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酬與波動之研究

An Analysis of the Impacts of Domestic and
International Events of Return and Volatility in
Vietnam Stock Market



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ABSTRACT

In first decade of the 21st century, Vietnam has been known as a developing economy in Asia with annual growth rate of 7% in average. During this time, a stock exchange was also established to meet the urgent needs of capital of the economy and have become an attractive and promising market to investors. To be a young and small market, Vietnam stock market is likely to be vulnerable to both internal and external changes in economy and politics. Lately, the recession of global economy and its influences on Vietnam economy have caused the investors' worries and doubts about this investment channel. The purpose of this study is to investigate which events impact significantly on stock return in Vietnam stock exchange in the recent.

The study used daily stock indices in Ho Chi Minh stock exchange from 2007 to 2011 as sample data in order to examine stock returns volatility by employing Exponential General Autoregression Conditional Heteroscedasticity (EGARCH) model. The preliminary results are expected to be found that interactive effect of domestic and international events on stock return volatility in Vietnam market. The research findings perhaps can be a reference benchmark for companies and investors in decision-making.

Keywords: Stock market, stock return, volatility, EGARCH model, VN-index, monetary policy, global financial crisis.

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CHAPTER ONE

INTRODUCTION

1.1 Research Background

An Overview of Vietnam Stock Market

Since Vietnam reformed its economy from centrally-planned system into a market-oriented system, there are a lot of remarkable changes in the economy. Initially, in order to find capital resources for the economic development, Vietnam government intended to establish a stock market since early 1990s. After many years of preparation, in July 11st of 1998, Vietnam government had approved the Decree number 48/CP on securities and stock market as a milestone of Vietnam stock market. In the same day, the Ho Chi Minh Securities Trading Center was licensed to operate but until Jul 28th of 2000 the first official transaction was successfully processed marking the birth of Vietnam stock market. Ho Chi Minh Securities Trading Center was upgraded to Ho Chi Minh stock exchange under Decision number 599/2007/QD-TTg issued on May 11, 2007 and abbreviated HOSE, which will be used in this dissertation. The stock index of the market is called VN-index. Five year later, the second securities trading center was debuted in Hanoi, Hanoi Securities Trading Center, on March 08, 2005. It also was changed to Hanoi Stock Exchange (HNX) with the stock index named HNX-index in 2009. Since then, the market has become a dynamic, direct capital mobilization channel, and the stock price movement has been gradually to be in tune with the growing economy's tempo (Vuong, 2008). At ten years old, Vietnam stock market has developed dramatically with two stock exchanges, a market for unlisted public company (called UPCoM), more than 550 commodities, 105 Securities companies, 46 mutual funds, about 1 million trading accounts of which 25% is foreign investors.

The framework of Vietnam stock market consists of following principal agents:

State Securities Commission (SSC)

It's the highest executive agency which is a part of Vietnam Ministry of Finance since 2004. It plays a main role in supervising activities in the whole securities market including financial organizations and individual. In particular, it is responsible for appraising and licensing for securities issuances, listings and business registrations; supervising the compliance with regulations of securities and securities market by related organizations; monitoring and inspecting daily trading activities in the market.

Securities Exchanges

The Stock exchanges operate under the supervision of State Securities Commission. In the present, Vietnam stock market has two stock exchanges running as stock trading floor for enterprises and investors. One is located in Ho Chi Minh City, named Ho Chi Minh Stock Exchange which was above introduced. Another is located in Ha Noi, called Ha Noi Stock Exchange. Both of them are state-owned legal entity in form of limited liability companies belonging to Vietnam Ministry of Finance. Their primary functions are to organize, operate and regulate securities trading activities following the Securities Trading Regulation such as regulation on listing, trading or information disclosure issued by SSC. The enterprises listed in HOSE must have at least charter capital of 80 billion Vietnamese dong (4 million USD equivalent) while the companies with charter capital of 10 billion VND (500,000 USD equivalent) or more are eligible to be listed in HNX.

Vietnam Securities Depository (VSD)

It started the operation under Decision No. 189/2005/QĐ-TTg signed on July 27th of 2005 by Prime Minister. It is also under the administration and supervision of SSC.

The establishment of VSD aimed to sustainability and transparency of the securities market, boosting investor's confidence in the market. It is mainly in charge of securities registration, depository, clearing and settlement for securities listed in stock exchanges and securities of unlisted public companies, as well as other trade support services such as transfer agency service, dividend and bond interest payment service and etc.

Securities Companies

Securities firms are organized in the form of limited liability companies or shareholding companies in accordance with the Law on Enterprises. Besides, they are required to be licensed by State Securities Commission. A securities company is then permitted to conduct one, a number, or all of the following professional business activities: (a) Securities brokerage; (b) Securities custody; (c) Securities self-trading; (d) Underwriting issues of securities; (e) Securities investment consultancy.

Securities Issuers

According to latest legal documents, securities issuers might be: (a) the Government with treasury bills, treasury notes, treasury bonds, investment bonds, etc; (b) Local governments with Municipal Bonds; (c) Joint stock companies with shares, corporate bonds, rights, warrants, etc; (d) State-owned companies and limited liability companies with corporate bonds, warrants; (e) Investment funds with investment fund certificates.

Securities Investors

According to the Law on Securities, securities investor means a Vietnamese organization or individual, or a foreign organization or individual who participates in investment in the securities markets. In which, institutional securities investor means a commercial bank, finance company, finance leasing company, insurance business

organization or securities business organization. Basically, investors in Vietnam stock market are divided into four major groups: (1) Domestic individuals; (2) Foreign individuals; (3) Domestic institutions; (4) Foreign institutions. In the end of 2011, the total of trading account eligible reaches over 1 million.

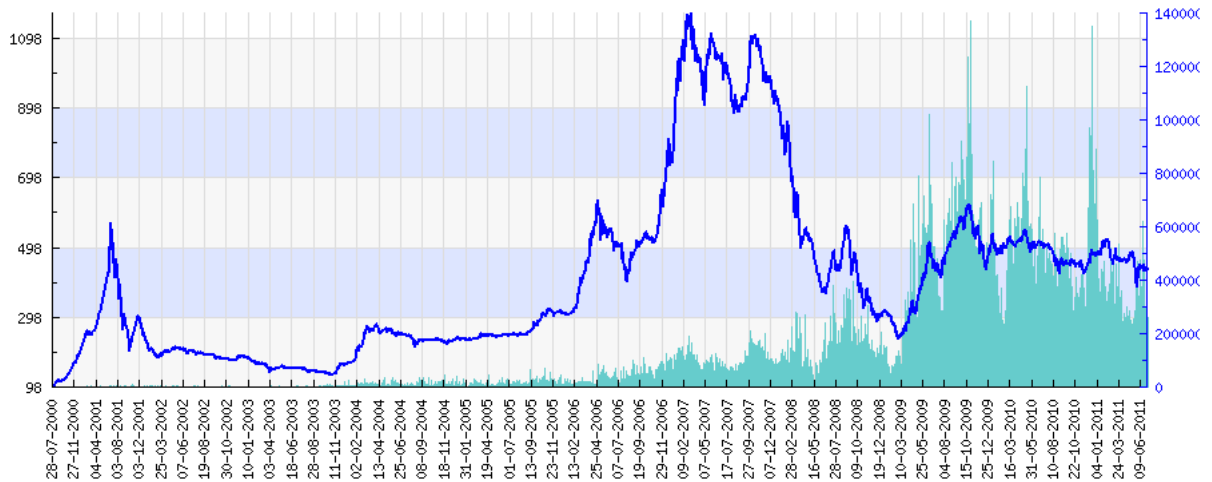


Figure 1-1 Performance of Vietnam stock market (VN-Index) from 2000 to 2011

Despite of being a small market comparing to other stock markets in Asian region and the world, the Vietnamese stock market has played an important role in creating a significant capital resource for the economy. In general, the Vietnam stock market has an upward trend since it was established. Along with policies of Vietnam economy reform into a market-oriented system, equitization process of state-owned enterprises was speeded up. That means more and more state-owned enterprises were listed in the stock markets. Moreover, with purpose of developing the Stock market to become a crucial channel for raising medium and long term capital for investment, the Government issued preferential and encouraging policies. Especially, in 2006, a booming year of Vietnam Stock market with newly 151 listed stock symbols. The stock market became more active and attracted great attention of domestic and foreign investors.

From the end of 2006 to the first quarter of 2007, Vietnam stock market grew rapidly. Within only first 3 month of 2007, the growth rate of HOSE is 126%. The VN-Index hit the peak in March, 2007 at 1170.7 point. In HOSE, in 2007, the market capitalization also increased 1.5 times, reached 364,414 billion VND. VN-Index stood at 927.02 points on December 28, 2007, up by 23.31% in comparison with the one at the end of 2006. The average trading volume (including stocks, fund certificates and bonds) in 2007 was approximately 9,550 thousand units, 2.12 and 6.79 times as many as the quantities of 2006 and 2005, respectively. Together with the development of the HOSE stock market is the growth of the HNX market. Namely, the market capitalization in 2007 reached 128,476 billion VND, increasing 75.54%; HNX-Index stood at 323.55 points on December 28, 2007, up by 33.2% in comparison with the one at the end of 2006; the average trading volume was 5.22 times as many as the quantity of 2006. In the year, HNX welcomed 26 new stock symbols to raise the total listing value up to 13,234 billion VND. Summarily, the total market capitalization of both HOSE and HNX at the end of 2007 was equivalent to 43.11% of GDP, approximately double the percentage of 2006 (Vuong, 2008).

However, the stock market has not been stable for any extended period. Starting from its peak, the VN-Index fluctuated strongly around the axis of 1,000 points over 6 months; and then sloped down from 1106.6 points on October 3rd, 2007 to 366.02 points on June 20th, 2008, losing 66.92% of value after near 8 months (Vuong, 2008).

Looking backward year 2008 of Vietnam Stock Market, indices and share prices slumped, even there are server share symbols fell below their par value; the liquidity of market became weak with the divestment of foreign investors. Despite of the positive intervention of Government such as adjustment of interest rate, investors still seemed

not interested in the market as before. In the same year, the Government continued to promote the equitization process of State-owned Enterprises, especially large enterprises, securities companies and listed enterprises issued more bonds and shares in order to increase charter capital. That all led to the redundancy of commodities in the market.

Along with the efforts of the Government to rescue the stock market, there are still strong recovery sessions in the market. However, the "waves" on the market is usually very short and unstable. End of 2008, the VN-Index stood at 315.6 point, the capitalization in both exchanges represents approximately 18.4 percent of Vietnam GDP in 2008. In the beginning of 2009, The VN-Index declined 22%, the worst level in comparison with other Asian markets. Total market capitalization fell down at 10 billion USD. But in some months later, the markets recovered and had a very impressive growth to the end of the year. As a whole year 2009, the VN-Index rose by 58%. Likewise, the HNX-Index also increased by 60.9%. Comparing to other investment channels such as gold, US dollars, real estate, savings, the securities investment was attractive and brought the highest profits in Vietnam in 2009 (Ta & Le, 2010).

The stock market in 2010 coped to severely difficulties that caused the disappointment of investors when it declined sharply compared to 2009. Although, the market had surprising recovery by the end of November, VN Index in closing date of 31/12/2010 is still 2% lower than last year, at 484.66 points. Likewise, the HNX-Index disappointed investors more when closing price was at 114.24, down up to 32% compared to the end of 2009. The indices had dropped the bottom on May 8 and May 11. VNI twice dropped the bottom of 420 while the HNX-Index declined at lowest level of 97.44 in the past 18 months. The market capitalization by the end of 2010 is nearly 726.000 billion Dong (approximately 35 billion USD), increased 17.1% of 2009 and

accounted for 30% GDP of 2010 (Vietstock, 2011). For comparison purpose, the market capitalization of the Thailand Stock exchange (SET) was 8,247,635 million Baht (approximately 274,921 million USD), the market capitalization of Malaysia was 1,275,280 million RM (approximately 411,380 million USD at the exchange rate of 3.1 RM/USD) (Vithessonthi & Techarongrojwong, 2012).

2011 was a more difficult year for Vietnam stock market. It was totally different from the forecast. The negative impact of the Euro debt crisis and Vietnam's economic troubles of high inflation and tight monetary policy took a toll on the stock trades. The VN-index and HNX-index fell 27.46% and 48.6% respectively. The market had higher quality but lack quantity. Many securities companies which had serious financial management issues were forced to be merged or withdrawn their licenses. In summary, the Vietnam stock market faced many heightened challenges. The problems faced by Vietnam economy is in no small part due to the lack of management capacity. However, it could be improved by stock market reforms as planned by the Government of Vietnam. In 2011, despite of an increase in listings, the market capitalization is continuously falling. It is about VND 220,000 billion, equals USD 10 billion against year 2010. The number of listed companies in HOSE in 2011 is 306, approximately 9.28% increase of 2010, but the market capitalization decreased by 23.26% (Nguyen, 2012).

Global financial crisis 2007-2009

In 2007, the financial crisis in United State (US) which started in the sub-prime market has spread to the most severe worldwide economic crisis. This crisis has been going on quite complicatedly and challenging most of economies in the world, specially, in advanced economies where a spectacular fiscal and monetary stimulus package was

introduced. However, its influence has still persistent, it have turned into a very big debt crisis. It has put pressure on emerging market in general, contributing to fast declines in their stock markets, and GDP growth rates (Neaime, 2012)

Since early 2007, most observers thought the world financial system would be facing the worst crisis since the Great Depression. It really happened when the sub-prime mortgage market of the biggest economy of the world, United State of America, fell into the crisis led to hundreds of billions of dollars worth mortgage related to investments went sour in the last half of year 2007. The first sign of a global crisis is the seizure in the banking system. Big banks in the world had to cease their activities in hedge funds which specialized in US mortgage. In 2008, the crisis became so severe since the big investment bank, Lehman Brothers, filed and agreed to go bankrupt by the US Government. Investment banks totally disappeared and the U.S. Federal Reserve took unprecedented steps to contain the crisis. The FED steps included large cuts in the target federal funds target rate which brought it to near zero, currency swaps with foreign central banks, and additional lending mechanisms (Kenc & Dibooglu, 2009). The weakness in the global financial system has surfaced. Every bank was deemed to be risky, that force other central bank of western governments to inject vast sum of capital into their bank to prevent them collapsing.

The bail-out package for financial institutions in US and major countries couldn't stop the spread of the crisis over the world. With a globalization system, a credit crunch can ripple through the entire economy very quickly turning a global financial crisis into a global economic crisis.

It's obvious to see the terrible effects of the crisis on the world stock market. In USA, the Dow Jones index dropped nearly 778 points on 29/9/2008, the largest decline

in its history and came back the point of 10 year ago. The Wall Street lost 1200 billion USD in same day. In 2008, the stock indices in worldwide markets dropped down. The overall of the world stock market is illustrated in Table 1-1 below.

The spillover of effects of this crisis challenges both advanced and developing economies across America, Europe, Asia...Up to now, the consequence of the crisis 2007-2009 still has gripped the global economy with the Debt crisis in Europe, inflation the increase of unemployment rate, the rising of oil price... Countries have been coping with a long period of recession and Vietnam is not an exception.

Table 1-1 Some of feature stock markets in the world in 2008

Market	Index	Closing value on 30/12	Increase/ Decrease vs 2007(point)	Increase/ Decrease vs 2007(%)
USA	Dow Jones	8,668.39	↓ 4,375.57	↓ 34.6
	Nasdaq	1,550.70	↓ 1,058.93	↓ 41.5
	S&P 500	890,64	↓ 556.52	↓ 39.3
UK	FTSE 100	4,392.68	↓ 2,024.02	↓ 31.5
Germany	DAX	4,810.20	↓ 3138.91	↓ 39.5
France	CAC 40	3,217.13	↓ 2,333.23	↓ 42
Taiwan	Taiwan Weighted	4,589.04	↓ 3,734.01	↓ 44.8
Japan	Nikkei 225	8,859.56	↓ 5,831.85	↓ 42.1
Hong Kong	Hang Seng	14,235.50	↓ 13,325.02	↓ 48.8
Korea	KOSPI Composite	1,124.47	↓ 728.98	↓ 40.7
Singapore	Straits Times	1,770.65	↓ 1,690.57	↓ 49
China	Shanghai Composite	1,832.91	↓ 3,428.65	↓ 65.2
India	BSE 30	9,716.16	↓ 10,749.14	↓ 52.2
Australia	ASX	3,591.40	↓ 2,842.70	↓ 44.1
Viet Nam	VN-Index	316.32	↓ 604.75	↓ 65.9

Source: CNBC, Thomson Reuters, Bloomberg

1.2 Research Motivation

The First, as introduced earlier, Vietnam stock market has turned down seriously and diminished the expectation of investor after a period of miracle growth. Recently,

there have been many comments that the Vietnam stock market is affected by many macroeconomic factors such as inflation via the CPI, tight or loose monetary policy through interest rate, borrowing rate, credit limit at banks, foreign exchange rates, the economic stimulus packages or negative information from the world market. Prominently, the USA financial crisis and the debt crisis in European countries remain unresolved and the ability of double recession in the global economy. The interactive effect of domestic and foreign factors causes the suspicions of investors skeptical about the future of the stock market. Many market analysts commented that the lack of motivation for the stock market because of instable macroeconomics undermining trust of investors. In addition, management policies of Vietnam State Bank limit the cash flow into stock market. Although the annual GDP index continued to grow up relatively high in comparison to many countries in the region and the world, the stock market remains “gloomy”. Because, this achievement was overshadowed by economic problems such as inflation, uncontrollable real exchange rate, high interest rates...The concerns of hyper inflation led to the State bank implemented a tight monetary policy. The worry of investors over the devaluation of Vietnamese dong currency kept growing so unstoppable that investors couldn't be confident to continue to invest in securities, which reduced the cash flow into capital channel.

As the particular situation of Vietnam stock market, this paper chooses to study the stock return volatility scientifically so as to detect which significant impacts on the market during last five years. It hopefully may help investors better understand the characteristics of Vietnam stock market, which is deemed to be inherently paradoxical and then allocate their investment capital effectively.

The Second, almost previous studies on stock volatility related to developed markets, even studies on regional ASEAN markets, there are a few researches on Vietnam stock market. Although it is still young and small, it has been developing and huge potentials. Therefore, it is worthy to be investigated.

1.3 Research Objectives and Scope

The purpose of this paper is firstly to find domestic or international events which impacts significantly on stock return volatility of Vietnam market during the period of five years from 2007 to 2011.

Secondly, the dissertation also investigates the interaction between domestic economic policies and the global economy crisis so as to investigate the efficiency of the governmental policies in practices.

Finally, the empirical findings of this study are expected to contribute to the literature about the stock volatility and emerging stock market.

1.4 Research Procedure

After the research motivation and objectives were identified as above-mentioned, the relevant previous studies as literatures were collected and reviewed for approaching and deeply understandings the facets of stock market and impacts on the stock market return volatility. By reviewing literature, a appropriate research methodology of EGARCH was developed with dummy variables of proposed events. After the secondary data and proposed events were collected from the published sources and journals, data preliminary analysis was carried out and then empirical results was generated and analyzed. Finally, the conclusion and suggestion was reported based on the results of the study. The research procedure of the study is shown in the Figure 1-2 as below:



Figure 1-2 Research Procedure

1.5 Research Structure of the Study

The structure of the dissertation is designed in 5 chapters. The summary of each chapter is as follows:

Chapter One outlines the research background, motivation, objectives, procedure and the structure of the dissertation.

Chapter Two presents the related literature review about the major events influenced to the stock markets in general. The events are divided into 2 types which are domestic events and international events. The prominent international events recently are global financial crisis starting in U.S.A and spread to European countries and then over the world. The domestic events contain politic events and economic events.

Chapter Three introduces the research design and methodology approached for the study. The research design includes the data sample, event identification. The methodology of EGARCH is discussed as well.

Chapter Four describes the preliminary data analysis and empirical research result. The validation of research procedure is fulfilled by test of stationary, ARCH effect and volatility asymmetry. The analysis of result is given with the supportive information in the practices.

Chapter Five are conclusion and suggestion. The results are discussed in accordance with given research objectives described in chapter one. Besides, some research conclusions and implication are also given in this chapter.



CHAPTER TWO

LITERATURE REVIEW

The volatility of stock return is a central issue in both theory and practice. There are a number of increasing studies investigating impacts on the stock return volatility in markets across the world from the advanced markets to emerging markets. Many economic and politic events were tested to detect their impacts on the volatility. The influences may be grouped into domestic events and international events.

In this chapter, popular events investigated from previous studies affect to stock market will be presented. The chapter has two parts: 1) Related literatures of effects of domestic events including politics, inflation and monetary policy; 2) Related literatures of effect of global financial crisis.

2.1 Domestic Events

2.1.1 Politics Events

Domestic events refer to any events of politics and economy occurred in a certain country. These events are possible to affect the stock market which is considered as a national economy barometer of that country. In the practice, there are a number of researches showing one or more than specific national event impact on stock market of a given nation.

Economics are closely connected to politics. The popular change in politics is the transition of ruling party in president, prime minister. By using political changes information in some democracy countries such as United State, France, Japan and United Kingdom, Chuang and Wang (2009) utilized panel data to examine the effect of political changes in their advanced stock markets. Their analytical findings show that the political changes negatively related to the countries' stock return at 5% significance

level and the effect magnitude is dramatically stronger after the financial crisis, the 1987 crash. The transition of ruling parties often has an intensive impact on the stock price due to it will affect business confident. The different parties have different economic agendas, which result to frequent modification in economic policies. So, long-term policies of a government cannot be implemented completely and cause the market confusion. The investor may become cautious of the stock investment.

In the earlier, Chan and Wei (1996) also analyzed the impact of political news on the stock market volatility in Hong Kong. They found that political news increases the stock volatility of both blue-chip and red-chip shares. Further, their results investigated that political news is correlated to index returns.

Following the study of Chan and Wei (1996), Fong and Koh (2002) in their work, found strong evidence the influence of major political uncertainties on the stock price volatility through the regime shifts in volatility. By using data on the Hong Kong stock market over a long sample period, they investigated whether political risk had induced regime shifts in stock. During the sample period, the authors conducted politic shocks including external events and domestic events. Their findings show that the politic risk is indeed an important source of uncertainties in stock markets. The external event accounts for three quarters of the high volatility periods. High volatility regimes are associated with bad news while the low volatility regimes are associated with good news.

2.1.2 Economics Events

Being a part of an economy, stock market cannot avoid the effect of changes in economic activities such as inflation, interest rates, investment, exchange rates, economy policies, financial reform, money supply, industrial production, etc... The

stock price is generally believed to reflect these changes. In the earlier literatures, macroeconomic variables play an important role in asset pricing theories. Therefore, a number of researchers have studied empirically the connection between macroeconomic variables and market stock volatility in different countries.

Reviewing the paper of Morelli (2002), he analyzed conditional stock volatility of UK market to examine whether it can be explained by time-varying conditional volatility in a set of macroeconomic variables. In accordance with Vector Autoregression (VAR) model, the results show a significant relationship between stock market and macroeconomic volatility with respect to the ability of macroeconomic volatility in predicting stock market volatility.

Kwon and Shin (1999) analyzed whether economic activities in Korea can explain stock market returns by using a cointegration test and a Granger causality test from a vector error correction model. This study found that the Korean stock market reflects macroeconomic variables on stock price indices. On the other words, the linkage between the stock market and macro variables is significantly tight. Moreover, the chosen method illustrated that stock price indices are cointegrated with a set of macroeconomic variables consisting of the production index, exchange rate, trade balance, and money supply.

Applying the same method with Kwon and Shin (1999), Gan et al. (2006) examined the relationship between New Zealand stock index and a set of seven macroeconomic variables. The Johansen Cointegration Test indicates that there exit a long run relationship between stock index and the macroeconomic variables tested. The results from all methods which they applied indicate that the stock index could be explained by inflation rate, Exchange rate, Gross Domestic product, Money supply,

Long term interest rate, Short term interest rate. Therefore, it is believed that stock price is generally to be determined by some fundamental macroeconomic variables.

Inflation and Monetary Policy

Inflation is one of the most important macroeconomic indicators and frequently used in economic analysis. The impact of inflation has been broadened in many areas and the stock market is not an exception. Indeed, in securities analysis, it is essential to examine the effect of inflation to supply and demand of securities in issuance and trading, especially which fixed-income securities. At the same time, the value of securities investments directly affected by the evolution of inflation, so this is one of the basic risks in securities investment. The business activities of listed companies also directly and indirectly suffer from inflation at different level. That is the reason that it will cause the changes in stock prices. Early, in empirical work, that expected inflation is negatively related to share prices.

In the context of increasing money supply and expansion of government spending, the increase of inflation rate will cause the overheating growth in stock market. When the inflation goes up to be out of control in the context of implementation of tight monetary policy, the stock market will decline rapidly. In the opposite, in the context of implementation of a loose monetary policy and loose fiscal policy, the stock markets will be recovered (Pham, 2011)

Monetary policy is the general tool of government to control the inflation rate appropriately. In order to control inflation rate, a tight monetary policy is often implemented. So the market interest rates generally tend to rise. The investors will not accept a lower rate of returns on securities. The difference between investment return yield and growth rate of companies becomes larger. In the other words, the stock price

of companies is predicted to go down. The securities then tend to be sold so as to avoid risk. It results to the recession of the stock markets. Besides, due to the increase of inflation and interest rates, the operation cost will rise up, the expected return will go down respectively. Consequently, the stock price also will decline.

Although, change in monetary policy mostly affects the economy through the money market, a increasing number of research provides the evidence of its changes affect the economy through stock market.

Monetary policy announcement affect significantly on stock price. Vithessonthi and Techarongrojwong (2012) examined the effect of monetary policy on stock prices. They used the repurchase rates as a proxy for monetary policy to measure the reaction of stock market to the policy announcement. They applied the regression-based event study and detected that stock prices respond negatively to the expected change in the repurchases rates. At the firm level, the results show interestingly that the expected change in the repurchase rates has a negative effect on stock returns but the unexpected change has a positive effect on stock returns. They detected that both the expected and unexpected changes in the monetary policy in a developing country with less developed financial markets such as Thailand have a significant effect on stock returns. However, the findings generated from the time series method, show an opposite result of which either the repurchase rate change or the unexpected component of the repurchase rate change doesn't have a significant effect on stock prices. The result is similar with the adoption of VAR estimation. In conclusion, they didn't find enough evidence to say that the stock market fully incorporate the expectation of future monetary policy actions but it response to the actual monetary policy.

In developing countries where the monetary authorities usually lack of practice experience and not confident about their actions and stock market may poorly response to monetary events. Evaluating the impact of monetary policy announcements on financial markets is extremely essential for monetary authorities concerned with formulating effective monetary policy.

There is a body of research found a positive association of monetary volatility with stock market volatility. Eichengreen and Tong (2003) have studied the volatility of stock markets in the long run in a number of countries across the developed countries such as Australia, Canada, Denmark, Finland, France, Italy, Japan, New Zealand, Sweden, Switzerland, United Kingdom and the United States, developing countries such as Argentina, Brazil, Chile, the Czech Republic, Hong Kong, Hungary, Malaysia, Mexico, Poland, Singapore, South Korea and Thailand. The findings that the monetary policy became increasingly volatile in a number of countries in the 1970s and 1980s thus may be part of the explanation for why stock markets have been more volatile in recent decades. Therefore, the conduct of monetary policy and the nature of the monetary regime are important for stock market volatility.

Becher, Jensen and Mercer (2008) explored the linkage between stock return predictability and the monetary sector by examining alternative proxies for monetary policy and found that monetary condition have a emerging and systematic relation with future stock returns. They found the relation between stock returns and monetary conditions is stronger than the relation between stock returns and business conditions.

In the context of tight monetary policy in Pakistan, Qayyum and Anwar (2011) studied the linkage between the monetary policy and the stock market. Using repo rate as a indicator of monetary policy, they applied EGARCH model to investigate the

connection between the stock price volatility and repo rate volatility. The results from the EGARCH model reveals that the stock market returns are not only affected by its lag but also the monetary policy in term of repo rate also play a key role in determining the returns to the stock markets. The result is consistent with previous research, that is, the monetary policy has a positive impact on the stock market.

2.1.3 Financial Reform

In some other studies, one of the impacts on the stock market is financial reform. In case of Taiwan, when there was a transfer of presidential power in 2001, the financial reform was implemented. The reform including the amendment of bank law, financial holding company law, the merge law of financial institution, deregulate foreign investor to Taiwan stock market, effect negatively on stock market return and positively on volatilities (Lin & Wang, 2007).

2.2 Global Financial Crisis

Globalization has been increasing the degree of dependence between the countries in all over the world recently. Thus, a crisis incurred in a country may extend widely into a global crisis. In history, the world economy faced not few small and huge crises, for example, the Great Depression in 1929, the Crash in 1987, Asian currency crisis in 1997 and currently credit crisis since 2007. In general, the volatility and crises always go together. Almost of empirical studies show that the negative influence financial crises on stock market return exists. In the other words, the stock volatility increases during the period of crisis.

As be introduced in previous part, the impact of global financial crisis 2007-2009 is broadly and deeply, not only in financial markets but also in real economy activities.

The stock markets reflected clearly this intensive influence. That attracts a lot of economists and financial analysts doing investigation about the influence.

In U.S.A financial market, the annualized and average return volatility of all main securities index, such as SPX, VIX, VXV, VIX futures, VIX options during the financial crisis are remarkable higher than other period. The financial market rebounded during the post-crisis period but the market volatility didn't revert back the Pre-crisis period (Manda, 2010).

The current financial crisis originated in the U.S.A has spread to almost all economies, from advanced to emerging alike. The current global financial crisis was really made by two type of shock – liquidity shocks and risk shocks. However, the shocks have had diverse impacts on different countries and on different market segments. Advanced countries were more massively influenced by liquidity shocks than emerging economies. In fact of advanced countries, the equity markets declined and conditions of financial markets were tightening during the crisis. The response of advanced economies to liquidity shocks is even stronger than in the USA itself. While emerging economies was relatively more vulnerable to risk shocks than to liquidity shocks like advanced economies. In addition, the financing conditions in advance economies mainly negatively affected by specific shocks. In contrast, the real side of economy of emerging countries is relatively sensitive to the shocks. Among advanced economies, Europe has seen the highest exposure to the shock in USA, while most other advance economies are likely to be affected to a similar degree by US liquidity shocks. The effect of the liquidity shocks on emerging economies of Asia Latin America, Central and Eastern Europe was more severe than other emerging countries (Chudik & Fratzscher, 2011).

In emerging markets like Middle East and North Africa (MENA), The spillover effects of the current global crisis on the countries in general and on the stock markets in particular are different according to their level of financial integration with the more developed financial markets. For example, the stock markets of Egypt, Jordan, Kuwait, Morocco, and the United Arab Emirates (UAE) were the most impacted by the global financial crisis because their stock market has linked quite strong with global stock markets. While the impact of global crisis on Saudi Arabia is insignificant because its finance market has remain relatively closed to foreign investors and its degree of financial integration has remained low. Likewise, the Saudi stock market's linkage with the global equity markets is also not significant enough, despite of their recent efforts to further enhancement of intra-regional integration with the remaining MENA countries' stock markets (Neaime, 2012).



CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

In this chapter, firstly the research design including sample data of stock indices is introduced with the data sources. Then, the proposed domestic and international events which are expected to influence on the stock market return are identified, the period of events are also clearly shown. Finally, the methodology of EGARCH is described by mean and variance equation.

3.1 Sample Data and Data Source

As be most well-known in stock market, stock market index, shortly called “stock index”, is popularly used as benchmark to measure the performance of the stock market or portfolios. It is simply defined to be an average price of stocks included in a certain sector or market. By doing so, the stock market is also a tool to describe the stock market and assess the response of investor to the state of an economy. In the practice, it is calculated and published every day following the trading day. There are many methods to calculate the stock index and is very often expressed in term of change from a base value which may be stock price or market price.

For the main purpose of investigating any impacts on stock market of Vietnam, the daily stock indices were chosen as sample data for this dissertation. The 1241 observations of daily closing stock prices, called VN-Index, are from 1/1/2007 to 31/12/2012 in Ho Chi Minh Stock Exchange market (HOSE). The sample data were collected from the official website of Bank for Investment and Development of Vietnam Securities Company Ltd.(www.bsc.com.vn). The English version can be obtained in website of Bloomberg (<http://www.bloomberg.com/quote/VNINDEX:IND/chart/>).

The VN-index is a market- value- weighted index. It is computed by calculating the proportion of the total market value of all companies listed in Ho Chi Minh stock market and initial value of those companies in the date of starting market (June, 2000) with the base index value of 100. It is demonstrated by following equation (1):

$$\text{VN - Index} = \frac{100 \sum_{i=1}^n P_{1i} Q_{1i}}{\sum_{i=1}^n P_{0i} Q_{0i}} \quad (1)$$

Of which,

P_{1i} : Current price of share i

Q_{1i} : Current listed quantity of share i

P_{0i} : Initial price of share i

Q_{0i} : Initial listed quantity of share i

By this method of calculation index, VN-index presents a substantial percentage of total market capitalization. The VN-Index is denominated in Vietnamese Dong (VND).

The reason of choosing index of HOSE market is that firstly it captures a large of share of Vietnam stock market. Ho Chi Minh stock market is not only the first one but also the biggest one in Vietnam with the number listed company up to 306 and market capitalization of 453,784 billion dong which account for more than 80% of total Vietnam market by the end of 2011. Secondly, the choice of daily interval is motivated by many previous studies about stock volatility. Mandelbrot (1963) and Fama (1965) gave the evidence that volatility changes overtime with short lags as daily, time series of daily stock index return exhibit positive autocorrelation. Moreover, they show that the daily stock index returns tend to have higher kurtosis than if they were normally distributed.

The daily returns as continuously compounded returns, on the market indices are computed on the basis of series of daily stock indices. They are the changes in logarithm of stock indices of successive days as following equation (2):

$$R_t = \ln(P_t) - \ln(P_{t-1}) \quad (2)$$

Of which,

R_t : is stock return on the t day

P_t is the stock index on the t day

P_{t-1} is the stock index on the t-1 day (the day before t day)

The daily dividends are not included in the computation because they are small enough not to cause much distortion.

3.2 Event Identification

The period from 2007 to 2009 was the most volatile period of Vietnam stock market. It grew rapidly, decline sharply, rebounded slightly, then continued to drop and finally oscillate around the axis of 450 points up to end of 2011. The reason explained for this phenomenon by many analysts are mainly effect of domestic monetary policy which was tight in growing period and loose in declining period and effect of current global financial crisis. Therefore, we assume them as events for the purpose of this dissertation as shown in the Table 3-1.

Table 3-1 Classification of event period

Event Description	Period (dd/mm/yyyy)		Duration	Sources	
Tight monetary policy	1 st event	From	28/05/2007	217 days	Directive 03/2007/CT-NHNN, Circular 7021/2007/CV, Decision 03/2008AD-NHNN
		To	31/12/2007		
	2 nd event	From	19/05/2008	216 days	Decisions on base interest rate (Table 3-2)
		To	21/12/2008		
	3 rd event	From	01/07/2011	183 days	Directive 01/CT-NHNN
		To	31/12/2011		
Global financial crisis 2007-2009		From	07/08/2007	724 days	(Chudik & Fratzscher, 2011)
	To	31/07/2009			

Table 3-2 List of decisions on base interest rate

Decision number	Date of issuance (dd/mm/yyyy)	Date of application	Base interest rate
2948/QĐ-NHNN	03/12/2008	05/12/2008	10%
2809/QĐ-NHNN	20/11/2008	21/11/2008	11%
2559/QĐ-NHNN	03/11/2008	05/11/2008	12%
2316/QĐ-NHNN	20/10/2008	21/10/2008	13%
2131/QĐ-NHNN	25/09/2008	01/10/2008	14%
1906/QĐ-NHNN	29/8/2008	01/09/2008	14%
1434/QĐ-NHNN	26/6/2008	01/07/2008	14%
1317/QĐ-NHNN	10/6/2008	11/06/2008	14%
1257/QĐ-NHNN	30/5/2008	01/06/2008	12%
1099/QĐ-NHNN	16/5/2008	19/05/2008	12%
3161/QĐ-NHNN	19/12/2008	22/12/2008	8.5%

3.2.1 Tight Monetary Policy

As be mentioned in introduction part, prior to first quarter of 2007, the stock market hit the peak, the “bubble” growth phenomenon appeared on the stock market due to the loose monetary policy of the Government. During this period, the loose monetary policy caused excessive money supply in circulation; a remarkable portion of the capital

was transferred to investment in non-production area, refer to stock market, and consumption. Stock market was overheated with the VN-Index had been increasing over 1100 points which is the highest point in the history of the Vietnamese stock market so far. Inevitably, the rate of inflation also climbed up to 8%, the highest level within 7 years since 2001 (Pham, 2011). In order to control inflation and manage the safe targeted credit growth, since the second half of 2007, the state authorities strictly implemented a tight monetary policy through a bunch of legal regulations on credit rate, interest rate. For this dissertation, I obtained 3 related events as details shown in the table 3-1as proxies of the tight monetary policy.

According to instruction of government about the procedure of issuance policies, written Directives are issued by the State Bank of Vietnam. And then the lower-level legal documents are Decision, Circulars and official letters adopted as specification or partly revision or replacement. The first, related event which considered to be the significant effect directly on the stock market are the issuance of Directive number 03 date 28/05/2007 and then was amended by Circular number 7021 date 28/06/2007 issued by State Bank of Vietnam. According to these, the portion of loan secured by securities or valuable certificates for stock investment, also named collateral loans, in total loans of a financial institution must be less than 3%, which before there were not any regulations specifying. Directive 03 prescribed the dead line for financial institutions to collect debts to meet the required percentage is the 01/07/2007. However, the issuance of this regulation was relatively sudden to all financial institutions, especially commercial banks. They didn't have enough time to collect debts. That's why the Circular 7021 was then issued to expand the deadline until the last day of 2007.

Thus, the restrict period of first event is from the date of issuance of legal document (28/05/2007) to the due date for required collateral loan portion (31/12/2007).

The second, related event is the increase of base interest rate structured and regulated by the State Bank. In the context of macro economy, change of base interest rate will lead to the change in commercial interest rate including deposit and borrowing rate in financial institutions. In previous years, the average of base interest rate was relatively stable at about 8% annually. For the purpose of controlling the mounting inflation since the second half of 2007, the base interest rate rose to more than 10% from the middle of May 2008 to the middle of Dec in same year. That time is a remarkable period of interest rate when frequently it was adjusted at 10%, 11%, 12%, 13% and 14% by a number of legal documentation as table 3-2. On 22/12/2008, the base interest rate came back the level of 8.5% and subsequently is below 10% since that on, which ended period of the high interest rate.

The third, related event is issuance of Directive 01/CT-NHNN date 01/03/2011 by the State Bank of Vietnam as well. It is the latest legal regulation during the sample period and replaced the Directive 03 as above-mentioned. Its unchanged purpose is to control the inflation and stabilize macro-economy. The Directive instructed the financial institutions to reduce the maximum portion of loan for non-manufacturing section including stock investment from 22% down 16% within 3 months since 01/07/2011 to 31/12/2011. Obviously It is once more movements of the government in implementation of tight monetary policy so as to improve circumstance of high inflation and enhance the credit rate in financial institutions as well. All legal documents were obtained from official website of the State Bank of Vietnam (www.sbv.gov.vn).

3.2.2 Global Financial Crisis: 2007-2009

The financial crisis in United State (US) started in August 2007 in the banking system when some huge banks announced that they had to cease transactions related to hedge funds specialized in mortgage debt.

In Vietnam, the stock market declined suddenly in the second quarter of 2007 and rebounded a bit in the middle of year 2008. But it again decreased deeply in Sep of 2008. At the same time, the financial crisis in USA became the most serious when US government allowed the investment bank Lehman Brothers go to bankrupt, then the crisis spread to the worldwide. This crisis had hit seriously the global economy until the middle of 2009. Since it is difficult to identify exactly when the crisis started and ended, we picked the crisis period as Chudik and Fratzscher (2011) in their study. It is from 07/08/2007 to end Jul 2009.

3.3 Modeling Time-varying Volatility

The GARCH family models have been well-known in modeling time-varying volatility. With contribution of many financial analysts during last two decades, this group of methodologies were developed from the method Autoregression Conditional Heteroscedasticity (ARCH) of Engle (1982) and General Autoregression Conditional Heteroscedasticity (GARCH) of Bollerslev (1986). By reviewing previous empirical literature about volatility of financial time series, we were motivated to employ Exponential GARCH model developed by Nelson (1991) for this dissertation.

The GARCH model imposes the nonnegative constraints on estimated parameters, while there are no restrictions on those parameters in the EGARCH model and it explicitly allows for asymmetries in relationship between return and volatility, thereby avoiding possibility of missing specification in the volatility process. Accordingly, the

chosen dummy variables are embedded in the EGARCH model to investigate the effect of domestic or international events on stock return as follows:

$$R_t = a_0 + a_1 TM_t + a_2 GF_t + a_3 TG_t + \sum_{i=1}^m b_i R_{t-i} + \epsilon_t \quad (3)$$

Where in equation (3) R_t denotes stock return at t time; R_{t-i} : stock return before t time i days; m : number of order autoregressive process

TM_t denotes the dummy of tight monetary policy effect, where TM equals 1 during the event period and equals 0 otherwise.

GF_t denotes the dummy of global financial crisis 2007-2009, after some big banks in USA announced that they had to cease transactions related to hedge funds specialized in mortgage debt in 2007, the crisis had hit seriously the global economy until the middle of 2009. Therefore, the sample period is distinguished between pre-crisis period (GF equals 0) and post-crisis period, 7 August 2007 - end Jul 2009 (GF equals 1).

TG_t denotes the dummy variables of interactive effects between tight monetary policy (TM) and global financial crisis (GF). It is computed by multiplying TM by GF .

The allocation of dummy variables is illustrated in the Figure 3-1. The areas marked by arrows are periods of events when the dummy variables are equal to 1.

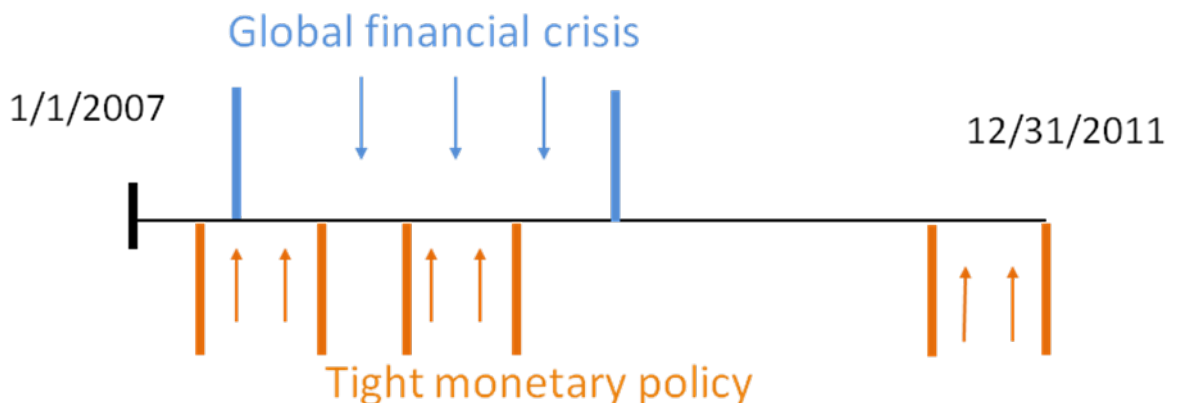


Figure 3-1 The allocation of dummy variables

Where error term ε_t is assumed to follow the student t distribution as equation (4) because central t-distribution allows stock returns have thicker tails, but is still symmetric (Ang & Chen, 2002; Harvely & Siddique, 2000).

$$\varepsilon_t | \Omega_{t-1} \sim T(0, h_t, \nu) \quad (4)$$

The volatility of the EGARCH model measured by the conditional variance h_t , is an asymmetric function of past innovation shock u_{t-1} as below equation (5):

$$\ln h_t = \tau_0 + \tau_1 TM_t + \tau_2 GF_t + \tau_3 TG_t + \alpha [|u_{t-1}| - E|u_{t-1}| + \theta u_{t-1}] \quad (5)$$

In other words, the volatility of stock return may asymmetrically response to favorable or adverse news. The innovation u_t is determined by dividing the error term by conditional variance ($u_t = \varepsilon_t / \sqrt{h_t}$). In the equation (5), the function $\alpha [|u_{t-1}| - E|u_{t-1}| + \theta u_{t-1}]$ contains two parameters which define the size effect and sign effect of the shock on stock return. The first term derived from unexpected shock, $|u_{t-1}| - E|u_{t-1}|$, determine the size effect and the second term θu_{t-1} , which is leverage effect, determines the sign effect when the impacts go in. According to (Lin & Wang, 2005), under such the condition, if the coefficient θ is positive, there is no leverage effect indicates the nonexistence of asymmetric volatility. if it is significantly negative, it indicates the presence of leverage effect. In addition, the term $\beta \ln h_{t-1}$ exhibits the linkage between the current volatility and past volatility. When β is positive and statistically significant, it denotes that current volatility is a function of past volatility. Furthermore, to be as parsimonious as possible as suggested by Bollerslev et al. (1992), EGARCH (1,1) model is practiced to capture the asymmetric volatility.

The lag length of conditional mean returns of GARCH (1,1)¹ model is chosen as two based on the minimum value of the Akaike information criterion (Akaike, 1973)

¹ The GARCH(1,1) model was considered adequately fit to capture the conditional heteroskedastical

and the Schwarz Bayesian Criterion (Schwarz, 1978). The maximum likelihood estimation method is used to determine the parameters of the mean and time-varying conditional variance-covariance are jointly determined. Because the log likelihood function of parameters is nonlinear, the algorithm proposed by Berndt and et al (1974) is used to obtain the maximum likelihood estimates of the parameters.



variance, suggested by number of previous studies such as Bollerslev (1986), Lin & Wang (2005, 2007), Do et al. (2009) and so on.

CHAPTER FOUR

DATA DESCRIPTION AND EMPIRICAL RESULTS

This chapter has four parts presenting: 1) Basic statistic descriptions of stock returns such as mean, standard deviation, skewness and kurtosis value; 2) Results of test of stationarity on stock return series, it includes the evaluation of optimal lag length in unit root test; 3) Analysis of ARCH effect and volatility asymmetry on stock return series; 4) Analysis on empirical results of impacts of events on the stock market return based on the significance and size of coefficients.

4.1 Data Description

In this section, a preliminary analysis of Vietnam stock market was carried out. According to the data sample of daily stock price, the trend and return of VN-index are shown as Figure 4-1 and 4-2 respectively. Visually, the VN-index declined dramatically in around first 400 days. After that, the market seemed to be recovered by the up-trend of VN-index in around 200 days later and it fluctuated within 400 and 500 score since then.

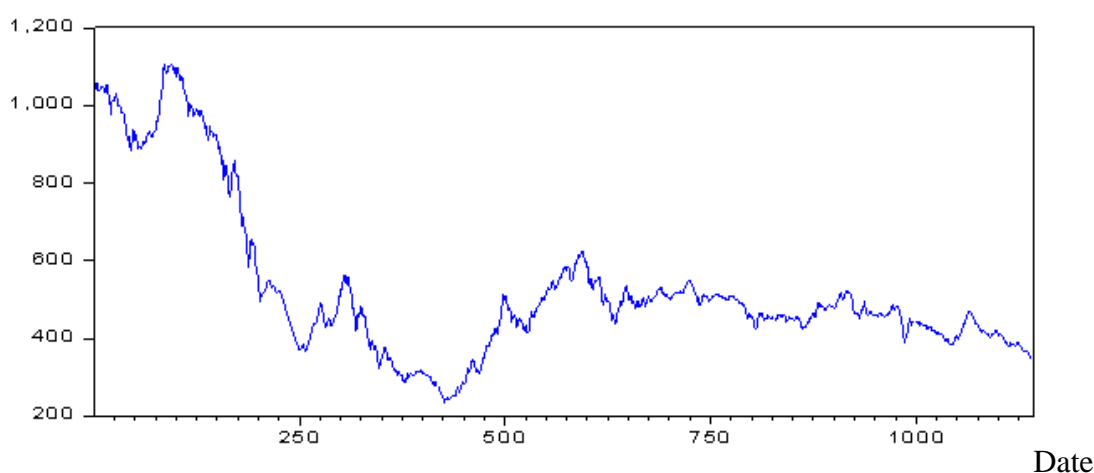


Figure 4-1 The graph of VN-INDEX

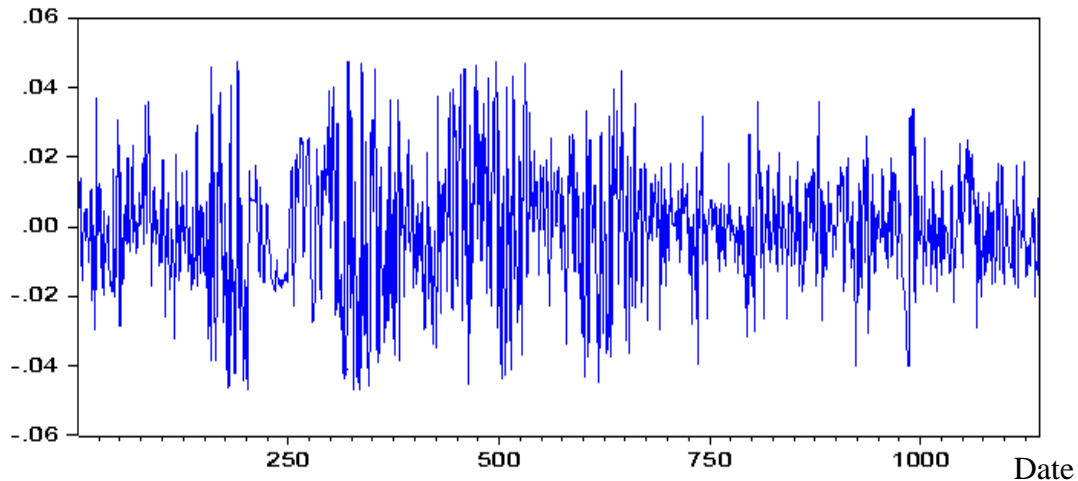


Figure 4-2 The trend graph of VN-INDEX return

As being introduced in previous chapter, the VN-index was base to compute the VN-index return which is the research object of the dissertation. Table 4-1 lists the basic statistic indicators of stock return series including sample size, mean return, standard deviation, skewness, kurtosis, the median, minimum, maximum returns, Jarque-Bera test statistic and Ljung-Box Q test statistic.

The result shows that the mean of VN-index returns is negatively small and not significantly different from zero at any statistical significance levels. It implies that the stock return slightly decreased in general.

In any conventional statistic textbook, the calculation of significance (p-values) for hypothesis test typically is based on the assumption that the population distribution is normal. Thus, it is practical to test the normality of distribution. Among variety test of normality, Jarque-Bera test found by Jarque and Bera (1987) has now become a popular method. In a data set, The Jarque-Bera test statistic is computed based on the skewness and kurtosis. The skewness and kurtosis parameters are the measurements of the asymmetry and thickness in the tails of probability density function. For normal distribution they equal 0 and 3 respectively. According the Jarque and Bera test, the null

hypothesis (H_0) is normal distribution against the alternative hypothesis (H_1) non-normal distribution. The test can be compared with chi-square (χ^2) distribution with 2 degree of freedom. The null hypothesis will be rejected if the calculated Jarque-Bera test exceeds the critical value from the chi-square distribution.

According to the results shown in the Table 4-1, although the skewness and Kurtosis statistics are different from the critical values and only kurtosis is significant at 5% significance level, the results from Jarque-Bera test is big enough to exceed the critical value from χ^2 distribution and also significant at 1% significance level. Thus, the null hypothesis of normality is confidentially rejected. In the other word, the distribution of VN-index is concluded not to follow a normal distribution.

Table 4-1 Basic statistics for HOSE stock market returns

Mean	-0.0601	Std. Dev.	1.8453
Maximum	7.7406	Minimum	-4.8157
Skewness	0.03112	Kurtosis	0.2679*
Q(6)	138.1142**	Q(12)	142.1142**
Q ² (6)	479.4855**	Q ² (12)	802.4835**
Jarque-Bera	386.1691**	Sample Size	1241

Notes: ** 1% significance level. * 5% significance level. Q(k) (Q²(k)) is the Ljung-Box Q-statistic for the returns and squared returns lagged k trading days.

The Ljung-Box Q-statistics is for testing the joint significant autocorrelation within series. As shown in the table 4-1, Q(6), Q²(6), Q(12), Q²(12), denoting the Ljung-Box Q-statistics for return and squared return at lags of 6 and 12 trading days, are statistically significant at the 1% significance level. It is justified that daily VN-index returns have significant serial correlation.

4.2 Test of Stationarity

In the literatures of time series analysis, the data have been approached as stationary series. According to the definition of Holton (2009), a stationary time series

is one in which two consecutive values in the series depend on the time interval between them and not on time itself. In the other words, the stationary time series is one whose statistical properties such as mean, variance, autocorrelation...are all constant over time. Because of this characteristic, most of forecasting and modeling models are based on the assumption of stationarized time series. The unit root test was used to detect the stationary of sample time series. There are some methods for unit root test and in this dissertation, the augmented Dickey-Augmented Dickey-Fuller (ADF) (1979) which is the extended Dickey-Fuller test for higher order and Phillips and Perron (P-P) (1988) tests were employed to indentify the unit root of stock index and return with the support of software Eview 7.

Under the unit root hypothesis of which the null hypothesis is that the time series has unit root or non-stationary and the alternative hypothesis is that the time series doesn't have unit root or be stationary. The null hypothesis should be rejected if the calculated statistic is smaller than the 5% level critical value following the critical value table of MacKinnon (1991). Conventionally, the unit root tests utilized three main unit root hypothesis with time trend (Trend and Intercept), with constant term (Intercepts) and with neither constant term nor time trend (None).

The value of Akaike Information criterion (AIC) (Akaike, 1973) and Schwarz Bayesian Criterion (SBC) (Schwarz, 1978) are calculated as below functions:

$$AIC(k) = n \ln \sigma_t^2 + 2k \quad (6)$$

$$SBC(k) = n \ln \sigma_t^2 + k \cdot \ln n \quad (7)$$

Where, k denotes the lagged period, n denotes the number of sample, and σ_t^2 denotes the lagged k periods of $\sum_{i=1}^k \varepsilon_t^2$

Table 4-2 The AIC and SBC value of unit root test of VN-index returns

Item	AIC	Order	SBC	Order
None	7.2765**	1	7.2853**	1
	7.2758**	2	7.2891**	2
	7.2725**	3	7.2903**	3
	7.2742**	4	7.2964**	4
Intercept	7.2756**	1	7.2889**	1
	7.2753**	2	7.2930**	2
	7.2724**	3	7.2945**	3
	7.2742**	4	7.3008**	4
Trend and Intercept	7.2753**	1	7.2930**	1
	7.2752**	2	7.2974**	2
	7.2727**	3	7.2993**	3
	7.2746**	4	7.3056**	4

Notes: ** 1% significance level. AIC denotes value of Akaike Information Criterion (Akaike, 1973) SBC denotes value of Schwarz Bayesian Criterion (Schwarz, 1978)

The optimal order or lag interval was determined based on minimum value of AIC and SBC. Among the value of AIC and SBC shown on the table 4-2, the order 1 correctively was eligible in favor of Schwarz Bayesian Criterion. Table 4-3 reports the results for the Augmented Dickey-Fuller (ADF) and Phillips and Perron (P-P) tests under the unit root hypothesis of VN-index returns and the lag interval is 1. All the computed statistics are less than 5% level critical value. Therefore, it is justified to reject the null hypothesis and VN-index returns are stationary.

Table 4-3 The ADF and P-P value of unit root test of VN-index returns

Item	ADF	Order	P-P	Order
None	-21.0728**	1	-25.47246**	1
Intercept	-21.1623**	1	-25.54414**	1
Trend and Intercept	-21.2287**	1	-25.5928**	1

Notes: ** 1% significance level. Order is lag length was selected according to Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC)

4.3 Test of ARCH Effect and Volatility Asymmetry

As introduced in the chapter 2, an important feature of many series of asset returns which motivate ARCH and GARCH class of models is volatility clustering. Obviously, we should not explicitly estimate the conditional volatility of series as GARCH model if there are not any signs of ARCH effects.

Test of ARCH effect is to find out if there is any conditional heteroscedasticity (Engle, 1982) by conducting the squared residuals series. In the dissertation, the method to test ARCH effect is Lagrange Multiplier test of which procedure was suggested by Engle (1982). The null hypothesis is that coefficient values of q lags of squared residuals are not significantly different from zero. If the value of test statistic is greater than the critical value from the chi-square distribution with q degree of freedom, the null hypothesis can be rejected. That means the series has ARCH(q) effect. In the research, the ARCH test is conducted at 5 lags of squared residuals.

The diagnostic test including sign bias test (SBT), negative size bias test (NSBT), and positive size bias test (PSBT) is to find out if the conditional heteroskedasticity has any asymmetric effect (Engle and Ng, 1993). The three tests jointly run as Joint test (JT) TR^2 for null hypothesis of no asymmetric effect. The null hypothesis can be rejected if

the value of test statistic is greater than the critical value from the chi-square distribution with 3 degree of freedom.

Table 4-4 listed the result of ARCH test and diagnostic test (SBT, NSBT, PSBT, and JT). The value of ARCH (5) statistic test is much greater than its critical value of 7.82 at 5% significant level from chi-square distribution with 5 degree of freedom. Then the null hypothesis is confidently rejected. Although, the positive size bias test (PSBT) is less than its 5% level critical value but the Joint test (JT) is much greater than its 5% critical value of 7.82 as chi-square distribution with 3 degree of freedom. Consequently, the null hypothesis is also justified to be rejected. Based on the above examination, the volatilities of VN-index returns exhibit conditional heteroscedasticity and asymmetry.

Table 4-4 The ARCH effect and volatility asymmetry test

Method	ARCH(5)	SBT	NSBT	PSBT	JT(3)
Value	446.3793**	2.6195**	-6.8856**	1.1291	398.4458**
	(4.8595)	(0.2750)	(0.1345)	(0.1301)	(4.8528)

Notes: ** 1% significance level. * 5% significance level. Numbers in parentheses are the standard errors of variables. ARCH denotes the Lagrange Multiplier test of Engle (1982), and the criterion is 7.82 at the 5% significant level. SBT, NSBT and PSBT denote the sign bias test, negative size bias test, and positive size bias test respectively, and the criterion is 2.353 at the 5% significant level. JT denotes the joint test, and the criterion is 7.82 at the 5% significant level.

4.4 Empirical Results

In previous session, the results from several diagnose tests of ARCH effect and asymmetry show that EGARCH model may fit with the research to estimate the response of VN-index stock returns and volatilities to tight monetary policy of Vietnam and global financial crisis 2007-2009.

Table 4-5 reveals that the coefficient of tight monetary policy dummy, a_1 (3.3130), is significantly negative at 1% significant level on VN stock returns. The result is explicitly reasonable and consistent with literature of financial asset returns. On 28/05/07, the State Bank of Vietnam issued Directive 03 which was considered as

sudden regulation to financial institution and investors. Before this time, the monetary policy was eased excessively which lead to increase of money supply in the market (Pham, 2011) and capital flew into the stock market also enlarged subsequently. The stock market grew up dramatically with the peak of VN-index at more than 1000 score motivated the banks and financial institutions to boost funds for their lending service to security investors. The sudden issuance of Directive 03 which prescribed the limit of loans secured by securities or valuable certificates shocked to firstly every banks and stock investors. In short time of three months, all of the commercial banks and financial institutions under the regulation were forced to collect the payment for the collateral loans so as to meet the regulated portion of 3%. In the fact, the portion of collateral loans over the loan total was far from 3%. That why, the supplement was issued to extend the deadline more three months. The policy led to the money supply for the stock market became to be narrowed while the investor who borrowed money from the banks had to sell out their stocks to repay the borrowings. In the stock market, the supply became in excess that pull the stock prices down gradually. In addition, the increase of interest rate in the second half of year 2008 contributed to the decrease of capital in stock investment. Due to the cost of capital grew up, the investors seemed not to be interested in the stock market that brought a lot of difficulties for the market.

These above reasons generated a decline of stock index significantly and started a recession of stock index in a long term later. Therefore, the significant coefficient, τ_1 (1.9432), indicates that the tight monetary policy is a crucial variable to VN-index volatility. It is significantly negative at 5% level on the stock volatility. Logically, the result infers that the tight monetary policy of Vietnam government was effective in reducing the risks of the stock market.

The coefficient of dummy variable of global financial crisis 2007-2009, a_2 (3.1639), shows that the effect of global financial crisis on Vietnam stock returns is significantly negative at 1% significance level. Many studies have been showing the evidence of relationship between the latest financial crisis with the stock markets in both advance and emerging economies. Once more time, in this study, the 2007-2009 global crisis is clearly an remarkable factor to the recession of Vietnam stock market. The result is explicitly practical and has proved the hypothesis of impact of global crisis on Vietnam stock market which was stated in chapter 3. The findings also show the adverse relationship between the Vietnam stock market and global financial crisis in a long-term.

The global financial crisis had also boosted risks in the stock market basing on the computed coefficient of volatility of the stock market, τ_2 (2.7618), which is significantly positively related at the 1% level to the global financial crisis. The empirical findings herein are the same as study of Kiran Manda (2008) stock volatility increased extensively during the crisis.

The table 4-5 also shows a significantly positive coefficient of interactive effect dummy variable, a_3 (3.5796), between the tight monetary policy and the global financial crisis on the stock market returns. The empirical result indicates that the tight monetary policy of Vietnam government was effective in stabilizing the stock market during the crisis period. Unfortunately, the impact of tight monetary policy in condition of the crisis, is not explicit enough to the volatility of the market

In the variance equation, the value of α , β , θ , b_1 , b_2 are all statistically significant at 1% and 5% level. The coefficient β and θ are positive that satisfy the sign effect of

the shock on stock return. The volatility correlates negatively to the stock return and the current volatility is a function of past volatility.

Table 4-5 The Empirical Results of AR(2)-EGARCH Model

$$R_t = a_0 + a_1 TM_t + a_2 GF_t + a_3 TG_t + b_1 R_{t-1} + b_2 R_{t-2} + \varepsilon_t$$

$$\ln h_t = \tau_0 + \tau_1 TM_t + \tau_2 GF_t + \tau_3 TG_t + \alpha[|u_{t-1}| - E|u_{t-1}| + \theta u_{t-1}] + \beta \ln h_{t-1}$$

Variable	Return	Volatility	
<i>Constant</i>	-0.00917 (0.0443)	7.31332** (0.0156)	
<i>The effect of tight monetary policies (TM)</i>	-3.31303** (0.0742)	-1.94327* (0.0186)	
<i>The effect of global financial crisis 2007-2009 (GF)</i>	-3.1639** (0.0804)	2.76187** (0.0193)	
<i>Interactive effect (TG)</i>	3.57963** (0.1328)	0.34558 (0.0224)	
Coefficient	Estimation	Coefficient	Estimation
β	63.88733** (0.0145)	α	-3.07987** (0.0580)
θ	10.48778** (0.0325)	ν	91.84928** (1311.1494)
b_1	15.52693** (0.0190)	b_2	-2.31057* (0.0216)
Model Diagnosis			
Q(12)	16.8286	Q(24)	29.9693
Q ² (12)	19.0708	Q ² (24)	34.3388

Notes: ** 1% significance level. * 5% significance level. ν denotes the degree of freedom in student t distribution. Numbers in parentheses are the standard errors of variables. Q(k) (Q²(k)) is the Ljung-Box Q-statistic for the returns and squared returns lagged k trading days. Critical value at 5% significant level for k =6 is 12.5916, and for k=12 is 21.0261

CHAPTER FIVE

CONCLUSION AND SUGGESTIONS

This chapter presents the conclusions of results in association with the research objectives, implication and suggestions are also expressed.

5.1 Research Conclusions

5.1.1 The Impacts on Vietnam Stock Market

The young Vietnam stock market is relatively exposed to the changes in both domestic and international conditions. After 7 years of spectacular growth, the stock market fell in a long recession until now. This study empirically examines the effect of domestic and international events on Vietnam stock returns and volatility. By employing model EGARCH process with AR(2) to investigate several domestic and international factors during late 5 years, the first conclusion is that the tight monetary policy and the latest global financial crisis (2007-2009) impacted significantly on Vietnam stock market return and strongly related to its risks.

In particular, the tight regulations on the lending secured by securities for stock investment activities in financial institutions and the increase of base interest rate are the practical presence of the tight monetary policy which is initially to control the inflation and stabilize the credit security in bank system of Vietnam. The regulations on the portion of collateral loans in financial institutions to investment in non-manufacturing sectors including the stock market have been carried out for a long time in accordance with the economic strategy of Vietnam government. However, the stock market was exposed to the shock of regulation issuance which was related directly to capital source for stock investment and the shock of increase by average 48% of base interest rate. The stock market may be affected by many variables but the money flow still plays a

fundamental role. Therefore, the tight monetary clearly affected negatively on the market return. Although the impact of the tight monetary policy have been causing the decrease in stock returns but it have helped in reducing the systematic risks for the stock market. The investigation found that both of VN-index stock returns and volatilities are significantly related at 1% and 5% significance level to the tight monetary policy. In addition, the finding shows that the relationship between the monetary policy and the stock market in Vietnam is substantial.

Thanks to globalization, the economic dependency among countries in the world becomes stronger and deeper than ever before. Despite of being a small and developing economy, the young Vietnam stock market also has suffered remarkably impact of the global economic crisis. The results of the study show that the financial crisis seriously not only affected the market value but also increased risks in the stock market. The investigation found that both of VN-index stock returns and volatilities are significantly related at 1% significance level to the global financial crisis. The empirical findings may support the evidence of worldwide and profound impact of the global financial crisis which started in subprime market in USA from 2007 until 2009, and triggered an enormous Debt crisis in Europe lasting until now.

5.1.2 The Efficiency of Monetary Policy

An extension of the paper is studying the interactive effect by combining the dummy variable of tight monetary policy and dummy variable of global financial crisis to Vietnam stock market. The investigation shows a good result that in the period of financial crisis, the tight monetary policy of Vietnam government was implemented effectively in stabilizing the market. The positive coefficient of dummy interactive effect is significantly at 1% level. Initially, the tight monetary policy targeted to control

the inflation and credit growth speed in condition of ease monetary policies before. In the practices, it seems that many risks in the stock market were foreseen by the government and investors. When the stock market attracted a huge number of individual investors, the market risks increased unexpectedly. It looked like a “bubble” phenomenon which happened in most of emerging markets such as China, or other markets in ASEAN. The tight monetary policy helped partly the government adjusted the investment behaviors. Despite tight monetary policy in the long term reduced the value of the stock market, but the research results show that in period of global crisis, monetary policy has a positive impact on the market value.

Unfortunately, the interactive effect is insignificant related to the stock market volatility. In global financial crisis period, the tight monetary policy seemed not to be successful to restrain risks in the market. Since 2007, the USA crisis has been made the financial crisis globally. According to Pham (2011), there are some intriguing differences among advanced economies and among emerging economies in their response to the crisis. Advance economies, in particular Europe, have seen the highest exposure to US shocks. Most advanced economies seem to have been affected to a similar degree by US liquidity shocks. By contract, emerging economies were comparatively less affected by liquidity shocks.

5.2 Implication of the study and Suggestions

In practice, the findings of the study may be useful for both investors and policy makers in Vietnam. For the investors, assessment of impacts on Vietnam stock market may support their evaluation of expected returns in general. The investors need pay attention to the changes in relevant monetary policies in order to adjust their investment portfolios. Vietnam stock market is still growing and continuously need to be improved

in term of legal framework. Therefore understanding the significant relationship between the economic policy and the stock market is essential for every investor. Especially, in the practices, it is likely that the investment behavior of individual investors in Vietnam stock market is still affected partly by crowd psychology.

There are many factors can affect the performance of the stock market, but the money flow can be considered as a main factor because stock market thrive on money. Therefore, any legislation related to the money supply is more important than the demand side and the most concern of investors. For policy makers, the findings illustrate the efficiency or inefficiency of the policies related. It may help them to enhance their awareness of the law practices which effectively support them to adjust or build up an appropriate legal flame only for the stock market but also for other sections of economy.

Finally, the findings of the study is also support previous studies about the vulnerable characteristic of stock return in emerging market.



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