisions took place.

Studies which investigate the effect of changes in SRI index show mixed price and liquidity effects. Capelle-Blancard and Couderc (2009) who assessed the impact of inclusion and exclusion of stocks in SRI indexes on stock prices found that stock prices do not react to the announcement of SRI index redefinitions except the Advanced Sustainability Performance Eurozone *Index* (ASPI). Meanwhile, Abdullah and Bacha (2001) who examined the impact of Malaysian Syariah Advisory Council's (SAC) decision on stock eligibility found that inclusions experience a positive impact while deletions have negative effects. Furthermore, 39 inclusions experienced positive Mean Cumulative Abnormal Return (MCAR) and increased trading volume. However, stocks deleted from the SAC list, experienced negative MCAR and reduced trading volume. This result is consistent with the study of Sadeghi (2008) who investigated the impact of the introduction of *Sharia* compliant Index (SI) in Malaysia by investigating changes in the volume of trade and bid-ask spread as proxies for changes in liquidity. Additionally, in Indonesia, Oktaviana and Wahyuni (2012) who investigate whether the announcement of JII composition change has information content, found that there are abnormal returns surrounding JII announcement but no significant difference before and after the announcement day by using data of 2004 – 2010. Sadeghi (2008) found that there was a significant percentage decrease in bid-ask spread associated with the introduction of *Sharia* compliant index in the short term.

Summing up, there are three hypotheses associated with changes in S& P index (Hegde & McDermott 2003) and SI in Malaysia. Firstly, the "price-pressure hypothesis" (Azevedo et al. 2014; Chen, Noronha & Singal 2004; Harris & Gurel 1986):"changes in index will generate temporary increase in stocks price and permanent changes in trading volume". Secondly, the "information hypothesis"(Abdullah & Bacha 2001; Jain 1987):"an addition of stock to the index is considered as good news so that there is a permanent increase in price". Lastly, the

[9]A popular measure of liquidity is the bid–ask spread which is the difference between the bid and the ask price quoted by a dealer who makes a market in a stock. The bid–ask spread may be viewed as the price required by the dealer for providing immediate execution of orders Krishnamurti, C 2009, 'Investment Management: A Modern Guide 13 to Security Analysis and Stock Selection', in C Krishnamurti (ed.), *Introduction to Market Microstructure*, Springer-Verlag Berlin Heidelberg, vol. DOI: 10.1007/978-3-540-88802-4 2, ch 2, p. 27..

"liquidity hypothesis"(Erwin & Miller 1998; Hegde & McDermott 2003; Sadeghi 2008): "a decrease in the long-term bid-ask spread accompanied by an increase trading volume for stocks added to the index".

Previous studies have shown mixed results. In the context of Indonesia, stocks that are included in the JII will be evaluated every six months. If a given stock does not meet the principles of *Sharia*, the exchange authority will remove it and replace it with another compliant stock. JII stocks have unique characteristics besides being based on Islamic principles. They have high market capitalisation and high liquidity. Thus JII stocks are liquid blue chip stocks. Therefore, the company can enter and leave JII due to their eligibility which is based on *Sharia* selection, changes in market capitalisation and liquidity. In other words, stocks enter and leave JII for different reasons: *Sharia* compliance, changes in market capitalisation and liquidity.

Furthermore, in the context of Indonesia, due to their characteristic which is based on Islamic principles such as free from gambling, interest and speculation, they also include company with low leverage in which financial ratio restriction excludes company with large amount of debt and interest income (maximum 45% and 10% respectively. See the Appendix F JII Screening Process). Therefore, JII stocks will be different from a matched sample of non-*Sharia* stocks. In summary, this study examined whether these different reasons all have the same impacts. It is expected that a study of this issue will provide new insights regarding investor behaviour with respect to ethical investments.

In this study, two proxies for liquidity, namely, turnover ratio and bid-ask spreads will be used. This study estimates bid-ask spreads by two methods. First, this study estimated spreads following Corwin and Schultz (2012) with daily high and low prices before and after announcement date to discern the effect of liquidity improvement. In addition, for robustness, this study also compared actual spread with Corwin and Shultz's spread for stocks entering and leaving JII.

This study presents tests for the effects of stocks entering and leaving JII on price, trading volume and spread. Event study was employed to capture this effect in addition to regression.

Previous studies that investigate stocks prices and liquidity effects associated with changes in the composition of stocks indices have a mixed result. This study investigated the effect of stocks entering and leaving JII towards price, trading volume and spread. Based on the theoretical background, due to their characteristics, it is expected that stocks entering JII will earn positive excess returns and experience an increase in trading volume. This study also expects a decrease in bid-ask spreads of stocks entering JII. This study therefore posits the following hypothesis:

H6. Stocks entering JII will earn positive excess returns
H7. Stocks entering JII will experience an increase in trading volume
H8. Stocks entering JII will experience a decrease in spread
H9. Stocks leaving JII will earn negative excess returns
H10. Stocks leaving JII will experience a decrease in trading volume
H11. Stocks leaving JII will experience an increase in spread

2.10 Concluding the Literature Review

Empirical studies show that there is mixed evidence regarding to the performance of ethical investments. In some markets, such as US market, Islamic indices show a better performance during a'bull' market. However, in other markets such as Malaysia, Islamic funds have performed better in 'bear' markets. In addition,

some researchers have found that there is no significant difference between the performance of Islamic and conventional stocks. From the perspective of volatility and trading volume, due to their characteristics, ethical and *Sharia*-compliant investments are expected to perform differently than conventional ones. The lack of research about the performance of *Sharia* stocks in the Indonesian context motivates this research. Further research is required.

Additionally, current literature on *Sharia*-compliant investments has not included the issue of liquidity in their model that has been used to assess stock performance. Therefore, in this study, the Fama and French three factors model has been applied, augmented with the liquidity factor and using dummy variables. Additionally, this study also investigates the effect of JII selection restrictions on the performance of stocks and the effect of stocks entering and leaving JII.

Therefore, this study represents a comprehensive examination of investment performance of JII stocks during the period 2005 to 2012 and is expected to provide substantial new insights. See Figure 2.6 Theoretical Framework of Investment Performance of JII Stocks.

Figure 2.6 explains that stocks which experience screening process based on *Sharia* selection restrictions (core business criteria and financial ratio criteria) and also trading performance (market capitalisation and liquidity) can be said to be eligible as JII stocks these requirements are fulfilled. Therefore, JII stocks are expected to have a high liquidity (high level of trading activity - both frequency and volume). In addition, this study expects JII stocks to have low volatility.

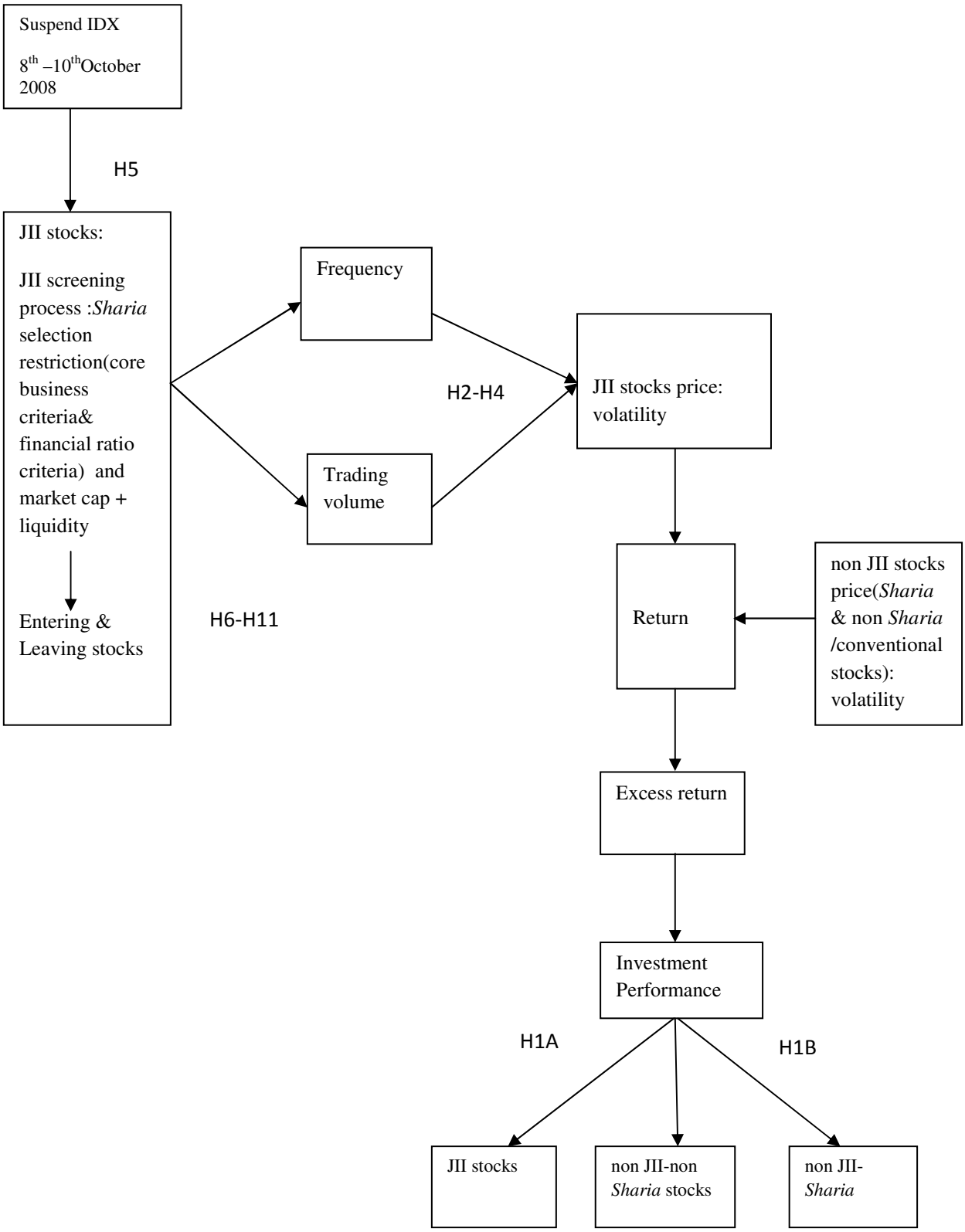

Figure 2-6: Theoretical Frame-work for Investment Performance of JII Stocks
Source: Extracted and reproduced from Literature Review and Hypothesis Development

CHAPTER THREE

3. Research Methodology

3.1 Introduction

This Chapter develops the methods that will be used to address the specific research questions discussed in Chapter Two. The fundamental issues of the research are (i) the assessment of the JII stock performance including an assessment of the volatility of JII stocks, (ii) investigation of the performance of JII stocks before and after the Global Financial Crisis from the perspective of trading volume and (iii) the effect of stocks entering and leaving JII.

3.2 Study Approach

This study assesses the performance of JII stocks and investigates whether there is an ethical effect by comparing them with non-*Sharia* stocks. The main model used in this study is the Fama and French three factors model. Fama and French (1992) found that beta has little or no ability in explaining cross-sectional variation in equity returns but variables such as size and book to market value of equity do have such ability. Furthermore, Fama and French (1993) argue that the time series regression results indicate that the size and book to market factors can explain the differences in average returns across stocks. In addition, this research also uses the event study method to measure the market's response to suspended IDX (due to GFC) and stocks entering and leaving JII through the observation of securities prices and TVA around such events (MacKinlay 1997; Peterson 1989). The models used in this study are elaborated below.

3.2.1 The Assessment of the Performance of JII Stocks and non-JII Stocks

This model is based on Fama and French's three factors model (Fama & French 1993, 1997). In assessing ethical investment performance, previous studies have used Fama and French model (Hassan, Antoniou & Paudyal 2005; Hong & Kacperczyk 2009). The model used is presented below in Equation (1):

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

Where R_{it} = historical stock return i on trading days t; R_{ft} = historical risk free asset on trading days t; α = intercept; β_{1i} = beta coefficient market; R_{mt} = historical daily market return (IHSG); β_{2i} = regression coefficient measuring sensitivity to of return to SMB; SMB = Small Minus Big is a difference of small stock portfolio (small firm size) with big (Big firm size) portfolio stock; β_{3i}= regression coefficient measuring sensitivity of return to HML return; HML = High Minus Low is a difference of stock portfolio with book to market ratio high with stock portfolio with book to market ratio low; e_{it} = error term.

3.2.2 The Testing of the Effect of JII Selection Restriction on Performance of Stocks by Using Dummy Variables

To test the effect of JII selection restriction on performance stocks, this study uses the following model as stated in Equation (2):

$$R_{it} - R_{ft} = \alpha_i + \beta_{1i} (R_{mt} - R_{ft}) + \beta_{2i} SMBt + \beta_{3i} HML_t + \beta_{4i} Liq_t + \beta_{5i} I + e_{it} \quad \text{..... .....} \quad (2)$$

R_{it} indicates stock returns on trading days t and β_1 ... β_5 are the regression coefficient of variables such as (R_m-R_f), SMB, HML, Liq and e_{it} is the error term. I is the dummy taking the value of 1 for JII stocks and zero otherwise. This study has augmented the Fama & French model with the liquidity factor following (Pastor & Stambaugh 2001).

3.2.3 The Assessment of Volatility of JII Stocks and non JII Stocks Performance by Using GARCH Model

Additionally, this study also investigates the volatility of JII and non JII using the ARCH/GARCH model of Bollerslev (1986) and Bollerslev, Engle and Nelson (1994). The model used is presented in Equation (3):

$$\sigma_t^2 = \omega + \alpha\varepsilon^2_{t-1} + \beta\sigma^2_{t-1} \text{.....} \quad (3)$$

Additionally, this study adds dummy variable to investigate whether JII and *Sharia* compliance influence the volatility in IDX during the study period. The model with the dummy is presented in Equation (4):

$$\sigma_t^2 = \omega + \alpha\varepsilon^2_{t-1} + \beta\sigma^2_{t-1} + \gamma_1 DJII + \gamma_2 D\text{-}Sharia \text{.....} \quad (4)$$

Where σ_t^2 is a function of constant average variance (ω), the volatility of previous period which is measured as the lag of the square residual of the mean equation,ε^2_{t-1} (the ARCH term), and the past variance σ^2_{t-1} (the GARCH term), DJII and D-*Sharia* represent respectively the dummy variables with DJII = 1 and zero otherwise and D-*Sharia* = 1, zero otherwise.

This study employs EGARCH model (Hyup Roh 2007; Nelson 1991) to investigate leverage effect in IDX. This model adds dummy variables (JII and *Sharia*). The model used is presented in Equation (5):

$$\ln\sigma_t^2 = \alpha + \beta(|\varepsilon_{t-1}/\sigma_{t-1} - \sqrt{2/\pi}|) + \gamma\varepsilon_{t-1}/\sigma_{t-1} + \omega\ln\sigma^2_{t-1} + \theta_1 DJII + \theta_2 D\text{-}Sharia \text{.....} (5)$$

Where $\ln\sigma_t^2$is log value of variance at t_{-1}, $(|\varepsilon_{t-1}/\sigma_{t-1} - \sqrt{2/\pi}|)$ is asymmetric shock due to leverage effect, and $\varepsilon_{t-1}/\sigma_{t-1}$ is leverage effect. The leverage effect is present if coefficient γ is negative and statistically significant.

The first step is to provide descriptive statistics of excess return then to find the residual. Next, from that residual, develop models by using ARCH-Lagrange Multiplier (LM) or Breusch-Pagan-Godfrey or White test to test sure whether heteroscedasticity is present. If there is heteroscedasticity, then it should be modelled with ARCH-GARCH. Finally, the best model is chosen. ARCH and GARCH effects should not be negative and their sum should be less than unity.

3.2.4 Trading Behaviour of JII Stocks Before and After the Global Financial Crisis

This study investigates Trading Volume Activity (TVA) using the approach of Lynch and Mendenhall (1997). The formulation of trading volume activity by Lo and Wang (2000) is given below. Most previous studies (Chordia & Swaminathan 2000; Kaustia 2004) have used this formulation.

$$TVA_{jt} = \frac{\text{Amount of firm stock j which is traded in time t}}{\text{Amount of outstanding stocks of firm j in time t}} \quad \text{..... (6)}$$

And

$$TVA_{jt} = \alpha i + \beta_{1i} T_{Mt} + \beta_{2i} JII + \beta_{2i} Sharia + et \text{.....} \quad (7)$$

Where TVA is trading volume activity of stock and T_M is market trading volume, JII and *Sharia* are dummy variables indicating JII and *Sharia* respectively. The trading volume of JII stocks and non JII stocks (*Sharia* and non-*Sharia*) before and after the event (event date is suspension of trading on IDX) will be compared with t-statistic test. The event date is 8^{th}– 10^{th} October 2008 (October is event month). On 8^{th} October 2008, IDX announced that it was suspending IDX trading due to dramatic drop in the value of IHSG or JCI due to the GFC. Trading reopened on 11^{th} October, 2008.

3.2.5 The Testing of the Effect of Stocks Entering and Leaving The JII.

This study employs a regression model with dummy variable and event study methodology. The formula is presented in Equation below:

The market model of regression presents in equation (8).

$$R_{it} = \alpha_i + \beta_1 R_{mt} + \beta_2 E_t + et \text{ .....} \quad (8)$$

R_{it} indicates trading on return on stock j for period t, R_{mt} is market return on JCI (Jakarta Composite Index) for period t as proxy of market return and β_1 and β_2 are the regression coefficient of R_{mt} and dummy variable E (dummy Entering) where E = 1 and zero otherwise; and et is the error term. An alternate specification using L as dummy variable for leaving was also used.

Trading volume and spread effects of entering and leaving are studied using equations 9, 10 and equation 11 defined below.

$$T_{it} = \alpha i + \beta i T_{mt} + et \text{ ....} \quad (9)$$

$$T_{it} = \alpha i + \beta_{1i} T_{mt} + \beta_{2i} E_t + et \text{ .....} \quad (10)$$

$$S_{it} = \alpha i + \beta_{1i} S_{mt} + \beta_{2i} E_t + et \text{ .....} \quad (11)$$

T_{it} indicates trading on day t, S_{it} indicates spread on trading day tand β_1 and β_2 are the regression coefficient of $T_{mt,}$ (S_{tm}) and dummy variable E (dummy entering) where E = 1 and zero otherwise; and et is the error term.

Abnormal stock returns are calculated by using market model as in equation (12).

$$AR_{jt} = R_{jt} - (\alpha_j + \beta_j R_{mt}) \quad \text{.....} \quad (12)$$

AR_{jt} is abnormal return for each stock j for period t; R_{jt} is return on stock j for period t; R_{mt} is return on JCI for period t; α_j is estimate of abnormal return stock j; β_j is slope relationship between return stock j and JCI.

This study adopted this formulation following Krishnamurti, Sawicki and Zhoungqi (2006), cumulative abnormal return are computed as presented in equation (13) and equation (14):

$$\overline{AR_t} = \sum_{j=1}^{N} AR_{jt} / N \quad \text{.....} \quad (13)$$

$$CAR_t = \sum_{k=-20}^{N} \overline{AR_k} \quad \text{.....} \quad (14)$$

Changes in trading volume are measured by using the formula of (Elliott & Warr 2003; Harris & Gurel 1986). Additionally, this study follows the approach of Chen, Noronha and Singal (2004) that use volume turnover (trading volume divided by shares outstanding) instead of trading volume, so that unusually high volume in a few large stocks does not disproportionately affect the market volume. Cai (2007) has used this formulation to measure the trading volume with an abnormal turnover ratio. The turnover ratio is calculated as given by Equation (15):

$$\text{Turnover ratio} = \frac{\sum_{t_{=1}}^{N} \frac{T_{it}}{T_{mt}}}{\sum_{t=-60}^{AD-1} \frac{T_{it}}{T_{mt}}} \quad \text{.....} \quad (15)$$

Where, the denominator is the reference period turnover standardised by market turnover during the reference period, while the numerator is the event period turnover standardised by market turnover during the event period. T_{it} is turnover for firm i at time t, the subscript m is the market and AD is announcement day, which is the first trading day following announcement. However, this study employed 41 days of event window. This study estimates the average abnormal return (ARs) and cumulative abnormal return (CARs) for 20 trading days prior to announcement through 20 trading days after (Krishnamurti, Sawicki & Zhoungqi 2006)

This study uses the model of Corwin and Schultz (2012) as well to measure the changes in liquidity surrounding stocks entering and leaving JII index. The formula of Corwin and Schultz (2012) is used to estimate bid-ask spreads from daily high and low prices which is presented below in Equation (16):

$$S = \left(\frac{2\,(e^{\alpha} - 1)}{1 + e^{\alpha}}\right) \quad \text{.....} \quad (16)$$

Where S denotes bid-ask spread and e is exponential.

Where $\alpha = \frac{\sqrt{2\beta} - \sqrt{\beta}}{3 - 2\sqrt{2}} - \sqrt{\frac{\gamma}{3 - 2\sqrt{2}}}$, and $\beta = \sum_{j=1}^{1} [\ln(\frac{H_{t+1}^0}{L_{t+1}^0})]^2$, which is sum of expected squared ratio of high and low prices ratio for two consecutive days. Gamma (γ) equals to $[\ln(\frac{H_{t,t+1}^0}{L_{t,t+1}^0})]^2$ a squared ratio of high and low prices over a range of two days.

Furthermore, using data from turnover and bid-ask spread from daily high and low prices, liquidity effects for the 41-day event window is tested by using the t test.

3.3 Data Collection

3.3.1 Source of Data

This study uses the daily and monthly closing price, trading activity, annual report and stocks price index of the JII stocks, as well as the data of non-JII during the 2005 up to 2012. This study employs IHSG of IDX as market indices and Sertifikat Bank Indonesia (SBI) as risk free rate. Furthermore, all data is collected from Osiris, Datastream and Indonesia Stock Exchange, Jakarta.

3.3.2 Matching Data

Previous studies focussed on comparing of JII with other indices such as IHSG, LQ45, Kompas 100 etc. However, a valid conclusion cannot be drawn as most of stocks belonging to JII are also included in the other indices. Therefore, this study employs elaborate procedures for matching JII with non-JII. This study also extends prior work to compare *Sharia* (non-JII) stocks with non-*Sharia* stocks. Firstly, the study is split into two periods: (i) 2005-2007 which contains of two groups of stocks: JII and non-JII and (ii) 2008-2012 which contains three groups of stocks: JII, *Sharia* and non-*Sharia*. There are two screening processes that must be gone through in order for stocks to enter JII: firstly, *Sharia* selection namely core business and financial ratio and secondly, trading performance selection namely market capitalisation and liquidity (see Screening Process, Appendix F).

Secondly, this study classifies stocks based on industry sector during each period. Next, each stock during each period is sorted based on market capitalisation (+/- 10% up to 20%) (see Appendix G).

This study employs monthly market capitalisation. For January 2005 up to December 2007, because the available data was just JII and non-JII stocks, therefore this study divides the data into two groups, namely; JII and non-JII (see Appendix G). In addition, the information of the announcement date by JII from IDX mentioned that from 2005 to 2007, the announcement of the JII list for each period occurs at the end of December and June. Hence one period is of six months duration: from January-June and July-December. However in 2008, this study began to divide the data into 3 groups: JII, non JII-*Sharia* and non JII-non *Sharia*. In 2008, JII began to apply the announcement of the JII list for each period occurs at the early of December last year up to May the following year (six months) and the early of June up to November (six months). However, especially in 2008, it began from January

2008 until May 2008 as the announcement of last year was on December 27th, 2007 (see Appendix G). Subsequently, period 1 is from December of the previous year up to May the next year; and period 2 is from June up to November (each period is 6 months). Then, the next step is to calculate the average of monthly market capitalisation of each period of each stock based on industry sector. Therefore, each year has two periods namely: period 1 and period 2. So, in this study has 16 periods (see Appendix G). From 2005 up to 2007, period 1 is from January – June and Period 2 is from July – December in each year. However, from 2008 – 2012, period 1 is from December last year up to May in the following year and period 2 is from June – November in each year.

Furthermore, from the results derived from matching data based on market capitalisation, we performed data matching based on book-to-market and liquidity (namely turnover and spread) for each group in each period. This study does not form portfolios because the amount of data obtained from the data matching are insufficient to form portfolio. Therefore, in this study in December of each year t from 2005 to 2012, all matching stocks (JII and non-JII) of IDX on Osiris are ranked on size (price times shares outstanding) then median is used to split the data into two groups namely, small (S) and big (B), S and B which are below and above the median. This study also splits JII and non-JII into two of book to market equity then median used to split it into two groups in where for the bottom is low and the top is high. Book to market equity is book common equity for the fiscal year ending in calendar year t-1, divided by market equity at the end of December of year t-1. For the liquidity proxy namely turnover and spread, this study also did the same in where median is used to split the data into two groups: for the bottom is low and the top is high. This study excludes negative or less than equal zero of BE/ME (Book to Market).

Monthly return is calculated from January t year till December t year for 2005 up to 2008 period. This study calculates returns beginning in January of year t to be sure that book equity for year t - 1 is known. However, from 2009 up to 2012, for period 1 of 2009 because it began in December 2008 up to May 2009 so it will use BE/ME 2007 due to the return ensures that the accounting data are available prior to the returns. However, for period 2, June up to November 2009, it uses BE/ME 2008 and so on. The average return used is the time-series average of monthly.

The group of SMB or small minus big means the difference of each month between the simple average of the returns on the small stocks and the simple average of the returns on the big stocks. This difference should be largely free of the influence of BE/ME, focusing instead on the different returns behaviours of small and big stocks (Fama & French 1993).

The group of HML or high minus low means the difference each month between the simple average of the returns on high-BE/ME stocks and the average of the returns on the low-BE/ME stocks. This difference should be largely free of the size factor in returns, focusing instead on the different returns behaviours of high and low BE/ME firms (Fama & French 1993).

The group of LMH or low minus high means the difference each month between the simple average of returns on Low-Liquidity stocks and the average of the returns on the High-Liquidity stocks.

The matching of data to address the data of JII performance assessment, the data of JII volatility measurement and the data of TVA measurement in GFC. The data analysis presented in chapter 4.

This section describes the data used, followed by BE/ME, and dividend yield. BE/ME ratios is known at the beginning of the return year or before year t observation. This study measures return in each period, for 2005 up to 2008, return of each period is measured from January of year t to June of year t and BE/ME ratio for year t-1 to price at the end of December of year t-1. Next, for period 2 in year t is measured from July of year t up to December of year t. While BE/ME ratio is t-1 as well.

However from period 1 (December 2008-May 2009) up to period 2 (June-November 2012) is the following: for period 1, December 2008-May 2009 will use BE/ME of the end of December t-1 (2007) and for period 2 (June-November 2009) will use BE/ME of the end of December t-1 (2008) and so on up to period 2 June-November 2012.

Moreover, for dividend yield used is dividend paid year t-1 for the year t observation. In summary, BE/ME ratio year t-1 and dividend yield year t-1 are referred to as the year t observation.

3.4 Data Analysis

The data are analyzed using multiple regression analysis and event study method. The IBM SPSS 21 is used to analyse performance of JII stocks, non-JII stocks and event study. To analyze the volatility of JII stocks and non-JII stocks, the study used Eviews 7.

3.4.1 Regression Model

Multiple regressions are conducted to test the hypotheses with respect to assessment of JII and non-JII stocks performance. It is used to measure the influence of independent variables on the dependent variable. Regression test is conducted to obtain the magnitude of coefficient regression of each variable. A dummy regression analysis conducted for the whole research period to reveal the impact on stock return. However, to see the effect of some stocks entering and leaving JII conducts a dummy regression analysis for each period in which there are 15 announcements for whole research period.

3.4.2 Event study

In addressing the research question regarding trading volume activity and the impact of some stocks entering and leaving JII stocks to price, volume and bid-ask spread effects, this study uses the event study methodology in addition to a dummy regression model. The standard approach is based on estimating a market model for each firm and then calculating abnormal returns, this abnormal return is assumed to reflect the stock market's reaction to the arrival of new information (McWilliams & Siegel 1997). In general, an event study is an approach which is used to analyze the effect of unanticipated event on stock price. The objective of an event study is to assess whether there are any abnormal or excess returns earned by security holders accompanying specific events (Peterson 1989). The process of the event study is the following:

1. To identify the event date
2. To determine estimation window[10], event window and post event window

[10]This study conducts two cases of event studies: (1) monthly study for TVA of JII during GFC and (2) daily study for stocks entering and leaving JII.

3. To calculate normal and abnormal (return and TVA)
4. To calculate Average of Abnormal Return ($\bar{A}R$) or average of TVA (ATVA) and CAR to see the total effect of the whole event window
5. To compare the result to see the difference significantly between both parts with t-test
6. Interpretation.

For testing the performance of JII and non-JII before and after Global Financial Crisis, this study employs event studies and runs multiple regressions. This study selects October 8th, 2008 as event date because on that day JII suspended trading activity in IDX due to dramatic fall in the value of IHSG or Jakarta Composite Index on October 7th, 2008. This study argues that on that particular date was a signal that the Global Financial Crisis was at its peak in Indonesia. This study investigates trading volume of JII and non-JII before and after event date. This study investigates JII and non-JII (*Sharia*-compliant and non-*Sharia*-compliant) stocks which consistently exist from 2007 up to 2009. Table 3.1 provides research periods of event study analysis. In this study uses monthly TVA of the data matching result to investigate the effect of suspended IDX. This study determines a 25 month event window and October 2008 was chosen as the announcement month.

Table 3.1: Research periods of event study analysis

Year	Announcement date[11]	Event window	Prior-event window	Post-event window
2008	8th October	October 2007-October 2009	October 2007 -September 2008	November 2008-October 2009

Source: Developed for this research

For testing the effect of some stocks entering and leaving JII, this study starts to identify announcement dates. The observation is from 2005 up to 2012. JII had made 15 public announcements[12]. There are two criteria of entering and leaving JII stocks namely: the *Sharia* and liquidity selection (see Appendix F JII screening process). Additionally, JII is unique indices because it has only 30 stocks members. The breakdown of entering and leaving for each of the fifteen announcements are shown in Table 3.2.

Table 3.3 provides research periods of event study analysis. This study uses a 41-day event window, 20 days prior and 20 days after the announcement day (Krishnamurti, Sawicki & Zhoungqi 2006). To measure whether stocks entering and leaving the JII had an impact on stocks price, this study estimates the average abnormal return (AR) and Cumulative abnormal return (CAR) during this window.

[11]October was chosen as announcement month
[12]This study employs fifteen announcement date in this case.

Table 3.2: JII Announcements dates and breakdown of entering and leaving

No	Announcement date	Stocks entering	Stocks leaving
1.	27, June 2005	5	5
2.	28, December 2005	3	3
3.	26, June 2006	4	4
4.	27, December 2006	4	4
5.	29, June 2007	7	7
6.	27, December 2007	11	11
7.	5, June 2008	13	13
8.	4, December 2008	9	9
9.	4, June 2009	9	9
10.	4, December 2009	3	3
11.	3, June 2010	7	7
12.	3, December 2010	4	4
13.	7, June 2011	9	9
14.	6, December 2011	3	3
15.	30, May 2012	3	3
	Total	94	94

Source: Extracted and reproduced from IDX

Table 3.3: Research periods of event study analysis

No.	Year	Announcement date	Event window	Prior-event window	Post-event window
1.	2005	27th June	30thMay-25th July 2005	30th May – 24th June 2005	28th June-25thJuly 2005
2.	2005	28th December	30th November 2005 -25th January 2006	30th November – 27th December 2005	29th December-25th January 2006
3.	2006	26th June	29th May – 24th July 2006	29th May - 25th June 2006	27th June-24th July 2006
4.	2006	27th December	29th November 2006- 24th January 2007	29thNovember – 26th December 2006	28th December 2006- 24th January 2007
5.	2007	29th June	1st June- 27th July 2007	1st – 28th June 2007	30th June-27th July 2007
6.	2007	27th December	29th November 2007- 24thJanuary 2008	29th November – 26th December 2007	28th December 2007- 24th January 2008
7.	2008	5th June	8th May – 3th July 2008	8th May- 4th June 2008	6th June – 3th July 2008
8.	2008	4th December	6th November – 1st January 2009	6th November-3th December 2008	5th – 1st January 2009
9.	2009	4th June	7th May – 2th July 2009	7th May – 3thJune 2009	5th June – 2th July 2009
10.	2009	4th December	6th November 2009 – 1st January 2010	6th November – 3th December 2009	5th December 2009 – 1st January 2010
11.	2010	3rd June	6th May – 1sh July 2010	6th May – 2nd June 2010	4th June- 1st July 2010
12.	2010	3rd December	5th November – 31st December 2010	5th November – 3rd December 2010	5th – 31st December 2010
13.	2011	7th June	10th May – 5th July 2011	10th May – 6th June 2011	8th June – 5th July 2011
14.	2011	6th December	8th November 2011 – 3th January 2012	8th November- 5th December 2011	7th December 2011– 3th January 2012
15.	2012	30th May	2nd May – 27th June 2012	2nd May – 29th May 2012	31th May – 27th June 2012

Source: Extracted and reproduced from IDX

3.4.3 Definition of Variables Used

The definition of variables used in this study is the following:

1. R_{it} : Average monthly returns of for each period (six months)
2. R_{ft} : Average monthly risk free return of SBI
3. R_m: Average of monthly market return (IHSG or JCI)
4. $R_{it} - R_{ft}$: Excess return of portfolio over risk-free return
5. $R_m - R_{ft}$: Market return factor
6. SMB : Returns of small stocks minus returns of big stocks
7. HML : Returns of group with high BE/ME stocks minus returns of group with low BE/ME stocks

8. LMH: Return of group with low liquidity stocks minus return of group with high liquidity stocks.

The research includes dividend to calculate stock return by using formulation by Damodaran (2001):

$$R_{it} = \frac{P_{it} - P_{it-1} + D_t}{P_{it-1}} \quad \text{..... ..... (17)}$$

R_{it} indicates stock return i on trading day t, P_{it} is price of stock i at the closing day and D_t is dividend on stock i in day t and P_{it-1} is price of stock i on the closing day before.

The formulation to calculate SMB, HML and LMH is the following:

SMB = Average return of small group – average return of big group

HML = Average return of high BE/ME group – average return of low BE/ME group. The negative-BE stocks excluded from the portfolios (Fama & French 1993).

LMH = Average return of low liquidity group – average return of high liquidity group

To calculate market return (Ri_{mit}), this study uses formulation on Equation 18. Previous study has used this formulation (Mansor, Bhatti[1] & Khan[1] 2012):

$$Ri_{mit} = \ln (Pi_{mit} / Pi_{mit-1}) * 100 \text{.....} \quad \text{..... (18)}$$

Where Ri_{mit} the average return of a market return is computed based on log price index Pi_{mit} for time t minus log price index of Pi_{mit} for a time t-1. This study employs IHSG or JCI as a market proxy.

Liquidity is measured by using two proxies: firstly, by using turnover ratio in which trading volume divided by number of shares outstanding and secondly, by using bid-ask spread from daily high and low prices Corwin and Schultz (2012) in where the formulation of this has been mentioned before (see Equation 16).

3.5 Summary of Chapter

This Chapter has described the different methods used to address the research questions. It has presented and justified the data collection, matching of data, analysis and interpretation techniques for each objective. To assess investment performance of stock, the CAPM three factors model of Fama and French is used. Additionally, this study develops the model by modifying it with the liquidity factor used by Pastor and Stambaugh (2001) and including dummy variables for JII stocks and *Sharia*-compliant stocks. For volatility, this study also modifies the relevant model with dummy variables. Furthermore, for measure trading volume and the effect of stocks entering and leaving JII, this study employs regression model using dummy variables and also conducts event study methodology. Particularly, for capturing the effect of some stocks entering and leaving JII, this study employs a new technique for estimating bid-ask spread high and low prices that was pioneered by Corwin and Schultz (2012) to investigate the changes in liquidity surrounding the entering and leaving of stocks in the JII. To the best of the researcher's knowledge,

this method has not been used in Islamic investment context. In many cases, this chapter has presented the critical analyses on why some current methods are not sufficient and why new methods are required.

CHAPTER FOUR

4. Empirical Results

4.1 Introduction

This Chapter reports the results from analysis of data to test the hypotheses generated in chapter regarding the following: JII performance, assessment of JII volatility, trading volume activity of JII during the GFC and the effect of stocks entering and leaving JII.

4.2 JII Performance

This study period is split into two: period 1 runs from January 2005 up to December 2007 and period 2 from January 2008 up to May 2012. This classification was done to facilitate data analysis. Before 2008, IDX classified stocks into JII stocks and non-JII stocks (conventional). However, from the start of 2008, classification based on *Sharia* compliance is also available in addition to the classification into JII and non-JII stocks. Therefore, this study has split the research period into two periods[13].

This study uses two proxies of liquidity, namely: turnover and spread. Bid-ask spread is estimated from daily high and low prices using the methodology outlined in Corwin and Schultz (2012).

4.2.1 Descriptive Statistics for the period 2005-2007

From descriptive statistics summary on the Table 4.1, it is found that the mean of average return for LMH is different when we use turnover as liquidity proxy (0.0247) as compared to using spread as liquidity proxy.

[13] This study classifies the groups (JII and non-JII) based on industry sector each period. Next, each group is sorted based on market capitalisation (+/- 10% up to 20%).

Table 4.1: Descriptive Statistics of Data used: 2005-2007

This table reports summary statistics (time series average of means and standard deviations) for the variables used for regressions. ExRet2005-2007 is the excess monthly return net of risk free rate. ExMarRet is the monthly market return of a stock net of the risk-free rate. SMB is the return of Small minus Big, the difference of each month between the simple average of the returns on the small stocks and the simple average of the returns on the big stocks. HML is the return of High minus Low,that is the difference each month between the simple average of the returns on high-BE/ME stocks and the average of the returns on the low-BE/ME stocks. LMH is the return of Low minus High, that is the difference each month between the simple average of returns on Low-Liquidity stocks and the average of the returns on the High-Liquidity stocks.

Variables	Proxy of Liquidity			
	Turnover ratio		Spread	
	Mean	Std. Dev.	Mean	Std. Dev.
ExRet2005-07	-0.0548	0.0835	-0.0548	0.0835
ExMarRet	-0.0627	0.1314	-0.0627	0.1314
SMB	0.0165	0.1183	0.0165	0.1183
HML	-0.0040	0.1097	-0.0040	0.1097
LMH	0.0247	0.0970	0.0075	0.1013

4.2.2 Descriptive Statistics for period 2008-2012

From descriptive statistics summary on the Table 4.2, it is found that the mean of average return for LMH turnover ratio is different from LMH spread (0.00628 versus -0.00605).

Table 4.2: Descriptive Statistics of Data used in Time-Series Return Regressions: 2008-2012

This table reports summary statistics (time series average of means and standard deviations) for the variables used for regressions. ExRet2008-2012 is the excess monthly return net of risk free rate. ExMarRet is the monthly market return of a stock net of the risk-free rate. SMB is the return of Small minus Big that is the difference of each month between the simple average of the returns on the small stocks and the simple average of the returns on the big stocks. HML is the return of High minus Low that is the difference each month between the simple average of the returns on high-BE/ME stocks and the average of the returns on the low-BE/ME stocks. LMH is the return of Low minus High,that is, the difference each month between the simple average of returns on Low-Liquidity stocks and the average of the returns on the High-Liquidity stocks.

Variables	Proxy of Liquidity			
	Turnover ratio		Spread	
	Mean	Std. Dev.	Mean	Std. Dev.
ExRet2008-2012	-0.03300	0.10632	-0.03300	0.10632
ExMarRet	-0.06062	0.07252	-0.06062	0.07252
SMB	0.01935	0.11869	0.01935	0.11869
HML	-0.00094	0.09697	-0.00094	0.09697
LMH	0.00628	0.10501	-0.00605	0.10369

4.2.3 T-test of Excess Return for Period of 2005-2007 and 2008-2012

This study employs t-test to compare excess returns across groups each period. The summary of descriptive statistics from monthly [14]excess return each group of each period (see Table 4.3 & Table 4.4), are presented in Tables 4.5 and 4.6 respectively. It shows that for the period of January 2005 up to December 2007, mean of average excess return of JII stocks is smaller than non-JII stocks and the standard deviation of JII stocks is slightly smaller than non-JII stocks as well. However, for period 2008 up to 2012, the standard deviation of different return of three groups shows that the dispersion of non-*Sharia*-compliant stocks is the largest among of the three groups. JII stocks have the second largest standard deviation and *Sharia*-compliant stocks are the smallest one. Additionally, the mean excess returns of *Sharia* stocks have the largest value than the other groups and the mean excess return of JII stocks have the lowest values.

Table 4.3: Monthly excess return period of 2005-2007
ExRet 2005-2007 is the excess monthly return net of risk free rate.

Month	**JII**	**Non-JII**
1	0.05193	- 0.00854
2	0.00767	0.26497
3	- 0.07432	- 0.07180
4	- 0.16012	- 0.07990
5	- 0.02529	0.14103
6	- 0.04142	- 0.06229
7	- 0.01128	- 0.06739
8	- 0.30538	- 0.22849
9	- 0.05795	- 0.06436
10	- 0.10866	- 0.09483
11	- 0.12367	- 0.09594
12	- 0.06691	- 0.11563
13	- 0.07479	- 0.04635
14	- 0.09670	- 0.12425
15	- 0.05501	- 0.05847
16	- 0.05491	- 0.09830
17	- 0.23218	- 0.21382
18	- 0.13407	- 0.15663
19	- 0.00471	- 0.08328
20	- 0.08725	- 0.02284
21	- 0.07912	- 0.02572
22	- 0.06885	- 0.04568
23	- 0.05466	- 0.07497
24	0.00864	0.00948
25	- 0.08807	0.04828
26	- 0.09103	0.00218

[14]The excess returns are calculated as stock returns minus the yields on one month Certificate of Indonesia Bank and cover the sample period January 2005 through November 2012.

Table 4.3 (Cont.)		
27	- 0.05827	- 0.07610
28	0.03227	0.02052
29	0.01324	0.01981
30	- 0.04276	0.01490
31	0.00586	0.05678
32	- 0.12504	- 0.17801
33	0.00421	- 0.02990
34	0.06986	0.00718
35	- 0.07503	- 0.13047
36	0.00986	- 0.08427

Table 4.4: Monthly Excess Return for the Period: 2008-2012

ExRet 2008-2012 is the excess monthly return net of risk free.

Month	**JII**	***Sharia***	**Non-*Sharia***
1	-0.12291	-0.12240	-0.14786
2	-0.09621	-0.04878	-0.08059
3	-0.19797	-0.11051	-0.14797
4	-0.19836	-0.06998	-0.13362
5	-0.05212	-0.02799	-0.01232
6	-0.16176	-0.08259	-0.17014
7	-0.09214	-0.06008	-0.11399
8	-0.19036	-0.12428	-0.15795
9	-0.27186	-0.09051	-0.21081
10	-0.46822	-0.26465	-0.46397
11	-0.18261	-0.09331	-0.20625
12	-0.00295	-0.07504	-0.02679
13	-0.12169	-0.12072	-0.04390
14	-0.06737	-0.05066	-0.08785
15	0.03106	-0.08248	-0.04554
16	0.12581	0.08930	0.10171
17	0.09712	0.05287	0.07746
18	0.05599	0.15905	0.07768
19	0.13403	0.00617	0.05481
20	-0.07824	-0.01475	-0.00092
21	-0.02053	-0.03547	-0.03137
22	-0.14429	-0.08190	-0.11224
23	-0.09191	-0.02225	-0.10826
24	0.07229	0.15883	0.18184
25	0.08237	0.06225	0.09286
26	0.07309	0.12534	0.04950
27	0.10398	0.11037	0.07482
28	0.09935	0.09556	0.01205
29	0.01209	-0.00104	-0.00655
30	-0.03074	0.11036	0.00921
31	0.06473	0.10709	0.06418

Table 4.4 (Cont.)			
32	-0.09026	0.02515	0.00229
33	0.10985	0.12243	0.19739
34	-0.02342	-0.00346	-0.07512
35	-0.09180	-0.08094	-0.04090
36	-0.01256	0.02997	-0.01941
37	-0.18097	-0.05113	-0.10497
38	-0.02331	-0.04953	-0.05957
39	-0.01483	-0.00988	0.02589
40	-0.00943	-0.03227	-0.03249
41	-0.04421	-0.04237	0.04709
42	-0.05009	-0.02163	-0.06041
43	-0.18837	-0.12398	0.00333
44	-0.03756	-0.05375	-0.06005
45	0.04147	-0.01409	0.00877
46	-0.00667	0.00016	-0.04242
47	-0.05622	0.02878	0.25511
48	-0.02102	-0.00839	-0.03942
49	-0.02394	0.10686	-0.01451
50	-0.01339	-0.08050	-0.02499
51	-0.01660	0.38398	-0.01211
52	-0.06816	-0.10829	-0.02612
53	-0.13775	-0.28160	-0.13732
54	-0.00256	-0.02076	-0.05993
55	0.01739	-0.01993	-0.00381
56	-0.05036	-0.09019	-0.08437
57	0.01205	0.02652	-0.06672
58	-0.03588	-0.03000	-0.11082
59	-0.11859	-0.03882	-0.07516

Table 4.5: Descriptive Statistics Summary of Stocks Excess Return for the Period: 2005-2007

Variables	Group			
	JII		non-JII	
	Mean	Std. Dev.	Mean	Std. Dev.
Excess Return (2005-2007)	-0.0609	0.0745	-0.0487	0.09237

Table 4.6: Descriptive Statistics Summary of Stocks Excess Return for Period of 2008-2012

Group	Excess Return (2008-2012)	
	Mean	Std. Dev.
JII vs *Sharia*		
JII	-0.04707	0.10754
Sharia	-0.01593	0.10310
JII vs non-*Sharia*		
JII	-0.04707	0.10754
non-*Sharia*	-0.03599	0.10770
Sharia vs non-*Sharia*		
Sharia	-0.01593	0.10310
non-*Sharia*	-0.03599	0.10770

The next step is to test whether there are significant differences between them. It was found that for period of 2005-2007 which consists of two groups namely JII and non-JII, p-value of JII-non JII comparison was 0.538. It implies that there is no significant different in excess return. For the period of 2008-2012, the p-value is 0.111 for the JII – Sharia comparison. The p-value of JII-non *Sharia* comparison is 0.577 and the p-value of *Sharia*-non *Sharia* comparison is 0.304. It implies from these tests that the three groups are not significantly different on the basis of excess return (see Table 4.7 & Table 4.8).

Overall, the results indicate that there is no significant difference in the performance between JII, *Sharia*-compliant and non-*Sharia*-compliant stocks.

Table 4.7: Independent Sample t-test of Excess Return: 2005-2007

	Independent sample t-test		Mean Difference
	t-statistics	p-value	
JII vs non-JII	-0.619	0.538	-.0122447

Table 4.8: Independent Sample t-test of Excess Return: 2008-2012

	Independent sample t-test		Mean Difference
	t-statistics	p-value	
JII vs *Sharia*	-1.606	0.111	-.0311472
JII vs non-*Sharia*	-0.559	0.577	-.0110852
Sharia vs non-*Sharia*	1.034	0.304	0.200620

4.2.4 Regression Results for Performance of JII and non-JII Stocks compared to other stocks: Period 1 2005 - 2007

The performance of JII stocks versus non-JII stocks and *Sharia* stocks using the models outlined in sections 3.2.1 and 3.2.2 are reported in Table 4.9. The study period is 2005-2007. The dummy for JII is not significant, indicating that there is no significant difference between JII and non-JII stocks on performance, for both the proxies for liquidity -turnover and spread.

Table 4.9: Return Regressions

Regression of excess stock return during period of 2005-2007
The table provides the coefficient estimates from regression of stocks return.
$R_{it}- R_{ft} = \alpha_i + \beta_{1i} (R_{mt} – R_{ft}) + \beta_{2i} SMB_t + \beta_{3i}HML_t + \beta_{4i}Liq_t + \beta_{5i}I + e_{it}$. Where Rt indicates stock returns on trading days t and β_1 ... β_5 are the regression coefficient of variables of ((R_m-R_f), SMB, HML, Liq (turnover or spread) and I)) shows following are market return, Small Minus Big, High Book to market Minus Low Book to market, Liquidity and e_{it} is the error term. This regression coefficient shows the average stock return on trading day t. I shows dummy JII stocks (JII stocks = 1 and zero otherwise)

Variables	Proxy of Liquidity							
	Turnover				Spread			
	β Coefficient	t	p-value	Adjusted R-square	β Coefficient	t	p-value	Adjusted R-square
Constanta(αi)	-3.90E-02	-2.863	***0.006	0.199	-4.00E-02	-3.062	***0.003	0.209
ExcessMarket Return (Rmt-Rft)	0.11	1.593	0.116		0.102	1.499	0.139	
Size(SMB)	-0.374	-4.023	***0.000		-0.37	-4.218	***0.000	
Book tomarket (HML)	0.066	0.668	0.506		0.01	0.083	0.934	
Liquidity (Liq)	-0.029	-0.262	0.794		-0.111	-0.971	0.335	
dummy of JII (I)	-0.003	-0.189	0.85		-0.002	-0.118	0.907	

*** Indicates statistical significance at the 0.01 level

This result is consistent with previous studies comparing *Sharia* and conventional stocks (Albaity & Ahmad 2008; Charles, Darné & Pop 2011; Dharani & Natarajan 2008; Girard & Hassan 2008; Natarajan & Dharani 2012). Thus, this finding does not support the hypothesis 1.A which states that investment performance of JII stocks will be substantially different from a matched sample of non-JII stocks.

4.2.5 Regression Results for Performance of JII and non-JII Stocks compared to other stocks: Period 2 2008 – 2012

The empirical results of regressions for the period of 2008-2012 reported on Table 4.10 shows that excess market return and size are significant at the 1% level[15]. However, book to market, liquidity, dummy JII and dummy *Sharia* stocks were not significant. It implies that excess market return and size have impact on excess

[15] See the model in chapter 3, $R_{it}- R_{ft} = \alpha_i + \beta_{1i} (R_{mt} – R_{ft}) + \beta_{2i} SMBt + \beta_{3i}HML_t + \beta_{4i}Liq_t + \beta_{5i}I + \beta_{6i}S + e_{it}$. Where Rt indicates stock returns on trading days t and β_1 ... β_5 are the regression coefficient of variables of ((R_m-R_f), SMB, HML, Liq (turnover or spread), I and S)) shows following are market return, Small Minus Big, High Book to market Minus Low Book to market, Liquidity and e_{it} is the error term.This regression coefficient shows the average stock return on trading day t. I shows dummy JII stocks (JII stocks = 1 and zero otherwise), S shows dummy *Sharia* stocks (*Sharia* stocks = 1 and zero otherwise)

return. In addition, this regression results have relatively high adjusted R squares of 47.9%.

Since the dummy for JII and *Sharia* are not significant, we conclude that there is no difference in performance between JII and non-JII stocks (*Sharia* and non-*Sharia*). This result is consistent with the previous studies which show that there is no difference in performance between *Sharia* and conventional stocks (Albaity & Ahmad 2008; Charles, Darné & Pop 2011; Dharani & Natarajan 2008; Girard & Hassan 2008; Natarajan & Dharani 2012).

Based on all the results previously described, the present study indicates that there is no difference in performance between JII and non-*Sharia*, and also there is no difference in performance between non JII *Sharia* and non-*Sharia* as shown by no significance of dummy variables. Overall the findings do not support the hypotheses 1.A and 1.B which stated that the investment performance of JII stocks will be substantially different from a matched sample of non-*Sharia* stocks and the investment performance of non JII-*Sharia* stocks will be substantially different from a matched sample of non-*Sharia* stocks.

Table 4.10: Return Regressions

Regression of excess stock return during period of 2008-2012
The table provide the coefficient estimates from regression of stocks return.
$R_{it}- R_{ft} = \alpha_i + \beta_{1i} (R_{mt} – R_{ft}) + \beta_{2i}$ SMBt + $\beta_{3i}HML_t + \beta_{4i}Liq_t + \beta_{5i}I + \beta_{6i}S + e_{it}$. Where R_{it} indicates stock returns on trading days t and β_1 ... β_5 are the regression coefficient of variables of ((R_m-R_f), SMB, HML, Liq (turnover or spread), I and S)) shows following are market return, Small Minus Big, High Book to market Minus Low Book to market, Liquidity and e_{it} is the errorterm. This regression coefficient shows the average stock return on trading day t. I shows dummy JII stocks (JII stocks = 1 and zero otherwise), S shows dummy *Sharia* stocks (*Sharia* stocks = 1 and zero otherwise)

Variables	Proxy of Liquidity							
	Turnover				Spread			
	β Coefficient	t	p-value	Adjusted R-square	β Coefficient	t	p-value	Adjusted R-square
Constanta(αi)	-0.04	2.125	**0.035	0.479	0.023	2.055	**0.041	0.479
Excess Market Return(Rmt-Rft)	0.999	11.48	***0.000		0.951	10.9	***0.000	
Size (SMB)	175	3.408	***0.001		0.164	3.249	***0.001	
Book to Market (HML)	0.083	1.284	0.201		0.049	0.69	0.491	
Liquidity (Liq)	0.059	0.945	0.346		-0.046	-0.664	0.508	
Dummy JII (I)	-0.013	-0.889	0.376		-0.015	-1.085	0.28	
Dummy of *Sharia* (S)	0.014	0.935	0.351		0.01	0.692	0.49	

*** Indicates statistical significance at the 0.01 level
** Indicates statistical significance at the 0.05 level

4.3 Volatility of JII Stocks

This study uses Eviews statistical package to conduct statistical analysis. The stationary of the data was first checked using the Augmented Dickey-Fuller (ADF) test and the results show that all data is stationary[16](see the result of ADF test in

[16]This study employs stationary test of data by using Augmented Dickey Fuller test (ADF). This study finds that t-statistics value of all data used is more than critical value 1% level and 5% level, therefore, the data has been stationary. See Appendix H

Appendix H). This study split the sample into two periods: 2005-2007 and 2008-2012 to exploit the additional disclosures since 2008 by the IDX. Two proxies of liquidity are used namely: turnover ratio and spread. This study uses monthly excess return which is calculated by using the three factor model of Fama and French augmented with liquidity.

4.3.1 Descriptive Statistics

Table 4.11 presents that mean of monthly excess return for all groups which are almost all negative. The value of standard deviation for average monthly return of non-*Sharia* stocks is the largest compared with other groups. It suggests that non-*Sharia* stocks are riskier compared to other groups. The small value of skewness states that the distribution of return for all groups has more thin tail than the normal distribution. Average value of kurtosis is positive, implying that that the distributions of value for all groups tend not to be well distributed or pointy.

Additionally, the value of mean leverage of non-*Sharia* stocks (0.355) is the largest compared to other groups. The smallest one is JII stocks (0.152). However, the value of mean ROA of JII stocks (14.76) is the largest compared to other groups. The smallest one is non *Sharia* stocks (6.62).

Next, the mean of Altman-Z Score is 3.72 for JII stocks and the maximum is 4.490 (Altman's score > 2.99 safe zone, it means that JII stocks included in "Safe" Zone. Next, for *Sharia* stocks, the mean of Altman-Z Score is 2.19 (1.1< Altman-Z" score < 2.60 "grey" zone) and the maximum is 3.71, it means that *Sharia* stocks are included in "Grey" Zone. Furthermore, for non-*Sharia* stocks, the mean of Altman Score is 1.807, the maximum Altman-Z Score is 4.34 and the minimum is -0.280, it means that non-*Sharia* stocks included in "Grey" Zone. Additionally, mean of Ohlson-score for JII stocks is – 18.6, *Sharia* stocks is -9.55 and non *Sharia* stocks is -7.89. The Ohlson score is less than the cut off value (0.38) for all groups.

Table 4.11: Descriptive Statistics

	JII						*Sharia*					
	Mean	Std. Dev	Max	Min	Skewness	Kurtosis	Mean	Std. Dev	Max	Min	Skewness	Kurtosis
Variables												
ExcessReturn	-.047	.108	.134	-.468	-1.055	2.856	-.016	.103	.384	-.282	.773	3.477
Market Return	-.061	.073	.102	-.355	-1.203	4.163	-.061	.073	.102	-.355	-1.203	4.163
Market Cap	.017	.084	.291	-.192	.827	1.907	.044	.158	.954	-.441	2.978	20.023
B/M	.000	.074	.186	-.236	-.149	1.490	.007	.112	.478	-.230	1.313	5.067
Turnover Ratio	-.006	.088	.207	-.273	-.324	.976	-.015	.102	.156	-.446	-1.497	4.457
Spread	-.002	.083	.174	-.285	-.654	1.994	-.024	.119	.153	-.514	-1.564	4.368
Leverage	.152	.018	.170	.120	-1.115	.065	.168	.026	.210	.130	.115	-.879
ROA	14.76	2.77	20.82	11.92	1.38	1.15	10.43	2.56	15.88	7.04	.83	.80
Altman	3.72	0.69	4.49	2.54	-0.385	-1.26	2.19	0.91	3.71	1.05	0.428	-0.958
Ohlson	-18.6	23.31	-7.21	-84.3	-3.06	9.50	-9.55	8.33	1.23	-31.14	-2.09	6.14

	non-*Sharia*						ALL					
	Mean	Std. Dev	Max	Min	Skewness	Kurtosis	Mean	Std. Dev	Max	Min	Skewness	Kurtosis
Variables												
ExcessReturn	-.035	.109	.255	-.464	-.584	3.932	-.033	.108	.384	-.468	-.333	3.436
Market Return	-.061	.074	.102	-.355	-1.188	4.040	-.061	.073	.102	-.355	-1.177	3.820
Market Cap	-.004	.099	.230	-.382	-.851	3.061	.019	.084	.954	-.441	2.416	22.630
B/M	-.010	.103	.212	-.255	-.073	-.298	-.001	.074	.478	-.255	.606	3.220
Turnover Ratio	.040	.117	.296	-.296	.021	.336	.006	.088	.296	-.446	-.370	2.076
Spread	.008	.105	.280	-.290	-.269	1.198	-.006	.104	.280	-.514	-1.031	3.632
Leverage	.355	.040	.400	.260	-1.527	2.467	.225	.098	.400	.120	.763	-1.192
ROA	6.62	3.88	10.63	-1.74	-1.31	1.14	10.60	4.53	20.82	-1.74	-.38	1.32
Altman	1.807	1.50	4.34	-0.28	0.534	-0.42	2.57	1.37	4.49	-0.28	-0.276	-0.89
Ohlson	-7.89	1.79	-3.22	-9.3	2.29	5.97	-12.02	14.63	1.23	-84.4	-4.49	22.15

4.3.2 Diagnostic Tests and GARCH Models for the 2005-2007 Period

4.3.2.1 Plot of variables (turnover as liquidity proxy)

Figure 4-1 shows the plots of all the variables with turnover as liquidity proxy for the period of 2005-2007. This study employs the three factor model of Fama and French augmented with liquidity. Therefore, the following variables are plotted: excess return (excess return of 2005-2007), market return (market), return of size (SMB), return of book to market (HML) and return of liquidity (LMH-turnover proxy).

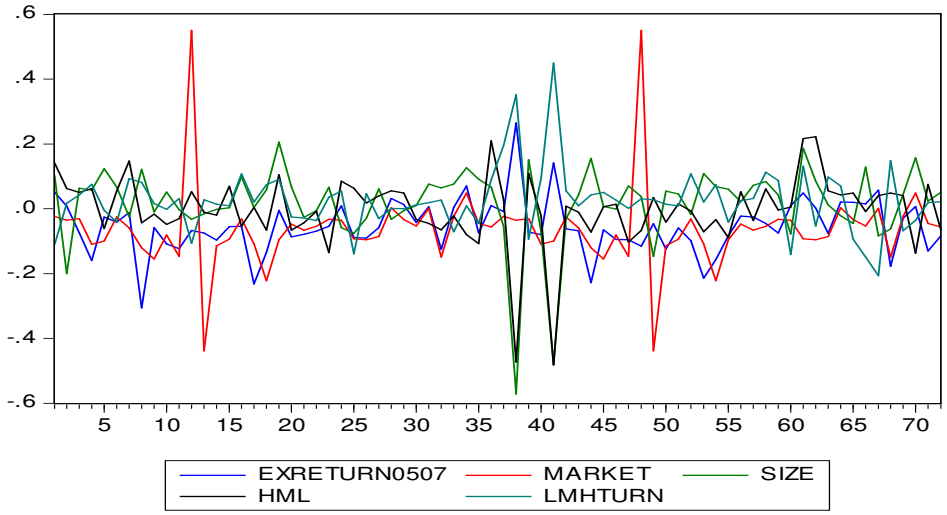

Figure 4-1: [17]Plot of Variables (Turnover as Liquidity Proxy) 2005-2007

For the group with turnover as liquidity proxy, displayed in Figure 4.1 it is seen that excess return, market return, return of size (SMB), return of book to market (HML) and return of liquidity (LMH-turnover proxy) have periods of low volatility followed by a period of low volatility and a period of high volatility followed by a period of high volatility. It seems there is a clustering of volatility. [18]However, to ensure whether there is an ARCH effect in this model, ARCH test or White test are carried out.

Table 4.12 reports that there is no ARCH effect in this model, because p-value of Obs*R-squared is significant at more than 5% level or in other words, in this period, ARCH effect does not exist. Therefore, for the period of 2005-2007, liquidity proxied by turnover cannot be used in a GARCH model.

4.3.2.2 Plot of variables (spread as liquidity proxy)

Figure 4-2 shows the plots of all the variables using spread as liquidity proxy for the period of 2005-2007.This study employs the three factor model of Fama and French augmented with liquidity. Therefore, the following variables are plotted:

[17]The data are monthly excess stock returns which are calculated as stocks returns minus yields on one-month Certificate of Indonesia Bank.
[18]One of requirement to develop ARCH / GARCH model is that there is ARCH effect in the model.

excess return (excess return of 2005-2007), market return (market), return of size (SMB), return of book to market (HML) and return of liquidity (LMH-spread proxy).

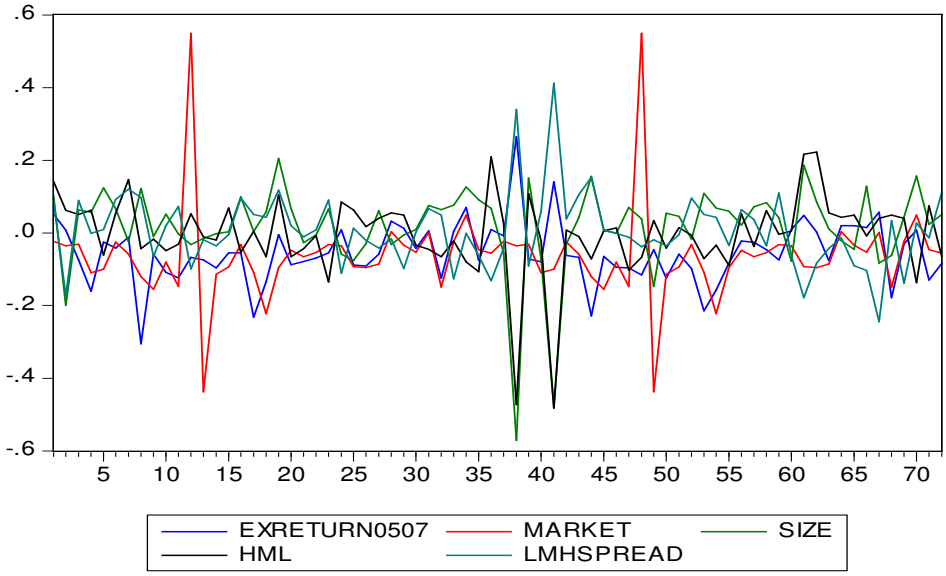

Figure 4-2: Plot of Variables (Spread as Liquidity Proxy) 2005-2007

Figure 4.2 shows that excess return, market return, return of size (SMB), return of book to market (HML), and return of liquidity (LMH-turnover proxy) have periods of low volatility followed by a period of low volatility and a period of high volatility followed by a period of high volatility. It seems that there is a clustering of volatility. However, to ensure the existence of an ARCH effect in this model, the ARCH test or White test is used.

From the result on Table 4.12, it is seen that there is an ARCH effect in this model, since p-value of Obs*R-squared is significant at less than 5% level. Therefore, for the period of 2005-2007 using spread as liquidity proxy a GARCH model may be developed.

With liquidity proxied by spread, this study uses the GARCH (1,1) model (see Table 4.14). The ARCH term coefficient is negative and GARCH term coefficient is insignificant. In GARCH (2,0) model, the ARCH term is positive but insignificant. Therefore, in this group there is no best model to investigate the volatility in IDX.

Table 4.12: Heteroskedasticity Test: ARCH /White: 2005-2007

Liquidity Proxy Group	ARCH		White	
	F-statistic	Obs*R-squared	F-statistic	Obs*R-squared
Turnover	3.01630	*0.075	29.46768	*0.0590
Spread	3.52616	*0.059	31.52993	**0.0353

**Indicates statistical significance at the 0.05 level
* Indicates statistical significance at the 0.10 level

4.3.3 Diagnostic Tests and GARCH Models for the 2008-2012 Period

4.3.3.1 Plot of variables (turnover as liquidity proxy)

Figure 4-3 shows the plots of all the variables using turnover as liquidity proxy for the period of 2008-2012.This study uses the three factor model of Fama and French augmented with liquidity to calculate return. Therefore in this study, the following variables are plotted: excess return (excess return of 2008-2010), market return (market), return of size (SMB), return of book to market (HML) and return of liquidity (LMH-turnover proxy).

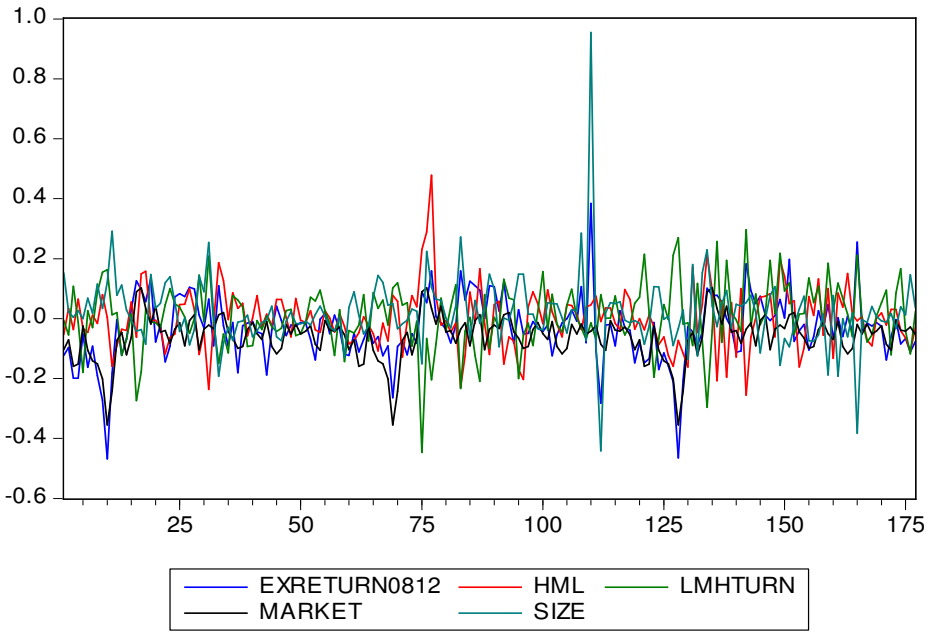

Figure 4-3: Return Plot of Turnover Liquidity Proxy Group 2008-2012

With turnover as liquidity proxy, as shown in Figure 4.3 excess stock return, market return, return of size (SMB), return of book to market (HML), and return of liquidity (turnover proxy) have periods of low volatility followed by a period of low volatility and a period of high volatility followed by a period of high volatility. It seems that there is a clustering of volatility. However, the presence of ARCH effect is tested by using the ARCH test or White test.

From the result on Table 4.13[19] it is seen that there is no ARCH effect in this model since the value of probability is more than 10%. From Table 4.13 as well by using the White test, there is an ARCH effect in this model. The p-value of Obs*R-squared is significant at the 1% level. Therefore, one can continue to develop GARCH model in this case to investigate which variables can influence the volatility of excess returns.

With liquidity proxied by turnover, for the GARCH (1,1) model, the coefficient of ARCH term is negative[20], and the coefficient of GARCH term is positive but insignificant. It is found that the GARCH (2,0) is the best model because the coefficient of ARCH term order two is positive and significant at the 1% level with coefficient is 0.608966. The dummy variable for JII is significant at the 10%

[19] The model from equation 2 in Chapter 3

[20]The ARCH and GARCH are not negative and their sum is less than unity

level.[21] Further, diagnostics tests such as ARCH-LM test, histogram-normality test and correlogram squared-residual, all suggest that this model is the best one.

Therefore, in this period, the volatility in IDX is influenced by the ARCH term or the lag of the square residual and the JII dummy but is not influenced by past variance or GARCH term and dummy for *Sharia*. However, based on these findings, hypothesis H2 which predicts that JII stocks will have lower volatility compared to non-*Sharia* stocks is not supported. Likewise hypothesis H3, which states that JII stocks will have lower volatility compared to *Sharia* stocks, is not supported. Finally, H4 which states that *Sharia* stocks will have lower volatility compared to non-*Sharia* is also not supported.

4.3.3.2 Plot of variables (spread as liquidity proxy)

Figure 4-4 shows the plots of all the variables using spread as liquidity proxy for the period of 2008-2012. This study employs the three factor model of Fama and French augmented with liquidity. Therefore, the following variables are plotted: excess return (excess return of 2008-2012), market return (market), return of size (SMB), return of book to market (HML) and return of liquidity (LMH-spread proxy).

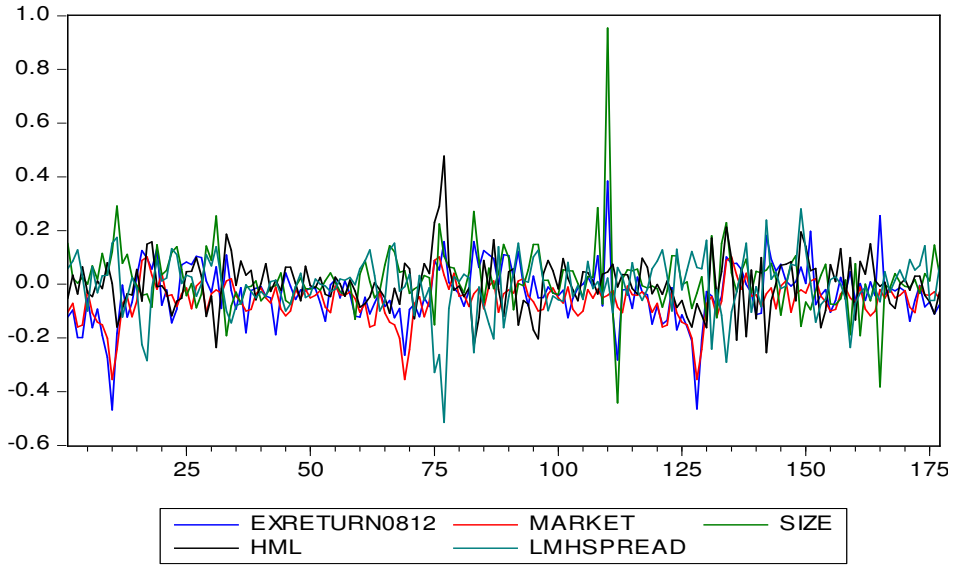

Figure 4-4: Return Plot of Spread Liquidity Proxy Group 2008-2012

Figure 4.4 shows that excess return, market return, return of size (SMB), return of book to market (HML), and return of liquidity (LMH-turnover proxy) have periods of low volatility followed by a period of low volatility and a period of high volatility followed by a period of high volatility. It seems that there is a clustering of volatility. However, to ensure the existence of an ARCH effect in this model, the ARCH test or White test is used.

Table 4.13 reports that there is no ARCH effect in this model because the value of probability is more than 10%. However, from Table 4.13 as well by using White – ARCH test, an ARCH effect is found in this model. In the White-ARCH

[21]Diagnostic checking of ARCH 2 or GARCH (2.0): ARCH-LM in where there is no ARCH effect; correlogram squared residual in where there is no serial correlation and histogram –normality in where there is not normality distributed. All this reasons have to fulfil to find the best model.

test, the p-value of Obs*R-squared is significant at the 1% level. Therefore, one can continue to develop GARCH model to investigate which variables can influence the volatility of excess return.

With liquidity proxied by spread, (see Table 4.14) the results of the GARCH (1,1), model shows that the coefficient of ARCH term is negative but the coefficient of GARCH term is positive and significant at the 1% level. Next, it is found that the GARCH (2,0) is the best model because the coefficient of ARCH term order two is positive and significant at the 1% level with coefficient of 0.436377. While the dummy variables for JII are insignificant.[22] This study also used diagnostics tests such as ARCH-LM test, histogram-normality test and correlogram squared residual, and the results suggest that this model is the best one.

In this period, the volatility in IDX is influenced by ARCH term or the lag of the square residual as well as by turnover as liquidity proxy but it is not influenced by past variance or GARCH term, dummy of JII and dummy of *Sharia*. However, based on these findings, hypothesis H2 predicting that JII stocks will have lower volatility compared to non-*Sharia* stocks is not supported. Likewise hypothesis H3, which states that JII stocks will have lower volatility compared to *Sharia* stocks, is not supported. Finally, H4 which states that *Sharia* stocks will have lower volatility compared to non-*Sharia* is also not supported.

Table 4.13: Heteroskedasticity Test: ARCH /White (2008-2012)

Liquidity Proxy Group	ARCH		White	
	F-statistic	Obs*R-squared	F-statistic	Obs*R-squared
Turnover	0.367007	0.5446	79.45701	***0.000
Spread	0.200403	0.6544	72.00476	***0.000

*** Indicates statistical significance at the 0.01 level

[22]Diagnostic checking of ARCH 2 or GARCH (2, 0): ARCH-LM if there is no ARCH effect; correlogram squared residual if there is no serial correlation; and histogram –normality if it is not normality distributed. All these requirements need to be satisfied to find the best model.

Table 4.14: GARCH (1,1)

$\sigma_t^2 = \omega + \alpha\varepsilon^2_{t-1} + \beta\sigma^2_{t-1} + \gamma_1$ dummy JII + γ_2 dummy *Sharia*

Variance Model (2005-2007) and (2008-2012)

Variables (period)	GARCH Liquidity proxy group							
	Turnover				Spread			
	GARCH (1,1)		GARCH(2,0)		GARCH (1,1)		GARCH(2,0)	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
(2005-2007)								
ARCH	-		-		-0.13942	0.00640	0.09197	0.53940
GARCH	-		-		0.44721	0.35380	-	-
Dummy JII	-		-		-0.00067	0.58650	0.00045	0.69890
Notes	No ARCH effect				Notes	No best model		
(2008-2012)	GARCH (1,1)		GARCH (2,0)		GARCH (1,1)		GARCH (2,0)	
ARCH	-0.06225	0.21650	0.60897	***0.0004	-0.06651	0.00000	0.43638	***0.0005
GARCH	0.58342	0.33460	-	-	0.84541	0.00000	-	-
Dummy of JII	0.00003	0.96280	0.00172	*0.0989	-0.00029	0.67930	0.00160	0.22090
Dummy of *Sharia*	0.00002	0.97810	0.00104	0.3184	-0.00058	0.56260	0.00064	0.56920
Notes	The best model is GARCH (2,0)				Notes	The best model is GARCH (2,0)		

*** Indicates statistical significance at the 0.01 level

* Indicates statistical significance at the 0.10 level

Notes: Dependent Variable: Excess Return[23]

Sample (adjusted): Sample: 177, January 2008 to November 2012

Method: ML - ARCH (Marquardt) - Normal distribution

4.3.4 EGARCH Model

The leverage effect on volatility is studied by employing the EGARCH model. The results from the EGARCH model are presented in Table 4.15, using both proxies for liquidity: turnover and spread. The leverage effect is present if the coefficient of γ is negative and statistically significant. For period of 2005-2007, this study does not develop an EGARCH model because in this period, ARCH effect does not exist and there is no best model.

The dummies for JII and *Sharia* are not significant. It is found that the coefficient of γ is negative but p-value is not significant for the period of 2008-2012 with turnover as liquidity proxy. For the same period with spread as liquidity proxy, the coefficient of γ is positive but is not significant. Therefore, the EGARCH (1,1) model did not confirm the existence of the leverage effect in IDX for period of 2008-2012. In other words, there is no observable effect of financial leverage changes on volatility of return during this period. This result is consistent with prior study which is conducted in Kuala Lumpur Composite Index by Mun, Sundaram and Yin

[23] R_{it}-R_{ft} 2008-2012 is the excess monthly return net of risk free, (R_{mt}-R_{ft}) is the monthly return of a stock net of the risk-free rate. SMB is the return of Small minus Big means the difference of each month between the simple average of the returns on the small stocks and the simple average of the returns on the big stocks. HML is the return of High minus Low means the difference each month between the simple average of the returns on high-BE/ME stocks and the average of the returns on the low-BE/ME stocks. LMH is the return of Low minus High means the difference each month between the simple average of returns on Low-Liquidity stocks and the average of the returns on the High-Liquidity stocks

(2008)[24].[25]However, prior study also found that there was leverage effect in stock market especially in US market although this effect explains only a small proportion of the changes in stocks' volatility. Additionally, the leverage effect found for individual stocks was moderate and much stronger for stock indices (Bouchaud, Matacz & Potters 2001). Overall, hypotheses H2, H3, and H4 comparing volatility across the three groups (JII, *Sharia* and non-*Sharia*) are not supported.

Table 4.15: EGARCH(1,1)

$\ln\sigma_t^2 = \alpha + \beta(|\varepsilon_{t-1/\sigma t-1} - \sqrt{}_{2/\pi}|) + \gamma\varepsilon_{t-1/\sigma t-1} + \omega\ln\sigma^2_{t-1} + \theta_1 dummyJII + \theta_2 dummy\textit{Sharia}$

Variance Model (2008-2012)

Variables	EGARCH (2008-2012) Liquidity proxy group			
	Turnover		Spread	
	Coefficient	p-value	Coefficient	p-value
α	-9.65057	***0.000	-2.17098	0.3598
β	-0.33285	**0.032	-0.10876	0.5055
γ	-0.00376	0.969	0.15908	0.2363
ω	-0.86696	***0.000	0.55645	0.2495
θ1	-0.35569	0.460	-0.04612	0.7435
θ2	0.04191	0.940	-0.10581	0.5898

*** Indicates statistical significance at the 0.01 level
**Indicates statistical significance at the 0.05 level
Notes: Dependent Variable: Excess Return
Sample (adjusted): Sample: 177, January 2008 to November 2012
Method: ML - ARCH (Marquardt) - Normal distribution

4.3.5 Comparison of ROA and Leverage across Groups

Although, no impact of JII or *Sharia* was found on volatility, it is possible that on other dimensions of risk, the three groups may be different. We therefore compare Return on Assets (ROA) and leverage for each period. Previous studies posit that leverage will lead to an increase in volatility (Schwert 1989). In other words, higher leverage is associated with greater volatility. However, this study does not attempt to run regression of the actual financial leverage with leverage due to data not being available on a monthly basis for leverage. Next, this study employed t-test to test whether the difference of those groups was significant or not.

The results of leverage calculation among two groups in the period of 2005-2007 and three groups in the period of 2008-2012 and are presented in Tables 4.16 and 4.17 respectively.

[24]This study investigated leverage effect of Malaysian stocks market indices namely Kuala Lumpur Composite Index (KLCI)
[25]Previous study found that financial leverage affects stock volatility, when stock prices fall relative to bond prices, or when firms issue new debt securities in large proportion to new equity than their prior capital structure, stock volatility increases (Schwert 1989).

Table 4.16: ROA and Leverage calculation: 2005-2007

ROA	2005,1	2005,2	2006,1	2006,2	2007,1	2007,2	**Average**
JII	9.01	8.94	9.27	7.49	12.08	12.59	9.90
non-JII	6.35	5.85	9.11	9.04	7.58	8.59	7.75
LEVERAGE	2005,1	2005,2	2006,1	2006,2	2007,1	2007,2	**Average**
JII	34.48%	35.49%	27.91%	27.85%	27.25%	25.23%	29.70%
non-JII	25.11%	26.75%	29.56%	26.67%	24.06%	32.74%	27.48%

ROA is return on assets.
Leverage is total debt to total assets.

Table 4.17: ROA and Leverage calculation: 2008-2012

ROA	**2008,1**	**2008,2**	**2009,1**	**2009,2**	**2010,1**	**2010,2**	**2011,1**	**2011,2**	**2012,1**	**2012,2**	**Average**
JII	13.33	12.50	11.92	13.18	13.35	13.17	14.38	16.19	18.73	20.82	14.76
Sharia	10.41	8.08	7.04	8.04	8.54	10.81	15.88	11.01	13.31	11.20	10.43
non-*Sharia*	6.84	5.56	0.80	-1.74	8.21	7.34	8.54	10.09	10.63	9.94	6.62
LEVERAGE	**2008,1**	**2008,2**	**2009,1**	**2009,2**	**2010,1**	**2010,2**	**2011,1**	**2011,2**	**2012,1**	**2012,2**	**Average**
JII	12.00%	16.16%	15.99%	16.96%	16.35%	16.45%	12.46%	16.70%	16.24%	13.67%	15.30%
Sharia	19.08%	19.90%	18.18%	16.11%	16.63%	12.50%	13.87%	16.37%	13.97%	21.15%	16.78%
non-*Sharia*	25.96%	38.93%	38.12%	31.02%	35.98%	38.01%	33.88%	36.39%	37.02%	39.85%	35.51%

ROA is return on assets.
Leverage is total debt to total assets.

In the period of 2005-2007 shown in Table 4.16, it is found that JII stocks have higher leverage (29.70%) than non-JII (27.48%). However, JII stocks also have greater ROA (9.90) than non-JII (7.75).

In the 2008-2012 period as shown in Table 4.17, JII stocks have the lowest leverage (15.30%) than the other groups (*Sharia* and non-*Sharia*: 16.78% and 35.51% respectively). Leverage calculations reveal that JII stocks have the lowest of leverage and the highest levels of ROA. Additionally, from independent sample t-test the leverage between JII and *Sharia* statistically is not different. However, the leverage of JII and non-*Sharia* and the leverage of *Sharia*-compliant and non-*Sharia*-compliant stocks are significantly different at the 1% level. The result of independent sample t-test can be seen in Table 4.18. These results indicate that JII stocks are less risky than non-JII stocks. Also, *Sharia*-compliant stocks are less risky than non-complaint stocks.

Table 4.18: Independent Sample t-test of Leverage: 2008-2012

	Independent sample t-test		Mean Difference
	t-statistics	p-value	
JII vs *Sharia*	-1.114	0.266	-.0156880
JII vs non-*Sharia*	-11.568	***0.000	-.2030071
Sharia vs non-*Sharia*	-10.360	***0.000	-.1858943

*** Indicates statistical significance at the 0.01 level

4.3.6 Comparison of Turnover Ratio across Groups

Previous study linking liquidity with volatility finds that liquidity is generally associated with a lower volatility (Chordia, Roll & Subrahmanyam 2001; Domowitz, Glen & Madhavan 2001; Li & Wu 2006). Considering illiquidity as a risk factor, this study calculates turnover ratio for each group in each period. The result of turnover ratio comparison among the two groups in period of 2005-2007 and the three groups in period of 2008-2012 is presented in Table 4.19 and 4.20 respectively. In Table 4.19, it is found that turnover ratio of JII (0.0056) is slightly smaller than non-JII (0.0057).

Next, for the 2008-2012 period (see Table 4.20) it is found that JII stocks have the highest average turnover ratio (0.0028) and *Sharia* stocks have the lowest average of turnover ratio (0.0012), and the second highest is non-*Sharia* stocks which have average of turnover ratio is 0.0019. Additionally, from independent sample t-test is found that the comparison of turnover ratio between JII and *Sharia* is significantly different at 1% level, and the turnover ratio between JII and non-*Sharia* and between *Sharia* and non-*Sharia* are significant at the 10% level. The result of independent sample t-test can be seen in Table 4.21.

Overall, it appears that JII stocks have lower liquidity risk compared to non-JII stocks but *Sharia* stocks are not more liquid compared to non-*Sharia* stocks.

A. Period: 2005-2007

Table 4.19: Turnover Ratio Calculation: 2005-2007

Average Turnover Ratio (Period)							
Group	2005,1	2005,2	2006,1	2006,2	2007,1	2007,2	Average
JII	0.0083	0.0057	0.0029	0.0064	0.0059	0.0047	0.0056
Non-JII	0.0026	0.0010	0.0051	0.0030	0.0185	0.0040	0.0057

Turnover Ratio: trading volume divided by shares outstanding

B. Period: 2008-2012

Table 4.20: Turnover Ratio Calculation: 2008-2012

Average Turnover Ratio (Period)											
Group	2008,1	2008,2	2009,1	2009,2	2010,1	2010,2	2011,1	2011,2	2012,1	2012,2	Average
JII	0.0031	0.0023	0.0030	0.0045	0.0039	0.0032	0.0024	0.0021	0.0021	0.0011	0.0028
Sharia	0.0008	0.0013	0.0026	0.0017	0.0017	0.0014	0.0007	0.0006	0.0005	0.0006	0.0012
non-*Sharia*	0.0038	0.0018	0.0017	0.0018	0.0026	0.0030	0.0017	0.0011	0.0010	0.0008	0.0019

Turnover Ratio: trading volume divided by shares outstanding

Table 4.21: Independent Sample t-test of Turnover Ratio: 2008-2012

	Independent sample t-test		Mean Difference
	t-statistics	p-value	
JII vs *Sharia*	4.191	***0.001	0.0015800
JII vs non-*Sharia*	1.949	*0.067	0.0008400
Sharia vs non-*Sharia*	-2.011	*0.060	-0.0007400

*** Indicates statistical significance at the 0.01 level
* Indicates statistical significance at the 0.10 level

4.3.7 Comparison of Altman- Z-Score and Ohlson -O-Score across Groups

Another measure of risk is bankruptcy risk. Therefore, this study employs two measures of bankruptcy by using Altman-Score and Ohlson-Score to investigate which of these three groups have "safe" zone for the Althman-Score and have a cut-off less than 0.38 which indicates not experiencing financial distress.

This study calculates each measure of bankruptcy in order to investigate which one of these three groups included in "safe" zone and not experiencing financial distress. There are no previous studies regarding this issue on Islamic investments. This study investigates whether JII stocks which have characteristics such as *Sharia* compliance, high market capitalisation and high liquidity are "safer" than other stocks.

The result of Altman-Z" Score (Altman 1968, 2002) comparisons are provided in Table 4.22[26]. Altman Z'' score > 2.60 is in the "Safe" Zone; 1.1 < Z'' < 2.60 is in "Grey" Zone; Z" < 1.1 is in "Distress" Zone. It is found that JII stocks have the highest Altman Z'' score (3.72) and included in "Safe" Zone, and the smallest one is non-*Sharia* stocks (1.81) included in the "Grey" Zone. *Sharia* stocks have the second biggest (2.19) and are also included in the "Grey" Zone.

By Altman's interpretation, a higher leverage ratio is a sign that the firm is close to bankruptcy as the market value of the firm's equity has declined dramatically (Ferguson, Clinch & Kean 2011). Based on the leverage ratio calculation in the Table 4.17, JII stocks have the lowest leverage ratio compared to *Sharia* and non-*Sharia*-stocks. The result from Altman-Z" Score on Table 4.22 shows that JII stocks are included in "Safe" Zone based on Altman Z" Score where its score is the highest among the three groups, non-*Sharia* stocks have the smallest average of Altman Z" Score which is included in "Grey Zone" and the *Sharia* stocks are also included in "Grey" zone. Therefore, this results support the finding that JII stocks are the least risky compared to other stocks and are therefore included in the "Safe" zone.

[26]Z'' Score Model for Manufacturers, Non-Manufacturer Industrials, & Emerging Market Credits: Z'' = 6.56X1+ 3.26X2+ 6.72X3+ 1.05X4.

Table 4.22: Average of Altman-Z" Score[27]: 2005-2007

	2008,1	2008,2	2009,1	2009,2	2010,1	2010,2	2011,1	2011,2	2012,1	2012,2	Z"-Score Average
JII	3.04	4.35	2.54	3.15	3.60	3.31	4.49	4.32	3.96	4.43	3.72
Sharia	1.05	1.31	1.63	1.99	2.29	2.78	3.71	1.29	3.37	2.49	2.19
non-*Sharia*	0.49	1.62	-0.28	0.22	0.93	1.59	2.57	2.37	4.22	4.34	1.81

Notes:Altman Z'' score: Z'' > 2.60 is in "Safe" Zone; 1.1 < Z'' < 2.60 is in "Grey" Zone; Z" < 1.1 is in "Distress" Zone.

The result of average of Ohlson-Score, is shown in Table 4.23. It shows that all the groups have scores less than the cut-off (0.38). This means that all groups are predicted to not experience financial distress (Ohlson 1980). The smallest value of Ohlson-Score is JII stocks and the largest one is non-*Sharia* stocks.

Table 4.23: Average of Ohlson-Z Score[28]: 2008-2012

	2008,1	2008,2	2009,1	2009,2	2010,1	2010,2	2011,1	2011,2	2012,1	2012,2	O-Score Average
JII	-84.35	-9.00	-7.21	-7.43	-11.42	-11.16	-15.97	-16.58	-10.34	-12.61	-18.61
Sharia	-31.14	-7.58	-11.80	-5.95	1.23	-10.55	-8.18	-6.60	-7.58	-7.34	-9.55
non-*Sharia*	-3.22	-7.26	-9.30	-8.84	-9.21	-8.43	-7.74	-8.74	-7.43	-8.80	-7.90

Notes: Ohlson-Score >cut-off (0.38) predicted financial distress

4.3.8 Summary of 2008-2012 Period Results

The results listed in Table 4.24 show a summary of the period of 2008-2012. It shows that GARCH (2,0) with turnover as liquidity proxy is stronger than with spread as liquidity proxy since the coefficient of ARCH second order (0.608966) with turnover liquidity proxy is bigger than the coefficient of ARCH second order (0.436377) group with spread liquidity proxy. Also, the significance of ARCH term is higher at 0.0004 compared to 0.0005. Further, the JII dummy JII with turnover as liquidity proxy was significant at the 10% level. However, leverage effect is not captured in IDX, as seen in the results of EGARCH reported in Table 4.15.

Summary of results states that based on ARCH/GARCH model, for period 2008-2012 either with turnover as liquidity proxy or spread as liquidity proxy had volatility that was influenced by ARCH term or the lag of the square residual at 1 %

[27]Z'' Score Model for Manufacturers, non-Manufacturer Industrials, & Emerging Market Credits: Z'' = $6.56X_1$+ $3.26X_2$+ $6.72X_3$+ $1.05X_4$ where X_1 is working capital divided by total assets; X_2 is Retained earning divided by total assets; X_3 is earning before interest and taxes divided by total assets; X_4 is Market value of equity divided by total debt.

[28]Ohlson-Score or O=-1.32 -0.407X_1 + 6.03X_2 - 1.43X_3 + 0.075dX_4 - 2.37X_5 - 1.83X_6 + 0.285X_7 - 1.72 X_8 - 0.521 X_9, where is X_1 is Size(log(total assets divided by GNP price-level index)); X_2 is TLTA(Total liabilities divided by total assets; X_3 is WCTA(Working capital divided by total assets); X_4 is CLCA (Current liabilities divided by current assets); X_5 is NITA(Net income divided by total assets); X_6 is FUTL(Funds provided by operations divided by total liabilities); X_7 is INTWO(One if net income was negative for the last two years); X_8 is OENEG(one if total liabilities exceeds total assets, zero otherwise); X_9 is CHIN ((Ni_t – Ni_{t-1})/ (INI_tI + $INI_{t-1}I$), where Ni_t is net income).

level and with turnover as liquidity proxy had volatility that was influenced by ARCH term and also influenced by JII dummy at the 10% level.

Additionally, it is found that JII stocks had the lowest leverage compared to non-JII (*Sharia* and non-*Sharia*) stocks. It was also found that JII stocks had the highest average turnover ratio compared to other groups. Additionally, it was found that *Sharia* stocks have lower leverage ratio than non-*Sharia* stocks and slightly bigger leverage ratio than JII stocks.

Using other measures of risk such as Altman-Z" scores, this study also finds that JII stocks are in the "Safe" Zone because the Altman Z" Score (3.72) is > 2.60. The Altman Z" Score of non-*Sharia* stocks which have the highest leverage ratio are in the "Grey" Zone as well as *Sharia* stocks in "Grey" Zone.

Based on the finding of Altman-Z Score, it can be said that *Sharia* and non-*Sharia* stocks are in the "Grey" Zone implying that they have a higher chance of becoming insolvent. Additionally, based on all of the results it is seen that JII stocks which have the lowest leverage, high market capitalisation and high liquidity, are therefore 'Safer" compared to other groups such as *Sharia* stocks and non-*Sharia* stocks.

Additionally, based on Ohlson-Score, this study finds that all the groups had scores less than the cut-off point (0.38). This means that all groups are predicted to not experience financial distress.

Table 4.24: Summary GARCH and EGARCH model

GARCH(1,1) $\sigma_t^2 = \omega + \alpha\varepsilon^2_{t-1} + \beta\sigma^2_{t-1} + \gamma_1$ dummyJII + γ_2 dummy *Sharia*

EGARCH(1,1) $\ln_{\sigma t}^2 = \alpha + \beta(|\varepsilon_{t-1/\sigma t-1} - \sqrt{}_{2/\pi}|) + \gamma\varepsilon_{t-1/\sigma t-1} + \omega\ln_{\sigma}^2{}_{t-1} + \theta_1$dummyJII+ $\theta_2$dummy *Sharia*

Variables (period)	GARCH Liquidity proxy group								EGARCH (1,1)			
	Turnover				Spread				Turnover		Spread	
	GARCH (1,1)		GARCH(2,0)		GARCH (1,1)		GARCH(2,0)					
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
(2005-2007)												
ARCH					-0.13942	0.0064	0.09197	0.5394				
GARCH					0.44721	0.3538	-	-				
dummy JII					-0.00067	0.5865	0.00045	0.6989				
(2008-2012)												
ARCH	-0.06225	0.2165	0.6089	***0.000	-0.06651	0.0000	0.43638	***0.000				
GARCH	0.58342	0.3346	-	-	0.84541	0.0000	-	-				
dummy JII	0.00003	0.9628	0.0017	*0.0989	-0.00029	0.6793	0.00160	0.2209				
dummy *Sharia*	0.00002	0.9781	0.0010	0.3184	-0.00058	0.5626	0.00064	0.5692				
α									-9.65057	***0.00	-2.17098	0.3598
β									-0.33285	**0.032	-0.10876	0.5055
γ									-0.00376	0.969	0.15908	0.2363
ω									-0.86696	***0.000	0.55645	0.2495
θ1									-0.35569	0.46	-0.04612	0.7435
θ2									0.04191	0.94	-0.10581	0.5898

*** Indicates statistical significance at the 0.01 level
** Indicates statistical significance at the 0.05 level
* Indicates statistical significance at the 0.10 level
Notes: Dependent Variable: Excess Return
Sample (adjusted): Sample: 177, January 2008 to November 2012
Method: ML - ARCH (Marquardt) - Normal distribution

4.4 Trading Volume Activity of JII Stocks During GFC

4.4.1 Preliminaries

The sample used in this study was generated by matching all the firms that were listed in IDX during this period. Firms were matched based on industry sector then by market capitalisation, and the process resulted in 15 stocks for JII stocks, 25 stocks for *Sharia* stocks and 22 stocks for non-*Sharia* stocks. In this study monthly Trading Volume Activity (TVA) is used from October 2007 up to October 2009 (see the Table 4.25 below).

Table 4.25: Sample Size[29]

JII	15
Sharia	25
non-*Sharia*	22

One sample t-test of the three sub-samples is shown in Table 4.26. The average trading volume activity (ATVA) is positive and significant in the month before the announcement month for JII and non-*Sharia* stocks but not significant for *Sharia* stocks. In addition, it is found that the result is positive and significant ATVA for the announcement month and the next trading month for JII and *Sharia* stocks. However, for non-*Sharia* ATVA is significant for the announcement month and insignificant after the announcement month. It implies that for JII stocks there is abnormal TVA surrounding announcement month which is significant at the 1% level and 5% level except the third month before the announcement month. Additionally, for *Sharia* stocks, there is abnormal TVA surrounding the announcement month at 1% level up to 10% level except the first, second, eleventh and twelfth months before the announcement month. Next, for non-*Sharia* stocks, there is abnormal TVA surrounding the announcement month at 1% level up to 10% level except the first month after the announcement month.

In addition, paired sample t-test is reported on Table 4.27. The statistical tests compare TVA of sample firms before and after the announcement of IDX suspension. For JII stocks there is no significant impact on TVA during the announcement month. However, 2-months after announcement it was significantly lower at the 5% level compared to the period prior to announcement. For *Sharia*-compliant stocks, after the announcement, the1-month and 2-month TVA were not significantly lower than prior announcement. However, the level of TVA started to move significantly lower at the 5% level in the third-month. For non-*Sharia* stocks, after the announcement the 1-month TVA is significantly higher than prior announcement period, although only significant at the 10% level in the 1-month and 5% level in the fifth-month. This result is consistent with the theory in which JII will

[29]Matching data used in this study is based on market capitalisation of industry sector from October 2007 up to October 2009.

experience smaller trading volume activity than non-*Sharia* with respect to informational event (IDX Suspended).

Furthermore, (see Table 4.27), for JII and *Sharia*, the post announcement TVA starts increasing from the 6thmonth. However, the post announcement TVA for non-*Sharia* starts decreasing from the 11-month. This finding is consistent with the theory that logically, after the announcement, JII stocks will experience less trading volume activity than non-JII stocks due to the traders conducting more selling activity of risky stocks to avoid loss. In addition, regarding this event, investors interpret that IDX suspension is bad news. Therefore, investors conduct more transaction in non-*Sharia* stocks to avoid loss, since non-*Sharia* stocks have a higher volatility or higher risk than JII stocks and *Sharia* stocks.

Table 4.26: One Sample t-test of TVA

Event Month	JII			*Sharia*			Non *Sharia*		
	Average TVA	t - statistic	p-value	Average TVA	t - statistic	p-value	Average TVA	t – statistic	p-value
-12	42.580	7.230	***.000	108.438292	1.667	.119	89.126	2.819	**.014
-11	49.427	2.832	**.014	68.650984	1.743	.105	89.572	2.426	**.029
-10	31.993	2.786	**.015	105.242392	3.466	***.004	40.609	2.648	**.019
-9	39.613	2.861	**.013	56.889620	1.782	*.098	72.608	2.058	**.059
-8	30.348	2.876	**.013	30.264256	2.426	**.031	47.424	2.697	**.017
-7	39.841	3.251	***.006	31.182384	1.999	*.067	42.249	2.548	**.023
-6	51.151	3.209	***.007	110.430743	2.279	**.040	67.913	1.812	*.091
-5	163.145	7.752	***.000	134.843886	3.383	***.005	64.548	2.262	**.040
-4	272.094	6.332	***.000	57.165141	3.248	***.006	33.085	1.976	*.068
-3	148.382	1.475	.164	48.019935	3.574	***.003	37.414	2.196	**.045
-2	110.293	7.208	***.000	36.585529	1.678	.117	31.336	2.259	**.040
-1	102.985	2.283	**.040	38.756763	1.645	.124	55.511	1.859	*.084
0	42.568	6.057	***.000	22.214254	2.574	**.023	37.744	2.177	**.047
1	57.561	3.304	***.006	33.935319	1.847	*.088	60.708	1.205	.248
2	48.553	2.493	**.027	15.481414	2.318	**.037	53.010	2.115	*.053
3	55.180	2.266	**.041	11.796187	2.261	**.042	39.736	2.100	*.054
4	65.264	4.492	***.001	19.203313	2.489	**.027	80.579	1.872	*.082
5	50.325	2.425	**.031	53.928796	2.476	**.028	102.093	1.594	.135
6	238.423	2.173	**.049	129.981208	3.282	***.006	240.947	2.173	**.047
7	290.306	9.159	***.000	198.895263	1.866	*.085	334.252	1.955	*.071
8	186.848	2.449	**.029	142.541449	2.042	*.062	143.602	2.852	**.013
9	126.047	2.702	**.018	76.663220	3.833	***.002	98.050	2.554	**0.02
10	111.845	2.451	**.029	109.321991	2.952	**.011	178.630	2.327	**.035
11	56.172	3.027	**.010	30.220365	2.493	**.027	51.011	2.670	**.018
12	75.150	2.406	**.032	35.385237	2.495	**.027	77.298	3.934	***.001

*** Indicates statistical significance at the 0.01 level
** Indicates statistical significance at the 0.05 level
* Indicates statistical significance at the 0.10 level

Table 4.27: Paired Sample t-test of TVA

Event Month	JII				*Sharia*				non-*Sharia*			
	TVA Before	TVA After	t-statistics	p-value	TVA Before	TVA After	t-statistics	p-value	TVA Before	TVA After	t-statistics	p – value
1	102.985375	57.561080	1.165	.265	38.7567630	33.9353195	1.025	.324	55.5111069	60.7079899	1.859	*.08
2	110.292510	48.552780	2.433	**.030	36.5855291	15.4814145	1.440	.173	31.3364906	53.0103217	-1.405	.182
3	148.382201	55.179840	.923	.373	48.0199350	11.7961875	2.716	**.018	37.4144240	39.7357520	-.272	.790
4	272.094324	65.263917	1.331	.206	57.1651409	19.2033128	2.762	**.016	33.0848674	80.5786507	-1.669	.117
5	163.144952	50.325181	2.362	**.034	134.8438858	53.9287958	1.338	.204	64.5482616	102.0930387	2.188	**.048
6	51.151311	238.423335	-1.742	.105	110.4307426	129.9812082	-.761	.460	67.9127999	240.9465719	-2.008	*.064
7	39.840996	290.305919	-1.583	.137	31.1823839	198.8952627	-1.740	.105	42.2491840	334.2515353	2.531	**.024
8	30.348475	186.848231	-2.147	*0,051	30.2642563	142.5414490	-.613	.550	47.4236443	143.6020743	-2.282	**.039
9	39.612879	126.046949	-2.365	**.03	56.8896195	76.6632204	-1.020	.326	72.6077478	98.0495055	-.987	.340
10	31.992974	111.845471	-2.037	*.06	105.2423918	109.3219911	1.024	.324	40.6093453	178.6302438	-2.085	*.056
11	49.427091	56.171706	-.732	.477	68.6509844	30.2203649	2.540	**.025	89.5723300	51.0108014	1.442	.171
12	42.579609	75.149943	-1.301	.216	108.4382922	35.3852368	1.860	*.086	89.1260668	77.2983039	.510	.618

*** Indicates statistical significance at the 0.01 level
** Indicates statistical significance at the 0.05 level
* Indicates statistical significance at the 0.10 level

The results of independent sample t-test can be seen in Table 4.28[30]. It was found that the p-value of JII versus *Sharia* stocks comparison is0.172, p-value of JII versus non-*Sharia* comparison is 0.574 and the p-value of *Sharia* versus non-*Sharia* comparison is 0.362. This implies that the comparison between JII and *Sharia* statistically is not different so is the comparison between JII and non-*Sharia*. Similarly, the comparison between *Sharia* and non-*Sharia* is not different.

In summary, based on the results mentioned before, although TVA of JII is less than non-JII after the GFC, however, based on paired sample t-test, this is statistically significantly lower than announcement month on the second day after the announcement day. Additionally, for TVA of *Sharia* stocks there is significantly lower TVA than the announcement day on the third day after the announcement and for TVA of non-*Sharia* stocks, there is higher significantly than announcement day on fifth day after the announcement day. However, from independent sample t-test is found that there is no statistically significant difference between JII and non-JII. Therefore, this finding does not support hypothesis 5 which states that TVA of JII is less than non-JII after GFC.

Table 4.28: Independent Sample t-test of TVA

	Independent sample t test		Mean Difference
	t-statistics	p-value	
JII vs *Sharia*	1.388	0.172	0.12539
JII vs non-*Sharia*	0.565	0.574	0.04622
Sharia vs non-*Sharia*	-0.921	0.362	-0.07917

4.4.2 Regression Results

Table 4.29: TVA Regressions

Regression of monthly trading volume activity on stocks during period October 2007-October 2009
The table provide the coefficient estimates from regression of trading volume.
$TVAjt = \alpha i + \beta_{1i} T_{Mt} + \beta_{2i} JII + \beta_{3i} Sharia + et$. Where TVA is trading volume activity of stock and T_M is market trading volume, JII and *Sharia* are dummy of JII and dummy of *Sharia* respectively.

Variables	β Coefficient	t	p-value	Adjusted R-square
Constanta(αi)	-1.051	-0.08	0.936	0.543
Market trading volume (T_{mt})	24238.69	9.254	***0.000	
dummy of JII	12.682	0.994	0.324	
dummy of *Sharia*	-18.521	-1.451	0.151	

*** Indicates statistical significance at the 0.01 level

The empirical results of regression reported in Table 4.29 show that the market trading volume is significant at the 1% level, while dummy of JII and dummy of *Sharia* are not significant. Additionally, it is found that the value of adjusted R-square is 54.3%. It implies that 54.3% of the variation in TVA is explained by market trading volume. Therefore, it can be said that there is no significant difference

[30]Monthly TVA computed from October 2007 up to October 2009.

in TVA between JII and other groups (*Sharia* and non-*Sharia*) due to dummy variables not being significant. In other words, these findings do not support the hypothesis H5, which states that trading volume activity (TVA) of JII is less than non-JII after Global Financial Crisis.

4.5 Stocks Entering and Leaving JII

This study investigates[31] the effect of stocks entering and leaving JII. We conduct regressions and event study in relation to stocks entering and leaving JII.

4.5.1 Descriptive Statistics

Table 4.30 provides descriptive statistics of data from June 2005 up to May 2012. The biggest mean is market spread which is 42.06043, and the smallest one is mean of return which is 0.000530. The biggest standard deviation is market spread which is 5.320193 and the smallest is TVA which is 0.002109.

Table 4.30: Descriptive statistics

Variables	Mean	St. Deviation
Return	0.000530	0.007278
Marketreturn	0.001279	0.004849
TVA	0.006335	0.002109
Market TVA	0.010530	0.046209
Spread	0.046926	0.004946
Market spread	42.06043	5.320193

4.5.2 The impact of entering and leaving on return

The empirical results regarding t-test of the sample are reported in Table 4.31 to Table 4.32. For one sample t-test in Table 4.31, a positive significant abnormal return was found on the first day after the announcement for stocks entering JII. This result is consistent with prior evidence which reports that price pressure hypothesis is supported in which the abnormal return in the first trading day after announcement day is around +3% from the prior announcement day (Chen, Noronha & Singal 2004; Harris & Gurel 1986).

For stocks leaving JII, they earned positive significant abnormal return on the 1-day after the announcement. This result is inconsistent with prior evidence. However, on the second day after the announcement, stocks leaving JII earned negative significant abnormal return. The result of one sample t-test can be seen in Table 4.31.

For pair sample t-test result of the cumulative abnormal returns of sample stocks before and after the announcement of stock entering and leaving JII, it is

[31] The model used is equation 8, 10 and 11 in chapter 3, $R_{it} = \alpha_i + \beta_1 R_{mt} + \beta_2 E_t + et$; $T_{it} = \alpha i + \beta_{1i} T_{mt} + \beta_{2i} E_t + et$; and $S_{it} = \alpha i + \beta_{1i} S_{mt} + \beta_{2i} E_t + et$

found that for entering stocks, the 1-day Cumulative Abnormal Return (CAR)[32] after the announcement is not significantly lower than the pre-announcement period. However, the 2-day and the 3-day CAR after the announcement are significantly higher than the pre-announcement period. The result of paired sample t-test can be seen on Table 4.32.

For leaving stocks of JII, interestingly because the 1-day CAR after the announcement and the 2-day are significantly higher than pre-announcement. This result is inconsistent with the prior study in which after the announcement for leaving stocks will experience a lower CAR.

[32] CAR in this case is computed by summation of abnormal returns for the number of days cumulative from the day of announcement

Table 4.31:One Sample t-test of Return & TVA of Entering & Leaving Stocks

Event Date	Average Ab Ret of Entering Stocks	t-statistic	p-Value	Average Ab Ret of Leaving Stocks	t-statistic	p-Value	Average TVA of Entering Stocks	t-statistic	p-Value	Average TVA of Leaving Stocks	t-statistic	p-Value
-20	0.0043298	-21.709	***.000	-0.0015998	-19.610	***.000	0.00799	3.592	***.003	0.00445	3.411	***.004
-19	0.0008571	.317	.752	-0.0019138	-26.248	***.000	0.01045	3.468	***.004	0.00611	2.850	**.013
-18	0.0028924	-22.728	***.000	0.0002087	.056	.955	0.01040	3.875	***.002	0.00842	-17.696	***.000
-17	0.0031705	-22.145	***.000	0.0092450	-20.750	***.000	0.01016	2.922	**.011	0.00745	2.317	**.036
-16	0.0093541	-23.550	***.000	-0.0019458	-.580	.563	0.00824	4.282	***.001	0.00862	2.723	**.016
-15	0.0030588	-25.054	***.000	0.0016645	-24.755	***.000	0.01163	2.688	**.018	0.00730	3.215	***.006
-14	0.0008681	-23.894	***.000	-0.0052004	-1.651	.102	0.00926	2.378	**.032	0.00455	3.841	***.002
-13	- 0.0009350	-17.772	***.000	0.0007526	.226	.821	0.00932	3.779	***.002	0.00406	4.525	***.000
-12	- 0.0049194	-25.426	***.000	-0.0033598	-1.163	.248	0.00862	3.654	***.003	0.00531	2.365	**.033
-11	0.0043165	-24.378	***.000	0.0009706	.359	.720	0.00927	3.654	***.003	0.01238	-15.598	***.000
-10	- 0.0029835	-1.189	.237	0.0021839	.868	.388	0.00981	4.286	***.001	0.00701	-16.640	***.000
-9	0.0017308	-22.297	***.000	0.0000310	.018	.986	0.00744	5.990	***.000	0.00506	3.073	***.008
-8	- 0.0115147	-20.607	***.000	-0.0056873	-31.995	***.000	0.00595	5.065	***.000	0.00508	4.327	***.001
-7	0.0011082	-28.288	***.000	-0.0021227	-21.590	***.000	0.00773	5.909	***.000	0.00448	4.551	***.000
-6	0.0081094	-21.621	***.000	0.0083777	-20.061	***.000	0.00836	4.674	***.000	0.00433	4.391	***.001
-5	0.0009030	-23.787	***.000	-0.0027364	-1.021	.310	0.00772	4.745	***.000	0.00470	3.746	***.002
-4	- 0.0031079	-22.460	***.000	-0.0012147	-26.577	***.000	0.00662	4.446	***.001	0.00401	5.756	***.000
-3	- 0.0057175	-27.605	***.000	-0.0003768	-25.194	***.000	0.00795	3.653	***.003	0.00426	5.766	***.000
-2	0.0009975	.441	.661	-0.0049360	-2.331	**.022	0.00633	3.811	***.002	0.00393	4.767	***.000
-1	0.0049696	-22.100	***.000	-0.0039330	-1.404	.164	0.00588	4.152	***.001	0.00320	4.050	***.001
0	-0.0007205	477.990	***.000	-0.0025249	-1.104	.273	NA			0.00363	4.432	***.001
1	0.0012623	-24.706	***.000	0.0005129	-26.514	***.000	0.00642	4.586	***.000	0.00478	3.040	***.009
2	0.0025282	-22.764	***.000	-0.0021761	-31.201	***.000	0.00636	3.467	***.004	0.00501	3.999	***.001
3	- 0.0029222	-1.233	.221	0.0028732	-23.182	***.000	0.00457	5.255	***.000	0.00548	4.655	***.000
4	0.0067614	-23.709	***.000	0.0036421	-25.459	***.000	0.00658	3.551	***.003	0.00581	2.777	**.015
5	0.0039969	-20.706	***.000	0.0068648	-22.194	***.000	0.00670	3.835	***.002	0.00810	-20.625	***.000
6	0.0002454	.082	.935	-0.0012182	-0.461	.646	0.00818	3.329	***.005	0.00646	2.298	**.037
7	- 0.0084035	-3.446	***.001	-0.0020805	-.686	.495	0.00481	4.658	***.000	0.00552	2.862	**.013
8	- 0.0015308	-.517	.607	-0.0012662	-.470	.640	0.00534	4.486	***.001	0.00604	3.018	***.009
9	- 0.0033195	-1.427	.157	0.0096819	-20.671	***.000	0.00462	4.6	***.000	0.00569	2.942	**.011
10	0.0031959	-26.708	***.000	0.0015980	0.704	.483	0.00414	5.507	***.000	0.00513	3.971	***.001
11	0.0001166	-26.143	***.000	0.0037825	-23.612	***.000	0.00402	7.181	***.000	0.00577	2.304	**.037
12	0.0000661	.026	.980	-0.0026557	-1.004	.318	0.00366	7.434	***.000	0.00510	2.884	**.012
13	0.0000637	-24.097	***.000	-0.0025748	-1.485	.141	0.00505	4.302	***.001	0.00394	4.138	***.001
14	0.0028821	-21.823	***.000	-0.0002195	-.435	.664	0.01079	-15.449	***.000	0.00433	3.652	***.003
15	- 0.0028097	-21.108	***.000	-0.0000594	-.033	.974	0.00876	-18.024	***.000	0.00393	4.825	***.000
16	- 0.0003789	-.163	.871	0.0012290	-23.037	***.000	0.00472	3.204	***.006	0.00535	3.378	***.005
17	- 0.0064941	-22.213	***.000	0.0045696	-25.746	***.000	0.00410	4.460	***.001	0.00592	4.383	***.001
18	- 0.0023481	-24.908	***.000	-0.0026139	-.837	.405	0.00485	4.113	***.001	0.00601	4.733	***.000
19	- 0.0019371	-.718	.474	0.0031263	-24.739	***.000	0.00366	6.718	***.000	0.00843	-16.577	***.000
20	- 0.0105154	-25.194	***.000	-0.0031520	-35.898	***.000	0.00504	3.142	***.007	0.00655	2.319	**.036

*** Indicates statistical significance at the 0.01 level

** Indicates statistical significance at the 0.05 level

Table 4.32:Paired Sample t-test of Return & ATVA of Entering & Leaving Stocks

Cumulative	CAR of Entering Stocks		t-Statistics	p-Value	CAR of Leaving Stocks		t-Statistics	p-Value	ATVA of Entering Stocks		t-Statistics	p-Value	ATVA of Leaving Stocks		t-Statistics	p-Value
Days	Before	After			Before	After			Before	After			Before	After		
1	0.4572	0.1161	1.094	0.284	-0.3618	0.0472	26.713	***.000	0.0059	0.0064	-0.565	.581	0.0032	0.0048	-1.029	.321
2	0.0918	0.2326	22.908	***.000	-0.4541	-0.2002	31.079	***.000	0.0063	0.0064	-0.04	.969	0.0039	0.0050	-1.255	.230
3	-0.5260	-0.2688	27.596	***.000	-0.0347	0.2643	-1.668	0.108	0.0080	0.0046	1.641	.123	0.0043	0.0055	-1.181	.257
4	-0.2859	0.6220	0.334	0.742	-0.1118	0.3351	-0.763	0.453	0.0066	0.0066	.034	.973	0.0040	0.0058	-.985	.342
5	0.0831	0.3677	-0.973	0.34	-0.2517	0.6316	21.992	***.000	0.0077	0.0067	0.596	.561	0.0047	0.0081	20.777	***.000
6	0.7461	0.0226	21.597	***.000	0.7707	-0.1121	20.2	***.000	0.0084	0.0082	.072	.943	0.0043	0.0065	-.816	.428
7	0.1020	-0.7731	27.765	***.000	-0.1953	-0.1914	21.259	***.000	0.0077	0.0048	3.205	***.006	0.0045	0.0055	-.590	.564
8	-1.0594	-0.1408	20.477	***.000	-0.5232	-0.1165	31.564	***.000	0.0060	0.0053	.597	.560	0.0051	0.0060	-.695	.498
9	0.1592	-0.3054	22.371	***.000	0.0029	0.8907	20.49	***.000	0.0074	0.0046	2.336	**.035	0.0051	0.0057	-.802	.436
10	-0.2745	0.2940	26.604	***.000	0.2009	0.1470	0.19	0.85	0.0098	0.0041	2.649	**.019	0.0070	0.0051	16.784	***.000
11	0.3971	0.0107	1.242	0.228	0.0893	0.3480	23.047	***.000	0.0093	0.0040	2.349	**.034	0.0124	0.0058	15.828	***.000
12	-0.4526	0.0061	25.637	***.000	-0.3091	-0.2443	-0.171	0.865	0.0086	0.0037	2.347	**.034	0.0053	0.0051	.244	.811
13	-0.0860	0.0059	-1.448	0.168	0.0692	-0.2369	0.813	0.418	0.0093	0.0051	2.580	**.022	0.0041	0.0039	.229	.822
14	0.0799	0.2652	0.286	0.778	-0.4784	-0.0202	-1.284	0.202	0.0093	0.0108	15.635	***.000	0.0046	0.0043	.254	.803
15	0.2814	-0.2585	1.846	*.095	0.1531	-0.0055	24.886	***.000	0.0116	0.0088	18.309	***.000	0.0073	0.0039	1.693	.112
16	0.8606	-0.0349	23.666	***.000	-0.1790	0.1131	23.144	***.000	0.0082	0.0047	2.090	*.055	0.0086	0.0054	1.275	.223
17	0.2917	-0.5975	1.095	0.287	0.8505	0.4204	0.893	0.381	0.0102	0.0041	1.913	*.076	0.0075	0.0059	.595	.561
18	0.2661	-0.2160	0.731	0.475	0.0192	-0.2405	0.648	0.519	0.0104	0.0049	2.441	**.029	0.0084	0.0060	17.834	***.000
19	0.0789	-0.1782	0.844	0.401	-0.1761	0.2876	-0.871	0.396	0.0105	0.0037	2.452	**.028	0.0061	0.0084	16.799	***.000
20	0.3983	-0.9674	0.446	0.663	-0.1472	-0.2900	1.272	0.217	0.0080	0.0050	1.397	.184	0.0045	0.0066	-1.114	.284

*** Indicates statistical significance at the 0.01 level

** Indicates statistical significance at the 0.05 level

* Indicates statistical significance at the 0.10 level

4.5.3 The impact of entering and leaving on trading volume

The empirical result regarding t-test of sample is reported in Table 4.31 and Table 4.32. This study found that for one sample t-test of TVA, the result shows positive significance for TVA on the first day after the announcement for stocks entering the market. This result is consistent with the price pressure hypothesis reported in prior evidence. A temporary increase in stock price is followed by permanent changes in trading volume (Chen, Noronha & Singal 2004; Harris & Gurel 1986).

However, for leaving stocks, TVA on the first day after the announcement day is positive and significant. This result is inconsistent with prior evidence on price pressure which indicates that leaving firms experience negative trading volumes.

In addition, the results of paired sample t-test of TVA reported in Table 4.32 show that the result of comparing ATVA of sample firms entering JII find that the 1-day ATVA after the announcement day is insignificantly higher than prior to the announcement. Additionally, the post announcement ATVAs start decreasing from about day 3. This evidence is consistent with the prior evidence although the increase in ATVA after announcement date is insignificant.

For ATVA of sample firms leaving JII, it was found that the first day ATVA after the announcement day is insignificantly higher than prior announcement. This result is inconsistent with the prior evidence in which leaving stocks from index will experience smaller trading volume activity on the first day after the announcement day with respect to informational event.

Regarding the results that found permanent changes in TVA of entering stocks which indicate price pressure hypothesis and a positive ATVA of leaving stocks after the announcement day, this evidence could indicate that stocks leaving the JII have high liquidity. It implies that when stocks leave the JII, investors are still buying these stocks and leading the price increase and getting a positive ATVA.

4.5.4 The impact of entering and leaving on spread

The empirical results regarding t-test of sample are reported in Table 4.33 and Table 4.34. For one sample t-test of spread (see Table 4.33), it was found that the result was a positive significant of spread on the 1-day and the 2-day either for entering and leaving stocks after the announcement. It means that there is a significant change in spread after announcement date.

In addition, the result of paired sample t-test in Table 4.34 reported that the result of statistical test comparing spread of sample stocks entering JII the first day after announcement spread is significantly higher than the prior announcement. This result is inconsistent with prior evidence. However, the 2-day after announcement spread is not significantly higher than the prior announcement. The interesting of the result here is that the post announcement spread start decreasing significantly from about day 3. This evidence is slightly different with prior evidence in where there is a decrease in the long term spread.

For sample stocks leaving JII, after announcement the1-day spread are significantly lower than prior announcement. This result is inconsistent with prior evidence. However, the 2-day spread is significantly higher than prior announcement. In addition, the post announcement spread start increasing from about day 10 although is not consistent until day 20.

Table 4.33: One sample t-test Corwin & Schultz Spread

Event Date	Entering Stocks			Leaving Stocks		
	Average Spread	t statistic	p-Value	Average Spread	t statistic	p-Value
-20	0.0540103	-45.461	***.000	0.05131	-46.687	***.000
-19	0.0528126	-46.753	***.000	0.05227	-44.832	***.000
-18	0.0525059	14.176	***.000	0.05341	-49.175	***.000
-17	0.0558931	-42.142	***.000	0.04967	-53.976	***.000
-16	0.0493321	-43.190	***.000	0.04567	13.453	***.000
-15	0.0565546	-42.711	***.000	0.04867	-50.152	***.000
-14	0.0622024	-37.864	***.000	0.05007	-47.126	***.000
-13	0.0542766	-39.845	***.000	0.04537	-48.047	***.000
-12	0.0528680	-42.930	***.000	0.04408	-53.446	***.000
-11	0.0496200	14.633	***.000	0.04265	19.307	***.000
-10	0.0507142	14.234	***.000	0.04430	16.467	***.000
-9	0.0495769	13.336	***.000	0.05171	-43.243	***.000
-8	0.0553682	-43.687	***.000	0.05300	-40.899	***.000
-7	0.0596706	-40.777	***.000	0.05372	-42.179	***.000
-6	0.0526151	-42.276	***.000	0.04846	11.752	***.000
-5	0.0510417	-47.038	***.000	0.04524	12.053	***.000
-4	0.0493124	12.763	***.000	0.04590	-43.578	***.000
-3	0.0447475	14.062	***.000	0.04307	13.746	***.000
-2	0.0426755	-48.705	***.000	0.04288	15.010	***.000
-1	0.0408247	-52.507	***.000	0.04472	-49.827	***.000
0	0.0421986	-50.385	***.000	0.03967	-54.479	***.000
1	0.0454868	-52.532	***.000	0.03916	-44.995	***.000
2	0.0455234	-52.912	***.000	0.04476	-41.749	***.000
3	0.0447118	-49.847	***.000	0.04413	13.375	***.000
4	0.0473344	-47.603	***.000	0.04202	14.817	***.000
5	0.0422701	-51.492	***.000	0.04134	15.722	***.000
6	0.0394164	17.341	***.000	0.04239	14.626	***.000
7	0.0403968	-57.141	***.000	0.04165	-52.360	***.000
8	0.0427708	-55.127	***.000	0.04151	15.009	***.000
9	0.0446607	15.215	***.000	0.04597	12.383	***.000
10	0.0440752	-47.881	***.000	0.04674	11.915	***.000
11	0.0461295	-46.866	***.000	0.04690	-48.799	***.000
12	0.0483164	-47.145	***.000	0.04898	13.526	***.000
13	0.0485087	14.144	***.000	0.04848	13.933	***.000
14	0.0475908	-48.738	***.000	0.04378	13.904	***.000
15	0.0421927	16.119	***.000	0.04283	12.317	***.000
16	0.0393297	-60.439	***.000	0.04508	11.249	***.000
17	0.0429736	13.442	***.000	0.05113	-41.217	***.000
18	0.0423233	-55.098	***.000	0.04942	-40.723	***.000
19	0.0416465	15.540	***.000	0.04624	13.926	***.000
20	0.0425477	-56.820	***.000	0.04259	15.044	***.000

*** Indicates statistical significance at the 0.01 level

The increasing spread of entering stocks and decreasing spread of leaving stocks after the announcement day could be explained by the higher liquidity of stocks

leaving JII than stocks entering JII. Therefore, when stocks leave the JII lead lower spread than when stocks enter the JII.

Table 4.34: Paired sample t-test Corwin & Schultz Spread

Cumulative	Average Spread of Entering Stocks		t-statistics	p-value	Average Spread of Leaving Stocks		t-statistics	p-value
Days	Before	After			Before	After		
1	0.04083	0.04549	-1.885	*.063	0.04472	0.03916	-2.029	**.046
2	0.04267	0.04552	1.433	.156	0.04288	0.04476	44.257	***.000
3	0.04475	0.04471	53.916	***.000	0.04307	0.04413	-.351	.727
4	0.04931	0.04733	51.196	***.000	0.04590	0.04202	46.361	***.000
5	0.05104	0.04227	2.586	**0.011	0.04524	0.04134	1.098	.275
6	0.05262	0.03942	44.955	***.000	0.04846	0.04239	1.376	.172
7	0.05967	0.04040	4.297	***.000	0.05372	0.04165	2.063	**.042
8	0.05537	0.04277	-2.023	**0.046	0.05300	0.04151	42.905	***.000
9	0.04958	0.04466	1.266	.209	0.05171	0.04597	45.809	***.000
10	0.05071	0.04408	51.734	***.000	0.04430	0.04674	-.690	.492
11	0.04962	0.04613	51.128	***.000	0.04265	0.04690	51.297	***.000
12	0.05287	0.04832	.506	.614	0.04408	0.04898	56.757	***.000
13	0.05428	0.04851	43.306	***.000	0.04537	0.04848	48.758	***.000
14	0.06220	0.04759	1.039	.302	0.05007	0.04378	49.966	***.000
15	0.05655	0.04219	45.128	***.000	0.04867	0.04283	54.375	***.000
16	0.04933	0.03933	1.789	*0.077	0.04567	0.04508	.120	.905
17	0.05589	0.04297	44.662	***.000	0.04967	0.05113	-.500	.619
18	0.05251	0.04232	59.186	***.000	0.05341	0.04942	1.609	.111
19	0.05281	0.04165	48.591	***.000	0.05227	0.04624	47.011	***.000
20	0.05401	0.04255	2.048	**0.044	0.05131	0.04259	49.128	***.000

*** Indicates statistical significance at the 0.01 level
** Indicates statistical significance at the 0.05 level

4.5.5 The empirical results of comparing spread between Corwin & Schultz and Actual: Entering and Leaving

In this section, this study compares the result of Corwin and Schultz spread with actual spread. This study reports that both the Corwin and Schultz spread and Actual spreads have similar effects on stocks entering and leaving JII. In general, entering stocks have wider spreads on average compared to stocks leaving JII. The interesting finding here is that, the 1-day after the announcement day, either Corwin and Shultz spread or Actual spread experienced the same evidence in where for stocks entering JII, either Corwin and Shultz spread or Actual spread has bigger spread after the announcement day than the announcement day.

Table 4.35: Corwin & Schultz and Actual Average Spread

Event Day	Corwin & Schultz Average Spread		Actual AverageSpread	
	Firm Entering	Firm Leaving	Firm Entering	Firm Leaving
-20	0.05401	0.05131	15.6377	16.86607
-19	0.05281	0.05227	19.0764	17.89607
-18	0.05251	0.05341	16.3267	18.73000
-17	0.05589	0.04967	15.2703	16.31899
-16	0.04933	0.04567	15.6804	15.72213
-15	0.05655	0.04867	16.4653	16.07506
-14	0.06220	0.05007	17.0609	15.17494
-13	0.05428	0.04537	18.5750	17.18483
-12	0.05287	0.04408	17.3262	16.55326
-11	0.04962	0.04265	24.1606	17.72011
-10	0.05071	0.04430	21.2010	14.76292
-9	0.04958	0.05171	23.8831	17.58528
-8	0.05537	0.05300	18.3254	13.86146
-7	0.05967	0.05372	18.2491	14.55978
-6	0.05262	0.04846	15.4297	15.13191
-5	0.05104	0.04524	17.9481	14.74416
-4	0.04931	0.04590	21.0881	14.88629
-3	0.04475	0.04307	16.8939	14.19236
-2	0.04268	0.04288	18.2214	12.84921
-1	0.04082	0.04472	20.3470	14.67157
0	0.04220	0.03967	18.4689	16.84640
1	0.04549	0.03916	18.7722	12.87775
2	0.04552	0.04476	17.9499	16.84843
3	0.04471	0.04413	20.3944	16.38798
4	0.04733	0.04202	17.3337	16.14618
5	0.04227	0.04134	17.4248	16.78382
6	0.03942	0.04239	19.5273	16.58247
7	0.04040	0.04165	17.8827	16.21337
8	0.04277	0.04151	18.5226	18.04000
9	0.04466	0.04597	17.5223	17.42933
10	0.04408	0.04674	21.2228	15.68966
11	0.04613	0.04690	22.0162	16.90921
12	0.04832	0.04898	21.3386	16.63809
13	0.04851	0.04848	18.6352	15.26629
14	0.04759	0.04378	21.1488	16.99663
15	0.04219	0.04283	19.2436	17.38427
16	0.03933	0.04508	20.1520	15.57573
17	0.04297	0.05113	16.6812	13.99798
18	0.04232	0.04942	21.9369	17.01393
19	0.04165	0.04624	21.7272	21.53034
20	0.04255	0.04259	18.7178	23.02427
Average	**4.773%**	**4.612%**	**1887.282%**	**1633.338%**

Additionally, for stocks leaving JII, either Corwin and Shultz spread or actual spread has lower spread after the announcement day than the announcement day. This finding is inconsistent with prior evidence in where the spread after the announcement for stocks entering the index will experience a decrease of spread and vice versa for stocks leaving the index. The results can be seen on the Table 4.35.

4.5.6 The empirical results of comparing Turnover Ratio: Entering and Leaving

In this section, this study investigates whether stocks entering JII have bigger turnover ratio than stocks leaving JII. In this study, it uses 20 days prior to

announcement through 20 trading days after (Table 4.36 and Table 4.37 are reported in Appendices I and J respectively). In these tables, it calculates of TVA each period to get turnover ratio of entering stocks and leaving stocks by using the Equation (15) in Chapter Three.

This study reports that stocks entering JII have smaller turnover ratio than stocks leaving JII which is 81.17% and 116.84% respectively. This result is inconsistent with the previous study in which entering stocks into index will experience higher turnover ratio than leaving stocks from index. Furthermore, the proportion of exhibiting an increase in turnover, it is found that there is 15% stocks experience an increase turnover when stocks enter JII. However, there is 65% stocks experience an increase turnover when stocks leave JII (see Table 4.38).

This result confirms that spreads using the Corwin and Schultz approach and actual spread show consistent results, that average spread of stocks entering JII is larger than average spread average of stocks leaving JII. Logically, if trading volume increases, spread will decrease. Based on the finding, this study finds that stocks entering JII have smaller turnover ratio and bigger spread than stocks leaving JII. In summary, changing in JII based on liquidity effect is inconsistent with the evidence in US market.

Table 4.38: Average turnover ratio of entering and leaving stocks

	$\sum_{t=1}^{N} \frac{T_{it}}{T_{mt}}$	$\sum_{t=-20}^{AD-1} \frac{T_{it}}{T_{mt}}$	Turnover Ratio $\sum_{t=1}^{N} \frac{T_{it}}{T_{mt}} : \sum_{t=-20}^{AD-1} \frac{T_{it}}{T_{mt}}$	Proportion of exhibiting an increase in turnover
Stocks Entering	40.764	50.222	81.17%	There is 15% stocks that experience an increase turnover when stocks enter JII
Stocks Leaving	46.837	40.087	116.84%	There is 65% stocks that experience an increase turnover when stocks leave JII

4.5.7 Regression Results

The results of regression can be seen in Table 4.31[33]. Regression based on equation 8 from chapter 3 (reported in Table 4.39) shows that market model of regression of return augmented with dummy variables of entering and leaving produce the value of adjusted R square is 41.17%. The coefficient of market return is positive significant at 1 %, however, there is no significant difference in stock returns between entering, since dummy of entering is not significant. Similar results are found when we use a dummy for leaving instead of entering (not reported to conserve space). Therefore, it appears that when a stock enters or leaves the JII, it does not affect the return.

[33] In this case, this study conducts regression of return, TVA and liquidity which is represented by spread regression.

The regression based on equation 10 (from chapter 3) and reported in Table 4.39 shows that market model regression of TVA augmented with dummy variables of entering has adjusted R square of 10.4%. In addition, the coefficient of entering dummy variable is positive and significant at 1%. It implies that when stocks enter the JII experience they experience a positive TVA and vise versa (similar results are found for dummy variable for leaving). The result implies that when stock enters the JII, it causes an increase of trading volume.

Additionally, estimation of regression equation 11 (from chapter 3) reported in Table 4.39 shows that the market model regression of daily spread has an adjusted R square of 9%. In addition, the coefficient of market spread is positive and significant at 1%. However, the dummy for entering is not significant. Similar results are found when we use a dummy for leaving. The result also implies that when stock enters (or leaves) the JII, it does not affect the spread.

Table 4.39: Regression Results

Regression Equation 8, regression of daily return of stocks entering and leaving JII during 2005-2012. The table provides the coefficient estimates from regression of stocks return.$R_{it} = \alpha_i + \beta_1 i R_{mt} + \beta_{2i} E_t +$ et . Where R_{it} is return of stock and $R_{mt}$is market return, Dummy E or L are dummy entering or leaving respectively.
Regression Equation 10, regression of daily trading volume activity (TVA) on stocks entering and leaving JII during 2005-2012. The table provides the coefficient estimates from regression of TVA stocks.$T_{it} = \alpha_i + \beta_{1i} T_{mt} + \beta_2 i E_t$ + et. Where T_{it} is TVA of stock and $T_{mt}$is market trading volume, Dummy E or L are dummy entering or leaving respectively.
Regression Equation 11, regression of daily spread on stocks entering and leaving JII during 2005-2012. The table provides the coefficient estimates from regression of spread stocks.$S_{it} = \alpha i + \beta_1 i\, S_{mt} + \beta_2 i E_t$ + et. Where S_{it} is Spread of stock and Smt is market spread, Dummy E or L are dummy entering or leaving respectively.

Regression	Variables	β Coefficient	t	p-value	Adjusted R-square
Equation 8	Constant (α_i)	-0.001	-1.018	0.312	0.417
	Market return (β_{1Rmt})	0.985	7.734	***0.000	
	Dummy entering (β_{2Et})	0.000	0.275	0.784	
Equation 10	Constana (αi)	0.006	18.082	***0.000	0.104
	Market TVA (β_{1Rmt})	-0.006	-1.235	0.220	
	Dummy entering (β_{2Et})	0.001	3.126	***0.002	
Equation 11	Constant (αi)	0.035	8.234	***0.000	0.09
	Market spread (β_{1Smt})	0.000	2.758	***0.007	
	Dummy entering (β_{2iEt})	0.002	1.547	0.126	

*** Indicates statistical significance at the 0.01 level

In summary, based on the regression results of return and spread we find that there is no impact of dummy for entering and dummy for leaving on JII. However, based on regression of TVA, there is an effect of dummy for entering and dummy for leaving on JII which implies that when stock enter the JII, TVA of stocks increase and vice-versa. Therefore, based on these results, hypothesis H6 predicting that stocks entering JII will earn positive excess returns is not supported. Likewise, hypothesis H9 which states that stocks leaving JII will earn negative excess returns is not supported. However, based on the results, hypothesis H7 predicting that stocks entering JII will experience an increase in trading volume is supported. Likewise, hypothesis H10 which states that stocks leaving JII will experience a decrease in

trading volume is supported due to the dummy of entering and leaving being significant at 1% level. Finally, based on the result of spread regression, H8 which predicts that stocks entering JII will experience a decrease in spread is not supported due to the dummy of entering and leaving not being significant. Likewise, hypothesis H11 which states that stocks leaving JII will experience an increase in spread is not supported since the dummy for entering and leaving is not significant.

Additionally, based on t-test, price pressure hypothesis is supported since the abnormal return in the first trading day after the announcement day is around +3 % from the prior announcement day, and also there are permanent changes in trading volume surrounding announcement up to the 20th day. The results are consistent with the previous study recorded by (Chen, Noronha & Singal 2004; Harris & Gurel 1986).

4.6 Summary of Chapter

This Chapter has presented the result of analysis data and can answer the hypothesis of this study. In summary, it is found are the following: Firstly, the results from regression excess return either for group of 2005-2007 or group 2008-2012, found that there is no significant different performance between JII, *Sharia* and non-*Sharia*. This findings is consistent with the prior studies in which there are no significant different between *Sharia* and conventional stocks. Secondly, volatility in IDX is modelled by using the GARCH Model during period of 2008-2012 either for group with turnover liquidity proxy or with spread liquidity proxy. Additionally, it is found that JII stocks have the lowest volatility comparable with *Sharia* and non-*Sharia* stocks. Thirdly, from trading volume perspective, the impact of Global Financial Crisis on JII, it is found that after announcement of IDX suspended which is implied that is GFC, JII stocks experience smaller TVA than pre-announcement as well as *Sharia* stocks and non-*Sharia* stocks experience significantly higher than pre-announcement. This result is consistent with the theory in which regarding to the bad news, investors will conduct more transaction on risky stocks (non-*Sharia*) to avoid loss. However, it is reported that basically there is no significantly different performance on TVA between JII, *Sharia* and non-*Sharia* stocks during research period. Finally, from the effects of stocks entering and leaving towards price, volume and liquidity, it is found that there is price pressure hypothesis in where stocks entering JII earns a positive and statistically significant abnormal return on the first day after the announcement day and experience a positive significant change in TVA on the first day after the announcement day. It also finds that for entering stocks the post announcement spread starts decreasing significantly from about the third day. These results remain robust to the use of alternate proxies for liquidity. However, stocks leaving the JII experience a positive abnormal return, an increase TVA and a decrease spread.

CHAPTER FIVE

5 Discussion and Conclusions

5.1 Introduction

This chapter presents discussions and conclusions based on the empirical results of the study. It also discusses the implications of the results and compares it to prior work. The chapter discusses the results of our analysis of the following: JII performance, assessment of JII volatility, trading volume activity of JII during GFC and the effect of stocks entering and leaving JII.

The conclusion in this chapter is a summary of all of the findings and also reveals the contribution made by this work and provides suggestions for further research in the future in this area.

5.2 Discussion

The first investigation in this study is to assess the performance of JII stocks. This study sought to answer the following questions: (i) How does investment performance of JII stocks compare to non *Sharia*-compliant stocks? (ii) How does investment performance of non JII-*Sharia*-compliant stocks compare to non *Sharia*-compliant stocks?

As mentioned in the previous chapter summary, the main model used in this study is the capital asset pricing model (CAPM) model extended to include the Fama and French three factors. This study also augments the model with the liquidity factor (Pastor & Stambaugh 2001). This study employs elaborate matching of data. The data used in this study is split into two periods due to IDX regulations. Before 2008, there were only two groups of stocks: JII stocks and non JII stocks. From 2008 to 2012, there are three groups: JII, *Sharia* and non-*Sharia*. This study classifies the groups based on industry sector in each period and each group of each period sort based on market capitalisation(+/- 10% up to 20%) and lastly, sort proportionally based on market capitalisation for each group and each period. Previous studies in Indonesia did not conduct matching of data. The present study uses elaborate matching of data based on industry factor which separated the data between JII and other group (*Sharia* and non-*Sharia*). Therefore a valid conclusion regarding the comparison of stocks performance between JII and non-JII (*Sharia* and non-*Sharia*) and between *Sharia* and non-*Sharia* can be obtained.

The results of regression indicate that basically there is no difference inperformance between JII and non-JII (*Sharia* and non-*Sharia*) stocks. The results from t-test also finds that there is no difference on performance between JII and non-*Sharia* and between *Sharia* and non-*Sharia*. Additionally, this study also found that there is no ethical effect in JII performance. However, this result is consistent with previous studies in which there is no significant difference between *Sharia* and conventional (Albaity & Ahmad 2008; BinMahfouz & Hassan 2013; Charles, Darné & Pop 2011; Dharani & Natarajan 2008; Girard & Hassan 2008; Natarajan & Dharani 2012). Previous studies in Islamic finance which assessed performance of stocks did not use the three factor CAPM model of Fama and French augmented by liquidity**.** This study has tried to use this model which was also augmented with

liquidity based on the characteristics of JII stocks which has high market capitalisation and high liquidity.

The second investigation is to assess volatility of JII stocks. This study sought to answer the following question: Do JII stocks have a lower volatility than non JII stocks?

As discussed in chapter 2, the aim of this study is to measure volatility of JII stocks and compare it with non-JII stocks during 2005-2012 by using the ARCH and GARCH models. This study split all stocks listed in IDX into two groups before 2008 (JII and non-JII) and three groups after 2008 (JII, *Sharia* and non-*Sharia*). Additionally, this study uses two proxies of liquidity: turnover and spread. Previous studies in this regard are lacking and there is no clear evidence as to whether or not Islamic investments are less or more volatile than conventional ones. The current study is interesting because it uses a sophisticated methodology to compare the volatility JII with non-JII. Further, leverage and liquidity were compared between JII and other stocks to assess the level of risk. Moreover, the study also used Altman-Z-Score and Ohlson-Score to predict the probability of bankruptcy.

This study found that for the 2005-2007 period, ARCH effect does not exist either for turnover or spread. Therefore in this period, ARCH/GARCH models were not estimated. However, for 2008-2012 period, it was found that there was an ARCH effect using turnover and spread as liquidity proxies. This study also found that both had GARCH (2,0), which means that ARCH influenced the volatility of excess return in period of 2008-2012. Additionally, dummy-JII influenced positively at 10% toward volatility of excess return as well. However, there was no impact of JII and *Sharia* on volatility, therefore based on the results it can be said that JII and *Sharia* stocks did not have higher or lower volatility compared to other stocks.

Although there was no impact of JII and Sharia on volatility, however, it is possible that on other dimensions of risk, there may be differences. According the result of leverage calculation during the 2005-2007 period, JII has higher leverage than non-JII. Furthermore, in the 2008-2012 period, it is found that JII has the lowest leverage than the other groups and non-*Sharia* has the biggest leverage in this group. This result also implies that JII stocks are less risky than conventional stocks. This finding is consistent with the finding of Al-Zoubi, Haitham A and Maghyereh, Aktham I (2007) who found that DJII is less risky than conventional stocks (DJ World Index). Our result also implies that JII has the lowest volatility compared to non-JII (*Sharia* and non-*Sharia*). Additionally, in the 2008-2012 period from turnover ratio calculation it was found that JII stocks have the highest turnover ratio than the other groups (*Sharia* and non-*Sharia*). It implies that JII stocks are the most liquid among the three groups.

Another important result in this study is the finding that JII stocks besides having the lowest leverage and the highest turnover ratio than the other groups (*Sharia* and non-*Sharia*) are also included in "Safe" Zone and predicted not to experience financial distress. This finding is robust to the use of alternate bankruptcy prediction methods such as Ohlson-scorewhich shows that the score of JII stocks is less than the value of cut off (which means predicted not to experience financial distress). Additionally, it is found that non *Sharia* stocks which have the highest leverage among them were included in "Grey" zone. This finding is consistent with Altman's interpretation, that a higher leverage ratio is a sign that the firm is close to bankruptcy.

The third investigation is to assess JII from the perspective of TVA in GFC.TVA of *Sharia* stocks to economic news during to the GFC has not been

examined before. This study sought to answer the following question: Was there a difference in TVA of JII and non JII before, during, and after Global Financial Crisis?

This study has found that after the announcement date (suspension of trading in IDX), JII stocks experienced smaller TVA than the pre-announcement period. Similar effect was found for *Sharia* stocks. However, non-*Sharia* stocks experienced significantly higher trading activity than pre-announcement period. This result is implies that in reaction to bad news, investors will sell risky stocks (non-*Sharia*) more in order to avoid losses. However, this study reports that basically there is no difference performance statistically on TVA between JII, *Sharia* and non-*Sharia* stocks. The interesting aspect of this study is that it has split stocks in IDX into 3 groups based on stocks belong to JII, *Sharia*, and non-*Sharia*. Although the result is not significantly different when comparing JII with non-JII (*Sharia* and non-*Sharia*) and *Sharia* with non-*Sharia* based on trading performance, this result contributes to the literature on the trading behaviour of ethical investments during the GFC.

The last investigation is to examination of the effect of stocks entering and leaving JII on price, trading volume and liquidity for different reason such as *Sharia* compliance, changes in market capitalisation and liquidity have the same impacts. This study sought to answer the question is the following: Is there an effect of stocks entering and leaving JII ?

The notable results of this study from regression analysis indicate that there is no impact of entering and leaving stocks on return and spread. However, it also found that there is an impact of stocks entering and leaving JII on TVA since the dummy of entering and leaving are significant at 1% level.

The other notable result of this study is that stocks entering JII earn positive and statistically significant abnormal return during the first day after the announcement day and experience a positive significant TVA on the first day after the announcement day and also on 1-day after the announcement day. This result is consistent with price pressure hypothesis recorded in prior work (Chen, Noronha & Singal 2004; Harris & Gurel 1986). In addition,during the post announcement phase,the spread starts decreasing significantly from about day three. Next, the post announcement (the first day) spread is lower than pre announcement day. However, the second day spread is higher than the prior announcement day. Additionally, the post announcement spread starts increasing from about day 10.

Another important result is that the average spread of stocks entering JII is wider than spread of stocks leaving JII. This finding is inconsistent with prior evidence in US market. In addition, this study finds that the turnover ratio of stocks entering JII is lower than that of stocks leaving JII. This result is inconsistent with the prior evidence in US market. The results remain robust to the use of alternate proxies for liquidity. The overall evidence suggests that investors prefer to buy stocks based on their performance rather than ethical compliance.

5.3 Conclusions

This study comprehensively assesses the performance of JII stocks. This study attempts to investigate JII stocks performance from the perspective of return, TVA, volatility and to investigate the effect of stocks entering and leaving JII. This study uses elaborate matching data to assess JII stocks performance. Another important issue is that this study attempts to compare JII with non-JII (*Sharia* and non-*Sharia*-compliant stocks) in order to get new insights regarding this issue.

In summary, this study finds that the performance of JII stocks essentially does not differ based on performance when comparing with *Sharia* and non-*Sharia*-compliant stocks. However, JII stocks have lower volatility compared to *Sharia* and non-*Sharia* stocks. Additionally, from the perspective of TVA, this study finds that JII stocks also are not significantly different in TVA during GFC compared to *Sharia* and non-*Sharia* stocks although JII stocks experienced smaller TVA than pre-announcement. Next, regarding the effect of stocks entering and leaving JII, this study indicates that investor's decision to buy stocks is driven more by the performance of stocks and less by its ethical compliance. Thus, the studies provide a comprehensive performance of JII stocks. The results of this thesis provide theoretical, practical guidelines and contribution to assess performance of JII stocks which is comprehensive performance assessment from many perspective of assessment.

This study investigates the effects of stocks entering and leaving JII due to *Sharia* reason and due to changes in market capitalization and liquidity. When leverage increases it can be reckoned that the stock is not *Sharia*-compliant. However, it is difficult to figure out other non-*Sharia* factors due to data limitations. Therefore, for further research, this study suggests further examination of the non-compliance criteria such as deviation of core business activity into non-acceptable lines.

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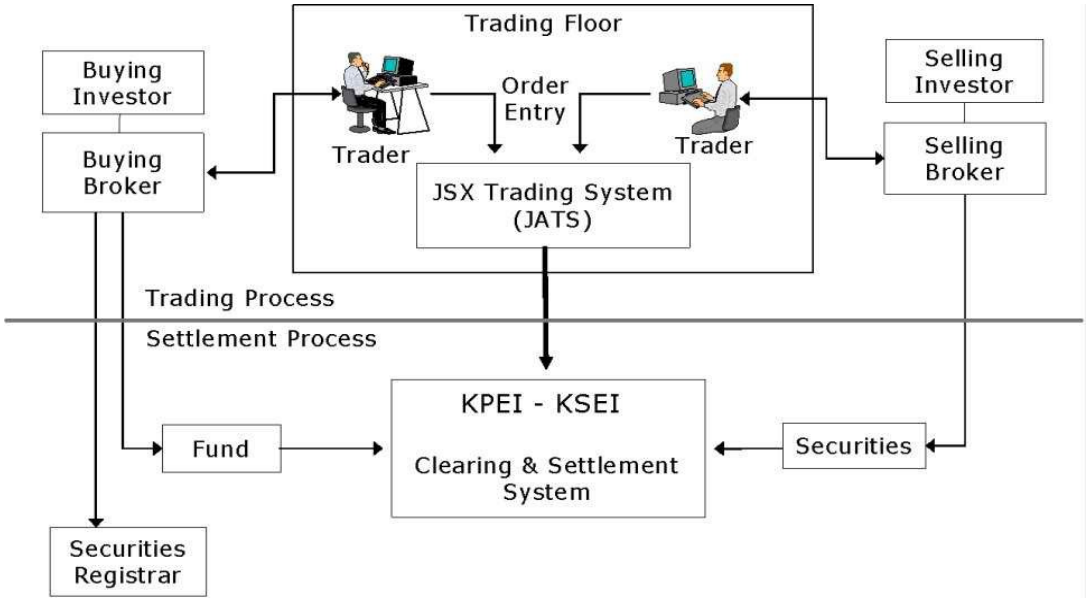
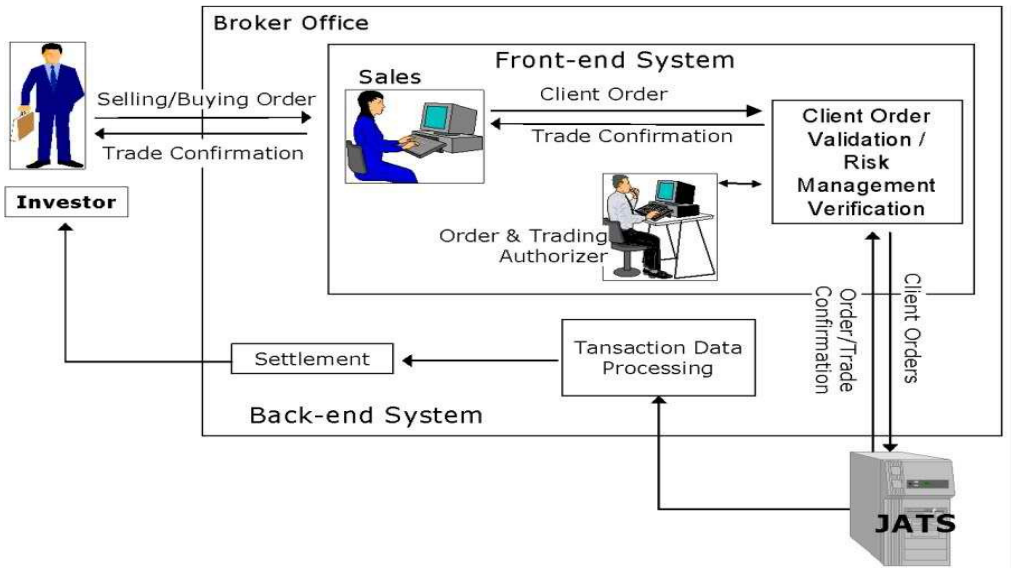
APPENDICES

Appendix A Trading Mechanism of Stock in IDX

Trading Process in the Exchange



The Process of Remote Trading



All transactions in the Indonesia Stock Exchange (IDX) are processed in a facility called as Jakarta Automated Trading System (JATS). Only the exchange members, who also become the members of the Indonesian Clearing and Guarantee

Corporation (KPEI), can input the orders into the JATS. The exchange members are responsible for every transaction they make in the Exchange

Exchange Members have the responsibility to settle all the transactions they've made, as stated in the Exchange Transaction List (DTB), including the transactions that occur because of:

- The errors made by the supporting equipment or Remote Trading applications of the Exchange Member, except for the errors made by the JONEC software that was provided by the Bourse; and/or
- The mistakes caused by the carelessness of the traders when inserting the purchase and sell orders into the JATS; and/or
- The mistakes caused by the carelessness of the IT Officer-RT when operating their supporting equipments or applications; a /orthe invalid access into the Exchange Member's supporting equipments or applications.

Appendix B Trading Hours in IDX

Reguler Market

Monday - Thursday	09:30 - 12:00 WIB	13:30:00 - 16:00 WIB
Friday	09:30 - 11:30 WIB	14:00:00 - 16:00 WIB

Cash Market

Monday - Thursday	09:30:00 - 12:00:00 WIB
Friday	09:30:00 - 11:30:00 WIB

Pre-Opening Session

Pre-opening session in Regular Market is opened every Exchange Day:

09:10:00 - 09:25:00 WIB	The Exchange Members input the buying and selling orders.
09:25:01 - 09:29:59 WIB	JATS processes the pre-opening price forming and allocates every done transaction.

Price Step

< Rp 200	Rp 1	Rp 10
Rp 200 to < Rp 500	Rp 5	Rp 50
Rp 500 to < Rp 2,000	Rp 10	Rp 100
Rp 2,000 to < Rp 5,000	Rp 25	Rp 250
> Rp 5,000	Rp 50	Rp 500

Note

* The maximum price step is 10 times of the step value, should be below the limit of Auto Rejection, and is not valid on the pre-opening.

Stock step value and its maximum price step are valid for one entire trading day and will be adjusted on the next day if its closing price falls on a different price range. The maximum price step should not exceed the percentage of Auto Rejection limit.

Auto Rejection*

The buying and selling price orders entered into the JATS have to be in a certain price range. If a Broker inputs a price order above or below the stock's price range, the JATS will automatically reject the price order.

JATS will automatically do the Auto Rejection to the price orders input into the JATS at the Regular and Cash Markets if:

1. The selling or buying order is smaller than Rp 50 (fifty rupiah);
2. The selling or buying orders input into the JATS are more than 35% (thirty five percent) above or below the Reference Price for stock price that ranges from Rp 50 (fifty rupiah) to Rp 200 (two hundred rupiah);
3. The selling or buying order input into the JATS are more than 25% (twenty five percent) above or below the Reference Price for stock price that ranges from above Rp 200 (two hundred rupiah) to Rp 5,000 (five thousand rupiah);
4. The selling or buying order input into the JATS are more than 20% (twenty percent) above or below the Reference Price for stock price that is more than Rp 5,000 (five thousand rupiah).

Stock trading as a result of initial public offering is determined twice wider than Auto Rejection percentage as mentioned above.

Reference Prices used to limit the highest and lowest offering price toward stocks entered into JATS at the Regular and Cash Markets are determined by the:

- Opening Price formed in the Pre-Opening Session; or
- Closing Price of the previous closing date if a Pre-Opening Price is not formed (Previous Price).
- In a case that a Listed Company doing corporate actions, in 3 (three) consecutive Exchange Days after the end of equity trading that has right (cum periode) in Regular Market, the Reference Price used is the Previous Price of each market (Regular or Cash).

*Refering to the IDX Trading Regulation No. II-A Kep-00005/BEI/01-2011 .

Pre-Opening Session

Stock trading at the Regular Market starts with a Pre-opening session. This session allows Exchange Members to input their purchase and sell orders according to the provisions of the stock unit, step value and Auto Rejection limit.

The Pre-opening price is formed from the accumulation of the total highest bids and asks matched by the JATS during the Pre-opening session.

All bids and asks that have not been matched during the pre-opening session will be processed in the first session of the trading day, except if the price of the bids and asks has excel the Auto Rejection limit.

Appendix C Transaction Settlement in IDX

Transaction Settlement

Market Segmentation	Settlement Period
Regular market	The third Exchange day after the trade is executed (T+3)
Cash Market	The same day as the trade (T+0)
Negotiated Market	Based on the agreement between the Seller and the Buyer

Regular and Cash Markets

Transaction settlements between the sellers and buyers in the Regular and Cash Markets are guaranteed by the KPEI.

- Transactions in Regular Market have to be settled on the third Exchange day after the trade (T+3).
- Transactions in Cash Market have to be settled on the same day as the trade (T+0).

Settlement process in the Regular and Cash Market is carried out by the KPEI through the Netting process and book-entry on the Exchange Members' accounts in the Indonesian Central Securities Depository (KSEI).

If an Exchange Member fails to fulfill its obligations to deliver the securities as determined, it has to pay an Alternate Cash Settlement (ACS) amounted to 125% (one hundred twenty five percent) of that securities' highest price in:

- The Regular and Cash Market, which deadline of settlement falls on the same date; and
- The first session of the Regular Market at the settlement date.

If an Exchange Member fails to fulfill its obligation to pay the service fees to the KPEI, the Exchange Member needs to settle the matter according to the KPEI Regulations.

Exchange Member who fails to fulfill its obligations to pay the settlement fees will be suspended from the market activities until IDX receives a confirmation from the KPEI stating that the Exchange Member has fulfill all its obligations. The Exchange Member might also receive other sanctions according to the Exchange Regulations.

Negotiated Market

The settlement date in the Negotiation Market is decided based on the agreement between the seller and buyer, and is settled Trade by Trade (without Netting). If the date has not yet been decided, the transaction settlement has to be settled on the third Exchange day after the trade (T+3) at the latest, or on the same day as the transaction (T+0), if the trade took place on the last day of pre-emptive rights trading.

The transaction settlements in Negotiated market sre settled by direct transfer accounts between the buyers and sellers and are not guaranteed by the KPEI.

Appendix D Milestone of the development of *Sharia* capital market in Indonesia

Below are milestone of *Sharia* market development in Indonesia until today:

[2000]	*Jakarta Islamic Index* (JII)
[2001]	Fatwa No. 20/DSN-MUI/IX/2001 concerning Guidelines for the implementation of Investment for *Sharia* Mutual Funds.
[2002]	Fatwa No. 32/DSN-MUI/IX/2002 concerning *Sharia* Bonds Fatwa No. 33/DSN-MUI/IX/2002 concerning Mudharabah *Sharia* Bonds.
[2003]	Fatwa No. 40/DSN-MUI/X/2003 concerning Capital Market and Guidelines for the implementation of *Sharia* Principles in the Capital Market. MOU between Bapepam & LK and DSN-MUI
[2004]	Fatwa No. 41/DSN-MUI/III/2004 concerning Ijarah *Sharia*
[2006]	Bapepam & LK Regulation No IX.A.13 concerning Issuance of *Sharia* Securities Bapepam & LK Regulation No IX.A.14 concerning Contracts Used for the Issuance of *Sharia* Securities in Capital Market.
[2007]	Fatwa No. 59/DSN-MUI/V/2007 concerning Mudharabah *Sharia* Bonds Conversion Bapepam & LK No II.K.1 Regulation concerning Criteria and Issuance of *Sharia* Securities List.
[2008]	Fatwa No. 65/DSN-MUI/III/2008 concerning *Sharia* Pre Emptive Rights Fatwa No. 66/DSN-MUI/III/2008 concerning *Sharia* Warrants Fatwa No. 69/DSN-MUI/VI/2008 concerning SBSN Fatwa No. 70/DSN-MUI/VI/2008 concerning Issuance Method of SBSN Fatwa No. 71/DSN-MUI/VI/2008 concerning Sale and Lease Back Fatwa No. 69/DSN-MUI/VI/2008 concerning Sale and Lease Back of Ijarah SBSN Law (UU) No. 19 Year 2008 concerning Government *Sharia* Securities (SBSN)
[2011]	Fatwa No. 80/DSN-MUI/III/2011 concerning The Implementation of *Sharia* Principles in the Equity Trading Mechanism at the Stock Exchanges Regular Market. Indonesia *Sharia* Stock Index (ISSI) *Sharia* Online Trading System

Appendix E Summary of Previous Studies on Ethical and Islamic Indices and Funds

The author's name (year)	Topic	Research method	Results
Previous studies on ethical indices / funds			
Mallin, Saadouni, and Briston (1995)	Financial performance on ethical investment funds	Sample : 29 ethical funds and non ethical ones 1986-1993 Using Jensen, Treynor and Sharpe ratios	On a risk-adjusted basis both the ethical and non-ethical trusts tend to underperform the market Taking the ranking of all three measures, Jensen, Treynor and Sharpe, again it is the ethical trusts which outperform the non-ethical ones
Sauer (1997).	This paper examined the potential impact of social screening on investment performance by comparing the performance characteristics of a carefully constructed, well diversified portfolio of socially screened stocks with two unrestricted benchmark portfolios.	Sample : the Domini 400 Social Index (DSI) and the S&P 500 & Chicago Center for Research in Security Prices (CRSP) Value Weighted Market Indexes. The potential performance implications that result from subjecting investment decisions to social-responsibility screens will be examined by comparing the: 1) average monthly raw returns and variability, 2) Jensen's alpha, and 3) Sharpe's performance index for the socially screened portfolio (i.e., DSI) with two unrestricted benchmark portfolios (S&P 500 and CRSP Value Weighted Market Indexes)	There was no statistically significant differences between ethical and non ethical portfolio in US And application of social responsibility screen does not necessarily have an adverse impact on investment performance
Bauer, Koedijk and Otten (2005)	International evidence on ethical mutual fund performance and investment style	Using an international database containing 103 German, UK and US ethical funds analysed ethical mutual fund performance and investment style.	They found that no evidence of statistically significant difference in risk adjusted returns between ethical and conventional mutual

		They investigated the investment styles of ethical funds, and control for their biasing influences in performance assessment routines. In order to do so they employed more elaborate multi-factor models that control for size, book to market, and momentum effects. More specifically, we build upon the work of Carhart (1997) on performance evaluation, which represents the current standard methodology on mutual fund performance.	fund after controlling for common factors like size, book to market and momentum for the 1990-2001 period
Bauer, Ottent & Rad (2006)	This study provides new evidence on the performance and investment style of retail ethical funds in Australia	By applying a conditional multi-factor model and after controlling for investment style, time-variation in betas and home bias, they observe no evidence of significant differences in risk adjusted returns between ethical and conventional funds during 1992–2003	During 1992–1996 domestic ethical funds under-performed their conventional counterparts significantly, whereas during 1996–2003 ethical funds matched the performance of conventional funds more closely.
Blancard and Couderc (2009)	The impact of socially responsible investing (SRI) : Evidence from stock index redefinition (to assess the impact of SRI by examining the stock market response to changes in SRI stock indexes) : to do so the effects on stock prices of inclusion in and exclusion from SRI indexes were measured	Using sample : 3 SRI : Dow Jones Sustainability Index (DJSI), the FTSE4Good Index (FTSE and Aspi Eurozone Index (ASPI) Using event study methodology	Stock prices do not react to announcement of SRI index redefinitions except for ASPI index, provided by the firm Vigeo, the European leading supplier of extra-financial analysis and no long term reaction can be observed.
Hong & Kacpercyk (2009)	Investigated the impact of social norms on market	Using CAPM model extended by Fama & French Sample : daily closing stock prices, daily share outstanding & daily dollar trading volumes of NYSE, Amex & Nasdag stocks 1962-2006 Analysis data : regression	Sin stock (alcohol, tobacco, & gaming) are less held by norm-constrained institutions

Previous studies on Islamic indices / funds			
Abdullah and Bacha (2001)	To examine the impact of Malaysian Syariah Advisory Council's (SAC) decision on stock eligibility	They focused on two variables, changing in the stock's returns and trading volume Using standard event study methodology	They found that inclusions experience a positive impact while deletions negative.
Hussein(2004)	To examine whether returns earned by investors who purchases shares in the FTSE Global Islamic Index are significantly different from those of the FTSE All-World Index, which is well diversified index, both in the short run and the long run, and he also investigated the performance of Islamic index compared to the FTSE4Good which is a socially responsible index.	Using sample: montly FTSE Global Islamic Index and FTSE All-World Index & FTSE4Good Global Index as counterpart indexes July 1996 to August 2003. Using CAPM to estimate risk adjusted returns to estimate the risk adjusted return since FTSE Global Islamic Index and its index counterparts are not from the same category of risk And finally measure excess returns (market adjusted return)	He found that the application of ethical screens does not have an adverse impact on the FTSE Global Islamic Index performance. In general, his findings reject the assumption that ethical investing offer inferior investment performance compared to unscreened portfolios where the FTSE4Good index outperforms the FTSE All-World index in the entire and bull market period. The Islamic index yields statistically significant positive abnormal returns in the bull market period, although it underperforms the counterpart index in the bear market period
Hassan, Antoniou & Paudyal (2005)	The impact of *Sharia* screening on investment performance: the case of the DJII	Using CAPM single model extended to the Fama & French three factor and Carhart (1997) four factor model The sample period : DJIM (Dow Jones Islamic Market) & Dow Jones Index Americas (DJGI) (January 1996 to December 2003)	The DJII has much higher raw return than conventional Dow Jones Index Market & the net effect of the various screens, even when a more rigorous measure of performance measurement models are employed, the alphas remain rather positive abnormal performance

Hussein and Omran (2005)	The impact of ethical screening on the performance of the Dow Jones Islamic Index	Using 3 primary measures of risk adjusted performance: Sharpe(1966); Jensen(1968) & Treynor (1965) The data: DJIMI and 13 subindexes (based on size & industry) The sample period is divided into two sub-periods, January 1996-March 2000 and April 2000-July 2003	Islamic indexes provide positive abnormal returns over the entire period and the bull market period, but they underperform their index counterparts over the bear market period
Hussein (2007)	To examine the impact of *Sharia* screening on the performance of FTSE Global Islamic index performance and DJI Market Index	Using monthly data : DJIMI and adopt the DJ World Index as a corresponding index January 1996 to December 2004 and FTSE All-World index as counterpart of the FTSE Global Islamic Index from 1993 Using CAPM in order to estimate the risk-adjusted return	Islamic indices yield statistically significant positive abnormal returns in the first bull market period. His finding provided strong evidence to reject the assumption that *Sharia* investing offer inferior investment performance compared to unscreened portfolios.
Yusof and Majid (2007)	To investigate the extent to which the conditional volatilities of both Islamic and conventional indexes in Malaysia are affected by monetary policy variables.	They used GARCH model together with VAR analysis conducted with monthly data during period January 1992 to December 2000.	They found that the interest rate volatility affects the conventional but not the Islamic stocks market volatility.
Zoubi and Maghyereh (2007)	To examine the relative risk performance of the Dow Jones Islamic Index (DJIS) and find that the index outperforms the Dow Jones (DJIM) WORLD Index in terms of risk.	Using the most recent Value-at-Risk (VaR) methodologies (Risk Metrics, Student-*t* APARCH, and skewed Student-*t* APARCH) on the 1996–2005 period, and assuming one-day holding period for both indices with a moving window of 500 day data,	The Islamic index outperforms the Dow Jones WORLD index in term of risk. From their study, the empirical results suggest that the Islamic index presents unique risk characteristics, the examination reflects a risk level that is significantly less than the board market basket of stocks

Abdullah, Mohamed and Hassan (2007)	Investigation of performance of Malaysian Islamic unit fund trusts, compare with conventional unit fund trusts.	Using sample 65 funds where in 14 of which Islamic funds Using Sharpe index and adjusted Sharpe index, Jensen Alpha, Timing and selectivity ability Divided the study period into three different periods : pre –(1992-1996), during (1997-1998) and post-(1999-2001)	Islamic funds performed better than the conventional funds during bearish economic trends while, conventional funds showed better performance than Islamic funds during bullish economic conditions. Additionally, Islamic funds perform better than conventional funds during bearish economic trend i.e. during the crisis period.
Mehdi Sadeghi (2008)	To examine the impact of the introduction of *Sharia*h-compliant Index (SI) by Bursa Malaysia on the performance and liquidity of included shares	Using an event study methodology to estimate mean cumulative abnormal returns (MCARs) in the days surrounding the event and investigate changes in the volume of trade and bid-ask spread in windows surrounding the event day, as a proxy for changes in liquidity. Used market model to measure abnormal return	His findings show that, overall, introduction of SI had a positive impact on the financial performance of included shares and the market shows positive reaction to the introduction of SI and MCARs becomes increasingly positive
Abaity and Ahmad (2008)	Performance of Syariah and Composite Indices: evidence from Bursa Malaysia	Using three separate measurements of risk adjusted returns (Sharpe, Treynor & Jensen) ; using bivariate Granger causality between KLSI & KLCI and Vector Autoregression & Impulse response analyses. Using data : Kuala Lumpur Syariah Index (KLSI) and Kuala Lumpur Composite Index (KLCI) during 1999-2005	There was no evidence of significant statistical differences in risk-adjusted returns between Islamic and conventional stock indices during 1999-2005.

Dharani and Natarajan (2008)	They analysed the performance of Islamic index and common index in India	Using Sharpe index, Treynor index and Jenson alpha to measure performance of both parts	They found that the risk adjusted returns for the both indices were under – performing with respect to risk free rate of return, and also disclosed the low volatile nature of Nifty *Sharia* than Nifty index. This study concludes that both of indices are performing in similar manner.
Girard and Hassan (2008)	Is There a Cost to Faith-Based Investing: *Evidence from FTSE Islamic Indices*	They study focuses on a set of broad indices: the FTSE Islamic Clobal Index, the FTSE Islamic Asia Pacific Index, the FTSE Islamic Americas Index, the FTSE Islamic Europe Index, the FTSE Islamic South Africa Index. Using CAPM by including Fama and French [1993, 1996] size and value factors, and a momentum factor that captures Jegadeesh and Titman [1993] momentum anomaly.	Their findings suggest that the behaviour of the FTSE Islamic indices does not differ from that of their conventional counterparts, with some indices outperforming their conventional counterparts and others underperforming them.
Charles, Darné and Pop (2011)	To investigate whether Islamic indexes (DJII) aremore or less affected by sudden changes in volatility regimes than the conventional counterparts (DJI)	Using The DJII and DJI stocks	They found that both Islamic and conventional indexes have been affected to the same degree by variance changes. However, when the variance was not the same across the two types of indexes, the Islamic index exhibited slightly higher volatilities than their conventional counterparts.

Hayat and Kraeussl (2011)	Risk & return characteristic of Islamic equity funds	Using a sample of 145 IEFs (Islamic Equity Funds) over 2000 to 2009 Using CAPM to evaluate the performance of IEFs Using pricing data at weekly frequency	IEFs are underperformance compared to Islamic as well as to conventional equity benchmarks. This underperformance seems to have increased during the recent financial crisis
Natarajan and Dharani (2012)	*Sharia*h Compliant Stocks in India - A Viable and Ethical Investment Vehicle	Using sample S&P CNX Nifty *Sharia*h index, S&P CNX Nifty index and BSE Sensex index. The study employed the t-test, market model and correlation to examine the study objectives.	They found that there is no difference between *Sharia*h Compliant Stocks and benchmark indices returns and also from among the *Sharia*h index and common index in India during the study period. The study infers that the equity based *Sharia*h Compliant investment is the viable and ethical investment avenue to the investors especially to small and individual ethical.
Arouri et al. (2013)	Are Islamic finance innovations enough for investors to escape from a financial downturn? Further evidence from portfolio simulations	Using conventional indexes, the MSCI closing prices that are obtained from the Morgan Stanley Capital International database (MSCI World, MSCI Europe and MSCI United States), while the FTSE TII Global Islamic Index, the FTSE TII Europe Islamic Index and the FTSE TII America Islamic Index are used as measures for Islamic indexes for the World, Europe and the US, respectively Islamic stock indexes were obtained from the International Data stream. Using Multivariate Vector Autoregressive (VAR) tools to test the interaction between conventional and Islamic	Their main findings are: (i) the impact of the current crisis on the Islamic finance industry is less marked than on conventional finance, (ii) investment in Islamic products generates high returns, (iii) portfolios that include Islamic products reduce systemic risk and generate significant diversification benefit, (iv) The US crisis has led to significant changes in resource allocation through change in investment choices.

		financial products, and implement the Granger causality test to specify the dependence orientation of feedback between Islamic and conventional stock prices	
Akhtar et al. (2011)	Intensity of Volatility Linkages in Islamic and Conventional Markets	Using sample of stocks, bonds of 9 Islamic and 37 non Islamic countries Using Pearson correlation and estimates from a stochastic volatility model with restrictions in GMM	They found that characteristic of Islamic financial market reduce volatility linkages (correlations) between Islamic and conventional stocks, bonds and bills.
Bin Mahfouz, Saeed; Hassan, M. Kabir (2013)	To examine the investment characteristics of four groups of investment portfolios mainly, DJ Global Index, DJ Sustainability Index, DJI Market World Index & DJI Market Sustainability Index	Risk adjusted equilibrium models, both single index and Fama & French multi index	The paper finds that neither the *Sharia* nor the sustainability screening process seems to have an adverse impact on the performance and systematic risk of the investment portfolios compared to their unrestricted conventional counterparts
Al-Khazali, Lean and Samet (2014)	To examine whether Islamic stock indices outperform conventional stock indices by comparing nine DJII to their counterparts: Asia Pacific, Canadian, Developed Country, Emerging Markets, European, Global, Japanese, UK, and US indexes from 1996 up to 2012	Using stochastic dominant (SD) analysis which is a non-parametric test and using daily data They split into 3 periods: period 1(1996-2000), period 2 (2001-2006) and period 3(2007-2012)	They found that over the whole period 1996-2012, conventional indices stochastically dominate Islamic indexes in all market except in the European market. In the Global, European and the US Islamic indices dominate their conventional counterparts during 2007-2012. It indicates that during and after the financial crisis Islamic indices stochastically dominate their conventional peers.

Ashraf and Mohammad (2014)	To explore whether Islamic equities perform better than conventional investments during a downturn of the economy on a risk adjusted basis.	The standard constant risk model (CRM) is used to measure the relative risk/return payoff of IEIs within the context of the Capital Asset Pricing Model (CAPM), a Logistic smooth transition autoregressive (LSTAR) model used to investigate whether the down market performance of IEIs differs from conventional indices. Using 24 indices (12 IEIs and 12 conventional indices) from Global and regional equities of three major equity index: MSCI, S&P, and Dow Jones from 2002-2012. Using monthly price.	IEIs in general perform better than conventional indices during period 2000-2012 but not found Abnormal returns on global basis however a positive abnormal return in the case of regional indices from Europe and Asia.. Overall, IEIs exhibit lower systematic risk as compared with conventional.
Ho et al. (2014)	To measure risk adjusted performance of Islamic indices compared to matched sample of conventional indices from 12 major global Islamic and conventional indices of eight countries: US, UK, Malaysia, Indonesia, Hong Kong, Switzerland, India and French from 2000-2011 And also testing performance during and after crisis period	They used Sharpe ratio, Treynor index, Jensen' alpha to risk adjusted performance. Using monthly return They split into 5 sub periods: Dotcom crisis period (2000-2002), after Dotcom crisis period (2003-2006), Global Financial Crisis period (2007-2008), after Global Financial Crisis period (2009-2011) and the overall period.	They found that Islamic indices outperformed their conventional counterparts during crisis periods but the results are inconclusive for the non-crisis periods. it could be due to the conservative nature of *Sharia* offering investors superior investment alternative during crisis
H Miniaoui, H Sayani, A Chaibi - 2014	To examine the performance of Islamic and conventional indices of the GCC in the wake of financial crisis of 2008 The objective this research is to understand whether the volatility in Islamic index was lower than the conventional	Using GARCH model and using log normal returns are calculated for each time series in the sample	The findings indicate that the GCC Islamic index exhibits similar attributes of the conventional indices in all the periods of analysis. The results show that the GCC Islamic index has similar risk profile as its conventional counterparts.

	indices during financial crisis		
Previous studies on Islamic indices in Indonesia			
Kurniawan (2008)	Volatilitas saham Syariah (Analisis atas JII) (The volatility of JII stocks)	Using sample : JII stocks 2004-2007 , using GARCH model to determine the volatility of JII stocks	Since 2004 until 2007, JII index value continues to increase and have good achieving in Islamic compliant stocks in IDX however it has high volatility, JII tends to arranged by "speculator" together with frenzy's investors in affecting price
Maskur(2009)	Conduct research about comparing of stocks volatility between *Sharia* stocks (JII) and IHSG, Kompas100 and LQ45 indices	Sample: daily stocks price of LQ45, IHSG, Kompas 100 and JII stocks during 2007 till July 2009 Using ARCH/GARCH model	He found that α value ≥ 0,7 all of indices, it means that the volatility are high and persistent. In addition, IHSG and LQ45 just affected by ARCH effect and it means that IHSG and LQ 45 only affected by current stocks price volatility without being affected by previous period. However JII is affected by current and previous stocks price volatility.
Utami and Nugraha (2011)	Analisis kinerja saham Syariah dan pengaruhnya terhadap respon pasar pada perusahaan yang tercatat di Jakarta Islamic Index (Analysis of *Sharia* performance)	Using Treynor Index to measure stocks performance They investigated the performance of JII stocks during period December 2008 to November 2010 with using Treynor index	They found that 16 of 17 *Sharia* stocks have a good performance and *Sharia* stocks performance of JII have significant effect on market response which is seen from trading volume analysis.

Malini (2011)	Performance analysis of Jakarta Islamic Index stocks at Jakarta Stock Exchange	Sample : JII stocks period January 2002 till December 2004 Using Sharpe, Treynor and Jensen Index	She found that just 6 stocks have a good performance

Appendix F JII Screening Process

Under the direction of the *Sharia* Supervisory Board of PT DIM, there are 6 conditions that must be met for these stocks to fulfil core business criteria (IDX):

A. The company does not conduct any business activities (core business criteria), as referred in item 1.b of the Regulations of Bapepam-LK No. IX.A.13, business that conflict with *Sharia* Principles, such as :

1. Gambling and games considered as gambling.
2. Trading that is prohibited according to *Sharia*, such as :
   a. Trading that is not followed by delivery/transfer of products and or services;
   b. Trading with a fake offer or demand; and
3. Ribawi financial services, such as:
   a. interest-based bank; and
   b. interest-based finance company
4. Buying and selling of risks that involve speculation (*gharar*) and gambling (*maisir*)
5. Producing, distributing, trading, and or providing:
   a. products or services that are forbidden because of its contents (*haram li-ghairihi*)
   b. products or services that are forbidden not because of its contents but because they are stated forbidden by DSN-MUI; and or
   c. products or services that can deprave one's morals and are harmful; and or
5. Transactions that contain elements of bribery (*risywah*)

B. The company fulfils/meets the following financial ratios criteria:

1. The ratio of interest-based liabilities to total assets is not more than 45%
2. The ratio of interest income and other non-*Sharia* income to total revenue is no more than 10% .

To become eligible for entering in the JII index, besides filters based on *Sharia*, stocks that enter the JII should be through some screening process. Below is the JII

selection process performed by IDX based on the performance of *Sharia* shares trading(JII):

1. Selected stocks are stocks that are included in DES issued by Bapepam & LK
2. From these *Sharia* stocks, IDX select 60 top stocks based on the last year's market capitalization;
3. From these 60 top stocks by market capitalization, IDX will then select 30 top stocks based on their last year's level of liquidity in the regular market.

Review is conducted every six months for the determination of the index components at the beginning of January and July each year. While major changes to types of business issuer will be monitored continuously on the basis of publicly available data. The company that changed the lines of business and becomes inconsistent with the principles of *Sharia* will be excluded from the index. The issuers of stocks issued will be replaced by other stock. All these procedures aim to eliminate the speculative stocks. Some speculative stocks have an average level of liquidity in regular trading value of high and low levels of market capitalization**.**

Appendix G The result of matching data period 1 and 2 from 2005 up to 2012

No	*Sharia* Stocks	Announcement Date															Non-*Sharia* Stocks
	Industry Sector	28-Dec-04	27-Jun-05	28-Dec-05	26-Jun-06	27-Dec-06	29-Jun-07	27-Dec-07	5-Jun-08	4-Dec-08	4-Jun-09	4-Dec-09	3-Jun-10	3-Dec-10	7-Jun-11	6-Dec-11	30-May-12	Industry Sector
	A. Agricultural																	**A. Agricultural**
1	AALI	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	
2	BISI						V	V	2	2	2	2	V	V	V	V	V	
3	CKRA						V	V	V				V	V				
4	BTEK						V	V	V	V	V	V	V	V	V	V	V	
5	DSFI								V	V								
6	IIKP						V	V	V	3	V	V	V	V	V	V	V	
7	LSIP	2	2	2	1	2	2		3	4	3	3	2	2	2	2	2	
8	SGRO								4	5	4	4	3	3	V	V	V	
9	UNSP			3	2	3			5	6	5	5	4				V	
10	GZCO							V	V	V	V	V	V	V	V	V	V	

11	TBLA						V	V		7							V	
12	BWPT											V	5	4				
13	CPDW								V	V	V	V	V	v	V in July	V	V	
14	MBAI											V	V	V	V	V	V	
15	SMAR						3	2		V		V	V	V	V	V	V	
16	CPRO						4											
17	SIMP															3	3	
18	JAWA															V	V	
	B. Mining																	**B. Mining**
19	ANTM	3	3	4	3	4	5	3	6	8	6	6	6	5	3	4	4	
20	BUMI	4	4	5	4	5	6	4	7	9	7	7						
21	CNKO						V	V	V	V	V	V	V	V	V	V	V	
22	ELSA							V	8	10	8	8	7	6	V	V	V	
23	INCO	5	5	6	5	6	7	5	9	11	9	9	8	7	4	5	5	
24	ITMG							V	10	12	10	10	9	8	5	6	6	
25	PKPK						V	V	V		V		V	V				
26	PTBA	6	6	7	6	7	8	6	11	13	11	11	10	9	6	7	7	

27	TINS	7	7				9	7	12	14	12	12	11	10	7	8	8	
28	APEX (delisted 1 April 2009)						10	8	V	15								
29	BIPI											V						
30	KKGI									V	V	V	V	V	V	V	V	
31	ATPK)												V	V	V in July	V	V	
32	CITA								V	V	V	V	V	V	V	V	V	
33	DEWA									V	13	13	12	11	V	V	V	
34	DKFT												V	V			V	
35	ENRG	8	8	8	7									12	8	9	9	
36	GTBO										V		V	V	V	V	V	
37	HRUM													V	9	10	10	
38	PTRO						V	V	V	V			V	V	V	V	V	
39	ADRO)										14	14			10	11	11	
40	ARTI							V		V	V				V			
41	MEDC	9	9	9	8	8	11											
42	BORN														11	12	12	
43	RUIS						V	V										

44	BRMS														V	V	V	
45	ARII															V	V	
46	GEMS															V	V	
47	INSA															V	V	
48	BRAU																V	
49	SMRU																V	
50	CTTH																V	
51	MITI																V	
	C. Basic Industry & Chemical																	**C. Basic Industry & Chemical**
52	AKKU						V	V	V	V	V	V	V	V				1.MLIA
53	AKPI						V	V	V	V	V	V	V	V	V	V	V	2.INAI
54	AMFG						V	V	V	V	V	V	V	V	V	V	V	3.JKSW
55	BRNA						V	V	V	V	V						V	4.MYRX
56	BTON						V	V	V	V	V	V	V	V	V	V	V	5.TBMS
57	CTBN						V	V	V	V	V	V	V	V	V	V	V	6.IPOL
58	DPNS						V	V	V	V	V	V	V	V	V	V	V	7.FASW
59	EKAD						V	V	V	V	V	V	V	V	V	V	V	8.SPMA

60	IGAR						V	V	V	V	V	V	V	V	V	V	V	9.PICO
61	IKAI							V	V						V	V	V in Augt	
62	INCI						V	V	V	V	V	V	V	V	V	V	V	
63	INTP	10	10	10	9	9	12	9	13	16	15	15	13	13	12	13	13	
64	ITMA						V	V	V	V	V	V					V	
65	JPRS							V	V	V	V	V	V	V	V	V	V	
66	KKGI						V	V	V							V	v	
67	LION						V	V	V	V	V	V	V	V	V	V	V	
68	LMSH						V	V	V	V	V	V	V	V	V	V	V	
69	MAIN						V	V									V	
70	SIMA						V	V	V									
71	SIPD						V	V	V	V	V	V	V	V	V	V	V in Augt	
72	SMGR	11					13	10	14	17	16	16	14	14	13	14	14	
73	SOBI						V	V	V		V	V	V			V	V	
74	SRSN						V	V	V		V	V	V	V	V	V	V	
75	TALF Delisted form IDX 1 Dec 2009						V	V		V	V							
76	TRST						V	V	V	V	V	V	V	V	V	V	V	
77	UNIC							V	V	V	V	V	V	V	V	V	V	

78	YPAS							V	V	V	V	V	V	V	V	V	V	
79	KIAS						V										V	
80	ALKA								V	v	V	V	V	v	V	V	V	
81	APLI										V	V	V	v	V	V	V	
82	ARNA								V			V	V	V	V	V	V	
83	BRPT	12	11							18		17	15	15	V	V	V	
84	CPIN												V	16	14	15	15	
85	FPNI								V	V	V	V	V	V	V	V	V	
86	GDST											V	V	V	V	V	V	
87	INRU									V		V	V	V	V			
88	KBRI											V	V	V	V	V	V	
89	KRAS													V	15	16	V	
90	NIKL											V	V	v	v	V	V	
91	SIAP									V	V	V	V	V	V	V	V	
92	SMCB	13	12	11	10	10	14					V	16	17	16	17	V	
93	TOTO										V	V	V	V	V	V	V	
94	TPIA									V	V	V	V	V	V	V	V	
95	BUDI											V				V	V	

96	INKP	14	13	12	11	11	15											
97	TKIM	15	14	13	12													
98	SULI					12												
99	JPFA														17		V	
100	ETWA						V		V		V	V	V	V	V	V	V	
101	LAPD															V	V	
102	ALDO																V	
103	ALMI																V	
104	SAIP																V	
105	TIRK																V	
	D. Various Industry																	**D. Various Industry**
106	AUTO						V	V	V	V	V		V	V	v	V	V	10. NIPS
107	BATA						V	V	V	V	V	V	V	V	v	V	V	11. ARGO
108	BRAM						V	V	V	V	V	V	V	V	V	V	V	12. CNTX
109	ESTI						V	V	V	V	V	V	V	V	V	V	V	13. ERTX
110	GDYR						V	V	V			V	V	V	V	V	V	14. KARW
111	HDTX						V	V	V	V	V	V	V	V	V	V	V	15. MYTX

112	IKBI						V	V	V	V	V	V	V	V	V	V	V	16. POLY
113	INDR						V	V	V	V	V	V	V	V	V	V	V	17. BIMA
114	KBLI							V	V	V	V	V	V	V	V	V	V	18. SIMM
115	KBLM						V	V	V	V	V	V	V	V	V	V	V	
116	LPIN						V	V	V	V	V	V	V	V	V	V	V	
117	MASA						V	V	V	V	V	V	V	V	V			
118	PTSN							V	V	V	V	V	v	V	V	V	V	
119	RDTX						V	V	V	V	V	V	V	v	V	V	V	
120	SMSM						V	V	V	V	V	V	V	V	V	V	V	
121	VOKS						V	V	V		V	V	V	V	V	V	V	
122	RICY						V	V	V	V	V	V	V	V	V	V	V	
123	DOID			14						V								
124	SCCO						V									V	V	
125	UNTX						V											
126	ASII		15	15	13	13	16			19	17	18	17	18	18	18	16	
127	UNIT						V	v	V	V	V	V	V	V	V	V	V	
128	TFCO												V	V	V	V	V	
129	GJTL	16	16	16	14	14											V	

130	ADMG																V	
131	IMAS																V	
132	JECC																V	
133	PAFI																V	
134	PBRX																V	
135	PRAS																V	
136	17. SSTM																V in Augt	
	E. Consumer Goods Industry																	**E. Consumer Goods Industry**
137	ADES						V	V									V	19. DAVO
138	AQUA Delisted from IDX 1 April 2011						V	V	V	V	V	V	V	V				20. DLTA
139	DVLA						V	V	V	V	V	V	V	V	V	V	V	21. MLBI
140	INAF						V	V				V	V	V	V	V	V	22. GGRM
141	KAEF						V	V	V	V	V	V	V	V	V	V	V	23. HMSP
142	KDSI							V	V	V	V	V	V	V	V	V	V	24. RMBA
143	KICI						V	V	V	V	V	V	V	V		V	V	25. SCPI
144	KLBF	17	17	17	15	15	17	11	15	20	18	19	18	19	19	19	17	

145	LMPI						V	V	V	V	V	V	V	v	V	V	V	
146	MERK						V	V	V	V	V	V	V	V	V	V	V	
147	MRAT						V	V	V	V	V	V	V	V	V	V	V	
148	MYOR						V	V	V	V	V	V	V	V	V	V	V	
149	PROD Delisted from IDX 1 December 2009						V	V	V	V	V							
150	PYFA						V	V	V	V	V	V	V	V	V	V	V	
151	SKLT							V	V	V	V	V	V	V	V	V	V	
152	SQBB						V	V	V	V	V	V	V	V	V	V	V	
153	STTP						V	V	V	V	V	V	V	V	V	V	V	
154	TCID						V	V	V	V	V	V	V	V	V	V	V	
155	TSPC	18					V	12	V	V	V	V	V	V	V	V	V	
156	ULTJ						V	V	V	V	V	V	V	V	V	V	V	
157	UNVR	19	18	18	16	16	18	13	16	21	19	20	19	20	20	20	18	
158	CEKA						V					V					V	
159	ICBP													V	21	21	19	
160	ROTI												V	V	V	V	V	
161	INDF	20	19	19	17	17	19									22	20	

162	MBTO														V	V	V	
163	INDS															V	V	
164	AISA																V	
165	PSDN																V	
	F. Property, Real Estate and Building construction																	**F. Property, Real Estate and Building construction**
166	ASRI PT							V	17	V	V	V	20	21	22	23	21	26. PWSI
167	BAPA							V	V	V	V	V	V	V	v	V	V	
168	BIPP						V	V	V		V		V	V	V	V	V	
169	BKSL						V	V	18		V	V	21	22	V	V	22	
170	BMSR						V	V		V	V	V				V	V	
171	COWL							V	V	V	V	V	V	V	V	V	V	
172	CTRA	21			18	18	20	14	19		20	21	22	V	V	V	V	
173	CTRP						V	V	20	22							V	
174	CTRS		20		19	19	V	V	V	V	V	V	V	V	V	V	V	
175	DGIK PT							V	V	V	V	V	V	V	V	V	V	
176	DILD						V	V	V	V	V	V	V	V	V	V	V	

177	DUTI						V	V	V	V	V	V	V	V	V	V		
178	ELTY						V	15	21	V	21		23		23	24	V	
179	FMII						V	V	V	V	V	V	V	V	V	V	V	
180	GMTD						V	v	V	V	V	V	V	V	V	V	V	
181	GPRA							v	V	V	V	V	V	V	V	V	V	
182	JKON								V	V	V	V	V	V	V	V	V	
183	JRPT						V	16	V	V	V	V	V	V	V	V	V	
184	KIJA	22	21	20	20		V	17	22	V	22			V	V	V	V	
185	LAMI							V	V	V	V	V	V	V	V	V	V	
186	LCGP						V	V	V	V	V		V	V	V	V	V	
187	LPKR				21	20	21		23	V	23	22	24	23	24	25	23	
188	OMRE							V	V	V	V	V	V	V	V	V	V	
189	PTRA Delisted from IDX 8 July 2011						V	V		V	V	V	V	V				
190	RBMS						V	V	V	V	V	V	V	V	V	V	V	
191	RODA						V	V	v			V				V	V	
192	SCBD						V	V	V	V	V	V	V	V	V	V	V	
193	SMRA		22	21			V	18	V	V	V	V	V	v	V	V	V	
194	SSIA						V	V	V	V	V	V	V	V	V	V	V	

195	TOTL					21	V	V	24	V	V	V	V	V	V	V	V	
196	WIKA								25	23	24	23	V	24	V	V	V	
197	BKDP						V			V	V	V	V	v	V	V	V	
198	DART					V	V										V	
199	KPIG					V	V						V	V	v	V	V	
200	LPCK						V									V	V	
201	SIIP delisting from IDX 28 Feb 2012						V	V										
202	BCIP											V	V	V	V	V	V	
203	BSDE									V	v	24	25	25	25	**V**	**V**	
204	JIHD												V	v			V	
205	MDLN								V		V		V	V		V in July	V	
206	MKPI											V	V	v	V	V	V	
207	SMDM									V	V	V	V	V		V	V	
208	ADHI	23	23	22	22	22											V	
209	PJAA						V	V	V	V	V	V	V	V	v	V	V	
210	MTSM								V	V	V		V	V	V	V	V	
211	APLN														V	V	V	
212	EMDE														V	V	V	

213	PWON														V	V	V	
214	MTLA															V	V	
215	BEST																V	
	G. Infrastructure, Utilities & Transportation																	**G. Infrastructure, Utilities & Transportation**
216	CMPP						V	V	V	V	V				V	V	V	27. APOL
217	HITS						V	19	V	V	V	V	V	V	V	V	V in Augt	28. SAFE
218	IATA						V	V	V	V	V	V	V	V	V	V	V	29. TMAS
219	IATG Delisted from IDX 29 December 2009						V	V	V									30. SUPR
220	MIRA							V	V	24								31. TBIG
221	RIGS						V	V	V	V	V	V	V	V	V	V	V	32. TOWR
222	SMDR						V	V										
223	TLKM	24	24	23	23	23	22	20	26	25	25	25	26	26	26	26	24	
224	WEHA							V		V								
225	ZBRA							V	V	V	V	V	V	V	V	V	V	
226	BTEL				24	24	23	21		V	26	26			27		V	
227	CMNP		25	24		25	V	22							V	V	V	
228	FREN						24	23										

229	INDX											v	V	v	v	V	V	
230	INVS										V	V	V	V	V	V	V in Augt	
231	RINA (delisted 1 Oct 2012										V	V	V	V				
232	TRAM									V	V	V	V	27	28	27	25	
233	INDY									26	27	27						
234	PGAS	25	26	25	25	26	25									28	26	
235	ISAT	26	27	26	26	27	26										V	
236	BLTA		28	27	27	28	27											
237	RAJA						v	v	v		v	v	v	V				
238	META						v	V								V	V	
239	TRUB						28	24	27	V		28						
240	BULL														V	V	V	
241	MBSS														V	V	V	
242	WINS															V	V	
243	GIAA															V	V	
244	PTIS															V	V	
245	SDMU															V	V	
246	EXCL																27	

247	JSMR																28	
248	CASS															V	V	
	H. Trade, Service & Investment																	**H. Trade, Service & Investment**
249	ABBA						V	V	V	V	V	V	V	V		V	V	
250	ACES								V	27	V	V	V	V	V	V	V	33. KONI
251	AIMS						V	V	V	V	V	V	V	V	V	V	V	34. LTLS
252	ANTA						V	V	V	V	V	V	V	V	V	V	V	35. WAPO
253	ASGR						V	V	V	V	V	V	V	V	V	V	V	36. TELE
254	ASIA								V	V	V	V	V	V	V	V	V	37. TRIO
255	BAYU						V	V	V	V	V	V	V	V	V	V	V	38. IDKM
256	BMTR						V	25	28	28	28	29	27	28	V	V	V	39. ABBM
257	CSAP							V	V	V	V	V	V			V	V	40. MFNI
258	DNET						V	V	V	V	V	V	V	V	V	V	V	
259	EPMT						V	V	V	V	V	V	V	V	V	V	V	
260	FAST						V	V	V	V	V	V	V	V	V	V	V	
261	FISH						V	V		V	V	V	V	V	V		V	
262	FORU						V	V	V	V						V	V	

263	HERO								V	V	V	V	V	V	V	V	V	
264	ICON						V	V	V	V	V	V	V	V				
265	INPP							V	V	V	V	V	V	V	V	V	V	
266	ITTG						V	V	V									
267	JASS						V	V	V	V	V							
268	JTPE						V	V	V	V	V	V	V	V	V	V	V	
269	KOIN							V	V	V	V	V	V	V	V	V	V	
270	LPLI							V	V			V	V	V	V	V	V	
271	MAMI						V	V	V	V	V	V	V	V	V	V	V	
272	MICE						V	V	V	V	V	V	V	V	V	V	V	
273	MNCN								29	29	V	V	28	29	V	V	V	
274	MPPA						V	26	V	30				V	V	V	V	
275	MYOH						V	V	V	V	V	V	V	V			V	
276	OKAS						V	V		V	V							
277	PANR						V	V	V								V	
278	PGLI							V	V	V	V	V	V	V	V	V	V	
279	PUDP							V	V	V								
280	PLIN						V	27	V	V					V	V	V	

281	PSAB						V	V	V	V	V	V	V	V	V	V	V	
282	PSKT							V	V	V	V	V	V	V	V	V	V	
283	RALS						V	28	V	V	V	V	V	V	V	V	V	
284	RIMO						V	V	V	V	V						V in Augt	
285	SCMA						V	V	V	V	V	V	V	V		V	V	
286	SDPC						V	V	V									
287	SING (no data available)						V	V					V	V	V		V in Augt	
288	SONA						V	V	V	V	V	V	V	V	V	V	V	
289	SUGI						V	V	V	V	V	V	V	V	V	V	V in Augt	
290	SQMI						V	V			V	V	V	V	V	V	V	
291	TMPI								V			V	V	V				
292	TMPO						V	V	V	V	V	V	V	V	V	V	V	
293	TRIL								V	V	V	V	V	V	V	V	V	
294	UNTR	27	29	28	28	29	29	29	**30**		29	30	29	30	29	29	29	
295	BNBR	28	30	29	29	30	30	30										
296	MACO Delisted from IDX 1 Dec 2009						V											
297	INTD						V								V		V	
298	GMCW						V			V		V	V	V	V	V	V	

299	INTA						V		V			V					V	
300	MTDL						V	V				V	V	V	V	V	V	
301	MDRN						V	V			V	V	V	V	V	V	V	
302	**ALFA Delisted 17 Oct 2011**											V	V	V	V			
303	BMSR												V	V	V	V	V	
304	CENT								V	V	V		V	V	V	V	V	
305	CLPI							V	V		V	V	V	V	V		V	
306	DSSA												V	V	V	V	V	
307	EMTK											V	V	V	V	V	V	
308	GOLD												V	V	V	V	V	
309	GREN												V	V	V	V	V	
310	HEXA									V	30			V	V	V	V	
311	HOME									V	V	V	V	V	V	V	V	
312	KARK						V		V	V	V	V	V	V	V in July	V	V in Augt	
313	MAPI											V	V	V	V	V	V	
314	MLPL	29											V	V	V	V	V	
315	PDES									V	V	V	V	V	V	V	V	
316	SHID									V	V	V	V	V		V	V	

317	SKYB												V	V	V		V	
318	TURI											V	30	V	V	V	V	
319	WICO											V	V	V	V	V	V	
320	LPPF											V	V					
321	AMRT										V	V	V					
322	KBLV									V						V	V	
323	**KOPI (No data available)(20 May 1991)**									V								
324	**POOL**								V	V								
325	PLAS			30	30												V	
326	LMAS	30																
327	AKRA							V							30	30	30	
328	BHIT														V	V	V	
329	BUVA														V	V	V	
330	JSPT														V	V	V	
331	MFMI														V	V	V	
332	PNSE														V	V	V	
333	PTSP														V	V	V	

334	SRAJ														V	V	V	
335	BYAN															V	V	
336	STAR															V	V	
337	TIRA															V	V	
338	ERAA																V	
339	GEMA																V	
340	MIDI																V	
341	SMMT																V	
342	TGKA																V	
343	TKGA																V	
344	VIVA																V	

Note: 1. Sign v is *Sharia* Stocks

2. Number is JII Stocks

3. Beyond sign v is Non-*Sharia* Stocks for each period plus Non-*Sharia* stock list on the right side

Appendix H Result of ADF Test

Table Result of Augmented Dickey Fuller test statistics (ADF)

	t-statistic	
	2005-2007 period	2008-2012 period
Excess Return	***-7.408	***-8.463
Market return	***-12.598	***-4.472
HML	**-3.224	***-10.255
Size	***-8.167	***-12.983
LMH turnover	***-7.934	***-11.734
LMH spread	***-7.728	***-9.414

*** Indicates statistical significance at the 0.01 level
** Indicates statistical significance at the 0.05 level

Appendix I Table 4.36: TVA of Stocks Entering JII

Period	2005,2 27 June 2005	2006.1 28-Dec-05	2006.2 26-Jun-06	2007.1 27-Dec-06	2007.2 29-Jun-07	2008.1 27-Dec-07	2008.2 5-Jun-08	2009.1 4-Dec-08	2009.2 4-Jun-09	2010.1 4-Dec-09	2010.2 3-Jun-10	2011.1 3-Dec-10	2011.2 7-Jun-11	2012.1 6-Dec-11	2012.2 30-May-12	Average Turno ver
Event Day																
-20	0.706	1.1021	11.279	8.596	1.710	0.418	3.138	3.543	2.280	0.829	2.978	1.743	1.451	0.470	1.196	2.763
-19	3.709	1.3974	7.281	3.345	2.249	0.347	1.889	4.056	3.692	0.224	1.790	2.131	0.411	1.141	2.118	2.385
-18	3.742	0.5171	9.240	5.308	1.898	0.798	2.048	3.039	2.679	0.400	2.449	2.254	1.984	1.397	2.349	2.673
-17	4.956	0.5108	5.213	6.246	4.171	0.561	1.252	1.984	3.006	0.732	2.523	2.419	1.020	0.962	2.515	2.538
-16	4.262	2.0284	7.255	3.494	1.745	1.096	1.098	0.795	2.864	0.662	2.173	1.208	1.411	0.710	1.455	2.150
-15	2.757	0.8463	11.747	8.150	1.592	0.672	1.251	1.202	3.076	0.838	2.014	1.220	4.270	0.519	1.916	2.805
-14	1.698	2.4859	7.985	3.184	1.941	1.312	1.174	1.243	3.125	1.404	1.692	1.684	1.751	0.417	1.196	2.153
-13	2.115	2.1662	10.713	6.179	3.760	1.110	2.192	1.957	2.715	0.891	1.432	1.366	1.838	0.712	1.650	2.720
-12	3.837	1.7901	6.735	6.237	1.875	0.530	1.763	5.147	3.403	1.413	1.881	1.228	3.039	1.422	0.892	2.746
-11	2.370	1.3453	10.784	2.649	1.528	1.476	1.068	2.381	2.949	3.507	1.409	1.014	1.002	0.633	0.762	2.325
-10	4.806	7.2321	15.662	11.706	0.602	1.320	1.017	2.664	2.745	3.858	2.941	1.238	1.711	0.737	2.254	4.033
-9	4.014	1.9005	5.076	7.578	0.962	2.246	1.790	2.245	1.658	1.413	2.741	2.528	0.931	0.600	2.191	2.525
-8	3.874	1.4205	5.056	2.318	0.533	1.259	1.160	0.920	3.147	0.691	2.510	2.412	1.476	0.909	1.797	1.966
-7	3.447	3.7581	8.682	3.202	1.592	0.967	2.619	2.551	2.683	0.766	2.566	1.719	1.322	1.278	2.333	2.632
-6	5.980	0.6583	8.606	2.559	2.252	1.050	1.743	1.845	2.092	0.742	1.402	4.509	1.056	1.245	3.225	2.598
-5	6.744	0.9217	8.525	4.032	2.795	0.460	1.795	2.268	1.401	0.994	1.476	1.652	0.528	1.212	1.334	2.409
-4	3.911	2.0844	7.036	3.040	1.789	0.527	0.842	0.288	2.543	0.881	1.204	1.846	1.745	1.027	1.604	2.025
-3	2.638	2.1933	1.711	4.417	5.134	0.286	1.322	1.347	2.115	0.756	1.177	5.472	0.987	0.438	1.838	2.122
-2	4.556	0.6501	5.514	4.354	2.890	0.390	1.323	1.821	2.581	0.935	1.029	2.693	0.377	0.510	1.784	2.094
-1	3.158	0.7018	3.363	12.350	4.960	1.024	1.013	1.486	2.547	1.567	0.001	2.946	1.418	0.426	1.446	2.560
0	4.276	1.0255	5.236	11.045	1.978	0.272	NA	3.325	1.335	3.087	0.000	1.287	1.354	1.174	1.961	NA
1	4.538	1.4527	4.100	4.779	2.014	0.318	0.616	4.241	3.017	0.953	1.896	2.184	1.749	0.440	3.393	2.379
2	4.495	1.4695	3.924	4.140	2.548	0.890	1.597	6.002	4.182	1.399	1.680	1.451	1.392	0.359	2.423	2.530

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3	3.908	0.6830	2.972	1.590	0.923	0.782	1.026	3.965	2.608	1.233	2.025	1.277	1.345	0.568	2.036	1.796
4	3.753	0.8589	3.310	1.605	3.954	0.699	0.811	2.543	2.574	0.734	1.982	0.518	1.257	0.420	1.294	1.754
5	2.807	1.4885	11.809	3.466	2.104	0.321	2.056	2.033	1.841	1.000	2.185	0.816	0.629	0.427	1.157	2.276
6	1.887	6.4222	11.807	2.056	7.052	0.215	2.741	4.503	2.423	0.478	1.525	1.281	1.388	0.282	1.211	3.018
7	2.939	1.9176	6.705	1.412	2.563	0.360	1.339	1.647	2.355	0.562	1.097	1.177	1.685	0.511	1.039	1.821
8	3.265	1.5074	6.459	1.124	1.719	0.360	0.931	2.768	2.685	0.716	0.854	1.821	1.499	0.405	0.837	1.797
9	3.021	1.0444	6.158	2.076	2.445	0.434	0.893	4.459	1.361	0.628	1.816	1.388	1.529	0.226	0.794	1.885
10	2.157	1.1309	8.277	1.883	1.527	0.852	2.007	1.069	1.428	0.698	0.483	0.548	1.549	0.358	0.550	1.634
11	0.997	2.3422	5.833	2.634	2.002	0.963	1.716	2.196	1.391	0.703	0.386	1.284	1.483	0.483	2.711	1.808
12	1.953	2.4543	6.189	2.063	1.661	0.953	1.300	1.590	1.089	1.222	1.590	0.332	0.829	0.162	1.228	1.641
13	2.051	1.9057	3.656	3.554	4.821	0.578	1.448	0.268	2.598	0.834	1.855	0.255	2.040	0.377	1.465	1.847
14	1.734	1.8667	5.198	3.991	18.452	0.641	1.307	0.054	2.083	2.286	1.879	0.714	1.281	0.186	0.826	2.833
15	1.801	3.9313	7.583	1.502	14.958	0.938	1.305	0.515	1.763	1.090	3.022	0.760	0.742	0.162	1.244	2.754
16	2.106	1.7263	4.955	1.321	2.955	1.041	0.523	1.374	1.779	1.100	1.288	0.813	1.257	0.530	0.963	1.582
17	1.758	2.1067	7.679	2.143	2.624	0.988	0.528	1.434	1.754	1.256	0.737	0.891	1.548	0.305	0.680	1.762
18	2.534	1.4873	13.468	1.178	1.821	0.816	1.251	1.278	1.521	0.724	1.271	0.750	1.146	0.828	0.900	2.065
19	2.237	1.3100	6.369	1.049	1.087	0.866	1.570	1.940	1.305	0.734	1.565	1.630	0.692	0.309	0.161	1.522
20	3.129	1.0910	7.868	1.514	3.678	0.630	1.523	3.813	2.200	0.879	0.532	1.382	1.450	0.663	0.520	2.058

Appendix J Table 4.37: TVA of Stocks Leaving JII

Period	2005,2 27 June 2005	2006.1 28-Dec-05	2006.2 26-Jun-06	2007.1 27-Dec-06	2007.2 29-Jun-07	2008.1 27-Dec-07	2008.2 5-Jun-08	2009.1 4-Dec-08	2009.2 4-Jun-09	2010.1 4-Dec-09	2010.2 3-Jun-10	2011.1 3-Dec-10	2011.2 7-Jun-11	2012.1 6-Dec-11	2012.2 30-May-12	Average Turno ver
Event Day																
-20	0.721	9.8455	0.368	0.624	0.519	2.778	0.648	1.932	2.048	2.176	0.963	1.896	1.250	0.143	0.258	1.745
-19	0.638	11.7075	0.409	0.319	0.748	2.007	0.601	3.374	1.159	0.637	0.815	1.658	0.362	0.304	0.526	1.684
-18	1.595	26.2779	0.363	0.769	1.665	1.774	0.728	2.594	0.917	1.933	1.667	1.943	1.451	0.278	0.602	2.970
-17	0.952	27.4342	0.499	0.742	0.426	2.299	0.483	4.183	0.993	1.372	1.888	2.240	0.822	0.226	0.522	3.005
-16	1.650	31.9822	0.912	1.489	0.258	2.845	0.992	4.398	1.579	0.563	2.195	1.769	1.038	0.357	0.227	3.484
-15	0.926	22.5648	1.851	1.180	0.475	1.743	0.650	2.905	0.737	2.175	1.879	0.951	2.333	0.237	0.969	2.772
-14	0.464	5.2840	0.867	2.365	1.645	0.738	0.445	1.114	0.564	1.449	1.230	1.731	1.040	0.085	0.998	1.335
-13	1.789	5.4376	0.496	1.333	1.203	1.088	0.716	1.116	0.685	0.769	1.435	0.892	0.858	0.164	0.786	1.251
-12	0.054	22.5292	0.297	1.114	0.843	1.631	1.023	2.053	0.827	0.664	1.449	1.204	1.114	0.248	0.290	2.356
-11	0.241	41.5026	0.388	0.438	0.903	1.329	0.567	1.002	1.152	1.137	1.573	1.099	0.625	0.436	0.503	3.527
-10	1.551	24.6277	0.289	0.411	0.362	1.398	0.288	3.594	2.983	0.674	1.417	1.479	1.059	0.218	0.951	2.753
-9	1.296	15.8359	0.204	0.304	0.637	2.655	0.297	1.675	1.670	0.763	1.286	2.197	0.904	0.543	0.663	2.062
-8	1.737	14.0042	1.740	0.157	1.483	1.149	0.187	1.903	2.597	1.048	1.686	1.517	0.982	0.084	0.871	2.076
-7	2.534	6.4185	0.715	0.285	1.835	0.807	0.195	2.819	1.458	0.785	2.405	0.956	0.865	0.262	0.516	1.524
-6	1.214	2.6440	0.864	0.253	1.046	1.100	0.520	1.343	1.740	0.733	2.602	1.846	0.559	0.383	0.622	1.165
-5	0.598	8.9993	0.994	0.336	0.318	2.371	0.218	0.926	2.093	1.147	1.724	1.738	0.303	1.034	0.649	1.563
-4	0.469	4.5906	1.288	1.092	0.938	1.558	0.136	0.305	0.941	1.699	1.295	1.677	0.741	1.452	0.365	1.236
-3	1.207	1.7780	0.093	0.678	1.340	1.382	0.510	1.890	1.339	1.816	1.551	1.527	1.435	0.375	0.841	1.184
-2	2.329	4.8381	0.243	0.263	2.143	1.276	0.382	2.809	1.208	1.534	1.593	0.927	0.568	0.377	0.458	1.397
-1	1.100	1.8173	0.095	0.384	1.400	1.460	0.337	1.759	1.880	1.125	0.002	1.450	1.445	0.249	0.457	0.997
0	2.692	3.4297	0.062	0.560	1.579	0.875	0.680	1.294	1.140	1.219	2.724	0.756	2.471	0.592	0.845	1.395
1	3.153	18.6411	0.189	0.502	1.432	0.590	0.108	1.854	2.152	1.311	1.289	1.331	1.552	0.428	0.640	2.345

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2	13.472	20.9865	0.333	0.115	1.255	1.660	0.397	2.639	2.212	2.223	2.351	1.809	1.624	0.387	0.998	3.497
3	6.822	9.8364	0.133	0.838	0.696	1.656	0.520	3.902	2.575	3.293	2.718	0.882	1.520	0.650	0.999	2.469
4	2.215	12.8698	0.224	0.398	0.420	1.505	0.393	1.724	1.376	2.110	2.637	0.543	1.381	0.521	1.101	1.961
5	2.944	41.2780	0.524	1.465	0.578	1.196	0.379	0.940	1.278	1.677	2.028	0.888	0.983	1.067	1.343	3.905
6	1.677	25.0224	0.172	0.953	1.234	1.245	0.339	1.690	1.396	0.991	2.142	3.154	1.291	0.222	1.589	2.874
7	1.005	9.3443	0.363	0.759	1.159	1.858	0.467	1.239	2.521	1.316	1.499	2.287	1.862	0.375	1.567	1.841
8	2.453	12.8981	1.413	0.806	0.607	1.921	0.560	1.330	1.353	1.121	2.123	3.006	1.574	0.467	0.659	2.153
9	1.537	13.9813	0.500	1.543	2.604	1.592	0.359	2.859	1.046	1.663	1.705	1.469	0.944	0.684	1.122	2.241
10	0.825	9.1921	0.595	0.680	1.267	2.697	0.451	4.534	2.084	1.392	0.657	0.638	1.539	0.250	1.017	1.854
11	1.110	25.8222	0.366	0.747	0.922	2.320	0.344	3.084	1.221	1.119	1.379	1.089	1.443	0.360	0.895	2.815
12	2.236	13.9608	0.473	1.154	2.116	2.697	0.201	1.015	1.370	0.598	1.716	0.489	0.463	0.181	2.106	2.052
13	2.550	7.4577	0.081	0.519	2.880	1.256	0.436	0.349	1.839	1.807	1.105	0.402	0.800	0.440	1.141	1.537
14	0.817	11.8533	0.305	0.641	1.735	2.034	0.699	0.082	1.498	2.014	2.570	0.754	0.759	0.143	0.714	1.775
15	1.839	6.8157	0.983	1.004	1.621	1.962	0.345	0.874	1.518	1.307	2.145	0.932	0.564	0.274	0.993	1.545
16	7.414	9.4868	0.140	0.425	0.973	2.537	0.256	1.510	1.916	2.161	2.327	0.729	0.720	0.491	1.595	2.179
17	2.863	11.3958	1.020	0.700	1.591	2.362	0.150	2.821	2.483	3.631	2.154	1.611	1.428	0.397	1.190	2.387
18	3.769	4.2964	0.942	3.769	0.894	1.304	0.316	1.856	2.598	3.017	2.215	1.502	1.194	0.181	0.601	1.897
19	0.871	18.8309	0.835	2.455	1.253	1.634	0.205	6.464	1.555	2.549	2.096	2.832	0.987	0.221	0.458	2.883
20	1.049	19.1074	1.324	1.880	1.016	1.546	0.401	3.839	1.899	2.302	0.781	2.183	1.006	0.530	0.546	2.627