THE IMPACT OF ECONOMIC SHOCKS ON STOCK RETURN AND TRADING VOLUME RELATIONSHIP

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ABSTRACT

This study analyzed the relationship between trading volume and stock return in the Main Market of Bursa Malaysia from April 2009 to October 2018, and ACE market from April 2000 to October 2018. The relationship was then re-examined surrounding four exogenous shocks in macro events. The first two shocks, standardization of lot size, and the global financial crisis were only applicable to the Main Market only while two other shocks, the oil price shock, and the 14th Malaysian general election were applicable to both market. Granger-causality test showed a significant bidirectional relationship between trading volume and stock return. Results of the ordinary least squares (OLS) further revealed that there was a positive and significant relationship between trading volume and stock return. This positive relationship is consistent with the sequential arrival of information model and the mixture of distribution hypothesis model (MDH). The positive relationship generally was held for the period before and after the economic shocks related to the standardization of lot size, the global financial crisis, and the oil price shock. The stock return-volume relationship was, however, significantly weaker during the global financial period and became insignificant during the 14th Malaysia general election in the Main Market. The findings of a weaker stock return-trading volume relationship are consistent with the MDH. Overall, the significant positive stock return-volume relationship for the overall and subsamples of economic shock events implied that when the investors observed an increase in the trading volume, they start to invest in the stock as the stock returns also increased due to the positive stock return-volume relationship. The stock return-volume relationship can help in the investor's investment decisions.

Keywords: Trading Volume, Stock Return, Granger-Causality Test, Regression Test, Macro Events

ABSTRAK

Kajian ini menganalisa hubungan antara volum dagangan dan pulangan saham di Pasaran Utama Bursa Malaysia dari April 2009 hingga Oktober 2018, dan pasaran ACE dari April 2000 hingga Oktober 2018. Hubungan tersebut kemudian diperiksa semula sekitar empat kejutan eksogen dalam peristiwa makro. Dua kejutan pertama, piawaian saiz lot, dan krisis kewangan global hanya terpakai untuk Pasaran Utama sahaja manakala dua kejutan lain, kejutan harga minyak dan pilihan raya umum ke-14 Malaysia terpakai bagi kedua-dua pasaran. Ujian causality-Granger menunjukkan hubungan bidirectional yang signifikan antara jumlah dagangan dan pulangan saham. Hasil kuadrat paling biasa (OLS) selanjutnya menunjukkan bahawa terdapat hubungan positif dan signifikan antara jumlah dagangan dan pulangan saham. Hubungan positif ini selaras dengan ketibaan model maklumat ketibaan dan campuran model hipotesis pengedaran (MDH). Hubungan positif umumnya diadakan untuk tempoh sebelum dan selepas kejutan ekonomi yang berkaitan dengan standardisasi saiz lot, krisis kewangan global, dan kejutan harga minyak. Walau bagaimanapun, hubungan volum pulangan saham adalah ketara lemah semasa tempoh kewangan global dan menjadi tidak penting semasa pilihan raya umum ke-14 di Pasaran Utama. Penemuan hubungan volum dagangan volum yang lemah adalah konsisten dengan MDH. Secara keseluruhan, perhubungan volum semula volum positif yang signifikan untuk keseluruhan dan subsimpel peristiwa kejutan ekonomi tersirat bahawa apabila pelabur melihat peningkatan dalam jumlah dagangan, mereka mula melabur dalam stok kerana pulangan saham juga meningkat disebabkan oleh saham positif perhubungan balik-volum. Hubungan jumlah pulangan saham dapat membantu dalam keputusan pelaburan pelabur.

Kata kunci: Jumlah Dagangan, Pulangan Saham, Ujian Kausaliti Granger, Ujian Regresi, Peristiwa Makro

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CHAPTER 1

INTRODUCTION

1.0 Background of the Study

Price-volume is a well-researched topic in finance. According to Karpoff (1987), there are mainly three reasons as to why a comprehensive understanding of this relationship matter. Firstly, the relationship can enhance our understanding of the structure of financial markets. For example, the price-volume relationship can be explained by the type of investors in the market which will lead to changes in the relationship between trading volume and stock price. The financial market is made up of a mixture of optimists and pessimists who directly affect stock price-volume relationship. Secondly, the relationship will help in event studies to outline the implications of these event studies. The speculator will also benefit from this study as they will know how the window selection in the event study will affect their decision to buy or sell stock. Furthermore, data from the price-volume relationship can be applied to event studies to calculate the changes in the variance of the price process either during the event or pre- and post-event. Lastly, the price-volume relationship can be support in the futures market where the changes in price is expected to have an effect on the trading volume in the futures market. This depends on the issue of the stabilization factor on future prices in speculation. The futures market is similar to the stock market in many aspects, for example, there is also private and public information in the futures market and expected to be the same relationship between price and trading volume as in the stock market. Tauchen & Pitts (1983) examined the price-volume relationship in the Chicago futures market and obtained similar to as positive price-volume relationship as shown in stocks. Kayali and Akarim (2010) examined the price-volume relationship in the Turkish Derivatives Exchange and the results showed a unilateral causality relationship running from trading volume to return. In addition, the study by Chen, Firth and

Xin (2005) showed a contemporaneous significant positive correlation between trading volume and absolute return in the China commodity futures market.

This paper examined the price-volume relationship surrounding four major economic shocks in Malaysia that significantly affected its economy. Specifically, the price-volume relationship was investigated in an event study focused on the relationship three years before and after these systematic shock events took place. The events are the standardization of stock trading lot size, the 2008-2009 global financial crisis, the oil price shock in 2014 and Malaysia's 14th General election that was held in 2018. Focusing on systematic economic shock events allows the study to directly test information uncertainty theory which hypothesizes that the price-volume relationship tend to have a negative relationship during the period of uncertainty. This is because when there is an economic shock, the uncertainty is expected to increase during the shock which leads to an increase of volume when investors sell off their stock to cut losses and the price is expected to drop.

A summary of the four events is briefly explained.

Effective on May 26th, 2003, the Malaysia stock exchange, Bursa Malaysia standardized the minimum lot size to 100 units per lot from 100, 200 and 1,000 shares previously. The standardizing of lot size could make the securities become more affordable and also increases the participation of retail investors. Thus, if there is an increment of market liquidity, this means that the trading volume will be increase.

The second major event was the global financial crisis in year 2008-2009 (GFC). According to the Reserve Bank of Australia, the crisis occurred mainly due to the following three reasons: - (1) overtaking of risk in a favorable macroeconomic environment, (2) increase in borrowings by banks and investors, and (3) problems in regulations and policies. The crisis represented a period of high uncertainty in the stock market where the Kuala Lumpur Composite Index

(KLCI) plummeted to 863.61 during the height of the crisis, which represented a 61% drop from its peak in January 2008. During the financial crisis, investors who were typically short of funding, preferred to reduce their investment or withdrew their money from the market. This reduced market liquidity and the stock prices faced a reduction as the global economy was not in a good condition. Therefore, the positive relationship between trading volume and stock return could be stronger during a crisis than a non-crisis period.

The third exogenous event was the oil price shock that occurred from July 2014 to March 2015. Crude oil prices declined by approximately 52 percent from USD 98.17 to USD 47.60 (Source: DataStream). The event was due to a drastic rise in the oil supply accompanied by a weak demand in the market. This had a direct consequence on exporters and importers of oil. As an oil exporting country, the supply and demand of oil will affect Malaysia foreign trading as well as its economy which directly affects the stock market performance. Because of information uncertainty, investors do not know how the crisis will affect the stock market, in fact, even economists find it hard to predict the effect of crises on the stock market. Investors do not know the minimum level the oil price will drop to, making it difficult to predict the reaction of the companies that listed in the market. When there is an oil price shock, investors are expected to reduce or stop trading which eventually reduces the trading volume. Companies which are affected by the crisis may suffer decreasing stock returns. Thus, this situation indicates a positive relationship between trading volume and stock return.

The last event was the 14th Malaysia general election, which was held on May 9th, 2018. It was an extraordinary victory for the opposition party, the Pakatan Harapan coalition (the Coalition of Hope). Pakatan Harapan won the election and Tun Dr Mahathir Mohamad once again becoming Malaysia's Prime Minister was least expected by the people. This is an event that from the political perspective contains information uncertainty and has a direct relationship to the country's growth and performance. The stock market will reflect the health of a country's

economy from all perspectives. Hence, the unprecedented outcome from the 14th Malaysia general election could affect the stock market performance as well as the price-volume relationship. The prediction on which party could win was uncertain and very difficult to predict. Thus, the uncertainty this may have an impact on investors' decision.

1.1 Problem Statement

Despite the voluminous empirical evidence on the price-volume relationship in countries around the world, the price-volume relationship is relatively under-researched in the developing and emerging markets. Thus, the relationship is still unclear, specifically, in an emerging country like Malaysia. A study using Malaysia data, generally, found a positive relationship between trading volume and stock return.

Previous studies have relied on time series methods such as abnormal returns, GARCH, prediction and forecasting, to uncover the price-volume relationship. One of the drawbacks of these time series approaches is that these studies do not directly test the implications of the price-volume theory. The study posits that the current crises need a cross-sectional approach which will be more appropriate as time series data include only historical data and are not able to test for current issues.

Karpoff (1987) reported that, "It takes volume to influence price movements" which means that the trading volume moves the price, as price and volume represent the key pillars around the whole stock market. The changes in price is characterized as the valuation of new information in the market while volume is characterized as an indicator of investors' disagreement on the valuation of new information in the market.

Similarly, Mohamad and Nassir (1995) posited that different investors might have different interpretations and analysis on the new information flow in the market which can be explained as a lack of consensus. Some time may pass before they reach a consensus and the increase in volume can be detected during that time. There will be changes in price if investors reach a consensus when the first transaction was made, under the assumption that investors have homogenous risk preferences. There will still be volume movements in the case where investors have different risk preferences. For example, before the election, there was a lack of

consensus as different investors support different parties. Thus, the investors have yet to reach a consensus and they tend to react according to their own preferences. Thus, when they have not reached a consensus and there are uncertain events happening, it is expected to have no relationship between trading volume and stock return. After the investors reached a consensus, uncertainty is relieved and it is expected to have a positive relationship between trading volume and stock return. More investors will trade similarly when they reach a consensus.

Furthermore, to the best of my knowledge, three studies have examined the price-volume relationship in the Malaysia context and the results have been mixed. Maziah (2016) carried out a study in the ACE market and found a negative contemporaneous relationship between stock return and past period trading volume. However, Kadour (2009) found a significant positive relationship between the absolute return and trading volume. This discrepancy could be due to the different time period chosen, or the different markets taken by the authors, where Maziah (2016) examined the ACE market, whilst Kadour (2009) examined the main market. This paper therefore attempts to bridge this gap by providing a more comprehensive analysis of the price-volume relationship using a longer time period (18 years) and covering more stocks (from the Main and ACE markets). Furthermore, there are studies that showed that price affects volume but there are also studies that showed that volume affects price. Thus, to verify the direction of the relationship, this study utilized the granger causality test to confirm the direction of price-volume causality.

The four major economic shocks discussed briefly above are expected to have a significant influence on Malaysia's economy which will be reflected in the stock market and is also expected to affect the relationship of trading volume and stock returns. The price-volume relationship during the major events has not been examined in previous studies. Thus, the aim of this study is to provide answers to this relationship.

1.2 Research Questions

1. What is the relationship between trading volume and stock return?
2. Is there any causality relationship between trading volume and stock return?
3. What is the impact of the trading lot size standardization on relationship between stock return and trading volume?
4. What is the impact of the global financial crisis on relationship between stock return and trading volume?
5. What is the impact of the oil price shock on relationship between stock return and trading volume?
6. What is the impact of the 14th Malaysia general election on relationship between stock return and trading volume?

1.3 Research Objectives

1. To investigate the relationship between trading volume and stock return.
2. To discover the direction of causality relationship between trading volume and stock return.
3. To examine the impact of the trading lot size standardization on stock return and trading volume relationship.
4. To examine the impact of the global financial crisis on stock return and trading volume relationship.
5. To examine the impact of the oil price shock on stock return and trading volume relationship.
6. To examine the impact of the 14th general election on stock return and trading volume relationship.

1.4 Significance of the Study

This study is important because it provides an ongoing attempt to explore how major exogenous events might affect the Malaysian stock market. Specifically, this study combines research by Kadour (2009) and Maziah (2016) by using data from both the Main Market and the ACE Market, as well as extending their research by examining data over a longer period of study from January 2009 until 2018. This study fills the time period gap between January 2009 until 2018 and in examining the Main Market.

A holistic understanding of the price-volume relationship is expected to deliver significant contributions to investors, financial managers as well as researchers. By understanding the price-volume relationship, investors can apply their knowledge or their investments in Main Market as well as the ACE market. For company and risk analysis analyze portfolio investments and portfolio requirements. For example, investors can start to invest when there is an increase in trading volume because a positive relationship is expected, and to be prepared to invest more after a crisis as the positive relationship is expected to be weaker during the crisis.

In addition, this study is important to financial managers as they are keen in learning the factors that affect stock price and slowing them to design appropriate company policies to enhance the stability and effectiveness of the company.

As a researcher, it is expected of them to study the market on a larger scale so that other parties, such as investors, financial managers and policy makers, can make use of the market analysis for investment decisions. This study uncover the effect of major events in Malaysia that affect its stock market which will become a good reference for others interested in making investment decision.

1.5 Scope and Limitations of The Study

The study included 379 companies listed in the Main Market of Bursa Malaysia for the period 2000-2018 and 71 companies listed on the ACE market for the period 2009-2018.

The Malaysia stock market can be divided into the Main Market, the ACE market (formally known as the MESDAQ until 2009), and the LEAP market. The Main Market is a combination of the main and second board companies, of which currently there are 800 companies. The ACE market mainly lists technology-based companies. In 2018, 120 companies were listed in the ACE market.

This paper faced a number of limitations to which future researchers may consider to overcome them. Data for the study consisted of 379 companies listed in the Main Market and 71 companies listed in ACE market. However, the study did not divide the companies by their respective sectors raising the question of whether the results would hold by sectors.

Another limitation of the study is a time frame limitation in the ACE market as it was introduced in 2009. The study was unable to examine two events, the standardization of lot size and the global financial crisis, as they occurred earlier in 2003 and 2008-2009, respectively. This study also unable to test for the long-term price-volume relationship of the 14th Malaysia general election as it occurred at the very end of the time period of this study (May 2018).

Next, this study was unable to obtain data for many more of the companies from the total of 120 companies listed in the ACE market due to data restriction as it was only available from August 2009. For the Main Market, the study included 379 companies which were listed since 2000 and remained active until today.

Finally, this study only considered the relationship between trading volume and stock return without controlling for other factors that could influence these variables.

1.6 Organization of the Study

The paper is divided into five chapters. Chapter One provides the background of the study as well as the problem statement, research questions and objectives. It is then followed by Chapter Two that includes a review of the literature and the relevant underlying theory related to this study. Chapter Three discusses the research framework and develops the hypotheses to be tested according to the research objectives stated in Chapter One. This chapter also includes explanation for the data from measurement, collection technique and technique of analysis. The following Chapter Four, represents a discussion of the empirical findings in this study and the implication of the theories in the findings. The last chapter summarizes the findings of this study and the recommendations for future research.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter is divided into two main parts, which are the underlying theories and empirical evidence. It is followed by a discussion of relevant theories and a detailed review of related empirical studies. Prior studies on the price-volume relationship were reviewed. This chapter concludes with a summary table.

2.1 Underlying Theories

The price-volume relationship can be clarified by the sequential arrival of information model (Copeland 1976) and the mixture of distributions hypothesis (MDH) (Karpoff 1987). The sequential arrival of information model stresses that information will only be distributed to one trader at a time and the optimist and pessimist will affect the trader actions and hence affect the price and volume. MDH clarifies the distribution of speculative prices and unobservable mixing variables. This paper also provides the theories that support information uncertainty which is very important to explain uncertainty during the crises.

2.1.1 Sequential Arrival of Information Model

Sequential arrival of information model explains the sequence that the information arrives in the market and the information is first reached to which types of investors, either the optimistic investors or pessimistic investors. This model mainly examines how the behaviour of different types of investors affect the stock return-volume relationship. Copeland's (1976) model assumes that there will be only one piece of information delivered to only one trader during a trading period and the news will cause a one-time immediate demand curve upwards shift if the trader is optimistic while a one-time immediate demand curve downwards shift if the trader is pessimistic. The shifting of the demand curve means that trading has occurred and the action

will only occur after the informed investors obtained the information and the uninformed traders do not get any signal of the information from the informed traders' actions. Moreover, short sales are denied in this situation. The information is delivered without any costs such as transactions costs and taxes and also each boundlessly divisible asset has a fixed supply.

Assume *k* represents optimists, *r* represents pessimists, and *N* represents the number of traders. If all traders are optimists then all traders will have absolutely the same view of the effect of the new information hence the order in which they receive the information is unimportant. As such, there will only be an adjustment path from the initial through the final equilibrium. Conversely, assume that all traders are pessimists, which means that all traders are totally pessimistic to the new information received. The situation will be the same as in the case where all the traders are optimists. For instance, the first trader who received the information will be binding for short sales and the first trader will be the one who shifts the demand curve downwards due to the 'bad' news received. He would sell short if he is allowed to do so in order to respond to the 'bad' news. Since there is a prohibition of short sales, the volume generated by pessimists will be less than the volume generated by optimists as pessimists are unable to sell short when they receive the new information. According to Karpoff (1987), if there is a mixture of optimists and pessimists then this situation will cause a lower trading volume and smaller changes in prices compared to if there is only one type of trader who predominates, either optimists or pessimists. This theory suggests that there is a positive bidirectional causality relationship between price changes and trading volume as the information will change both trading volume and price movements.

Furthermore, the positive relationship explained in this theory is expected to have a weak relationship when there is uncertainty. For example, during a crisis, there is uncertainty in the market as there are many unsure situations and the investors are not confident to the movements of the stock price. In this case, there will be a mixture of optimistic and pessimistic

investors in the market but the number of pessimistic investors is expected to be more than optimistic investors who will react inversely. This will lower the trading volume and the smaller stock price changes will make the relationship weaker.

2.1.2 Mixture of Distributions Hypothesis

The mixture of distribution hypothesis (MDH) highlights the positive relationship between trading volume and return volatility which derived from some unobservable mixing variables. According to Carroll and Kearney (2015), MDH is concerned with the speed of information towards the market and the public announcement of takeover. MDH concludes that the trading volume will react to the changes in the speed with which new information arrives to the market and also the change in the spread of the traders' opinions on the information received for the underlying values of the assets they hold. Comparing the speed of information to theMain Market and the ACE market, the speed in the Main Market is assumed to be faster than the ACE market as there are more companies listed in the Main Market with more traders as compared to the ACE market. The higher the speed of information flow into the market, the higher the number of transactions which also leads to stock price increase, there is a positive relationship between trading volume and stock return under this theory.

From the speed of information point of view, we can infer from the study that the speed of information during a crisis is expected to be faster as investors are more alert during a crisis in order to make appropriate investment decision. Conversely, it is expected to have a slower information flow in the market in a non-crisis period. In other words, the speed will slow down before or after a crisis period in comparison to during the crisis period. This indicates that the positive relationship will be weaker when there is a non-crisis period compared to during a crisis period.

Anderson (1996) pointed out that various kinds of information will have different effects on trading volumes and stock returns. For instance, the announcement on market-wide events like GDP growth, inflation and current account performance, will affect the impermanent spikes in volume and have a small effect on returns. Furthermore, firm-specific events like dividend payments, announcements on earnings, and options contracts expiration, will have the same effect as market-wide events. Yet, there are some events that will affect more in return volatility along with movements in trading volume such as interest rates announcement, price changes on commodity, and so on. When there is an announcement on the decrement on commodity price, investors will sell their stock in order to cut losses so there will be a negative relationship between trading volume and stock returns as the investors sell the stock which increases the trading volume and the stock price will drop. On the other hand, if there is an announcement of an increase in GDP growth then the investors might invest more in the stock market as the country's economy is in an uptrend. This will generate a positive relationship between trading volume and stock return as the investors invest more which increases the stock price and the stock return also increases accordingly.

The varied kinds of information can also be the information that varies due to crisis. During crisis, the GDP and also the interest rate is expected to decrease as a crisis gives a bad impact towards a country's economy. When the GDP and interest rate decreased, the investors might short sell their shares in order to gain from the transaction. However, short selling is prohibited so they can only hold their investment or in other words, not to trade during the crisis. This will decrease the trading volume while the stock price continues to decrease due to the crisis and downtrend of the country's economy. This assumes that it is expected that there is a weak positive relationship between two variables during the crisis.

2.1.3 Simultaneous Information Arrival Model

Unlike the sequential arrival information model, this model only deals with the initial and final equilibrium as this model assumes that all of the information or news, the good and bad, will arrive at the same time. According to Copeland (1976), if there are *N* investors, and *j* represents the optimistic investors, therefore $q = N - j$ will be the number of the pessimistic investors. Trading volume will be the changes between the initial equilibrium and final equilibrium. Similarly, price changes, will be the changes between the initial equilibrium price and final equilibrium price. The outcome of the final equilibrium will be one of these three following scenarios: - (1) both optimists and pessimists hold positive amounts of stock in the final equilibrium which shows the high volume and associated with low price changes. This infers negative stock return-volume relationship. (2) The pessimists hold no shares as they had sold their holdings previously when the share prices had already reached a peak at the time and are prohibited by short selling. This situation shows that the highest volume arises when investors disagree. The investors did not evaluate the information identically hence no volume will be generated. (3) When all investors are pessimists in the final equilibrium and short selling is bounded which will lead to the relationship between trading volume and the portion of optimistic investors becoming asymmetric. This shows that increases in trading volume is associated with decreases in stock changes which indicates a negative relationship between trading volume and stock return, if irrespective of a crisis or non-crisis period as this model is only concerned on the final equilibrium.

2.1.4 Information Uncertainty

The information uncertainty theory by Zhang (2006) states that when there is more information uncertainty on good news, then there will be higher expected returns and conversely, when there is more information uncertainty on bad news, there will be lesser expected returns. A proxy used by the author to test for information uncertainty is the return volatility where when

there is better information uncertainty, it will lead to lower stock returns in the future resulting in 'bad' news, conversely, to higher stock returns in the future resulting in 'good' news. Zhang (2006) also mentioned that information uncertainty will delay the flow of information into the stock market and then to stock prices. Low-uncertainty stocks will react completely to the market information while high-uncertainty stocks are yet to fully react to the new information.

We can infer from the study that there is a link to uncertainty during the crisis where during a crisis, there is information uncertainty and since crisis is seen as 'bad', the stock return is expected to decrease. When there is information uncertainty, some investors will tend to hold their investment which will reduce the trading volume and thus leads to a positive relationship between the two variables. On the contrary, some investors might sell off their shares due to the uncertainty which will increase the trading volume. In this case, there is a negative relationship between trading volume and stock return. In summary, this model suggests two possible outcomes, either a positive or a negative relationship.

Daniel, Hirshleifer, and Subrahmanyam (1998) modelled information uncertainty from the perspective of the investors' reaction. Investors tend to overreact on private information and underreact on public signals or information as they are more confident on the private information that they received. They are expected to be more confident when the firms' value is hard to predict due to uncertainty. This statement supports that higher uncertainty will have greater stock returns following positive news. On the other hand, a negative relationship between these variables may occur in a situation where investors may panic when they receive uncertain information, hence, selling off their shares, which increase the trading volume in the market and the stock return will decrease due to the 'bad' news from the crisis.

2.1.5 Random Walk Hypothesis

The random walk hypothesis states that the stock market variables may not directly affect the mechanisms of the economy but is influenced by its psychological climate (Granger and Morgenstern, 1963). The random walk hypothesis emphasizes that the stock prices evolve randomly and cannot be forecasted. The past trend of a stock price cannot be used to predict its future price. Malkiel (1973) stated that efficient markets are random. When the asset price fully reflects all available information then all investors will not be able to earn excess return. The random walk hypothesis suggests that there is no relationship between trading volume and stock return and assume a strong form of market efficiency.

2.2 Empirical Evidence

According to Granger and Morgenstern (1963), the influence of economic variables affect movements in the stock market, yet, the strength of the impact is not strong according to the random walk hypothesis. The purpose of their research was to analyze stock prices in the NYSE from January 1939 –September 1961 using a new statistical technique, the Spectral method. Their results showed that there was no relationship between trading volume and absolute changes in stock price.

Besides that, Copeland (1976) emphasized on the effect of sequential information arrival model on price changes. Results from this research showed a negative correlation between the absolute value of price changes and volume which is supported by the simultaneous information arrival model, a tatonnement model of sequential information arrival.

Tauchen and Pitts (1983) examined the price-volume relationship using daily data from 90-days T-bill futures contract in the Chicago Mercantile Exchange for period January 1976 until June 1979. The authors referred to the MDH to explain the price-volume relationship by focusing on the rate of movement of new information in the market and the reaction by the

investors when they received the information. They used the bivariate normal mixture model and showd a positive relationship between the rice-volume relationship supporting the mixture of distribution hypothesis.

According to Chen, Firth and Xin (2005), there is a significant positive contemporaneous correlation between absolute return and trading volume in the China commodity futures market which is supported by the sequential information arrival hypothesis. Using the Granger causality test during January 1999 - December 2002, they showed a significant relationship of causality running from absolute return to trading volume. However, the result get from this study is there is bidirectional causality relationship between trading volume and stock return in Malaysia stock market. There might be a conflict between the result in stock market and future market. This paper is used to compare the result from future market and stock market.

Prior empirical evidence also indicates that there is a bidirectional causality relationship between stock return and trading volume. In Malaysia, Kadour (2009) found causality from stock return to trading volume for a sample of 78 listed companies during 2001 - 2009. Maziah (2016) however, found a negative contemporaneous relationship between stock return and past period trading volume based on a sample of 77 ACE companies during 2009 - 2015. Kadour (2009) further divided stock return into value stock and growth stock due to the linkage between risk and expected returns as the risk associated with value or growth stock are different which may affect expected returns. Results showed that there is no causality relationship between trading volume and stock return of growth stock. There is, however, evidence of a bidirectional causality relationship between trading volume and stock return of value stock.

Kayali and Akarim (2010) examined the granger causality relationship between price and trading volume on the China commodity futures market from February 2005 - June 2008.

Results showed that there is a causality relationship running from trading volume to return by using which supported the sequential information arrival hypothesis.

Carroll and Kearney (2015) tested the validity of the MDH in explaining the price-volume relationship before and after the takeover announcements. The authors focused on the non-financial targets of public listed US mergers and acquisitions for the period January 2000 - December 2008. Using the autoregressive and GARCH models, they reported a positive price-volume relationship before and after the announcement of takeover. It can be concluded that the takeover announcement did not affect the price-volume relationship and the relationship remained the same before and after the announcement supporting the MDH.

Moreover, Chaudhuri and Kumar (2015) examined the dynamic relationship between stock return and trading volume using data from the Bombay Stock Exchange (BSE) for the period 1996 - 2003. BSE is the oldest market in Asia and has the highest number of listed companies in the market. The authors pointed out that the main issues that affect the price-volume relationship are the rate of information movement in the market, size of the market as well as the presence of short selling which are categorized under MDH. Nonetheless, in the stock market volume is higher when the market is bullish and lower when the market is bearish. It is volume that affects the price which means that prices will only move when volume moves. Results showed that there is a positive price-volume relationship, yet the magnitude of the changes is different. The result is supported by the theory of MDH.

Wang and Yang (2017) focused on the price-volume relationship on the China stock market and NASDAQ from January 2009 - December 2016. The authors explained the price-volume relationship according to two theories which are the MDH and the asymmetric information hypothesis. The key factors that affected trading volume are the entire volume, the ideal percentage in the risk asset, the different between absolute deviation of the risk asset's

return and risk-free rate as well as transaction costs. By using Augmented Dickey–Fuller test and regression analysis, results showed that the China stock market and US stock market have a significant positive relationship between the change in stock return and trading volume which supports the MDH and asymmetric information hypothesis.

2.3 Summary of the Chapter

This chapter provides an explanation of the underlying theories selected for the study. Consistent with the issues to be determined in the study, this chapter presented the empirical evidence on the price-volume relationship. Prior studies on the price-volume relationship were also reviewed. According to the review of literature, it is proven that considerable efforts have been made by prior researches to give clarifications on the positive relationship between price changes and trading volume. Nevertheless, there are indecisive signs among different researchers from different countries. The positive relationship in this study can be supported by the sequential arrival of information model in which the main concern on the relationship is the type of investors either optimistic or pessimistic investors. This theory also suggests a bidirectional relationship between trading volume and stock return. Furthermore, the MDH model also supports the positive relationship from the perspective of the speed of information flow in the market and the varied kinds of information.

On the other hand, the simultaneous information arrival model supports a negative relationship and is only concerned on the changes between the initial and final equilibrium levels. Information uncertainty is another theory that supports a negative relationship when there is uncertainty in the market which mainly focused on the type of news and the behavior of the investors. Lastly, the random walk hypothesis is used to explain that there is no relationship between trading volume and stock return. The sequential arrival of information model and the MDH argue that there will be a weaker relationship during the crisis period where there is

expected to be more pessimists than optimists and the various kinds of information are also expected to drop during the crisis. For the MDH model the speed of information flow in the market is expected to have a weaker relationship after the crisis or non-crisis period. This is because the speed of the information during the crisis is faster than the non-crisis period. To the best of researcher's information, the major events that occurred in Malaysia which may affect the stock market is yet to be explored. Hence, this study seeks to extend the literature on whether the impact of these events will change the relationship between price changes and trading volume.

Table 2.2 Literature Review Summary Table

NO	Autor & Years	Objective	Sample	Method	Findings	Supported Theories
1	Granger & Morgenstern (1963)	To analyze New York stock price by a new statistical technique.	New York stock exchange from January 7, 1939 to September 29, 1961.	Random Walk Hypothesis and Spectral Methods.	The movements in the amount of stock sold are unconnected with movements in price.	Random Walk Hypothesis.
2	Copeland (1976)	To examine asset trading in a world with sequential information arrival.		Simultaneous information arrival model.	There is negative correlation between the absolute value of price changes and volume.	Simultaneous Information Arrival Model.
3	Tauchen & Pitts (1983)	To examine the relationship between the variability of the daily price change and daily volume of trading on speculative markets.	90-days T-bill future contracts in Chicago Mercantile Exchange from January 6, 1976 to June 30, 1979.	Durbin-Bartlett Autocorrelation test.	There is positive correlation between price changes and trading volume.	Bivariate normal mixture model.
4	Chen, Firth & Xin (2005)	To examine the relationship between returns and trading volume.	China commodity future market from January 1999 to December 2002.	Correlation test, regression analysis, ADF test and Granger causality test.	There is significant positive contemporaneous correlations between absolute return and trading volume in all future market. There is significant relationship of causality from absolute return to trading volume.	Sequential Arrival of Information Model.

5	Kadour (2009)	To investigate the relationship between trading volume and value versus growth stock's return. To discover direction of causality relationship between trading volume and value stock.	78 companies listed in KLCI from January 1, 2001 to January 1, 2009.	Regression analysis and Granger test.	The relationship between absolute return and trading volume is positive and significant. There is no evidence of causality relationship between volume and return for growth stock; there is bidirectional causality relationship between volume and value stocks return.	Mixture Distributions Hypothesis. Sequential Arrival of Information Model.
6	Kayali & Akarim (2010)	To investigate granger causality relationship between prices and trading volume.	Turkish Derivatives Exchanges from February 2005 to June 2008.	ADG unit root test and Granger causality test.	There is causality relationship running from trading volume to return.	Sequential Arrival of Information Model.
7	Carroll & Kearney (2015)	Test the mixture of distributions hypothesis (MDH) in which equity trading volumes and return volatilities.	All non-financial targets of publicly listed US mergers and acquisitions in excess of $50 million between 1 January 2000 and 31 December 2008.	Autoregressive and GARCH models.	The volume and volatility remain positively correlated supporting the MDH before and after the announcement of takeover.	Mixture Distributions Hypothesis.

8	Chaudhuri & Kumar (2015)	To examine the dynamic relationship between return and volume.	Stocks listed in the BSE during the period 1996–2003.	Markov-switching Model and Cointegration Analysis.	Both return and volume increase but the magnitude of the increase differs.	Mixture Distributions Hypothesis.
9	Maziah (2016)	To investigate the relationship between trading volume and stock return/stock return volatility in Malaysian ACE market. To test the causal effect between trading volume and stock return in Malaysian ACE market.	77 companies listed in Malaysian ACE market starting from August 2009 to December 2015.	Vector Autoregressive (VAR) model and Granger Causality Test.	Negative contemporaneous relationship between stock return and past period trading volume. There is a bidirectional relationship between stock return and trading volume at 1 % significant level respectively.	Arrival information of news.
10	Wang & Yang (2017)	To analyse the explicit price-volume relation in Chinese and the U.S. stock markets.	CSI 300 Index for the Chinese stock markets from January 5, 2009 until December 30, 2016 and NASDAQ stock market from January 2, 2009 until December 29, 2016.	Augmented Dickey–Fuller test and regression analysis.	For both the Chinese and the U.S.'s stock markets from the beginning of 2009 to the end of 2016, there is a significant positive relation between trading volume and change of return.	Mixture Distributions Hypothesis and Asymmetric Information Hypothesis.

CHAPTER 3

METHODOLOGY

3.0 Introduction

This chapter explain the methods used for answering the research questions. As discussed earlier, the main aim of this study is to examine the relationship between trading volume and stock return on Bursa Malaysia's Main Market and the ACE market. The first stage of the analysis is to examine the Granger causality relationship between trading volume and stock return. The second stage of the analysis is to examine the stock return-volume relationship using the Ordinary Least Squares (OLS) method. The final stage is to examine the stock return-volume relationship surrounding major exogenous events, namely, standardization of lot size, global financial crisis, oil price shock and the 14th Malaysia general election.

3.1 Research Framework

Figure 3.1 Research Framework for Granger Causality Relationship between Trading Volume and Stock Return

Figure 3.2 represents the research framework for the study that involves of dependent variable of trading volume and independent variable of stock price. It shows that the changes in stock return will change in trading volume and vice versa. This is in-line with previous research that examined the price-volume relationship i.e. Maziah (2016) and Mohamad and Nasir (1995). An OLS analysis of this relationship is conducted for all listed stocks in Main and ACE markets.

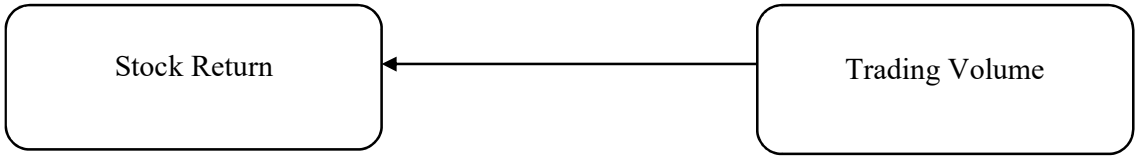

Figure 3.2 Research Framework for Relationship between Trading Volume and Stock Return

As shown in Figure 3.3, the study is re-examined for the above relationship surrounding major events as discussed earlier. Specifically, this study estimates the price-volume relationship centered on these major events. The event window contains 72 monthly data, with data collected for three years before and three years after these events. According to information uncertainty theory, the relationship is expected to be negative during these major events due to the crises, assuming to be 'bad' news that lead to the trading volume to increase associated with a decrease in stock return. This is because investors panicked and were overconfident in trading during the crises. Besides, the sequential arrival of information model's theory argues that the positive relationship is expected to be weaker during the crisis due to a larger number of pessimistic investors than optimistic investors. The MDH also infers that the positive relationship will be weak during a non-crisis period.

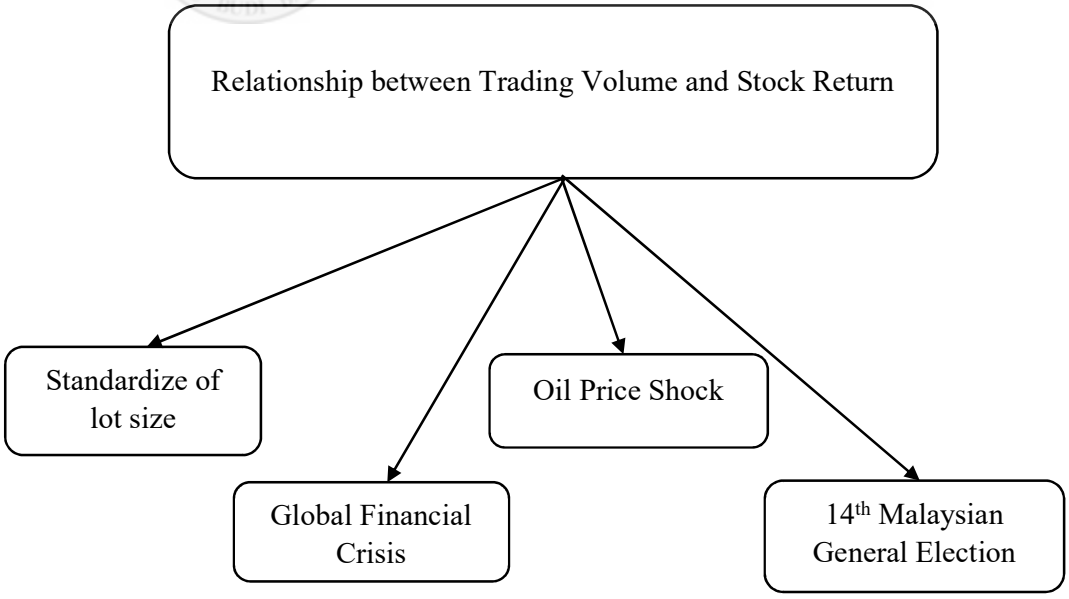

Figure 3.3 Research Framework for the Relationship between Trading Volume and Stock Price by Major Events

3.2 Hypotheses Development

Hypotheses were developed in line with the research questions and research objectives. According to the research framework in Figure 3.1, Figure 3.2 and Figure 3.3, the hypotheses are as follows:

H_1: There is a significant stock return-volume causality relationship in the Main Market and the ACE markets.

H_2: There is a significant relationship between trading volume and stock return in the Main Market and the ACE markets.

H_3: There is a significant relationship between trading volume and stock return in the Main Market and the ACE markets surrounding major exogenous events of standardization of lot size.

H_4: There is a significant relationship between trading volume and stock return in the Main Market and the ACE markets surrounding major exogenous events of Global Financial Crisis.

H_5: There is a significant relationship between trading volume and stock return in the Main Market and the ACE markets surrounding major exogenous events of Oil Price Shock.

H_6: There is a significant relationship between trading volume and stock return in the Main Market and the ACE markets surrounding major exogenous events of 14^{th} Malaysian General Election.

3.3 Measurement of Variables

This study uses one dependent variable and one independent variable. The aim of this study is to determine the relationship between the trading volume and stock price for the sample period. The dependent and independent variables are discussed below.

3.3.1 Dependent and Independent Variable

The dependent and independent variables for this study are trading volume and stock return in the Main Market and the ACE market, respectively. The monthly data for trading volume and stock return were taken from April 2000 – October 2018 for 378 companies listed in the Main Market. Monthly data for 71 companies listed in Malaysia ACE market was collected for the sample period from January 2009 – October 2018. All data were collected from DataStream. Trading volume is measured as the changes of the number of shares traded for particular stock in a specific day while stock return is measured as the changes of closing price in a specific day for each stock.

3.3.2 Major Events Windows

The date for the event standardization of lot size was May 2003. Thus, data collected for the 3-year period before the event was from May 2000 – April 2003 while data for the 3-year period after the event was collected from May 2003 – April 2006. Data for this event was collected from the Main Market is only as there was a limitation of data in the ACE market.

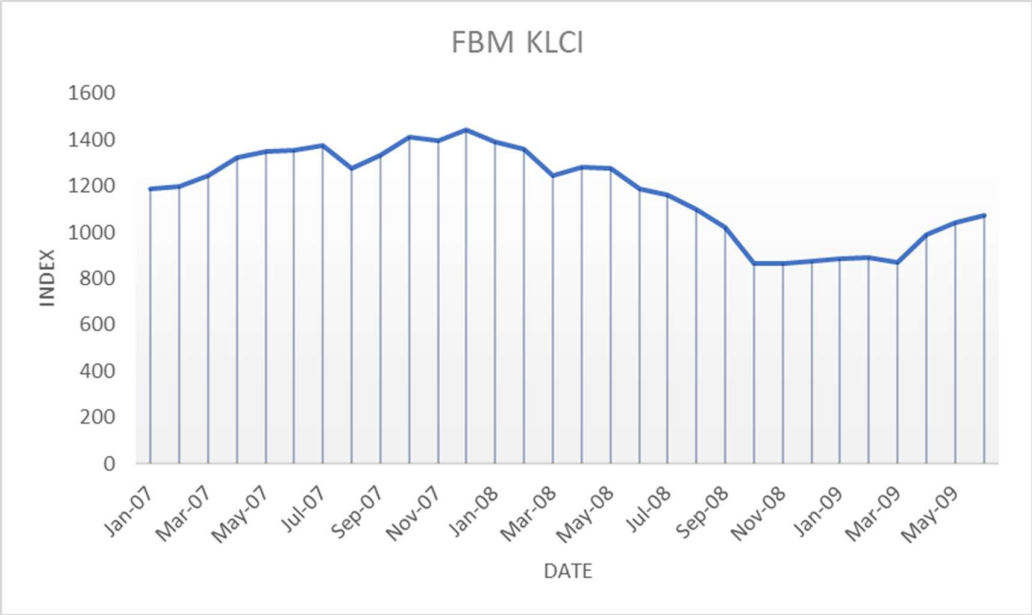

Figure 3.3.2 FBM KLCI trend during the Global Financial Crisis

According to David Brett (2017), the first signal of a problem in the US housing market was in April 2007 which was identified as the starting point of the global financial crisis. This continued to affect the market until June 2009 when the world economy was at its lowest as noted by the OECD. By looking at Figure 3.3.2, the FBM KLCI still showed an uptrend on April 2007. It started to drop from July 2007 and continued to have an overall downtrend until April 2009. Figure 3.3.2 showed that the global financial crisis had an effect on the Malaysia stock market, but the period was slightly delayed. However, for this study the crisis period was identified as between August 2007 - June 2009. Thus, this study also collected data for a 3-year before and the 3-year period after the crisis which was from August 2004 – July 2007 and from July 2009 – June 2012. The crisis was only applicable in the Main Market as data from the ACE market was only accessible after 2009.

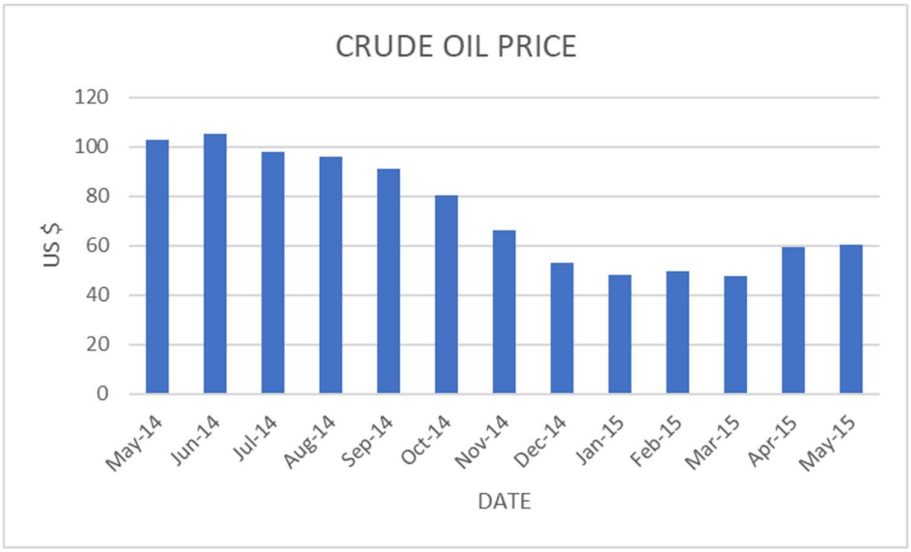

Figure 3.3.3 Historical Oil Price 2014 – 2015

According to Figure 3.3.3, the oil price showed a sharp decline throughout the time period, from July 2014 – February 2015, which was known as the oil price shock period. Thus, the study identified this time period as the crisis period. Data collected for the 3-year period before the crisis was July 2011 – June 2014 while data for the post-crisis period was from March 2015 – February 2018, applicable to both markets.

The last event, the 14th Malaysia general election, fell on May 9th, 2018 while the announcement of election was on April 10th, 2018. Since data was only available until October 2018, the study's data for the post-election until October 2018. Thus, data collected for the post-election period was from April 2018 - October 2018 in both markets. Furthermore, as the pre-election period must be of the same time horizon with the post-election period, data collection for the pre-election period was from September 2017 – March 2018 for both markets. This event was applicable on both markets.

3.4 Techniques of Data Analysis

This section explains the different methods and techniques that was used to achieve the research objectives and research questions of this study.

3.4.1 Descriptive Statistics Analysis

Firstly, there was a need to take natural logarithm for trading volume as the difference between trading volume and stock return was too large so natural logarithm was to standardize the number in both variables. The calculation is shown in the equation below for trading volume:

$$\text{Volume, V} = \frac{Volume_t}{Volume_{t-1}} - 1 \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

The calculation for stock return is as follow:

$$\text{Stock Return, R} = \frac{Stock\ Price_t}{Stock\ Price_{t-1}} - 1 \quad \ldots\ldots\ldots\ldots\ldots (2)$$

Descriptive analysis is aimed to identify the shape of distribution for both variables in both markets by using skewness and kurtosis. In addition, this analysis provides other description using the measures of central tendencies which are maximum value, minimum value, standard deviation and mean. For example, standard deviation is used to quantify the amount of variation in the variables while mean is the average value of the variables.

3.4.2 Correlation Test

Correlation test is used to evaluate the association between two or more variables. A positive correlation indicates that there might be a likelihood of a causality relationship between the variables in this study.

3.4.3 Pairwise Granger Causality Test

To identify the direction of the causality between trading volume and stock return, pairwise Granger causality test is proposed. This test is used to examine whether the first variable caused the second variable or the second variable caused the first variable where trading volume represents the first variable and stock return represents the second variable. Two equations were formulated to test for Granger causality.

$V = \beta_0 + \beta_1 R + \varepsilon$ …… (3)

$R = \alpha_0 + \alpha_1 V + \varepsilon$ …… (4)

There exists a unidirectional causality relationship if either of Equation (3) or Equation (4) is significant. There will be a bidirectional causality relationship if both Equation (3) and Equation (4) are significant.

3.4.4 Regression Analysis – Ordinary Least Squared Method (OLS)

Regression analysis was proposed as the appropriate statistical method to achieve the research objectives and research questions. Two models were employed in this study which are the Main Market model and the ACE market model in order to capture the objectives of this study. The details of the models is explained in the following section.

3.4.4.1 The Main Market Model

The formula for the relationship between trading volume and stock price is as follows:

$V = \beta_0 + \beta_1 R + \varepsilon$ …… (5)

where

V = Trading Volume

R = Stock Return

β = Model Parameters

ε = Error Term

Stock return refers to the changes in the value by a particular stock in the sample period. The changes in stock return is mainly due to the inequality of trading volume for a given stock. For instance, an increase in stock return is affected by high trading volume. Equation (5) is used to test for the relationship between trading volume and stock return in the Main Market and the ACE market. It is also the same equation used to identify the relationship surrounding major events.

3.5 Summary of the Chapter

This chapter explains the data collection, types of data as well as the hypotheses that was developed for the study. The chapter also discusses the types of techniques or models used to answer the research questions in this study. The models that were employed in this research are descriptive statistical analysis, correlation test, pairwise Granger causality test and regression analysis.

CHAPTER 4

RESULTS AND DISCUSSION

4.0 Introduction

Chapter 4 provides the analysis and discussion on the results which answer the research questions. This chapter starts with the discussion and explanation for the descriptive statistical analysis of the variables used in this study and followed by a detailed discussion for the results of correlation, Granger causality, and regression analyses. The chapter also includes the results of comparison between the Main Market and the ACE market. The chapter concludes with a summary of main findings.

4.1 Descriptive Statistics Analysis

	Δ Trading Volume		Stock Return	
	Main Market	ACE Market	Main Market	ACE Market
Mean	-0.01	0.03	1.02	1.01
Median	-0.05	-0.06	1.00	1.00
Maximum	7.77	9.70	5.13	10.48
Minimum	-8.35	-6.55	0.19	0.19
Std. Dev.	1.04	1.31	0.22	0.13
Skewness	0.34	0.46	4.26	9.25
Kurtosis	5.60	5.54	51.66	438.26
Observations	83916	8307	83916	8307

Table 4.1 Descriptive Statistics of Trading Volume and Stock Return in the Main and ACE Markets

Table 4.1 presents the descriptive statistics for changes in the monthly trading volume and monthly stock returns in both the Main Market and the ACE market which includes size, mean, median, maximum value, minimum value, standard deviation, skewness and kurtosis. The sample consisted of 378 companies listed in the Main Market over a period of 19-years and 71 companies in the ACE market over a period of 10 years period.

The average for changes in trading volume in the Main Market and the ACE market are -0.01% and 0.03% respectively. The maximum change in trading volume in the Main Market and the ACE market are 7.77% and 9.70%, respectively, showing that the maximum changes in volume in the Main Market and the ACE market are not much different. The minimum changes in trading volume for the Main Market and the ACE market are -6.55% and -8.34%, respectively. The table also reports a standard deviation of 1.04% in the Main Market trading volume and 1.31% in the ACE market trading volume. As a conclusion, the result showed that trading volume for the ACE market is more volatile than the Main Market which is consistent with the expectation. On the other hand, skewness identify the balance of distribution. When there are negative values of the skewness, the the data is skewed left, conversely, when there are positive values for skewness, the data is skewed right. If skewness is equal to zero, the data are perfectly symmetrical. The skewness of trading volume in both the Main Market and the ACE market are 0.34 and 0.46 respectively. It also can be said that trading volume for both markets are almost approximately skewed. Furthermore, descriptive statistics also show the kurtosis of trading volume for the Main Market and the ACE market are 5.60% and 5.54%, respectively. The values indicate that trading volume in the Main Market is leptokurtic which has longer, and thicker tails, as well as a higher and sharper central peak compared to normal distribution.

The average stock return in the Main Market and the ACE market were 1.01% and 1.02% respectively. The maximum stock return in the Main Market is 10.48% and the minimum was 0.18% which showoed a large difference between the highest and lowest stock price indicating the large fluctuation in the Main Market. On the other hand, the maximum and minimum stock returns in the ACE market is 5.13% and 0.19% respectively. Data showed that the stock return in the ACE market is lower compared to the Main Market stock price. The variability of the stock return in the ACE market is also relatively smaller compared to the Main Market. The standard deviation for stock return in the Main Market and the ACE market are 0.13% and

0.22% respectively. Results showed that trading volume for the ACE market is more volatile than the Main Market which is consistent with the standard deviation in the trading volume and is also consistent with the expectation of the study. The skewness of stock return in the Main Market and the ACE market are 9.25 and 4.26, respectively. The positive values are similar to the skewness in trading volume with the tail skewed to the right. The stock return in both markets are assumed to be highly skewed as both values are larger than +1. Result indicate the frequency of having losses in the stock is lesser than the frequency of achieving gains. By comparing the two markets, the percentage of achieving gains in the Main Market is higher than the ACE market as the positive values in the Main Market is higher. Investors could also estimate that future returns will be more or less than it previously was. The positive values tells the investors that the stock return will be more than it previously was. The kurtosis for stock return in the Main Market and the ACE market are 438.26% and 51.66% accordingly which can be explain as the kurtosis for trading volume in main and ACE market, stock price is leptokurtic. Investors will experience more extreme irregular returns than the usual return which is unstable and hard to predict.

Figure 4.1 represents the shape of distribution for trading volume and stock price in the Main Market while Figure 4.2 represents the shape of distribution for trading volume and stock price in the ACE market. Hence, the data of skewness and kurtosis reject the null hypothesis that explains the series is normally distributed.

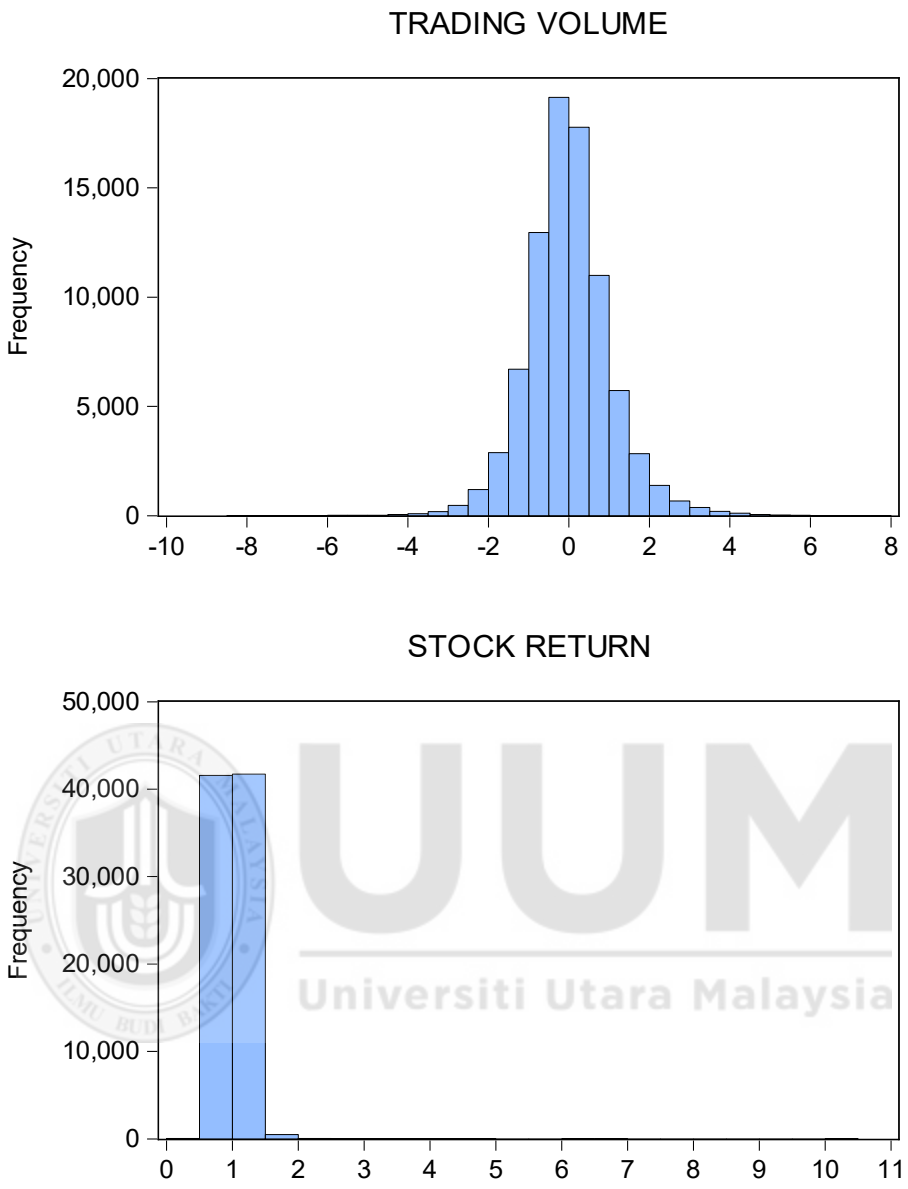

Figure 4.1 Histogram for Trading Volume and Stock Price in Main Market

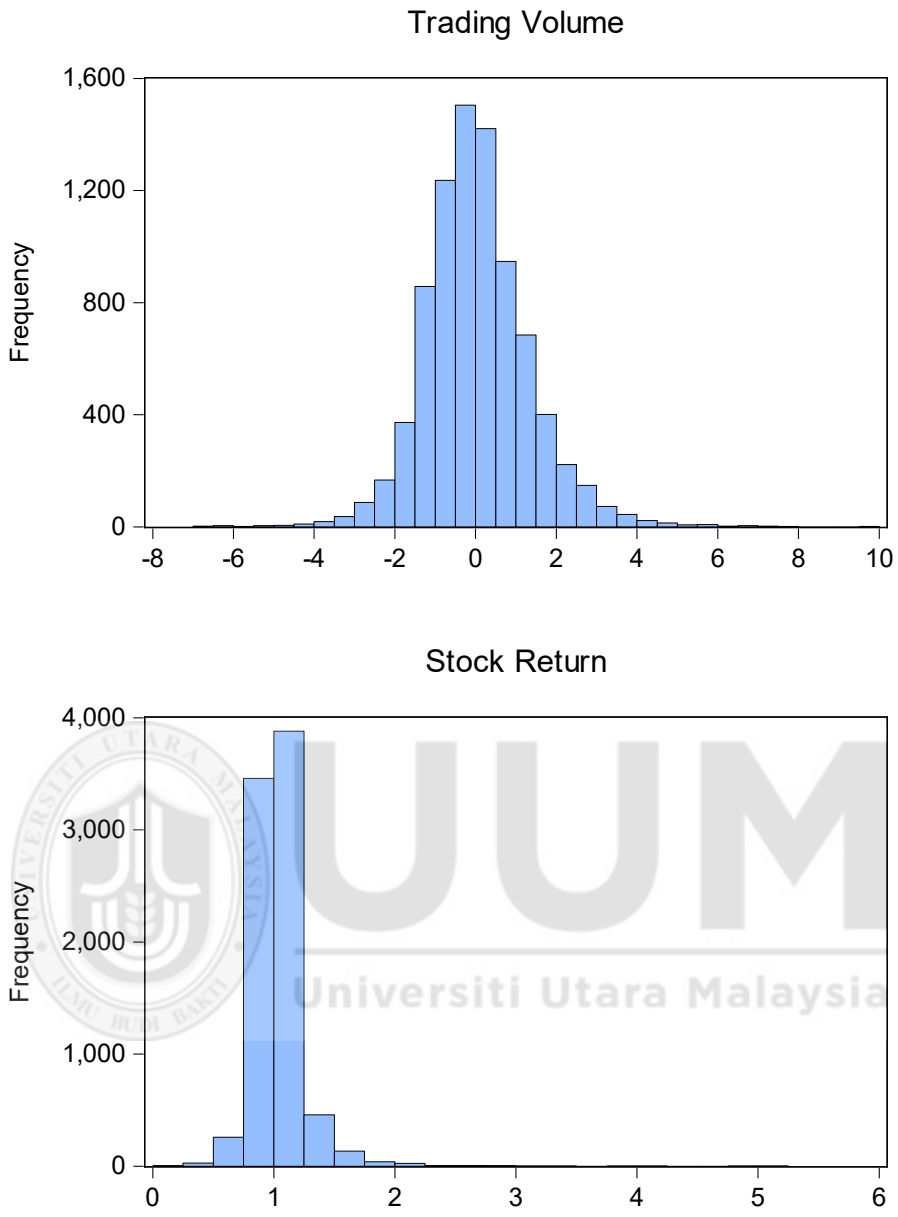

Figure 4.2 Histogram for Trading Volume and Stock Price in ACE Market

4.2 Correlation Analysis

	Δ Trading Volume	Stock Return
Δ Trading Volume	1	
Stock Return	0.23	1

Table 4.2.1 Correlation Coefficients between Trading Volume and Stock Price in Main Market

	Δ Trading Volume	Stock Return
Δ Trading Volume	1	
Stock Return	0.27	1

Table 4.2.2 Correlation Coefficients between Trading Volume and Stock Price in ACE Market

Table 4.2.1 shows the correlation coefficients between trading volume and stock return in the Main Market while Table 4.2.2 shows for the results in the ACE market. 0.23% which indicated that the trading volume is positively correlated to the stock return in the Main Market and the ACE market also showed a positive relationship with a value of 0.27%. The low correlation coefficient showed that the estimation of one variable will not be able to enhance the estimation of the other variable. These results were subjected to further analysis to examine the relationship between trading volume and stock price in the Main Market as well as the ACE market.

4.3 Pairwise Granger Causality Test

Pairwise Granger Causality Tests
Sample: 2000M05 2018M10
Lags: 12

Null Hypothesis:	Obs	F-Statistic	Prob.
Stock Return does not Granger Cause Δ Trading Volume	79380	207.30	0.0000
Δ Trading Volume does not Granger Cause Stock Return		26.55	8.E-61

Table 4.3.1 Pairwise Granger Causality Test for Main Market

Pairwise Granger causality test was carried out to test for the causal relationship between the changes of trading volume and stock return in the Main Market and the ACE market. Table 4.3.1 shows the result in the Main Market which illustrate the stock return Granger-cause the changes in trading volume and also trading volume Granger-cause stock return, both are significant at the 1% level. The F-statistic for stock return Granger-cause trading volume is 207.30 while for trading volume Granger-cause stock return is 26.55. The higher F-statistic value supported the choice of making trading volume as the dependent variable in the following analysis. Results support the existence of a bidirectional relationship between trading volume and stock return. This implies that stock return holds important data for the changes of trading volume and trading volume also holds important data for stock return. These findings support hypothesis 1 that as there is a causality relationship between trading volume and stock return in the Main Market. The result is in-line with the sequential arrival of information model that there is a bidirectional relationship between trading volume and stock return as the information flow in the market not only affects trading volume but also stock return.

Pairwise Granger Causality Tests
Sample: 2009M02 2018M10
Lags: 12

Null Hypothesis:	Obs	F-Statistic	Prob.
Stock Return does not Granger Cause Δ Trading Volume	79380	28.28	8.E-64
Δ Trading Volume does not Granger Cause Stock Return		1.67	0.07

Table 4.3.2 Pairwise Granger Causality Test for ACE Market

Table 4.3.2 shows the results of the pairwise Granger causality tests in the ACE market. Result are similar to the Main Market where there is significant Granger causality relationship between trading volume and stock price in both direction which is called bidirectional relationship between trading volume and stock price. Again, the results support hypothesis 1 of the existence of a significant causality between trading volume and stock return. As a conclusion, there is a bidirectional relationship between trading volume and stock price in both the Main Market and the ACE market. As such, means that both markets support the sequential arrival of information model.

4.4 Regression Analysis – Ordinary Least Square (OLS) Method

In this section, this study has conduct a regression analysis with change in trading volume as the dependent variable while stock return as the independent variable. Regression analysis was first carried out for both the Main Market and the ACE market with changes in trading volume as the dependent variable and stock return as the independent variables. The next rounds of regression analysis examined the relationship surrounding the major events, i.e. the standardization of lot size, the global financial crisis, the oil price shock and the general election. Table 4.6 represents the relationship between changes in trading volume and stock return in the entire sample period as well as according to the major events to analyze if there are the changes in the relationship during major events. Result showed that changes in trading volume

had a positive and significant contemporaneous relationship with stock return at the 1% significance level in both the Main Market and the ACE market. Results proved that changes in stock return and changes in trading volume affect each other. In other words, stock return comprises information on trading volume behavior. The coefficient value for stock return in the Main Market showed that a 1% increase in stock return lead to a 1.78% return in trading volume. The corresponding value for the ACE market is 1.61%. This result supports the hypothesis 2 and is consistent with the prediction of the sequential arrival of information model and the MDH. This is also consistent with the study by Kadour (2009), Carroll and Kearney (2015), Chaudhuri and Kumar (2015), Chen, Firth and Xin (2005) and Wang and Yang (2017).

	Main Market				ACE Market			
	Coefficient	Std. Error	t-Statistic	Adj. R-squared	Coefficient	Std. Error	t-Statistic	Adj. R-squared
Panel A								
Stock Return	1.78	0.03	67.43*	0.05	1.61	0.06	25.19*	0.07
Panel B								
Standardization of Lot Size								
Before Regulation	1.85	0.07	28.01*	0.05				
After Regulation	2.19	0.07	33.22*	0.08				
Global Financial Crisis								
Pre-Crisis	1.75	0.07	26.65*	0.05				
Crisis	0.7	0.08	9.05*	0.01				
Post-Crisis	1.95	0.07	30.06*	0.06				
Oil Price Shock								
Pre-Crisis	2.02	0.07	29.26*	0.06	1.72	0.11	15.38*	0.08
Crisis	2.40	0.14	17.32*	0.09	3.27	0.28	11.81*	0.20
Post-Crisis	2.37	0.08	29.44*	0.06	2.18	0.12	18.07*	0.11
General Election								
Before Election	0.94	0.26	3.60*	0.01	0.96	0.37	2.62*	0.02
After Election	0.12	0.10	1.25	0.00	1.91	0.33	5.77*	0.08

Table 4.4 Regression Analysis Result in Overall and by Major Events for Main and ACE Market

Note: All variables are stated in Table 4.6 and are standardized. The coefficient, standard error and t-statistic are representing according to the column and split into two markets. This study split the sample in three periods. ***, **, and * specify whether coefficient values are different from those in the pre-crisis period, using a probability for differences in means at the 10, 5, and 1% level.

Next, the validity of the stock return-volume relationship is reexamined using the six years event window surrounding four exogenous shocks in macro events. Note that the test for the first two shocks, the standardization of lot size and the global financial crisis, are only applicable to the Main Market due to the problem of data availability in the ACE market. The results are presented in Panel B of Table 4.4.

The first event is the standardization of lot size that, all else being equal, will improve liquidity in the capital market. This event captures shock in stock liquidity. Before the standardization of lot size, a 1% increase in stock return results in a 2.19% increase in trading volume. The marginal increase in the magnitude (positive) of stock return-volume relationship following a liquidity shock is consistent with the prediction of the MDH's theory which states that the relationship will be weaker before the regulation event due to the speed of the information flow in the market which is expected to be slower before the event.

The coefficient values of stock return for the second event, the global financial crisis, exhibit a clear difference between the crisis and non-crisis periods. The coefficient value of 0.73 during the crisis is significantly smaller than the pre-crisis value of 1.75, and post-crisis value of 1.95, although the coefficient value is still strongly significant at the 1% level. The weaker stock return-volume relationship is consistent with the prediction of the sequential arrival of information model's theory which states that the number of pessimists during the crisis will be more than the optimists which weakens the positive relationship. The MDH also supports the weak positive relationship during the crisis due to the various kinds of information that are closely related to the economy, which leads to a decrease of trading volume and stock return.

For oil price shock, the coefficient value during crisis of 2.4 is the highest among the three periods in the Main Market as compared to a value of 2.02 during the pre-crisis period and a value of 2.37 during the post-crisis period. The coefficient values for all three periods is strongly significant at the 1% level but there was not much difference between the sub-periods. The result was similar in the ACE market where the coefficient value during the crisis of 3.27 is also the highest among the three periods. The coefficient values for the pre-crisis period and post-crisis period were 1.72 and 2.18, respectively. By comparing the result in both markets, the ACE market shows the highest coefficient value during the crisis. The marginal decrease in the magnitude (positive) of stock return-volume relationship following an information uncertainty is consistent with the prediction of the MDH which states that the relationship will be weak during the non-crisis period. This is because the speed of the information flow in the market is expected to be slower before the event as investors tend to be more alert during the crisis.

Nonetheless, results were different for the 14th Malaysia general election. Results showed a significant positive relationship before the election which coefficient values of 2.14 and 0.96 in the Main Market and the ACE market, respectively. This can be explained by the MDH that speed is faster in the Main Market as compared to the ACE market. Furthermore, there was no significant relationship after the election in the Main Market and this can be explained by the random walk hypothesis that stock prices will move randomly and cannot be predicted. Conversely, there is a significant positive relationship after the election in the ACE market which can be supported by the MDH that the speed of information flow in the market is expected to be slower before the event as investors tend to be more alert during the crisis as compared to a non-crisis period.

4.5 Summary of Hypotheses Testing

Table 4.5 presents a summary table of the results of the hypotheses tested on the relationship between trading volume and stock return for the entire sample period and also specified into the major events. The results and hypotheses for Granger causality test for the two variables in the Main Market and the ACE market are also shown in the table. Table 4.5 also shows that six of the hypotheses are fully supported and one of the six hypotheses are partially supported.

	Hypothesis	Sign Obtained	Support for Hypothesis	Supported Theories
H_1	There is a significant stock return-volume causality relationship in Main and ACE markets.	Significant (Bidirectional)	Supported	Sequential Arrival of Information Model.
H_2	There is a significant relationship between trading volume and stock return in Main and ACE markets.	Significant (+ve)	Supported	Sequential Arrival of Information Model and Mixture of Distribution Hypothesis.
H_3	There is a significant relationship between trading volume and stock return in Main and ACE markets surrounding major exogenous events of standardization of lot size.	Significant (+ve)	Supported	Mixture of Distribution Hypothesis.
H_4	There is a significant relationship between trading volume and stock return in Main and ACE markets surrounding major exogenous events of Global Financial Crisis.	Significant (+ve)	Supported	Sequential Arrival of Information Model and Mixture of Distribution Hypothesis.
H_5	There is a significant relationship between trading volume and stock return in Main and ACE markets	Significant (+ve)	Supported	Mixture of Distribution Hypothesis.

	surrounding major exogenous events of Oil Price Shock.			
H_6	There is a significant relationship between trading volume and stock return in Main and ACE markets surrounding major exogenous events of 14th Malaysian General Election.	Significant (+ve)	Partially Supported	Random Walk Hypothesis and Mixture of Distribution Hypothesis.

Table 4.5 Summary of Hypotheses Testing in main and ACE market

4.6 Summary of chapter

This chapter shows the results for the empirical findings in this study between the relationship of trading volume and stock price in the Main Market and the ACE market. Regression analysis and Granger causality test were conducted to answer the research questions. The empirical results suggest that there is a significant positive relationship between trading volume and stock price in the Main Market and the ACE market which is consistent with the Sequential Arrival of Information Model and the MDH. For the events, standardization of lot size, there is a significant positive relationship before and after the regulation but the relationship is weaker before the regulation and supported by the MDH. For the global financial crisis, results showed a significant positive relationship in all sub-periods during the crisis supporting both the sequential arrival of information model and the MDH. For oil price shock event, results showed a significant positive relationship during all the sub-periods in both markets but the relationship is weaker during the pre- and post-crisis periods supporting the MDH. The 14th Malaysia general election showed different results in both markets where results showed a significant positive relationship before the election in the ACE market and the Main Market only in the Main Market the relationship was weaker after the election, but in the ACE market the relationship was weaker before the election. The MDH is supported in the Main Market for the before election sub-period and the whole event in the ACE market while the random walk hypothesis is supported for the no significant relationship after the election in the Main Market.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter summarize the results and findings in this study in aspect of the relationship between trading volume and stock price on the Main Market and the ACE market. This chapter is started with the summary of findings according to the objectives and followed by the implication of study and recommendations for future research.

5.1 Summary of Findings

According to the results shown in Chapter 4, both the Main Market and the ACE market have a bidirectional relationship between trading volume and stock return. This result is supported by the sequential arrival of information which also proved that there is a positive correlation between both variables from both directions. In addition, for the relationship between trading volume and stock price, the results are similar in the Main Market and the ACE market which supports the sequential arrival of information model and the MDH. There is a positive correlation between the absolute changes in price and trading volume due to the types of investors in the market, speed of the information flow as well as the various kinds of information. For the standardization of lot size, there was a weaker positive relationship before the regulation supported by the MDH. The global financial crisis showed a weaker positive relationship during the crisis which supports the sequential arrival of information model and the MDH. The oil price shock showed a weaker positive relationship during the non-crisis sub-periods and this supports the MDH. For the 14th Malaysia general election, the Main Market showed a significant positive relationship before the election which was supported by the MDH and no significant relationship after the election period is supported by the random walk

hypothesis. Result in the ACE market supports the MDH such that there will be a weaker positive relationship before the event.

5.2 Implications of the Study

The empirical findings in this study provide some useful implications to investors, financial manager, researcher as well as speculators. The result also contributes to the market for the relationship during crisis, before crisis or even after crisis in both main and the ACE market which had not been done by other researchers.

Firstly, investors can predict the movement of the stock prices and make the investment decisions even when there is a crisis or any major events. For example, by looking at the results, such as the global financial crisis, the positive relationship was weak during the crisis but strong during the pre- and post-crisis period, so investors may invest before and after the crisis. But for crisis like the oil price shock, there is a strong positive relationship during the crisis, so investors might invest or trade more during such a crisis. Moreover, based on the results of this study, it is expected that there will be more pessimistic investors in the market when there is 'bad' news. This shows investors' possessiveness in herding behaviour and also to stop investing when there is a prohibition of selling.

Secondly, this study gives information that will influence stock prices and trading volume to financial managers. By using the findings of this study, financial managers are able to provide solutions to overcome the possibilities of making losses when faced with crises or develop policies to handle changes in stock price when facing major events. Besides, investors tend to overreact to information uncertainty in the market hence it is very important for financial managers to disclose the right information. For example, financial managers could signal to investors of a future crisis and provide them the techniques to overcome the crisis efficiently and reduce the anxiety and panic among the investors.

Furthermore, researchers may extend this study in the future through enhancements in the research design and methodologies. For example, this study only tested for four major events that affected the Malaysia stock market, there are many more events that had effects on the stock market. The relationship can also be examined in the futures market. The studies can be add more value to gain a deeper understanding of the price-volume relationship.

Lastly, speculators can make better decisions by using the results of this study. For instance, before an election, the speculator may invest more in the Main Market but after an election, investors may invest more in the ACE market. The findings in this study could help speculators to reduce their investment risk as they have a guideline on the movement of stock prices. Speculators will also be able to handle any major events or crises in the future by referring to identical events or crises examined in this study.

5.3 Recommendations for Future Research

Since this study is the first to examine the relationship between trading volume and stock return on both the Main Market and the ACE market in Malaysia and linking the relationship to four major events that is assumed to have an impact in the Malaysian market, it is subject to a few limitations. The following are several recommendations in which future research can be extended.

Firstly, the study in the ACE market can be enhanced by extending the time period of study as data for this study covered a period of only ten years from 2009 – 2018.

Secondly, listed companies can be categorized by their respective sectors so that the relationship can be examined more specifically. The current study examined the relationship for all companies included in the sample without dividing them into sectors. For example, the oil price shock may have a higher effect on the price-volume relationship on oil related companies. The price-volume relationship is yet to be investigated by sectors in these studies.

Future research can include: (i) several major events in the time period of study, or (ii) only one major event, such as the Malaysia general elections in the study. The current study included only the 14th Malaysia general election (in 2018), but there were 13 other elections in Malaysia since then and each election might show a different relationship in trading volume and stock return, or the changes in the degree of the relationship under examination. The event also can be carried out further by different sectors or industries.

Lastly, there are other variables that affect stock return such as the GDP, interest rates and inflation rate. Future research may include these variables to evaluate the relationship of the variables and stock return to have more robust results.

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