Faculty of Economics and Business

RELATIONSHIP BETWEEN MACROECONOMIC VARIABLES VOLATILITY AND STOCK MARKET VOLATILITY IN INDONESIA

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RELATIONSHIP BETWEEN MACROECONOMIC VARIABLES VOLATILITY AND STOCK MARKET VOLATILITY IN INDONESIA

LOKE PHUI SEA

This project is submitted in partial fulfillment of the requirements for the degree of Bachelor of Finance with Honours

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Statement of Originality

The work described in this Final Year Project, entitled

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ABSTRACT

RELATIONSHIP BETWEEN MACROECONOMIC VARIABLES VOLATILITY AND STOCK MARKET VOLATILITY IN INDONESIA

By

Loke Phui Sea

The aim of this study is to examine the relationship between macroeconomic variables volatility and stock market volatility in Indonesia. There are four macroeconomic variables selected, including industrial production, exchange rate, inflation rate and money supply in this paper. The stock market and macroeconomic variables are carried out from January 1986 to December 2013 which contains a monthly data set of 336 observations. Data of all the variables are obtained from the DataStream. This paper employs GARCH (1, 1) model to estimate the conditional volatility. The results showed all variables exhibit volatility clustering. Based on VAR Granger Causality test, the result indicates that there is only an unidirectional causal relationship from stock market volatility to exchange rate volatility in the short run. In addition from the multiple regression analysis, exchange rate volatility is found to be significant with stock market volatility. However, the findings concluded that there is a weak relationship between macroeconomic variables volatility and stock market volatility in Indonesia. Policy makers should take into account the stock market volatility in making any policy related to exchange rate and vice versa.

ABSTRAK

HUBUNGAN ANTARA VOLATILITI PEMBOLEHUBAH MAKROEKONOMI DAN VOLATILITI PASARAN SAHAM DI INDONESIA

Oleh

Loke Phui Sea

Tujuan kajian ini adalah untuk mengkaji hubungan antara volatiliti pembolehubah makroekonomi dan volatiliti pasaran saham di Indonesia. Beberapa pembolehubah makroekonomi terpilih termasuk index pengeluaran perindustrian, kadar pertukaran asing, kadar inflasi dan bekalan wang. Data kajian diperolehi daripada DataStream meliputi tempoh dari Januari 1986 hingga Disember 2013. GARCH (1, 1) model digunakan untuk menganggarkan volatiliti dalam kajian ini. Hasil kajian menunjukkan semua pembolehubah mempamerkan kluster volatiliti. Berdasarkan ujian sebab penyebab Granger dalam jangka pendek, keputusan menunjukkan bahawa hanya terdapat hubungan satu arah daripada volatiliti pasaran saham kepada volatiliti kadar pertukaran. Di samping itu daripada analisis regresi, volatiliti kadar pertukaran adalah signifikan dalam mempengaruhi volatiliti pasaran saham. Walau bagaimanapun, hasil kajian membuat kesimpulan bahawa hubungan antara volatiliti pembolehubah makroekonomi dan volatiliti pasaran saham di Indonesia sangat lemah. Pembuat dasar perlu mengambil kira dalam volatiliti pasaran saham dalam membuat apa-apa polisi yang berkiat dengan kadar pertukaran begitu juga sebaliknya.

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TABLE OF CONTENTS

LIST OF FIGURES viii

LIST OF TABLES ix

CHAPTER ONE 1

1.0 Introduction 1

1.1 Historical of Indonesia stock market 4

1.1.1 Development of Indonesia Stock Market 6

1.2 Problem Statement 7

1.3 Objectives 9

1.3.1 General Objective 9

1.3.2 Specific Objective 9

1.4 Significance of the Study 10

1.5 Scope of the Study 11

1.6 Conclusion 11

CHAPTER TWO 12

2.0 Introduction 12

2.1Theoretical Framework 13

2.1.1 Arbitrage Pricing Theory (APT) model 13

2.2 Reviews of Related Studies 14

2.2.1 The relationship between macroeconomic variables and stock market 14

2.2.2 The relationship between macroeconomic volatility and stock market volatility 18

CHAPTER THREE 21
3.0 Introduction 21
3.1 Conceptual framework 22
3.2 Research Design 23
3.2.1 Data Collection 23
3.2.2 Data Description 23
3.2.3 Data analysis 25
3.3 Methodology framework 26
3.3.1 Descriptive statistic 26
3.3.2 Correlation 26
3.3.3 Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model 27
3.3.4 Granger causality test 28
3.3.5 Multiple Regression Analysis 31
3.4 Conclusion 32

CHAPTER FOUR 33
4.0 Introduction 33
4.1 Descriptive Statistics and Correlation 34
4.2 GARCH (1, 1) model 36
4.3 Descriptive statistics for macroeconomic volatility and stock market volatility 38
4.4 VAR Granger causality test 39
4.4.1 Conclusion for Granger causality test results 42
4.5 Multiple Regression Model 43
4.6 Discussion of findings 45

CHAPTER FIVE 47
5.0 Introduction 47
5.1 Summary of Findings 48
5.2 Policy Implications 50
5.3 Limitations of the study 51
5.4 Recommendations for further research 52

REFERENCES 53

LIST OF FIGURES

Figure 1: Economic growth of Indonesia from year 1982 until 2010 5

Figure 2: Conceptual framework of the relationship between macroeconomic variables volatility and stock market volatility based on monthly data from 1986-2013 in Indonesia 22

Figure 3: The Granger causality relationship between macroeconomic volatility and stock market volatility in short run 42

LIST OF TABLES

Table 1: Stock market development from year 2008 until 2012 6

Table 2: Estimation results of descriptive statistics 34

Table 3: Estimation results of correlation 35

Table 4 : Estimation results of GARCH (1, 1) model and diagnostics 36

Table 5 : Summary statistics for the conditional variance series 38

Table 6: Granger causality between stock market volatility and macroeconomic variables volatility 40

Table 7: Estimation results on the relationship between stock market volatility and macroeconomic volatilities 43

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Of all issues in the financial field, the economists and financial analyst tend to concern more on the impacts of the volatility of macroeconomic activities on stock market volatility. By understanding the significant information of volatility in macroeconomic variables would generally help to forecast the stock market volatility (Liljeblom & Stenius, 1997; Errunza & Hogan, 1998; Morelli, 2002; Adjasi, 2009; Chinzara, 2011; Oseni & Nwosa 2011; Zakaria & Shamsuddin, 2012).

The Asian financial crisis in 1997 and subprime mortgage crisis in 2008 had greatly affected the stock markets and caused many industrialized economics suffered from significant downturn in economic. According to Chinzara (2011), Choo, Lee and Ung (2011), Al-Rjoub and Azzam (2012) and Elashareif, Tan and Wong (2012) during financial crisis, stock market volatility register high levels and caused stock prices drop dramatically in emerging markets. It led to less incentives provided to the risk-averse investors or companies when the volatility of the underlying economic situation is high.

The term of volatility is an important factor in economy world as it was widely used in financial markets to examine risk. It serves as a measure of risk because volatility can determine the degree of uncertainty surrounding the stock future's returns (Madura, 2012). Additionally, Raunig and Scharler (2010) determined that volatility reflects the fluctuation of the stock price for numerous of reason. For instance, it indicates that when the volatility is high, the larger the movement of stock price changes. Conversely, the changes are small in the stock prices when the volatility is low.

Furthermore, Engle (2001) defined that volatility is a response towards news in the stock market where the movement of public or private information influences the stock market volatility. This implies that the stock prices fluctuate according to new information in short term period. The standard deviation of the continuously stock return in the historical period of time is one of the approaches to calculate the stock price volatility (Madura, 2012). Another study from Tsay (2005) mentioned that the variance of underlying asset return is a special feature of volatility however it is not directly observable. Though, financial market analyst is keen of this conditional variance to obtain good estimates in order to improve the portfolio allocation and evaluation of financial derivatives. Abdalla and Winker (2012) stated volatility is a crucial concept and has gotten attention from economic and financial application such as risk management, portfolio optimization and asset pricing.

The stock market has a prominent role as it represents a country's real economic activity which also figuring a country's growth and financial development. Arnold and Vrugt (2006) stated that the relation between the stock market and real macroeconomic variables is intuitively appealing as macroeconomic fundamentals may affect company cash flows and overall market risk. Madura (2012) noted that the factors which consist of economic conditions, market conditions and firmspecific conditions may give impact toward future cash flows could influence the stock price.

In addition, several attempts based on simple discounted models also found evidence to prove that the stock markets are forecasted with given any of the anticipated or non anticipated arrival of new information about macroeconomic variables through the impact on the present value of expected cash flow or discount rate (Chen, Liu & Zhang, 2007; Chen & Xu, 2009). Therefore, it reflects that the volatility of stock prices also depends on the volatility of the expected future cash flows or discount rate. Consequently, the value of corporate equity in the future relies on the condition of the macroeconomic activities, thus it is not surprising the stock market volatility acts as a function of the macroeconomic variables volatility (Liljeblom & Stenius, 1997; Morelli, 2002; Oseni & Nwosa, 2011).

Therefore, the performance of stock market volatility is reflected especially where there is a change in the expected of macroeconomic variables. It lets researchers want to have a deeper insight on the relationship between macroeconomic variables volatility and stock market volatility, deliver new information and knowledge to investors, policy makers and others constitutions.

1.1 Historical of Indonesia stock market

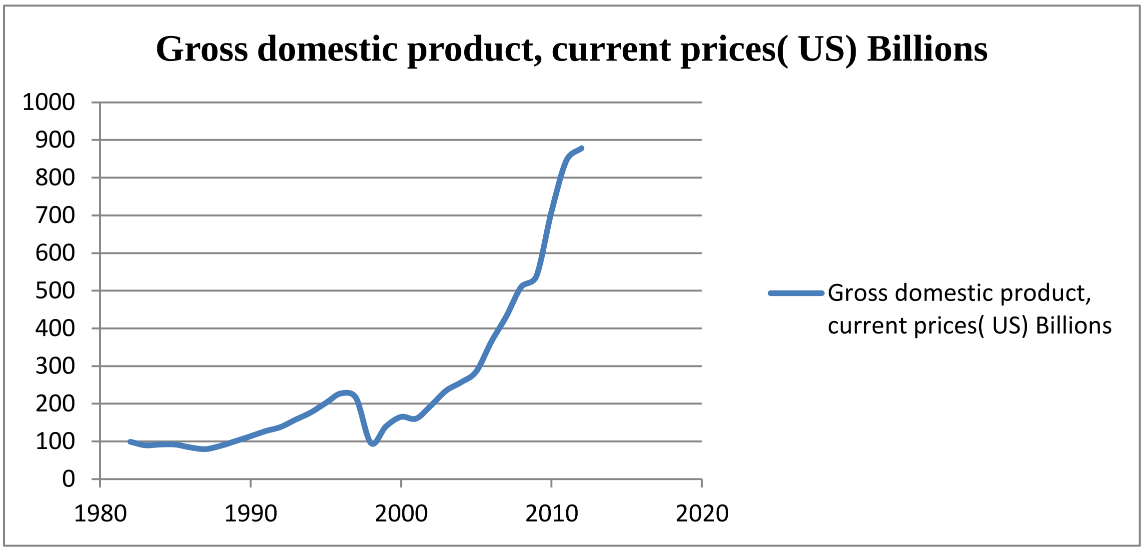
Indonesia Stock Exchange (IDX) is currently the stock exchange in Indonesia from the year 2007. It previously known as Jakarta Stock Exchange (JSX) which established in 1976 before its name changed after merging with Surabaya Stock Exchange (SSX) by the Indonesian Minister of Finance. Indonesia stock market is one of the emerging markets of the Association Southeast Asian Nation and plays a significant role in the international economic policy. Since the year 1967, Indonesia stock market has opened for foreign direct investment (Suyanto, 2004).

According to Indonesia Stock Exchange (n.d.), during the period 1977 to 1987, the IDX was not active as it was only 24 companies listed on the market, however Indonesia government tried to implement some deregulation associated with private and foreign roles to reactive the market. During the period 1998, Indonesia Stock Exchange has experienced considerable turbulence and growth. When the Asian financial crisis hit Indonesia, it suffered an extremely heavy debt burden because of the Indonesian currency against US dollars dropped severely and caused many companies collapse. This reported in the Graph 1, the Gross Domestic Product (GDP) in current US dollars is the power indicator to give evidence of Indonesia's economy falling. It showed a slump from $215.749 billion to $95.445 billion from year 1997 to 1998. Hardiyanto (2007) stated that Indonesia adopted the free floating exchange to stabilize the exchange rate as the speculative attack on Indonesia's currency when the Asian financial crisis.

In year 2008, the GDP is increasing but the percentage of the GDP was decline tremendously from 18.20% to 5.47%. It is because Indonesia stock market was experienced in global financial crisis during that period. Central Bank of Indonesia is trying to solve the impact of the crisis through optimizing monetary and fiscal policies (Praptiningsih, 2011). Moreover, Indonesia experienced positive economic growth after crisis happened.

In addition, Index of Economic Freedom (2013) reported that Indonesia is the biggest economy in the Southeast, East Asian region as Indonesia exports large amounts of manufactured goods, coal and tins. Permani (2011) mentioned that tins and coal exports are the largest amount in the world which contributing 30% and 37% respectively however the lack of infrastructure development and uncertainties include taxation are the addition of challenges for Indonesia.

Figure 1: Economic growth of Indonesia from year 1982 until 2010



Source: International Monetary Funds (IMF), 2013

1.1.1 Development of Indonesia Stock Market

Stock market development of a country can explain through stock market size, stock market liquidity and integration growth. The table 2 showed the stock development of Indonesia. It is used to explain the equity market growth from the year 2008 to the year 2012. Based on the Table 2, Indonesia stock market capitalization of Indonesia is large and increased every year as government of Indonesia has sought support from the International Monetary Fund to trigger the economic growth and enhance the stock market development. However the total value of the share traded and stock traded turnover ratio is smaller after the global financial crisis happened in the year 2008.

Table 1: Stock market development from year 2008 until 2012

Year	Market capitalization of listed companies in US (billion)	Total value of share traded in the US (billion)	Stock Traded Turnover Ratio (%)
2008	98.761	110.678	71.30
2009	178.191	115.310	83.27
2010	360.388	129.546	48.11
2011	390.107	139.618	37.21
2012	396.772	91.685	23.30

Source: Worldbank, 2013

1.2 Problem Statement

The influence of the macroeconomic variables volatility in stock market volatility is important because of risk management (Adjasi, 2009). Consequently, market traders and money market analyst can utilize the information from the macroeconomic fundamental to improve their previous portfolio to minimize the risk.

There are abundant of the empirical studies focus on the macroeconomic variables affect developed and developing stock markets. These studies found that macroeconomic variables such as inflation, GDP, money supply, exchange rate, treasury bill and etc have positive relationship and exist co-integrating towards stock prices in long term equilibrium by different methodology (Gjerde & Saettem, 1999; Kwon & Shin, 1999; Ibrahim & Yusoff, 2001; Ibrahim & Aziz, 2003; Adel, 2004; Maysami, Howe & Hamzah, 2004; Suyanto, 2004; Merikas & Merika, 2006; Lin, Li & Liu, 2007; Liu & Liang, 2008; Liu & Shrestha, 2008; Rahman, Sidek & Tafri, 2009; Abbas, 2011; Bekhet & Mugableh, 2012; Hasanzadeh & Kianvand, 2012; Isa, Hasan & Adbullah, 2012; Kuwornu, 2012; Ozcan, 2012; Gul & Khan, 2013; Sangmi & Mubasher, 2013).

Besides, there is also a voluminous number of extended analysis examining the relationship between macroeconomic volatility and stock market volatility in developed countries or emerging markets. There is evidence showed that significant relationship was found between stock market volatility and real macroeconomic volatility in a developed country (Liljeblom & Stenuis, 1997; Errunza & Hogan, 1998; Morelli, 2002). However, there are several studies found that stock market volatility cannot be explained by macroeconomic volatility or weak evidence on the relationship among macroeconomic volatility and stock market volatility (Schwert, 1989; Choo et al., 2011). Furthermore, in the case of emerging markets examined the nexus of volatility macroeconomic and stock market volatility and employed different models to estimate the results along with the results showed significant influence in the uncertainty macroeconomic variables (Adjasi 2009; Chinzara 2011; Oseni & Nwosa, 2011; Zakaria & Shamsuddin, 2012).

To this extent, there are numerous of empirical studies from economists extended analysis to determine the relationship between macroeconomics variables volatility and stock market volatility however studies in developing markets particularly Indonesia is very limited. Therefore, this study intends to provide new empirical evidence on the relationship between macroeconomic volatility and stock market volatility particularly in an emerging market, Indonesia. Interest in this country is mainly because Indonesia is the Southeast Asia's largest economy in emerging countries and yet studies conducted in this country based on Indonesia data are still limited. In the other hand, it helps to develop and better understand of the impact of macroeconomic fundamentals on emerging markets whose institutions, structure and organizations are different from developed markets and Asian countries. We hope to further shed some light on the issue and contribute to the existing literature review on the subject matter.

1.3 Objectives

1.3.1 General Objective

To examine the relationship between macroeconomic variables volatility and stock market volatility in Indonesia

1.3.2 Specific Objective

i. To investigate whether there is a relationship between GDP volatility and stock market volatility in Indonesia
ii. To determine whether there is a relationship between exchange rate volatility and stock market volatility in Indonesia
iii. To explore whether there is a relationship between inflation rate volatility and stock market volatility in Indonesia
iv. To examine whether there is a relationship between money supply volatility and stock market volatility in Indonesia

1.4 Significance of the Study

Throughout this study, crises tend to happen with no expectation which could lead to economic downturns of worldwide countries. Therefore the knowledge on the relationship between macroeconomic volatility and stock market volatility is practically important for investors as well as policy makers in this global equity market. Other than that, the discussion and the results are able to benefit for long term investments as this paper used twenty-eight years data.

For public investors, the main objective is to maximize their return when investing in the stock market. Hence, they can appropriate forecast stock price movement more efficiently while discovering macroeconomic variables volatility. It also helps them in managing and stay vigilant in their investment position and portfolio if utilizing the macroeconomics volatility news releases as reliable indicators for the stock market volatility. In other words, investors reduce dilemma and make better decision in the investment instead of relying only their experience.

Furthermore, from the macroeconomic point of view, policymakers shall pay attention and able to recognize the relationship between stock market volatility and macroeconomic volatility. This is crucial due to the situation of the stock market that could be observed and forecast future economic volatility. Other than that, they could have better navigate on direction, magnitude and stability of the economy by controlling the macroeconomic variables volatility to stimulate the financial and economic growth of the country.

1.5 Scope of the Study

This study is to inspect the relationship among a set of macroeconomic variables volatility, which are industrial production, exchange rate, inflation rate and money supply and stock market volatility in Indonesia. The monthly data on industrial production, exchange rate, inflation rate and money supply are adopted in this study. These are extracted from the Indonesia stock market, Indonesia Stock Exchange. The periods of study are among January 1986 to December 2013.

1.6 Conclusion

This chapter covered the introduction of the study in general covering salient scopes such as problem statement, research objectives and significance of this study. The following sections consist of Chapter Two where theoretical framework and literature review are discussed; Chapter Three provides a description of data, estimation strategy and outlines the methodology of the research; Chapter Four discusses the empirical result and lastly the Chapter Five presents the conclusion and recommendations based on findings obtained in this study.