STOCK MARKET AND ECONOMIC GROWTH IN VIETNAM

By

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ABSTRACT

For many years, the relationship between the financial system and economic growth has attracted the attention of scholars intending to uncover the direction of the relationship. The stock market is a part of the financial system and plays an essential role in channelling equity funds into the economy and creating liquidity for the equity instruments. A substantial empirical study postulates that the stock market can boost the economic growth of an economy. However, other studies assert that, at best, the stock market is an unimportant economic driver.

This thesis aims to examine the causal relationship between the stock market and economic growth in Vietnam in the period from 2000 to 2015. In order to examine the potential impact of the financial crisis and develop a well-functioning stock market in Vietnam, this study also undertakes a critical comparative quantitative research of a selected developing country in the South-East Asian region to identify potential policy implications. This analysis utilises the Autoregressive Distributed Lag Model to investigate the causal linkage in the long and short-run between the stock market and economic growth. The determinant vectors present in the stock market are the price index and the size of market capitalisation. This study defines economic growth as a real increase in gross domestic product per capita. Then, to develop the well-functioning stock market in Vietnam, this study undertakes a critical comparative quantitative research of a selected developing country in the South-East Asian region for the implications.

The findings of this study suggest that there are significant cointegration relationships between stock market development and economic growth in Vietnam from 2000 to 2015. Furthermore, there are also significant cointegration relationships between economic growth and the development of the banking sector and foreign direct investment. In the long run, the market capitalisation has a positive impact on economic growth. Conversely, economic growth has a negative long-run relationship with the stock market index. This negative relationship is significant, but the impact is low. In the short run, stock market capitalisation size, and the economic growth; stock market index and economic growth are pairly bi-directional short-run Granger causality relations. The findings also suggest that, from 2000 to 2015, economic growth supports the development of the money market and attracts more foreign direct investment inflows in Vietnam. However, in this period,

the speed in increasing FDI was lower than speed of economic growth leads to the negative sign in the long run relationship between FDI and economic growth.

Also, in the comparative study, the findings in the Vietnam case are consistent with the results obtained for the pre-crisis subsample in the case of Thailand. The findings suggest the causality runs from both directions between the stock market and economic growth. However, when the crisis data was taken into consideration, the significant estimated long-run coefficients give a stronger negative impact that confirms the financial crisis worsened the economic conditions in Thailand between 1994 and 2014.

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
ADF	Augmented Dickey-Fuller
ADF	Intercept and Trend
AIC	Akaike Information Criterion
AK	Endogenous Growth Model
ARDL	Autoregressive Distributed Lag
ASEAN	Association of South-east Asian Nations
BOT	Bank of Thailand
BTA	Bilateral Trade Agreement
CEE	Central Eastern Europe
CPI	Consumption Price Index
CUSUM	Cumulative Sum Test
CUSUMsq	Cumulative Sum of Squares of Recursive Residuals
ECM	Error Correction Model
ECT	Error Correction Term
EEA	Emerging East Asia
EGARCH	Engle-generalised Autoregressive Conditional Heteroscedasticity
EMH	Efficient Market Hypothesis
FDI	Foreign Direct Investment
FSAP	Financial Sector Assessment Program

GDP	Gross Domestic Product
GMM	Generalised Method of Moment
GSO	General Statistics Bureau of Vietnam
HaSTC	Hanoi Securities Trading Center
HNX	Hanoi Stock Exchange
HSX	Hochiminh Stock Exchange
ICOR	Incremental Capital to Output Ratio
IFS	International Monetary Statistics
IMF	International Monetary Fund
JSC	Joint Stock Company
JSCB	Joint-Stock Commercial Banks
JVBs	Joint-Venture Banks
LA-VAR	Lag-Augmented Vector Autoregressive
M2	Money Supply (Broad Money)
MAI	Market for Alternative Index
MWALD	Modified Wald Test
NESDB	Thailand's Office of National Economic and Social Development Board
NPLs	Non-performing Loans
OLS	Ordinary Least Square Simple Regression
OTC	Over-The-Counter
Panel VAR	Panel-Vector Autoregressive
PCFs	People's Credit Funds

PP	Phillip-Perron Test
SBV	State Bank of Vietnam
SCIC	State Capital Investment Corporation
SEMS	Stock Exchange of Malaysia and Singapore
SET Index	Stock Market Index
SET	Stock Exchange of Thailand
SETHDI	Stock Exchange of Thailand High Dividend Index
SOBs	State-Owned Banks
SOCBs	State-Owned Commercial Banks
SOEs	State-owned Enterprises
SSC	State Securities Commission of Vietnam
THB	Thai Bath
TRI	Total Return Index
TSA	Treasury Single Account
US	The United States
UK	The United Kingdom
UPCoM	Unlisted Public Company Market
USD	American Dollar
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
VND	Vietnamese Dong (Vietnamese currency)
VNI	Vietnam composite Stock Market Index

WB	World Bank
WTO	The World Trade Organisation

CHAPTER 1 - INTRODUCTION

1.1. Background of the study

The stock market is a part of the financial system having the function of supporting the direct financing channel to the economy. It creates an environment, which enables firms to raise funds and trade their stake in the form of stock trading. A majority of studies demonstrate that the financial market is an important institution in mobilising savings, allocating funds, exerting corporate governance and risk management. It can be said that the development of the stock market links to the country's financial development and economic growth, or "larger, more efficient stock markets boost economic growth" (Levine and Zervos, 1996).

There are substantial studies in analysing financial development and its relationship with economic growth. Some studies reveal the evidence that there is a strong positive relationship between financial development and economic growth (Arestis et al., 2001; Beck and Levine, 2004; Ayadi et al., 2013 etc.). In contrast, some other scholars raise the concerns that finance could harm economic growth. Beck and Levine (2004) argue banks and stock markets have done more harm than good to the morality, transparency, and wealth of societies. In consequence, bank activity can even hamper economic growth. In the other studies, Harris (1997) and Baotai Wang and Ajit (2013) demonstrate the relationship between the financial market and economic growth is a weak and even of a negative form.

Meanwhile, other studies give evidence that financial development follows economic growth, creates a demand for financial services (Robinson, 1952). Also, other researchers consider that the stock market has no effect on the financial system and economic growth, and this relationship does not matter (Lucas, 1988)

To date, there have been only a few academic research studies regarding the contribution and impact of the stock market on economic growth in Vietnam (Farber et al., 2006; Leung, 2009; Vuong, 2010). One of the most likely reasons for the lack of studies on these issues is that the stock market is a fairly new industry in Vietnam. The first stock exchange was launched in Vietnam in 2000 named the Hochiminh Stock Exchange (HSX), and the second one was in 2005 called the Hanoi Stock Exchange (HNX). By the

end of 2013, there were 678 listed companies in both of these stock exchanges with an approximate 949 thousand billion VND of market capitalisation, equal to 26.5% of the GDP of Vietnam (SSC, 2014). Theoretically, the stock markets provide easily accessible information, low transaction costs and efficient resource allocation and so, as a consequence, should boost economic growth. However, economic development requires an increase in financial services that could support the expansion and development of the financial sector, including the stock market. Therefore, after over a decade of operation, it could be said that it is time to evaluate the relationship between the stock market and economic growth in Vietnam.

Moreover, Vietnam is a one-party socialist state (run by the Communist party); Vietnam aims to develop a socialist-oriented market economy. Consequently, the financial structure and management differ significantly from other economies. The findings of the analysis could support policymakers, business managers, and investors in understanding stock markets and the investment environment in Vietnam.

This thesis aims to examine the causal relationship between the stock market and the economic growth in Vietnam in the period from 2000 to 2015. To examine the potential impact of the financial crisis and the development of a well-functioning stock market in Vietnam, this study also undertakes a critical comparative quantitative research of a selected developing country in the South-East Asian region for the policy implications. To reach the aim of this study, several objectives have been set to answer the questions: Does the stock market promote economic growth in Vietnam? What is the causal linkage between the stock market and economic growth in the long-run association and the short-run dynamic relationship? How strong are these relationships? To answer these questions, the study uses quantitative methods in analysing. In other words, in this quantitative study, the time series analysis with Autoregressive Distributed Lag Bounds testing approach and unrestricted error correction models are employed to investigate the secondary dataset of macroeconomic and stock market indicators in Vietnam and Thailand.

Theoretically, there is the existence of the relationship between financial development and economic growth. This relationship is discussed very early and first developed by Bagehot (1873) and Schumpeter (1912). To follow this idea, Goldsmith (1969), Shaw (1973), and McKinnon (1973) build models to evaluate the role of financial system development in economic growth. Also, by more clarifying the discussion of the

mentioned predecessor, King and Levine (1993) confirm on Schumpeter's argument in indicating: by providing services, financial intermediaries make an essential contribution to technological innovation and economic growth. Further, in empirical research, McKinnon (1973) also gives evidence to illustrate the close relationship between financial and economic development for a few sample countries. Another study demonstrates that better financial systems can improve the probability of successful innovation and accelerate economic growth (King et al., 1993).

Additionally, Al-Yousif (2002) supports that these relationships are mutually causal. Besides that, he demonstrates these relationships cannot be generalised across countries because of country-specific economic policies. For further analysis, by examining the causality relationship, he also suggests that the causality of the relationships is not always bidirectional, and it is different among countries. In another study on the relationship between financial development and economic growth in the short-run, utilising the sample of 65 developing countries, Narayan (2013) demonstrates interesting empirical results. First, except in developing countries in Asia, the rest of the countries in his sample have a weak relationship. Second, there are significant negative impacts of bank credit on economic growth in almost all countries except for those in the Middle East.

Also, the analysis and discussion on the relationship between financial development and economic growth have been more intensively investigated regarding the existence of the stock market. Many studies suggest the relationship between the stock market and economic growth of the country is different in the stage of the stock market and economic development. For example, Arestis et al., (2001) investigate five developed countries (the US, Japan, the UK, Germany and France) by using time series methods and find that both banks and stock markets may contribute to economic growth in a positive way, in which, the effects of banks are stronger. However, in examining further the role of the stock market in economic development, they show that the stock markets play a more important role in economic growth in the U.S, the U.K., and Japan, where the stock markets are more active and liquid, while the banking sector has more influence on economic growth in Germany, France and Korea (Arestis et al., 2001). This research also suggests that cross-country regressions should be utilised. However, in many instances, the results of cross-country studies may not be able to address the specific issue of an individual country satisfactorily as country-specific studies do.

Besides that, the absence of less-developed economies in this research's sample suggests that there are no inferences about the contribution of the stock markets at the early stages of economic development. Similarly, in research on the stock market and economic growth in some Euronext markets, Boubakari and Jin (2010) also demonstrate that they do not find the evidence of causality relationship in the countries which have small and less liquid stock markets. Lately, in another research, Lee (2012) examines the role of the banking sector and the stock market in economic growth. The research also utilises the sample of developed economies. Importantly, Lee finds that in the early stages of economic growth, the banking sector played a very important role in the economic growth of most of the economies. Recently, in another research on the role of the stock market development in economic growth in Turkey, Bayar et al. (2014) have also found a positive link in the relationship between stock market development and economic growth. The study concludes that stable stock market development should lead to the sustainability of economic growth in Turkey. Nevertheless, the research only directly investigates the impact of stock market development on economic growth in Turkey, while the influences of the other financial sectors were omitted. The dataset of the research includes ratios of market capitalisation, the value of stocks traded on GDP, and the turnover ratio of stocks traded in the period of 1999 – 2013.

The findings of the strong positive relationship between financial development and economic growth dominate in all most studies (see Ayadi et al., 2013; Beck and Levine, 2004; Bayar et al., 2014). However, the linkage and contribution of stock market development in financial development and economic growth may vary in different economies and stages of development (Arestis et al., 2001). For example, in a technical report on financial development, bank efficiency and economic growth in Mediterranean economies (including developed and developing economies), Ayadi et al. (2013) demonstrate the evidence of strong positive relationships between financial sector development and growth in developed economies, while the negative or insignificant impacts in the developing ones. Even so, by including the improvement and quality of financial institutions in its analysis, this research also gives interesting results. It demonstrates that the improvement of institutions plays an important role in growth but not sufficiently to make the banking sector development positively contribute to economic growth.

However, while the investigation of the impact of the stock market side, the market capitalisation and quality of institutions give a positive and significant contribution to

economic growth, many studies propose there is a negative or weak influence of the stock market on economic growth. For example, in another empirical research using the two-stage least squares method to examine the relationship between stock markets and economic growth of 49 selected countries, Harris (1997) demonstrates the evidence of a weak relationship in the sub-sample of developed countries. He also concludes that it is even harder to find the relationship in the sub-sample of less developed ones. Further, the studies on the relationship between stock markets with economic growth in several transition economies, which share some similarity with Vietnam, also argue about the stock market indices which lead economic growth (Lyócsa, Baumöhl, and Výrost, 2011). The research implements Polish, Hungarian, Slovakian, and Czech Republic cases by using a single-equation Granger causality test. Although these transition economies are in the same region (Central Eastern Europe – CEE) and share many similarities in the social, economic environment and development, the findings are different among them. The stock market indices for the Czech Republic, Poland, and Hungary are leading indicators of economic growth although they are not for Slovakia.

Similarly, in a more recent study on the single and transition economy, China, the country has had remarkable economic growth for a long period. However, Wang and Ajit (2013) also give evidence of a negative relationship between stock market development and economic growth. The research is based on quarterly data from 1996 to 2011. Wang and Ajit (2013) apply time series method by using a modified aggregate demand model.

Additionally, the approaches and methods used in doing research are very important, as they may influence the result of research as we can see from the differences of Harris's (1997) study and Arestis et al. (2001). There are widespread uses of vector autoregressive (VAR) models analysing the relationship among time series variables of stock market development and economic growth issue. VAR model systems are considered as rather flexible in dealing with time series data analysis and forecasting. These models can be applied in both single country and cross-country analysis. The time series method with the error-correction model and generalised method of moment (GMM), and Panel vector autoregressive (Panel VAR) dominate in examining the nexus of the stock market and economic growth. Meanwhile, GMM and Panel VAR are emphasised in cross country analysis (see: Arestis et al., 2001; Beck and Levine, 2004; Caporale and Bank, 2003; Naceur and Ghazouani, 2007; Cooray, 2010; Rachdi and Mbarek, 2011; Pradhan et al., 2013; Cavenaile et al., 2013). The time series analysis on Granger Causality linkage and error correction models is widely employed in single country analysis and multi-country

analysis (Van Nieuwerburgh et al., 2006; Hou and Cheng, 2010; Ibrahim, 2011; Marques et al., 2013; Wang and Ajit, 2013; Bayar et al., 2014).

Concerning the case of Vietnam, there are only a limited number of studies on the relationship between stock market development and economic growth. The role of the stock market in the economy in those studies has not demonstrated clearly that bank financing has dominated the financial system. For example, Faber et al. (2006) implement a study on policy impacts on the Vietnamese stock market. The study suggests that the overuse of policy tools can harm the market, especially the application of price band limits which become irrelevant and prevent self-adjustment to the equilibrium of the market. Even though this research demonstrates the fact that Vietnam's stock market is heavily impacted by the herd effect and existing anomalies in stock returns in this period (Farber et al., 2006), the sample for study is taken from only on the HSX for the period 2000 – 2006, the initial construction time of market development in Vietnam. In another research on banking and financial sector reforms in Vietnam, Leung (2009) gives an overview of the development in banking and finance, which included the information on stock market development up to 2008. She states that the financial market in Vietnam grew and diversified rapidly; however, the equity market is still quite behind that of other countries. Besides that, for the longer-term development of the markets and financial sector, Vietnam should address the transparency problem through strengthening transparency, the information disclosure system and better applying corporate governance. Also, in an analysis of financial development and economic growth in Vietnam, Anwar and Nguyen (2009) apply the GMM method in examining the issue. However, the stock market is not included in their analysis. In another analysis of the financial system in Vietnam, Vuong (2010) describes the development history of the financial system in Vietnam quite clearly. He demonstrates a deep insight into the operation of the financial market at that time, however, the influence of the global financial crisis in 2008 should be more updated.

Theoretically, the developed stock market should promote economic growth by creating more efficient capital resource allocation and liquidity of the capital assets. Therefore, this would contribute to encouraging savings and investment in the economy. In other words, by better capital resource allocation, well-functioning stock markets contribute to promoting economic growth (Caporale, Howells, and Soliman, 2004). To develop the stock market and enhance economic growth, researching the stock market issue is required. Questions have been raised about how the relationship works if the stock markets are not yet well functioning and still have existing problems to be addressed, like

the stock market in Vietnam? What are the causal linkages of this relationship and how to deal with this causality in the long run? Do the other developing countries share a similar experience in the initial stage of development with Vietnam on the causal linkages of this nexus?

Vietnam has made significant progress in socio-economic terms since the launch of the reform programme called Renovation or "Doi moi" in 1986. The economy has gradually transitioned to the market-oriented economy from the centrally planned economy. In the most recent three decades, Vietnam has had rather stable economic growth. The financial system has developed to the new level as the banking system switched from a mono system into 2-tier, and the function of the central bank was separated from the function of commercial and investment banks. In the mono system, the central bank acts as the role of the regulator and policymaker for the banking industry as well as the commercial bank (Nahm and Vu, 2013). In the integration process with the global market, the Vietnam government has gradually implemented financial liberalisation. Financial liberalisation brings to the country numerous benefit toward the market economy but also disadvantages.

Through the high-speed development of the financial system and financial liberalisation in the global integration process, Vietnam's economy has revealed many limitations. This miracle boom in the size and number of commercial banks with their branches, alongside the weakness in bank management and risk management, has brought about an increase in the ratio of non-performing loans in the economy. Besides that, there are the low-performance results in the banking sector in Vietnam in comparison with other countries in the region, especially since 2008, when the spread out of the global financial crisis happened. Since 2008, the banking sector has been consolidated and restructured. Many weak and inefficient performance banks have been merged and acquired in this process.

Together with the improvement in financial system development, Vietnam's government launched a programme to reconstruct the state-owned enterprises. Since 1990, the inefficient performance enterprises have been re-evaluated to equitise[1] to promote the competitiveness, and economic effects of those enterprises then obtain the sustainable development for the whole economy (Le, Cabalu, and Salim, 2014). This equitisation

[1] 'equitise' means privatise the state-owned enterprises.

process is the fundamental step for the establishment of the primary and secondary stock market in Vietnam.

The first stock exchange in Vietnam was put into operation in 2000. Since then, the numbers of listed companies, together with market capitalisation and investors' accounts, have been increased gradually. However, many constraints and changes in regulations and rules, such as on information disclosure, profit tax, or foreign investor limit ratio[2] etc., are still of much concern for both the business environment and public investors. Besides, there exists a strong herd effect and speculation on the stock market in Vietnam (Farber et al., 2006). These will have a negative impact on the stock market and economic development of the country.

Thus, the concerning issue is the stock market a casino which exists to fulfil the financial system structure? Or whether the stock market played an important role in raising capital for business; creating the efficient and transparent environment for investment and business; enhancing risk management and corporate governance in business, then promoting the economic growth as a whole? How are policy implications in dealing with the issue? To answer these questions, the research to evaluate and examine the causal relationship between the stock market and economic growth in Vietnam should be implemented.

1.2. Aims and objectives

This thesis aims to examine the causal relationship between the stock market and the economic growth in Vietnam in the period from 2000 to 2015. In order to examine the potential impact of the financial crisis and develop a well-functioning stock market in Vietnam, this study also undertakes a critical comparative quantitative research of a selected developing country in the South-East Asian region for the policy implications.

To reach the aims of the study, this study establishes the set of objectives of this study as follows:

Investigate the long-run relationship and short-run dynamic adjustment of the relation between the stock market development and economic growth in Vietnam by applying the

[2] Currently, foreign investors can own up to 49% equity of a Vietnamese enterprise, but not exceed 30% of a bank

Autoregressive Distributed Lag Bounds testing technique. Then do the comparative study with the case of Thailand will be carried out using the same technique.

Evaluate the long-run impact causality and short-run adjustment in the stock market development, banking sector and foreign direct investment sector and economic growth nexus.

Implement the comparative study to analysis to get the policy implication in regulating and managing the stock market in Vietnam.

Figure out the policy implications in developing the stock market in Vietnam

1.3. Research questions

Does the stock market promote economic growth in Vietnam, or does the causality run in the opposite direction? What is the causal linkage between the stock market and economic growth in the long-run association and the short-run dynamic relationship? How strong are these relationships? Do the banking sector and foreign direct investment sector support the development of the stock market and economic growth or vice versa? Is there any bilateral causal relationship between the stock market, banking sector, foreign direct investment and economic growth?

The hypotheses of this study are:

i. *All the time series variables are stationary.*
ii. *The stock market/banking sector/foreign direct investment sector and economic growth have a long-run relationship.*
iii. *The relationships between the stock market/banking sector/foreign direct investment sector and economic growth are a causal relation in the long-run and short-run.*
iv. *The stock market/banking sector/foreign direct investment sector cause the economic growth*

1.4. Data

The time duration for this analysis is counted from the first quarter of the stock exchange's operation in Vietnam (2000 – 2015). Therefore, the quarterly time series data are used in this analysis and collected from available sources. In these, economic indicators of the country such as real GDP, are obtained from Vietnam's General Statistics Office (GSO);

money supply (M2) is from the International Monetary Fund's data source (IFS); data on population for calculating quarterly GDP per capita is collected from the World Bank's data source. Between the two national censuses in 2000-2005, population data is calculated on a quarterly average in the whole period. Since 2005, this data has been calculated and adjusted on the quarterly basis of the reported annual population and natural birth rate. Meanwhile, the data stream on stock market development, such as market capitalisation, trading volume, trading value, and a stock index is from the available source of stock markets on the website of the Hochiminh Stock Exchange (HSX, n.d.). In this research, the analysis focuses on examining data on the Hochiminh Stock Exchange – HSX. This stock exchange has operated since the year 2000 with approximately 80% of total market capitalisation in Vietnam. It also applies more standardised criteria for listing companies, especially in terms of information disclosure in comparison with the Hanoi Stock Exchange (HNX). Additionally, since commencing operation, HSX has dominated in the stock listing volume and the stock liquidity in Vietnam's stock exchanges.

Besides that, to do further analysis on the developing countries, especially the countries in the South-East Asia area, this study applies the same process of analysing as mentioned above on the data set from a selected developing country in South East Asia - Thailand. However, this data series will be broken down into two periods for analysis: (i) the initial stage pre-financial crisis 2008-2009 (from 1997 to 2008) and (ii) the whole stage of the stock market development (from 1994 to 2014). The sources of this data set are from the websites of the Stock exchanges and the Central Bank of Thailand and Malaysia, respectively (SET, n.d., BOT, n.d.)

1.5. Methodology

This research focuses on the single case study analysis by utilising time series approach and the Autoregressive Distributed Lag (ARDL) bounds testing technique on the time series data variables of economic growth and stock market development. Particularly, this study will implement a single country analysis in Thailand and Vietnam to explore what the nexus of the stock market development and economic growth is in these two nations independently. The research tests the hypotheses of

i. All the time series variables are stationary.

ii. *The stock market/banking sector/foreign direct investment sector and economic growth have a long-run relationship.*

iii. *The relationships between the stock market/banking sector/foreign direct investment sector and economic growth are a causal relation in the long-run and short-run.*

iv. *The stock market/banking sector/foreign direct investment sector cause the economic growth*

Also, the study will implement the comparison analysis and forecast the relationship between stock market development and economic growth in Vietnam and Thailand based on the results of the single country analysis.

1.6. Findings and contributions

1.6.1 Findings

This study finds that there are significant cointegration relations between stock market development in size and economic growth variables. The size of the stock market capitalisation and economic growth have positive long-run relationships and bi-directional short-run Granger causality. The findings from the Granger causality tests support the uni-directional long-run causal impact of the economic growth on the stock market index; the short-run dynamic adjustments are found in both directions. The findings also suggest that from 2000 to 2015, economic growth supports the development of the banking sector and attract more foreign direct investment inflows in Vietnam.

Also, in the comparative study, the findings in the Vietnam case are consistent with the analysis results of Thailand before the global crisis of 2008-2009 occurred. Besides, this study examines the supporting evidence of the Thailand case in analysing the stock market development and economic growth for the period after the financial crisis 2009 and proposes policy implications in developing the stock market in Vietnam, especially in avoiding the potential impact of the financial crisis.

1.6.2 Research contributions

This thesis makes several main contributions, as summarised below.

(1) There are many studies that investigate the role of the financial sector that include the stock markets. However, there are few which discuss the financial system and stock market in Vietnam. Especially, after 15 years of operation, the performance and contribution of the

stock market to Vietnam's economy should be evaluated. Therefore, this thesis devotes an evaluation under the quantitative view on the development of the stock market in Vietnam.

(2) The findings of the causal linkages in the long-run and short-run between the stock market and economic growth in Vietnam could support policymakers, business managers, and investors in understanding stock markets and the investment environment in Vietnam.

The stock market creates investment opportunities, efficient asset allocation and diversified risks for both investors and entrepreneurs. However, to realise those investment opportunities, the investors and business managers take consideration of their rational expectations of the investment environment. Besides, among natural and external impacts, the investment environment is also influenced by the government's behaviours. To maintain the sound and stable environment for investment with a well organised and functioning stock market that facilitates investment, a sustainable economic growth brings positive impacts and attracts more potential investments in the long run. Therefore, it contributes to boosting the economic development of the country. In the short run, besides the investment opportunities, the causal linkage between the stock market and economic growth still gives the applicable signals for the arbitrage activities. However, the policymakers should be aware that the arbitrage can push up the investors' income in the short run, but in the long run, the economy's growth must rely on the industry and feasible investment opportunities.

(3) This study employs the advantages of specific single country analysis and the comparative analysis with another country's case study for implications. Also, this thesis is the first comparative study of the Vietnam stock market, which introduces the effects of different funding channels to the economy, such as the banking sector and foreign direct investment.

(4) This also compensates for the lack of past empirical papers in this area, which mainly use time series data in their studies, especially in developing countries.

1.7. Conclusion and the structure of the study

As a result of the initial analysis in Vietnam, it reports the stock market index influences economic growth. Meanwhile, the stock market capitalisation does not support economic growth. The demand side of growth has an impact on stock market development. However, is this result consistent with the situation in other countries in the initial stage of stock market development? Further analysis among other developing countries is necessary, especially those in the same region.

In summary, investigating the influence of the financial sector regarding the contribution of the stock market to economic growth in Vietnam should be updated and implemented. The analysis of its relationship with economic growth also should take into consideration the impact of the macroeconomic policy to evaluate the role of the stock market in Vietnam's economy. The research is also in the context of the stock market and economic development of the developing countries in the South-East Asian region. Therefore, the research results may provide the valuable reference evidence for the policymakers in adjustment regulation frameworks to promote the stock market development and economic growth in Vietnam and other countries with new-born stock markets in this region.

1.8. The structure of the study

This thesis is organised as follows. Chapter 1 gives the introduction of the research in this thesis. Chapter 2 discusses the theoretical framework on the relationship between the finance market, which includes the stock market and economic growth. Chapter 3 is an empirical literature review on the financial and stock market development and economic growth nexus. Chapter 4 discuss the economic conditions, the financial and the stock market development background of Vietnam. Chapter 5 describes the methodology applied in the research and the empirical analysis process of the study. The main empirical sections are in Chapter 6 and Chapter 7. Chapter 6 focuses on discussing the stock market development and economic growth relationship in Vietnam from 2000 to 2014. It also considers the impacts of the banking sector and foreign direct investment on the stock market development and economic growth in Vietnam. Meanwhile, Chapter 7 discusses the analysis of the relationships between the stock market and economic growth in Thailand, in both the time pre-financial crisis from 1997 to 2008 and the whole development period from 1994 to 2014, then makes the recommendation and implications in developing the stock market in Vietnam. Chapter 8 comprises the conclusion of the thesis, the limitations of the study and makes suggestions for further study.

CHAPTER 2 - THEORY FRAMEWORK ON THE STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH RELATIONSHIP

2.1. Introduction

The economic growth of a country may be defined as a long-term rise in capacity to supply increasingly various economic goods to its population. This growing capacity based on advancing technology and the institutional and ideological adjustment that it demands (Kuznets, 1973). The financial development of an economy happens when financial instruments, markets, and intermediaries improve the effects of information, enforcement, and transaction costs and implement better financial functions (Demirgüç-Kunt and Levine, 2008). It is assumed that these improvements in the financial markets could spur economic growth. For instance, the financial markets channel the mobilising of idle funds to the more effective and productive projects that may lead to an increase the wealth for the economy. In turn, the surplus wealth from economic growth could be the driving force to facilitate the development of the financial markets. Therefore, the relationships between financial market development and economic growth have attracted the attention of academics and policymakers in answering the question: does financial development cause economic growth and vice versa?

Also, the stock market is a sub-sector but plays a vital role in the financial market in channelling and facilitating the long-term financial resources for the economy. To support the view that the stock market contributes a positive role in economic development, this chapter demonstrates the fundamental theoretical framework regarding the savings and investment on how the financial market in general and then stock market development could influence the economic growth in the light of the neo-classical model and endogenous growth model.

This chapter is presented in five sections. Section one gives the overall argument on the possible causal link between financial sector development and economic growth and the introduction of supporting the ‘supply-side’ that the stock market causes economic growth. Section two discusses the finance and economic growth nexus in neoclassical and endogenous economic growth models. Section three establishes the theoretical linkage between finance, stock market development and economic growth. Section four gives the chapter’s conclusion.

2.2. Finance and Economic Growth Nexus in Theory

The neoclassical growth theory Solow-Swan model (1956), and the endogenous economic growth theories of Lucas (1988) and Romer (1986) are the complementary models in explaining the finance and economic growth relationship. According to these theoretical economic growth models, in the long run, higher saving and investment will result in a higher level of per capita income and faster economic growth.

2.2.1 Neoclassical Growth Theory

The Neoclassical growth theory was introduced by Robert Solow[3]. This is also best known as the Solow Growth Model. By using the production function, the model involves input factors including capital (K), and labour (L) that promote economic growth. The model is presented as in equation (2.1).

$$Y = AF(K, L) \tag{2.1}$$

The theory assumes diminishing marginal returns to scale of factor inputs (K and L), where growth per unit labour increases with growth per unit capital at a diminishing rate. The change in output is due to technical progress and the changes in inputs can be written as equation (2.2:

$$\Delta Y/Y = [\theta \times \Delta K/K \ + (1 - \theta) \times \Delta L/L \ + \Delta A/A] \tag{2.2}$$

where θ and $(1 - \theta)$ are the marginal products of capital and labour, respectively.

According to this theory, economic growth would be attained with a sufficient amount of these factors (K, L and A).

The neo-classical model also assumes that in the absence of technological progress, or when technology is held constant, that is, $\Delta A/A = 0$, while labour force rises at a steady rate, $\Delta L/L = n$, this implies that the rising labour force totally relies on the available capital stock for production. This will lead to overuse of the capital stock, as every unit increase in the labour force would cause more use of capital, hence diminishing return per every input. Production per capita will reduce, hence diminishing the level of output. Here the aggregate output is a function of capital and labour where the production function shows constant return to scale, holding technological progress constant or the

[3] See *'A Contribution to the Theory of Economic Growth'* (Solow, 1956)

equation (2.2 becomes equation (2.3, where the only one variable element left is the growth rate of capital:

$$y = f(k) \tag{2.3}$$

in which, y is economic growth and k is the capital growth rate.

The capital growth (k) is determined by saving, which, in turn, depends on income.

In brief, the neoclassical growth model forecasts a steady state of equilibrium, wherein the absence of technical progress, growth would be constant, but growth is said to rise as technological progress takes place, due to its influence on labour. It posits that when technological progress occurs, labour and capital need to be adjusted accordingly.

Although Kuznets (1973) argues that technological advancement is a permissive source of economic growth, it is only a necessary condition and not a sufficient condition for economic growth. However, the neoclassical theory model considers technology advancement as an exogenous factor. This exogenous factor has influences on growth. Also, in the absence of technological progress, growth would not continue. Therefore, the theoretical model is that long-run growth is determined by an exogenous factor is criticised.

2.2.2 Endogenous Economic Growth Theory

Despite the great recognisable contribution of Solow (1956) to the theory of economic growth, the endogenous growth model developed by Romer (1986) and Lucas (1988) devotes a big improvement in comparison with the neoclassical growth model. The endogenous growth model takes into account technological progress as an endogenous factor rather than an exogenous one. Caporale et al. (2005) suggest in the endogenous growth models that the economic growth performance is related to financial development, technology and income distribution. The technology progress, $\Delta A/A$ in the endogenous growth model, is also a significant determinant of economic growth in a country. In addition, if there are constant returns to factors of production that can be zero. The theory considers investment in technology, human capital and knowledge as important contributors to economic growth. Technological progress is said to arise through an increase in savings and investment as well as accumulated population growth; the steady-state growth rate is determined by the growth of technological change.

In the simple form of endogenous growth model "AK", Greenwood and Jovanovic (1990) suggest that no diminishing returns to the reproducible factor, and a permanent, exogenous improvement in financial structure, would cause a permanent increase in the rate of growth. Meanwhile, Pagano (1993) investigates the simplest endogenous growth model "AK" and demonstrates that financial intermediation can affect economic growth by acting on the saving rate, on the fraction of saving channelled to investment, or on the social marginal productivity of investment.

The simple endogenous growth, "AK" model, as in Pagano (1993), will clarify how stock market development may affect economic growth through saving and investment.

The AK models, because they result in a production function of the form $Y = AK$

K is the aggregate capital stock including physical and human capital as in Lucas (1988), and A is the social marginal productivity of capital.

An early variant of the AK model was the Harrod-Domar model (Aghion and Howitt, 1998), which assumes that labour input grows automatically in proportion to capital. To see how this works, suppose first that the aggregate production function has fixed technological coefficients:

$\mathrm{Y} = \mathrm{F}(\mathrm{K}, \mathrm{L}) = \min\{\mathrm{AK}, \mathrm{BL}\}$, where A and B are the fixed coefficients. Under this technology, producing a unit of output requires $1/\mathrm{A}$ units of capital and $1/B$ units of labour; if either input falls short of this minimum requirement, there is no way to compensate by substituting the other input.

With a fixed-coefficient technology, there will be either be surplus capital or surplus labour in the economy, depending on whether the historically given supply of capital is more or less than (B/A) times the exogenous supply of labour. When $AK < BL$, capital is the limitational factor. Firms will produce the amount $Y = AK$, and hire the amount $(1/\mathrm{B})\mathrm{Y} = (1/\mathrm{B})\mathrm{AK} < \mathrm{L}$ of labour. With a fixed saving rate, the capital stock will grow according to

$$\dot{K} = sAK - \delta K$$

Thus, the growth rate of capital will be:

$$g = \frac{\dot{K}}{K} = sA - \delta$$

Because the output is strictly proportional to capital, g will also be the rate of growth of output, and $g - n$ will be the growth rate of output per person[4].

In the model as just described, an increase in the saving propensity s will raise the rate of growth g. If output per person is rising, then the increase in growth will not be permanent, because with K growing faster than L, eventually, the binding constraint on output will become the availability of labour rather than the availability of capital; beyond that point, there will be no more possibility of growth in per capita output. If output per person is falling, however, the increase in growth resulting from an increase in saving will be permanent. In this case, diminishing returns will never set in because the faster growth of capital will be accompanied by permanently faster growth of labour input, which is made possible by the fact that there is always a surplus of unemployed labour in the economy.

The growth rate $(Y_t/Y_{t-1} - 1)$, is represented by y which at time $(t + 1)$, is determined only by the growth of capital input as:

$$y_{t+1} = \frac{K_{t+1}}{K_t} - 1 \tag{2.4}$$

The model assumes that the economy produces a single good that can be either invested or consumed. If invested, it depreciates at the rate δ per period. Hence, the gross investment I_t is given by:

$$I_t = K_{t+1} - (1 - \delta K_t) \tag{2.5}$$

The equation (2.5 means that gross investment equals the difference between the capital stock at time $(t + 1)$ and time t, plus the depreciated capital stock at time t.

Thus, the amount of saving absorbed by the financial system is $(1 - \varphi)\, S_t$ and the higher φ, the lesser the capital accumulation in the economy.

From equation (2.4 to (2.5, the growth rate of the economy at time $(t + 1)$ is y_{t+1} and can be expressed as the ratio of gross investment to capital minus depreciation $y_{t+1} = (I_t/K_t) - \delta$. Then, capital can be substituted by the ratio of output to productivity:

$$y_{t+1} = A\frac{I_t}{Y_t} - \delta \tag{2.6}$$

[4] n is the rate of population growth

Denoting the gross saving rate (S/Y) by s, from the capital market equilibrium equation, the steady-state growth rate can be expressed by the following equation:

$$y = A\varphi s - \delta \tag{2.7}$$

Equation (2.7 indicates how the endogenous growth theory explains the relationship between the financial sector and growth in the economy. In this, savings and investment are considered as avenues through which the financial sector affects economic growth, as this plays a significant role in resource mobilisation. An increase in the saving rate (s), and the investment rate, by using economic policies impacts directly the determinants of saving behaviour. Also, an increase in a φ in equation (2.7 consequently increases the growth rate, y through the channelling of more saving to investment by avoiding the loss of funds during the intermediation process through a rise in the fraction φ. Finally, through the improvement of capital productivity (A) resources can be allocated to more productivity. Thus, saving channelled through financial intermediaries (stock market) is allocated more efficiently, and the higher capital productivity results in higher economic growth. Positive externalities and spill-over effects of a knowledge-based economy would lead to economic growth. Policy measures, such as government subsidies for education expenditure and research and development, increase incentives to innovation and capital accumulation (physical capital and human capital) which would have an impact on the long-run growth rate of an economy.

2.3. The Finance, Stock Markets and Economic Growth

The financial sector, including stock markets, plays an important role in the economy. Financial markets bring together savers who buy financial instruments and the users of funds who issue financial instruments. Also, the financial markets and intermediaries may link to economic growth by implementing their basic functions and channelling capital funds into the economy (Levine, 1997). The basic functions of the financial system are pooling and allocating savings to investment. Furthermore, utilising expertise and technology, the financial system facilitates the transactions and creates liquidity of financial instruments. With the wide range of investment opportunities and information provided, the investors may diversify their investment risk, taking part in the corporate control. Also, the financial market creates the motivation to enhance corporate management activities.

2.3.1 Mobilising funds

The financial system mobilises savings. Financial markets and institutions pool the savings of diverse households with different available time durations and make these funds available for lending or investing. This activity reduces the transaction costs associated with external finance for both firms and households. By going directly to a financial institution, firms seeking to mobilise/borrow avoid the costs of having to contact a diverse group of savers. Similarly, savers avoid the costs of evaluating every potential borrower/firm by placing their funds in a financial institution. In other words, the banking system and stock market accumulates small savings, pooling them together and making them available for financing the investment projects, which eventually leads to economic growth as output increases.

2.3.2 Allocating savings

The financial system allocates savings more efficiently than individual savers. Since financial institutions are specialists, they can determine profitable investment opportunities and judge the creditworthiness of the fund users at a lower cost than the average small investor. According to Greenwood and Smith (1997), and Viney and Phillips (2015), the financial markets are considered the most prominent means of encouraging and allocating savings to competing users by providing financial instruments with a range of combinations of the attributes of risk and return. Capital allocation may be done efficiently as firms requiring capital may have easy access to information regarding available capital from the equity market. Stock prices exhibited in stock markets are a driving force for resource allocation. Investors are motivated to find out more about well-performing firms, as their share prices are shown on the stock exchange. This eventually enables resources to be allocated to more profitable firms (Enisan and Olufisayo, 2009). Ang and McKibbin (2007) point out that the stock market has the capability of identifying profitable investment projects on behalf of lenders and diversifying risks among these projects. Stock markets take time to evaluate funds and channel them to the most profitable and productive ventures.

2.3.3 Diversifying risk

The financial system supports the reduction of risk by spreading investors' savings across many different investment opportunities and, hence, encourages savings. The development of sophisticated derivative instruments can improve the allocation of risk in the economy and increase the efficiency of the saving-investment process. Spreading

savings diversifies risk for households and reduces their exposure to the uncertainty associated with individual projects.

The pooling of risk over various projects among several investors is one method of risk diversification that stock markets operate. The risk could be liquidity or productivity (Levine, 1997). According to Levine (1997), the risk sharing function of the stock market promotes risk diversification, optimises savings as well as allocating resources which enhances economic growth. This is because savers can sell their assets quickly and with ease, especially when the stock market is liquid. The stock markets help investors who usually invest in a single project or firm by identifying other plausible projects on their behalf, as it is safer to invest in multiple projects in differing sectors. The stock market has the capability of identifying profitable investment projects on behalf of lenders and diversifying risks among these projects. Stock markets take time to evaluate funds and channel them to the most profitable and productive ventures. This enhances the quality of investment and, hence, is a positive influence on economic growth.

2.3.4 Creating liquidity

The financial system succeeds due to its ability to generate liquidity. Some investments with potentially high returns involve projects that require long-term commitments of capital. However, some investors may unexpectedly need access to their savings. Fortunately, when the financial system pools the investments of many households, it allocates funds to both short- and long-term projects. Thus, investors obtain higher returns on their savings than they would if their investments were limited to short-term projects, but they still have access to their savings in unforeseen circumstances. Further, mixing investments in this way ensures that worthwhile long-term projects are funded.

The stock markets have the ability to create liquidity (ease of converting investment into cash). Liquid stock markets boost investors' confidence as far as settlement and trades timing is concerned as it reduces the costs (Levine, 1997). The stock market liquidity enables financing of long-term projects that are high earning, yet which fulfil investors' short-term commitments of return.

2.3.5 Facilitating transactions

In carrying out their functions, financial intermediaries reduce transaction costs for savers and investors and help to reduce problems of asymmetric information that are inherent in the relationship between investors and entrepreneurs. (Fischer, 2003). The financial

system facilitates trading goods and services and financial transactions. One example of this is the exchange of goods and services without having to resort to barter. Additionally, letters of credit help firms order the inputs for current production when they experience delays in payment for past sales. Furthermore, how well financial systems reduce information and transaction costs will also influence savings, investment decisions, technological innovation, and economic growth rate in the long run.

2.3.6 Monitoring managers and exerting corporate control

The financial system also exerts corporate control and monitors managers. Entrepreneurs' or managers' information about the operation and outcome of their projects tends to be superior to information that outside creditors and shareholders have. Insiders' attempts to exploit this informational advantage by engaging in opportunistic behaviour would tend to discourage savings. For example, the managers must disclose the performance result of their firms to lenders and shareholders to raise their funds, especially if they are listed companies. To offset this information advantage, banks monitor borrowers, and equity markets allow shareholders to discipline managers by voting out poor management.

Through voting, even minority stockholders may influence managers. This is because proxy voting gives them the power to exercise voting rights on behalf of other shareholders who delegated them to represent them in the shareholder's reunion. The takeover mechanism ensures that managers make use of past investment (Yartey and Adjasi, 2007). This perpetuates control over managers, as takeover threats keep managers in check and on their best behaviour due to fear of the firm making loss in case they failed to maximise shareholder value. Djoumessi (2009) contended that, without the involvement of the financial market, managers would stray from the aims of the enterprise eventually which would lead to its collapse.

In summary, these roles suggest that a well-functioning financial system might permit a higher level of saving and investment and, therefore, economic growth (Khan, 2000).

2.4. The stock market as a cause of the economy's growth

The stock market, as a part of the financial system, plays an important role in economic growth. It is supposed that a well-developed stock market will help increase saving and efficiently allocate financial capital to the corporate sector for real productive investment, which leads to an increase in the rate of economic growth. When the stock market is liquid, it enables employment of higher production techniques that are long-term and

enables the enjoyment of higher production techniques that are long-term and enables employment of economies of scale, which eventually stimulate economic growth (Boyd and Smith, 1998). Yartey and Adjasi (2007) also credit stock market liquidity's ability to enhance growth through the provision of increased motivation to acquire information about firms and help to improve corporate governance. Stock market liquidity reduces risk hazards and provides finances for long-term projects that take longer to mature, yet with a higher rate

As advanced by Patrick (1966), three hypotheses have been developed to explain the causal relationship between financial markets and economic growth: (i) Supply leading hypothesis: Financial development is said to positively influence economic growth through the supply of financial services by financial intermediaries. Such financial services include low-cost investment information and opportunities which encourage better allocation of resources by the saver in the more profitable alternatives, which will boost economic growth eventually. Levine (2005) also agrees with this hypothesis; (ii) Demand following hypothesis: On the other hand, the demand following hypothesis argues it is demand rather than economic growth that accelerates the development of stock markets through the increasing demand for financial instruments which expedite the development of the financial scheme. Robinson (1952), as cited in Levine (2005), supports this hypothesis from his findings showing that growing enterprises need more financial support (high demand for finance); (iii) Feedback hypothesis: This hypothesis argues that stock markets and economic growth have a reciprocal relationship. It explains that while a country is still at a low stage of growth, stock markets are dormant and underdeveloped, and once economic growth is boosted the financial market surges. Therefore, the economic growth spurs stock market development. Stock market development is also an important condition for boosting economic growth.

Van Nieuwerburgh et al. (2006) and Tachiwou (2009) both agree with the early view that stock markets need to build savings as well as allocate capital to profitable ventures and investments. Also, regarding the cost of mobilising savings, financial intermediaries are able to be more efficient than individuals could be.

The channels through which stock markets impact economic growth

The endogenous growth theory has it that stock markets have a positive role in the economic growth of a country. According to Singh (1997), the stock market is anticipated

to boost economic growth, theoretically speaking, through providing a channel to enhance domestic savings and investments, both in quantitative and qualitative terms. Levine and Zervos (1998) argue that 'the stock market may be an avenue for generating domestic savings, as business and individuals may obtain supplemental financial instruments which may meet their risk preferences and liquidity'. There has been growing literature arguing in favour of the stock market being vital in stimulating growth. They suggest that a well-performing stock market can contribute to growth through various channels, including, among others, the following:

The endogenous growth model as the theoretical framework for this study is traced from the work of Levine (1997) who created an endogenous growth model explaining that the stock market boosts economic growth through a better resource allocation or increased firms' productivity. Stock markets are said to improve the efficiency of firms though availing capital, which stimulates the physical capital accumulation rates of firms. This eventually increases output. Levine (1997) also constructed an endogenous growth model to explain how stock markets contribute to economic growth. Here, financial sectors skim through potential firms, identifying innovative and well-performing firms and allocate finance to them for productive activities, with hopes of increasing profits. These firms eventually multiply output, hence boosting economic growth.

A stock market serves as the primary market through which shares are initially issued to obtain finance for the development and expansion of investment. This transaction raises new funding for a corporation and allows increased investment in productive capital and economic growth (Viney and Phillips, 2015). However, in most stock market literature, the main channels to economic growth are seen in the efficiency of capital allocation, encouragement of saving, and lead to more capital formation. On a microeconomic level, such channels can be discussed in terms of the impact on corporate finance and corporate governance.

Stock market development is supposed to encourage saving by providing households with additional instruments which may better meet their risk preferences and liquidity needs. A liquid equity market makes the investment less risky and more attractive because they allow savers to acquire asset equity and to sell it quickly and cheaply if they need access to their portfolios. At the same time, companies enjoy permanent access to capital raised through equity issues. However, by facilitating long-term investment and making it more

profitable, stock market liquidity improves the allocation of capital and enhances prospects for economic growth in the long run (Levine, 1996).

Moreover, Rousseau and Wachtel (2000) describe the reasons the stock market is an important financial institution in the economy, even when equity issuance is a relatively minor source of funds. Firstly, the stock market provides investors and entrepreneurs with a potential exit mechanism. Moreover, the stock market is an important financial institution even when equity issuance is a relatively minor funding source (Rousseau and Wachtel, 2000). If the countries have liquid stock markets, it is possible for investors to realise the gains from a successful venture capital investment project that could be realised when the company makes an initial public offering. On the other hand, the option to exit through a liquid market mechanism makes venture capital investments more attractive and might well increase entrepreneurial activity generally. The investors can quickly, cheaply and confidently sell their company stake. Secondly, capital inflows in both foreign direct investment and portfolios are potentially important sources of an investment fund for emerging market and transition economies. The International Monetary Fund (1997) argues that, recently, fund managers have become aware of the importance of international diversification; the international portfolio investments increase rapidly, and the portfolio flows tend to be larger to countries with organised and liquid stock markets. Therefore, the existence of stock markets facilitates capital inflow and the ability to finance current account deficits. Thirdly, the provision of liquidity through organised stock markets encourages investors to transfer their surpluses in the short-term to the long-term capital market, where firms can access the permanent pooling funds to finance the large, high-return projects, then enjoy substantive scale economies. Many high-return projects require a long-run commitment of capital. Meanwhile, the investors have a reluctance to control their savings holding for a long period. By pooling those reluctant savings, stock markets may help to promote investment in the potentially profitable projects in the long run; effective capital allocation then becomes a prospect for long-term economic growth.

Finally, the stock market provides an important information channel that improves the efficiency of financial intermediation. Also, the stock market improves the flow of information from the management of the company and quickly produces a market valuation of company development. This valuation provides benchmarks for the value of company assets, which can be helpful to other business and investors, thereby improving the depth and efficiency of company assets. For traded companies, the stock market

improves the flow of information from management to owners and quickly produces a market evaluation of company developments.

However, the impact of stock market development on savings could be a positive, negative, or uncertain effect on savings. A positive effect of stock market development on savings may occur due to an increase in the rate of return on savings that provides an incentive for individuals to postpone consumption. A stock market, and the securities issued, simultaneously meet portfolio preferences of savers (surplus units) and debt requirements of borrowers (deficit units), thereby leading to a higher level of saving, S, and more funds being channelled into real investment, I.

Theoretical models of financial market development and economic growth also suggest that stock market development may reduce the riskiness of income while, at the same time, increasing the rate of return. For example, Levine (1991) considers that liberalisation and expansion of stock markets allow individuals to diversify their risk better, meaning that stock market development could be associated with a decrease in the riskiness of saving.

On the negative effect side, the stock market development may decrease saving because of two wealth effects. The first refers to the degree of uncertainty that distinguishes the two sources of lifetime income. Income from labour is much more uncertain than from tangible assets. The permanent income hypothesis, therefore, states that the ratio of tangible assets to labour income is an important variable for determining consumption and, hence, saving propensity. Continuing this statement, it is possible to argue that stock market development may further decrease the propensity to save because it increases the tradability of assets, thereby reducing the transaction costs that occur for lenders. Secondly, an increase in the rate of return on saving also increases wealth, which, in turn, increases consumption and decreases saving.

Also, the theoretical effects of a change in risk on the saving rate are ambiguous and depend critically on assumptions regarding preferences. Rothschild and Stiglitz (1971), in fact, show that risk and saving are positively related only if the coefficient of relative risk aversion is non-increasing and greater than one, a condition consistent with a precautionary motive for saving. Whether saving increases or decreases with a change in risk, therefore, depends critically on the coefficient of relative risk aversion (Bonser-Neal and Dewenter, 1999).

In summary, the impact of the stock market development on saving is ambiguous. Nevertheless, the actual net impact has critical implications for economic growth. Models by Bencivenga and Smith (1991), Jappelli and Pagano (1994), Devereux and Smith (1994) and Obstfield (1994) identify the condition in which the stock market could cause saving to fall enough so that the overall economic growth rate falls.

The stock markets appraise the project, its expected contributions to the future earnings of the company, and its risks. If the value of the project, as appraised by investors, exceeds the cost, then the company shares will appreciate to the benefit of existing stockholders. That is, the market will value the project more than the cash used to pay for it. If new debt or equity securities are issued to raise the cash, the prospectus leads to an increase in share prices (Yoshikawa, 1980).

A financial system consists of financial institutions – e.g., commercial banks – and financial markets – e.g., stock and bond markets. At a broader level, a robust and efficient financial system promotes growth by channelling resources to their most productive uses and fostering a more effective allocation of resources. A stronger and better financial system can also lift growth by boosting aggregate savings.

2.5. Conclusion

This chapter provided a comprehensive theoretical consideration of how the financial system and stock market development could affect real economic growth. In finance theory, there are four basic functions and channels in which the stock market may influence economic growth:

(i) the stock market provides investors and entrepreneurs with a potential exit mechanism;

(ii) capital inflows in both foreign direct investment and portfolios are potentially important sources of investment funds;

(iii) the provision of liquidity through an organised stock market encourages both international and domestic investors to transfer their surplus from short-run assets to the long-run capital market, and finally:

(iv) the existence of the stock market provides important information that improves the efficiency of financial intermediation.

In contrast, the economic theory of the endogenous economic growth model illustrates that stock market development may affect economic growth through an increase in the saving rate, the channelling of more saving to investment, and the improvement of capital productivity with better resource allocation toward their most productive use. Thus, saving channelled through the stock market is allocated more efficiently, and higher capital productivity leads to higher economic growth.

The potential effect of stock market development on saving is ambiguous and depends, critically, on assumptions regarding risk-return ratio and saving. A positive effect may occur due to an increase in the rate of return on saving that provides an incentive for individuals to postpone consumption. In contrast, the stock market may decrease saving because of a wealth effect, where an increase in the rate of return on saving also increases wealth, which in turn increases consumption and decreases saving.

This chapter is of fundamental importance and presents a comprehensive theoretical framework of how stock market development affects economic growth, with a focus on the endogenous growth models. The subsequent chapters will assess the empirical relevance of the role of stock markets in explaining economic growth.

CHAPTER 3 - EMPIRICAL LITERATURE ON THE RELATIONSHIP BETWEEN STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH

3.1. Introduction

Schumpeter (1911), McKinnon (1973) and Shaw (1973) are the pioneers in contributing the evidence that financial development correlates with economic growth. Schumpeter (1911) argues that by providing services such as mobilising funds, evaluating investment projects, managing risk, monitoring entrepreneurs, and facilitating transactions, the financial sector can stimulate technological innovation and economic development. Meanwhile, McKinnon (1973) and Shaw (1973) also coincide in demonstrating the positive correlation between financial development and economic growth. However, the directions of the correlation between the financial market and economic growth have remained an interesting topic in the debate Hence, follow the pioneers' work, much literature has endeavoured to examine the correlation between the financial market and economic growth; whether it is the financial markets which cause economic growth and vice versa.

As discussed in chapter 2, the functions of the financial markets, the financial market promotes and channels the mobilisation of idle savings in the economy and converts them into useful and productive capital. On the other hand, economic growth generates a surplus for the economy. This surplus can fuel the development of the financial sector. Hence, the direction of causality between financial market development and economic growth remains ambiguous and open to empirical scrutiny. Furthermore, the direction of this causal relationship has significant implications for policy. Therefore, the stock market, a sub-sector of the financial market, attracts more and more researchers in exploring the nature of the relationship between its development and economic growth.

Levine (1991) argues liquidity created by stock markets makes investment less risky as it allows investors to buy or sell equity without locking in their savings for a long investment period, while, at the same time providing long-term capital to companies raised through equity. However, it can be argued that the liquidity created by the stock market may also have a negative impact on the long term economic growth in the real economy. Demirgüç-Kunt and Levine (1996) identified three possible channels through which this effect may propagate. First, a higher rate of return on the stock market will encourage investment as more investors will engage with the stock market. However, on

the other hand, it can be argued that a higher rate of return may decrease the saving rate, as investors will consume a higher proportion of their income (income effect) and prepone future consumption of today's consumption (substitution effect), thereby reducing the overall amount of money invested in the economy and consequently reducing the level of capital accumulation. Second, a highly liquid stock market reduces the level of uncertainty associated with investing in the stock market, which makes investment more attractive for investors. At the same time, however, it also discourages precautionary saving (the component of saving that is achieved by postponing the consumption, due to uncertainty regarding the future), thereby causing an ambiguous impact on the overall saving rate and overall investment in the economy. A third channel would be the creation of investor myopia (focus only on short terms gains and losses and the cost of long-run returns) due to a very liquid stock market. A very liquid stock market allows the investor to quickly and without much cost, sell their portfolio of ill-managed company stocks, thereby reducing incentives for demanding greater accountability from managers running the firms. This, in turn, may lead to a weakening of corporate governance in the economy and hurt economic growth in the long run.

This study discusses how the stock markets promote investment, and therefore economic growth, by employing an Autoregressive Distributed Lag (ARDL) model and the Toda Yamamoto causality test to determine the nature of the relationship between stock market development and the real economy in Vietnam.

This chapter is organised as follows:

The following section presents a brief review of the relevant literature and discusses the major empirical studies that have explored the stock market regarding economic growth. Section 2 discusses the determinants of financial development and economic growth. Section 3 demonstrates the methodology applied in the empirical studies on stock market development and economic growth. Section 4 classifies the empirical results according to the country's level of development. Section 5 gives some empirical study in the financial market development in Vietnam, and a conclusion is provided in Section 6.

3.2. Determinants of financial development and economic growth

3.2.1 Economic growth determinants:

Theoretically, the economic growth of a country may be defined as a long-term rise in capacity to supply increasingly divergent economic goods to its population. This growing

capacity is based on advancing technology and the institutional and ideological adjustment that it demands (Kuznets, 1973). Therefore, based on this theory, in examining the relationships between economic growth and the financial market, most of the empirical researches employ the growth rates of real GDP of the economy as the determinants to present the economic growth.

Nevertheless, some other studies use the growth rate of real GDP per capita to present the economic growth variable. Demirgüç-Kunt and Levine (2001) and Ergungor (2008) employ the real GDP per capita growth in their cross-country analyses of 46 countries in the period 1980–1995 to examine the nexus of the financial market structure and economic growth.

3.2.2 Financial market determinants

Financial development of an economy happens when financial instruments, markets, and intermediaries improve the effects of information, enforcement, and transaction costs and implement better financial functions (Demirgüç-Kunt and Levine, 2008). Hence:

Monetary policy attempts to stabilise the economy by controlling interest rates and the supply of money. Successful implementation of monetary policy requires a fairly accurate consideration of how fast the impact of such policy changes could be delivered to other parts of the economy and how large the impact is. In Vietnam, financial markets are built as a transition to a market economy. There has been an increasing but realistic emphasis on the use of market instruments, to the extent that such a transmission mechanism can be delivered.

The impact of money supply change can be expressed by adjustments in investors' portfolio allocations. An increase of capital breaks the balance of a given portfolio, changing the marginal utility ratio of the assets therein. Money is a comparatively stable asset. To maximise the return, a rational investor will generate a new balance by investing more in riskier assets. If the supply of a given riskier asset stays unchanged, its price climbs. Therefore, in principle, when the money supply increases, the stock prices follow in the same direction.

The interest rate is the price which the borrower pays to use the capital resource at a given time. This implies that the higher the interest rate, the more valuable that resource is today. Interest rates change the cost of holding cash. When interest rates increase, the borrowing cost rises. Investors will, therefore, reduce the allocation to the stock market

as it is considered to be riskier. Additionally, with a decline in higher interest rates, investors buy more stocks as they prefer to hold comparatively more profitable investments. Interest rate changes will also affect companies' profitability. Higher capital costs lead to a lower expected return. If the rate adjustment is already expected by investors, based on the efficient market hypothesis, the demand for stocks will not change much. However, if the rate decreases unexpectedly, according to Keynes' liquidity preference theory, people will believe interest rates will rise in the future, meaning stocks will become cheaper. In this situation, people believe that one should sell now and buy later. This leads to a drop in the stock market price, and the converse is true.

Various studies are inclined to use charts and regression methods to analyse the relationship between the money supply, interest rate change and stock market performance. Friedman (1988) utilised data from 1961 to 1986 in the United States. He found the evidence suggesting that the real quantity of money demand (defined as M2) relative to income is positively related to the deflated price of equities of Standard and Poor composite, which lagged by three quarters and was negatively related to the contemporaneous real stock price. Based on these analyses, the findings suggest that future stock returns can be predicted on the historical data set. However, according to the efficient market hypothesis theory, the stock prices reflect fully all available information. Therefore, if the investor is rational, they will adjust the portfolio in time, leaving no excess return. As such, monetary policy change cannot be the foundation to forecast future stock returns. Later research shows that money supply and interest rate changes in the past do not have predictive value. On the contrary, it is an opposite Granger causality relation, meaning stock prices causes a change in money supply and interest rate change (Rogalski and Vinso, 1977).

Due to the conflict discovered from empirical studies, researchers start to look at the characteristics of money supply and interest rates, and the limitations of the approaches used in empirical studies.

3.3. The empirical literature on the approach to the study

Based on the techniques applied and the nature of data analysis in the empirical literature on the relationship between financial markets which are including stock markets and economic growth, the empirical literatures are classified as three main approaches: cross-sectional analysis, time series analysis and panel data analysis.

3.3.1 Cross-sectional analysis

The empirical studies in the literature provide extensive evidence of a positive relationship between financial markets and economic performance. However, Levine (1997) argued that this relationship does not necessarily imply that the development of financial markets is always exogenous to economic growth. The evidence that financial development encourages economic growth was provided by Goldsmith (1969). Although the study sample included 35 countries, and the study period was from 1860-1963, this work has been criticised because it did not control for several relevant factors, and it did not draw any conclusion regarding causality or the relative importance of various transmission channels. King and Levine (1993a) provide a starting point for intense empirical research on the finance-growth nexus. Based on the nature of data used, the empirical research on this subject can be divided into three groups: pure cross-country evidence, time series studies and panel data studies.

Regarding cross-country studies, in their study of 80 countries during the period 1960-1989, King and Levine (1993b) showed that the initial level of financial development was a good predictor of the economic growth rate. Many subsequent studies have used their measures of financial development; later studies attempted to investigate the relationship between stock market performance and economic performance. Atje and Jovanovic (1993) found that the stock market had positive effects on economic growth. Levine and Zervos (1998) subsequently confirmed their findings. Although the research based on pure cross-country analyses has made a significant contribution to the literature, it has been criticised. Economists that performed cross-country studies usually used instrument variables to control for the bias associated with endogeneity. However, according to Ahmed (1998), the instrumental variable approach cannot be used to solve the potential reverse causality problem in the relationship of economic growth to financial activities when data are averaged over a long period. Shortages in grouping countries have also been demonstrated by Harris (1997). Employing the same data source, Harris showed that the results in Atje and Jovanovic (1993) work were not robust. Moreover, Garrestsen et al. (2004) found that the positive relationship between the stock market and economic performance discovered by Levine and Zervos (1998) disappeared when legal and other societal factors were controlled. Based on this review, the general conclusion is that the findings of cross-country studies are not consistent. They are sensitive to the selection of the sample countries, independent variables, time span and methodology.

The earliest time series study of the finance-growth nexus was conducted by Gupta (1984). His results suggested a uni-directional causality from the development of the financial system to economic growth. Recently, Neusser and Kugler (1998) used financial sector GDP and manufacturing GDP as proxies for financial market development and economic growth, respectively. Their results supported the supply leading view that financial market play a vital role in economic growth. Their findings were consistent with numerous subsequent studies (e.g., Choe and Moosa, 1999; Xu, 2000; Rousseau and Vuthipadadorn, 2005). However, because of data constraints, the sample period used in the majority of time series data research was short. The problem is particularly serious in developing countries, where data are difficult to obtain. High-quality time-series research requires a lengthy study period to account for persistent dynamics, which is the common feature of most macroeconomic series.

In recent years, because of the shortcomings of cross-sectional studies, researchers have employed panel data techniques to study the relationship between financial development and economic growth. A plethora of studies (e.g., Beck, Levine, and Loayza, 2000; Rousseau and Watchtel, 2000; Beck and Levine, 2004) confirmed that financial development had a significant positive influence on economic growth. Because of several problems, such as limited data points and spurious regression, Christopoulos and Tsionas (2004) suggested that the causality pattern could be examined by applying panel unit root and panel cointegration tests. They found only a uni-directional causality running from the development of financial systems to economic growth. Other researchers (e.g., Rajan and Zingales, 1998; Fisman and Love, 2003; Allen et al., 2005) investigated the topic at the micro level by using firm or industry level data to supplement cross-country studies. However, the conclusions drawn from the panel regressions were also criticised. Pesaran and Smith (1995) argued that the omitted variable or heterogeneity bias could not be resolved when the error terms included country-specific effects, which could lead to biased estimation results and inconsistent conclusions.

There are numerous empirical studies that have been performed to establish the link between stock market development and economic growth. This debate escalated in recent years as more and more significance is continuously being attached to the stock market – economic growth association. This section of the chapter will review some of these studies, dwelling more on the endogenous growth theory context, since this theory consents to the idea that financial market development plays a considerable role in the growth process of the economy. Both cross-country research and single country time-

series empirical studies are a review in this chapter. This section also reviews different research performed on the link between the stock market and economic growth in various perspectives, such as in the context of developed countries, developing countries and Vietnam.

These form various empirical studies conducted on financial market development and economic growth. The researches were carried out in many countries, using the same variable, to explain comparatively how the two variables are related to different country situations. They use short period data sets which makes them relatively easier to investigate. Countries with a well-developed financial system are more likely to experience increasing growth in the long-run through resource allocation, capital accumulation and efficiency stimulation. Rousseau and Wachtel (2000) as well as Beck and Levine (2004) also found a positive relationship between stock markets and economic growth in the developed countries in the long-run. Atje and Jovanovic (1993) and Harris (1997) equally established that countries with well-functioning stock markets are associated with growth in the economy. On the other hand, cross-country studies carried out in 14 African countries by Adjasi and Biekpe (2006) and Enisan and Olufisayo (2009), show that only a few countries experienced growth with the development of their stock markets. These researchers concluded that stock markets have a more positive impact on economic growth in countries with high-income levels, as was found in South Africa and Egypt.

Criticism has been raised on the cross-country type of study because it looks at many countries at once, and studies these countries superficially, but does not take into account the different countries' special prevailing economic situation. More so, the standards and accuracy of the econometric techniques are questioned.

Therefore, the single country time-series study is another type of technique used to analyse the relationship between the stock market and economic growth. It focuses on a single country and analyses policies and institutional changes that may affect growth. This study is said to be more reliable in decision making because it looks at one single country and exploits in-depth information (historical) which gives a better understanding of the country.

3.3.2 Time series analysis

Various time series studies carried out usually control for other factors that affect economic growth so as identify the exact contribution of the financial markets to the growth of the countries according to studies. Such factors as trade openness, government expenditure, inflation, education attainment, and on, are used as control variables.

This is the fourth type of technique employed to study the relationship between financial development and economic growth. This method has been employed by many researchers and seems to be a reliable technique for decision making by policymakers in an economy, as it concentrates on one single country exploring the link between finance and growth in the context of one country. It examines policy and institutional changes occurring in an economy and how they are likely to affect growth. They primarily look at the long-term relationship between financial development and economic growth. They collect long-term data of the variable in the study, that is long-run growth and financial development. This analysis is designed specifically to study a country in depth (tailor-made) and understand its historical dynamics. Many researchers, for example Patrick (1966), Demetriades and Hussein (1996) and Arestis and Demetriades (1997), have argued in favour of the country-specific series as opposed to cross-country regressions, on the grounds that the former takes specific conditions (governance, institutions and so on) of a country into consideration, rendering the technique much more desirable for policymakers in decision-making processes. Country-specific research has been carried out by, including others, Osei (2005), Van Nieuwerburgh et al. (2006) and G.C and Neupane (2006). These scholars performed separate studies of Belgium and Ghana, and, in both cases, stock markets were found to have a positive association with economic growth, as per the endogenous growth theory. Other single country time-series studies are those by Shahbaz et al. (2008) and Brasoveanu et al. (2008) in Pakistan and Romania respectively, and yet again concurred with the endogenous growth theory that stock markets stimulate growth in the long-run. Asai and Shiba (1995), however, did not find any causal link between the stock market and economic growth in Japan, using the same technique.

The flaws of this technique are that the findings may not serve other countries in decision making, this is because it is not easy to generalise studies that concentrated on a single country with different institutional, policy and financial systems. Despite its flaws, the single country time-series is still preferred and recommended by many economists over

the other types,such as the cross-country and panel techniques, which are said to be prone to conceptual and statistical measurement problems (Levine and Zervos, 1996).

In this study, a single country time series was used to establish the relationship between the stock market and economic growth in Vietnam. Other single country time-series studies in both developed and developing countries as well as Vietnam, were reviewed and are explained below.

Demirgüç-Kunt and Levine (2008) classified these empirical studies into four groups: cross-country approach, panel data analysis, microeconomic studies and single country analysis.

Chizea (2012), however, points out problems related to the microeconomic studies, saying the data have specific endogeneity problems, as access variables are not determined exogenously and, furthermore, there is the issue of determining the sample size and population, as these are hindered by time, cost, and relevance to the study.

3.3.3 Panel data analysis

This is another type of technique employed by many scholars in analysing the relationship between the stock market and economic growth. This is a much better option to the previous one as it takes into consideration the impact of the model. Still using the cross-country method, this technique employs time-series data, seeking to establish a long-term relationship among the variables under study. In the case of developed countries, in a panel data study carried out by Wachtel (2002), Rioja and Valev (2004) and Beck and Levine (2004) the findings were that a positive relationship existed between stock market variables and economic growth. Calderón and Liu (2003), found a dual direction of causality, yet Christopoulos and Tsionas (2004) established a one-way direction, running from stock markets to economic growth.

Despite its attempt to lessen the disadvantages of the cross-country method, the panel technique is seen to be associated with omitted variable bias (heterogeneity) as it studies a country superficially, and does not take into account the country's specific effects, given different economic situations prevailing due to the use of many countries. This could make the results useless due to bias and inconsistencies in the estimates (Pesaran and Smith, 1995). Moreover, the results in such studies are not reliable for decision making by policymakers, as they focus more on differences among countries, instead of concentrating on differences within a nation (Watchel, 2003).

3.4. Empirical research on the country development level

3.4.1 Empirical research on developed countries

This section contains a variety of empirical studies carried out in a single country using time series to analyse the relationship between the stock market and economic growth in developed countries, using various time series methods.

Using a Vector Autoregressive model (VAR model), Levine and Zervos (1996) endeavoured to explain the relationship between stock market development and economic growth in Japan. They used multivariate specification with variables of the stock market, interest rates, inflation rate and industrial production. Their findings were that, indeed, there existed a relationship between the stock market and the above-mentioned macroeconomic variables, though the nature of causality was moving from economic growth and other macroeconomic variables to stock markets. Therefore, increasing economic growth in Japan has stimulated the growth and development of the financial market. Using the same method, that is the VAR model, with real GDP per capita as the dependent variable to proxy economic growth in the UK, Levine and Zervos (1996) concurred that financial markets do accelerate the rate of economic growth in an economy (in this case the UK). The direction of causality, however, was from the financial market to economic growth, as opposed to economic growth to financial market growth as is the case was in Japan, in the study by Levine and Zervos (1996).

In agreement with the endogenous growth model, Levine and Zervos (1996) found a positive relationship between the stock market and economic growth in Switzerland. The authors employed vector Auto-regression to analyse this relationship. Stock market variables such as market capitalisation, stock market volume as a ratio of GDP and stock volumes as a ratio of market value, were found to impact real GDP (proxy economic growth) positively and significantly in Switzerland. In the case of Greece, Hondroyiannis et al. (2005) used, yet again, Vector Auto-regression to examine the possible link between financial development (stock market and banks) and growth of the economy with a monthly frequency data of 14 years (1986-1999). The financial sector was found to have a positive impact on growth, and growth also impacted the financial development positively, hence a two-way relationship. Banks were found to have a stronger effect on growth as compared to stock markets. This is exactly the opposite of the study in Australia, where banks were found not to influence economic growth, although stock markets did boost growth. In this study, Thangavelu et al. (2004) found that, when stock

market variables are employed, banks are seen to have no effect at all on growth, while stock markets affect growth even when banking sector variables are employed. The Australian banks are viewed as passive and not boosters of the Australian economy.

Similarly, research performed in Belgium by Van Nieuwerburgh et al. (2006) using Real GDP per capita to proxy growth and five different proxies of the stock marketover a long period time-series of 170 years (from 1830 to 2000), their findings revealed that stock markets had a long-run effect on growth and that stock market development had caused economic growth in Belgium, especially within the period of 1873 to 1935.

Another time-series study was carried out by Van Nieuwerburgh et al. (2006) in Korea, intending to establish the finance-growth relationship with a data set from 1972 to 2002. The results revealed that financial development does enhance growth as per the endogenous growth theory. The study exhibited a one direction causality running from the stock market in Korea to economic growth there. Another one directional kind of causality was the one established by Van Nieuwerburgh et al. (2006), during the study of stock market growth relationship in Germany. Using the Vector error correction model on time-series data ranging from 1965 to 2007 of variables including GDP, stock price and bank lending rate, they found a one direction causality running from the stock market to economic growth after application of the Johansen cointegration test to discover if there is a relationship, and the Granger causality test to establish the direction of causality.

All the above-reviewed studies have shown that, indeed, stock markets and financial markets, in general, have a positive effect on economic growth in developed countries. However, will the same result hold for the case of developing countries which have small and underdeveloped financial sectors, with new, small and illiquid stock markets. The next section presents empirical studies carried out to examine the relationship between the stock market and economic growth in developing countries.

3.4.2 Empirical studies on developing countries

This section will discuss two types of empirical studies. First, those that discuss the first research question, which is whether there is a relationship between stock markets and economic growth. Empirical research that established the effect of stock markets on economic growth is reviewed and discussed first. Then, secondly, the literature that is in line with the second question; what is the nature and direction of this relationship.

Therefore, empirical studies that explain the causal relationships between stock markets and economic growth are reviewed here.

Van Nieuwerburgh et al. (2006) carried out a study of Mauritius, endeavouring to establish the effect of the Mauritius stock market on its economic growth. Using time-series data from 1989 to 2006, for market size and liquidity, that is a market capitalisation ratio and turnover ratio respectively, to proxy stock market development, economic growth indicators such as Human Capital and Foreign Direct Investment were studied. The findings validated the endogenous growth theory as it found that in both the short-run and long-run, stock market development had a positive effect on the economic growth of the country. The variables employed to proxy economic growth are not, however, the best choice to explain economic growth. GDP per capita growth rate, Real GDP, GDP, per capita GDP, and others would have been better representations of GDP, other than FDI and Human capital development.

In a time series study of India from 1981 to 2001, Van Nieuwerburgh et al. (2006) attempted to establish the relationship between the stock market and economic growth, using Ordinary Least Square simple regression (OLS). The findings were that the stock market was significantly related to economic growth before liberalisation. A negative association between the stock market and economic growth was established in the periods after liberalisation. Furthermore, for the entire period of the study, the research found no relationship between the stock market and economic growth in India. Criticisms can be raised on this study on the grounds of the methodology adopted. Simply running the OLS test without carrying out a stationarity test may yield spurious regressions, as R-square may be high even if the variables are unrelated. More so, OLS simple regression is not the appropriate technique to be employed in such a kind of study with a small sample size of 21 observations (21 years), less than 25 observations, as it will not yield statistically significant analysis. Moreover, the breaking down of the study into before- and after-liberalisation further reduces the number of observations, and the reliability of the findings are questioned because of loss of the degree of freedom (Chizea, 2012).

Another single country time-series analysis, by Nazir et al. (2010) in Pakistan, revealed a positive contribution of stock market size (Market Capitalisation) and stock market liquidity (Value of shares traded), to the economic growth of the country over 23 years, that is from 1986 to 2008. Van Nieuwerburgh et al. (2006) used the Johansen cointegration test as well as the Vector Error Correction Model (VECM) to establish the

relationship between the stock market and economic growth in Iran, with 12 years' quarterly time-series data. The findings found that, in the short-run, stock markets influenced economic growth, and economic growth enhanced stock market development in the long-run.

A bulk of recent empirical studies in developing countries have strived to investigate the causal linkage between stock markets and economic growth, attempting to establish whether the stock market causes economic growth or whether it is growth that causes stock market development. These studies include the following among others: Osei (2005) predicted that the stock market caused economic growth in Ghana and his findings matched his prediction where stock market variables (market capitalisation ratio and market capitalisation) were found to Granger cause Real GDP, a proxy for economic growth in Ghana. The researcher had employed a time-series from 1991 to 2003, VAR model, then used the Granger causality test[5] to establish this causal relationship.

Similarly, Shahbaz et al. (2008) also found a causal linkage between the stock market and economic growth in Pakistan. Shahbaz et al. (2008) used 35 years (1971-2006) annual time-series data and applied the Julius and Johansen cointegration tests to investigate this association. Once again, in support of the endogenous growth model, they found a positive association between these variables. The Autoregressive Distributed Lag (ARDL) bound testing and the Granger causality test revealed a two-directional causality, implying the stock market caused growth and growth also caused stock market development. On a precise note, the dynamics of this bidirectional causality was that stock markets were seen to Granger cause economic growth in the short-run.

With the same aim of establishing the direction of causality between stock market variables and economic growth, Bahadur G.C and Neupane (2006) used an 18 years' time-series data of Nepal from 1988 to 2005. The findings agreed with the endogenous growth theory. Not only did they find that there existed a relationship between stock market variables (market capitalisation to GDP ratio, turnover ratio to market capitalisation and turnover to GDP ratio) and GDP a proxy to economic growth, but also a causal relationship existed between these variables. This causal relationship moved

[5] See *'Investigating Causal Relations by Econometric Models and Cross-spectral Methods'* (Granger, 1969) for Granger causality definition.

from stock market to economic growth. The stock market was found therefore to Granger cause economic growth in Nepal.

Kaplan (2008) carried out a related study on the relationship between the stock market and economic growth in Turkey with quarterly data from 1987 to 2006. He used the Johansen cointegration test along with Granger causality, all with a Vector Auto-regressive (VAR) framework. His cointegration findings exhibited a long-run relationship between stock markets and economic growth. The Granger causality test revealed a one-directional causality, running from the stock market to economic growth in the long-run. The stock market is said to have Granger caused economic growth in Turkey from 1987 to 2006.

Unlike Kaplan (2008), who found a causal relationship between stock markets and economic growth in Turkey, Wang (2010) did not find any causal relationship between the stock market and growth in China. To establish the volatility and causal relationship between the stock market and economic growth, Wang (2010) used the EGARCH model (Engle-generalised autoregressive conditional heteroscedasticity model) and LA-VAR (Lag-augmented Vector Autoregressive) model respectively. The results of the EGARCH model indicated no causal linkage between market volatility and growth, yet a two direction association was demonstrated between stock market volatility and inflation volatility from the LA-VAR model.

Conversely, Tuchinda (2011) also investigated the causal relationship between the stock market and economic growth in the Agricultural and the non-agricultural sector in Thailand. He used different variables to proxy both economic growth and the stock market. The study employed four proxies of economic growth, namely GDP at the current price, GDP per capita, Real GDP and Real GDP per capita. To represent stock market, Tuchinda (2011) used market capitalisation and turnover by volume. The feedback from the cointegration test revealed that the variables in question had a long-run relationship, and this causality was running from stock market to economic growth, especially in the nonagricultural sector, as per the Granger causality test.

In the same way, Odhiambo (2010) investigated the causality in the stock market-growth relationship in South Africa. He found a causal linkage between these variables, with a stronger causality running from stock market to economic growth, and valid results in the short-run as well as the long-run. His choice of the variables is similar to that of this

research. He used market capitalisation, the value of traded stocks and turnover ratio to proxy stock market development, and used real GDP per capita for economic growth. He applied an ARDL bounds testing technique with yearly data from 1971 to 2007. Causality in this study varied according to the stock market variable chosen to the proxy stock market. In the instance where market capitalisation was used, economic growth was found to Granger cause stock market development, yet this was not the case when turnover ratio and value of traded shares were used to the proxy stock market.

A recent single country time-series study by Chizea (2012), investigated the stock market – growth relationship in Nigeria. He used market capitalisation ratio to GDP (stock market size), traded shares value ratio to GDP and turnover ratio (stock market liquidity) as a proxy for stock market development, together with Real GDP per capita to proxy economic growth in Nigeria. Controlling for other factors that affect economic growth, such as government expenditure, banking sector credit activity, capital stock, trade openness and political instability as a dummy variable, Chizea (2012) used time-series data from 1980 to 2007. The study used Multivariate Vector Auto-regressive Models (VAR) as well as Vector Error Correction Models (VECM). Johansen cointegration and Granger causality tests were performed, and the finding of the tests revealed that a short- and a long-run relationship existed between stock market variables and growth. A bidirectional causality was established, stock markets Granger cause economic growth in Nigeria. Similarly, economic growth Granger causes stock market development in this country.

Similarly, Vacu (2013) assessed the long-run association between stock market development and the growth of the South African economy, using quarterly time-series data from 1990 (first quarter) to 2010 (fourth quarter). He used market capitalisation, turnover ratio and all share index as a proxy for the stock market, and GDP as a proxy for economic growth. The research employed the Johansen cointegration test and found a long-run relationship existing between the variables in the study. The short-run and long-run dynamics were also captured using the VECM. The stock markets effect on growth was found to be statistically weak. The Granger causality test revealed that causality ran from economic growth to the stock market.

It is difficult, and not appropriate, to make a conclusive statement concerning the impact of stock markets and economic growth in developing countries, as different country studies reveal different roles and relationships between stock markets and economic

growth, owing to differences in economic settings, policies and institutions, governance and political systems, to mention but a few.

3.5. Empirical research study on the case of Vietnam

To date, there have been only a few academic research studies regarding the contribution and impact of the stock market on economic growth in Vietnam (Farber et al., 2006; Leung, 2009, Vuong, 2010). One of the most likely reasons for the scarcity of studies on these issues is that the stock market is a newly born industry in Vietnam. The first stock exchange was launched in Vietnam in 2000, named the Hochiminh Stock Exchange (HSX), and the second one was in 2005, called the Hanoi Stock Exchange (HNX).

Theoretically, the stock markets provide easily accessible information; low transaction costs and efficient resource allocation so, as a consequence, boost economic growth. However, economic development requires an increase in financial services that could support the expansion and development of the financial sector, including the stock market. Therefore, after over a decade of operation, it could be said that it is time to evaluate the relationship between the stock market and economic growth in Vietnam. Moreover, Vietnam is a transition economy under the control of the single-party government. Consequently, the financial structure and management differ significantly from other economies. The findings of the analysis could support policymakers, business managers, and investors in understanding stock markets and the investment environment in Vietnam.

In fact, regarding the case of Vietnam, there are a few, limited studies on the relationship between the stock market development and economic growth. The role of the stock market in the economy in those studies has not been demonstrated clearly. For example, in a study on policy impacts on the stock market in Vietnam, Faber et al. (2006) criticise the overuse of policy tools can harm the market, such as the application of price band limits becomes irrelevant and prevents self-adjustment to the equilibrium of the market. Also, this study demonstrates the fact that Vietnam's stock market is heavily impacted by herd effect and existed anomalies stock returns in this period, but the sample for study is taken in the period 2000 – 2006, the initial time of market development in Vietnam. In another research on banking and financial sector reforms in Vietnam, Leung (2009) gives an overview of the development in the banking and financial sector which included the information on stock market development up to 2008. She states that the financial market

in Vietnam grew and diversified rapidly, although the equity market is still quite behind other countries. Besides that, for the longer-term development of the markets and financial sector, it should address the transparency problem through strengthening information disclosure and better applying corporate governance. Anwar and Nguyen (2009) apply the GMM method in examining the financial development and economic growth in Vietnam, however, the stock market is excluded in their analysis. Even though, by providing clear picture of the financial market development history which includes the stock market in Vietnam, Vuong (2010) demonstrates the deep insight of operation of the financial market, however, his study does not take into account the influences of the global financial crisis of 2008.

3.6. Conclusion

In general, both theoretical and empirical literature suggests a positive contribution of the stock market to economic growth. However, the empirical literature has exposed the divergent results on both the relationship and the direction of causality between stock markets and economic growth, especially in developing countries. The inconsistencies are majorly attributed to the country's condition, such as the policies, financial structures, investment base and so on. The policymakers exploit options that boost stock markets so as to enjoy full benefits of a well-developed stock market and, therefore, promote the growth of the economy.

There are limited country-specific studies which have been performed on the relationship between the stock market and economic growth in the case of Vietnam. Hence, it is necessary to undertake this study. The economic condition, applicable laws, regulations, and policies in the financial sector are markedly different across economies and over time. Therefore, it is necessary to investigate a single country analysis.

This study will demonstrate the analysis of the case of Vietnam, where the stock market has developed since the beginning of the 21st century.

CHAPTER 4 - OVERVIEW ON MACROECONOMIC GROWTH AND STOCK MARKET DEVELOPMENT IN VIETNAM

Theoretically, the financial system is the engine of the economy. Consequently, the stable development of the financial system is one of the contributors to sustainable economic growth. Furthermore, healthy economic development positively facilitates financial system operations. Thus, supporting the ideas of the financial system has a positive contribution to the economic growth and vice versa. This chapter will investigate Vietnam's macroeconomic situation and the performance of the economy with the existence of the stock market in Vietnam. By giving and discussing the facts and figures of the economic and stock market development in Vietnam in recent years, this chapter describes the background of the progress and the linkage between the economic growth and stock market development in Vietnam. These relationships also will be analysed and discussed further in chapters 6 and 7.

4.1. Introduction

South East Asia is a dynamic economic region where most of its members are developing economies. Although located in the South East Asian area, and one of the countries in Emerging East Asia (EEA) in terms of economic development, Vietnam's economy still has a difference to other EEA economies because of its transition from a centrally planned economy to a market-oriented system. This commenced with the political and economic reforms in 1986 that marked the turning point for the country; Vietnam has transitioned its economy from a centrally planned economy to a market-oriented system. The positive progress of the economic transition contributed to the country's high economic growth. As in the IMF's statistical source, Vietnam gained an average economic growth rate of approximately 7 % per annum between 1996 and 2000. Meanwhile, the global economy was 3.6 % per annum in the same period. As a result, Vietnam gained lower middle-income status, according to the World Bank's classification criteria in 2010 (The Bertelsmann Stiftung, 2016). Vietnam has achieved a rapid increase in income and significant reductions in poverty. The per capita income reached USD 1,755 in 2013 from only USD 437 in 1986. The population living in absolute poverty have an average per capita income of USD 1.25 a day, this population fell sharply to 16.9% in 2008 from 63.7% in 1993. Furthermore, Vietnam's government aims to achieve higher middle-income country status, with a per capita income of at least USD 3,000 and significant

improvements in human development and poverty reduction by 2020 (Asian Development Bank, 2014).

Together with the stable economic growth, the financial system is gradually being strengthened and improved in its structure and functions, by such means as the reform of the banking system, the birth of the insurance market and the stock market. Vietnam's government has put considerable efforts into developing the capital markets, which includes the stock market, to secure sufficient stable and long-term capital for sustainable development. The stock market is an important part of the capital market. In over 15 years of operation, Vietnam's stock market is still at its early stage of development. To analyse to what extent and how it contributes to the economic development in Vietnam and vice versa, this chapter will investigate the economic growth situation in Vietnam regarding the existence of the stock market.

The chapter will be organised as follows: The introduction is in section one. Section 4.2 will give an overview of the macroeconomic situation in Vietnam. Section 4.3 will then discuss the role of the financial markets in Vietnam's economy. Section 4.4 will examine, in detail, the stock market development in Vietnam in the linkage with macroeconomic development and economic growth. The chapter's conclusion is in Section 4.5.

4.2. Macroeconomic Overview in Vietnam

This section will review the economic growth with the presentation of the stock markets development in Vietnam. The macroeconomic situation of Vietnam will be discussed in two periods 1986-2000 and 2001-2015. The breaking point is the year 2000 when the first launch of the stock market in Vietnam occurred.

4.2.1 The period from 1986 to 2000

This period is the time since Vietnam started to reform the economy by implementing the renovation program called 'Doi Moi' – from 1986 when the country tended toward the market-orientated economy, to the time the stock market was born in 2000.

The year 1986 marked a major change in the economic system. Launching the 'Doi Moi' program, the government announced a transition of the economic mechanism from a socialist economy, adopted a decade earlier under the Soviet-style model, to a market-oriented economy. The former model is the model with state ownership of industry, collectivisation of agriculture and handicraft sectors, a state monopoly on trade and a

central plan for allocating inputs and outputs and fixing prices (Riedel, 2015). The latter model has greater reliance on the market and increases the participation of the private sector (World Bank, 2014).

Moving toward the market-oriented economy from central planning, Vietnam's government launched several key reform policies that laid the basis for stable growth and significant reductions in poverty, such as agricultural reform, tax reform, price reform, banking reform and developing and diversifying the market participants and ownership. Consequently, Vietnam's economy has begun to achieve considerable progress in the 1990s when the annual average growth was 7.4%.

In this period, with over 80% of the population in work, the agriculture sector dominated contribution to the economic growth of the country through the incentive to grow more crops and by the creation of the markets for the agricultural products where the farmers could sell their products at the market price. In 1989, Vietnam became the third largest rice exporting country in the world (Q. H. Vuong, 2014).

Equally impressive is the substantial reduction of poverty in Vietnam. The percentage of the population living below the poverty line has been reduced from well above 50% to below 30% in the period 1993-2002 (Camen, 2006). In 1993, 58% of the population lived in poverty, compared to 37% in 1998. This implies that more than a fifth of the total population was lifted out of poverty in five years.

Regarding international trade, under the *'Doi Moi'* programme there were significant changes in trade policy. The government eliminated the state monopoly in trade in 1988 and replaced the import quotas with tariffs (Riedel, 2015). The expansion in export directly contributed to the country's economic growth. Between 1989 and 1997, the exports value in US dollars increased sevenfold (Van Arkadie and Mallon, 2003). However, together with the positive impact of changing trade policy, during the late 1990s the country was also influenced by international economic volatility, including the Asian financial crisis in 1997-1998. Even though Vietnam's economy had the least impact from the 1997-1998 financial crisis in comparison with other economies in Asia, due to its less internationally integrated economy in this period and not yet having the existence of the stock market, the country could not avoid some negative effects. In fact, in the mid-1990s, the macroeconomic performance worsened in some countries in Asia, up to the trough of 1997-1998 when the financial crisis occurred (Corsetti, Pesenti, and Roubini, 1999).

Then, the Asian financial crisis, with the wide volatility in the exchange rates, directly impacted on the exports and imports of Vietnam, followed by the current account and economic growth of the country.

In 1987, a Foreign Investment Law was introduced, which officially permitted and regulated foreign direct investment (FDI) flow in Vietnam. The launching of this new law on foreign direct investment (FDI) helped create a surge in foreign capital inflow to the country and was recorded at 10% of GDP in 1994 (Q. H. Vuong, 2014). Meantime, as per the report of Poverty Reduction and Economic Management Unit and East Asia and Pacific Region of the World Bank (1999), regarding the FDI proportion to the size of the economy, Vietnam was the biggest FDI recipient among developing countries and transition economies. This capital resource contributed to the achievement of the country's economic reform (Q. H. Vuong, 2014). However, the system of international trade and investment was considered to be towards protecting the state-owned sector, with the result that 99 % of FDI was in the form of joint ventures with state-owned enterprises (Riedel, 1997).

Under Vietnam's central planning system, the government subsidised and financed the state enterprises. In the case of state enterprise deficits, the central bank had a responsibility to print money to cover the enterprises' losses. Subsequently, the inflation from 1980 to 1985 rose to an annual average of 165 %, soaring to 487 % in 1986, with deleterious social and economic effects (Riedel, 2015). The hyperinflation situation forced the government to raise interest rates and issue bonds. Consequently, it created an incentive for saving from the public, thus reducing the money in circulation and the inflation pressure on the economy. As a result, inflation was reduced from triple digits in 1986 to double ones in the 1990s.

The transition to the market-oriented economy also marked the turning point of the banking system's development. Firstly, in early 1990, Vietnam transformed its banking system into two tiers from the one-tier system. In the one-tier system, there was only the central bank (State Bank of Vietnam – SBV) in the banking system. However, in the two-tier system, the SBV functions as the central bank and the other banks and financial companies operate the commercial banking activities (Dang-Thanh, 2012). Secondly, the domestic operation of the banking system became more competitive and diversified by the increased participation of the many joint-stock commercial banks (JSCB), joint venture banks (JVBs) and foreign bank branches (Table 4-1). However, in this period, the

state-owned banks (SOBs) still maintained their domination in capital size and banking services.

Together with the banking system, in the late 1980s, the financial market had the participation of the People's Credit Funds (PCFs) which operate similar to the commercial banks but on a smaller scale. This type of institution is located throughout the country by the local geographic coverage such as district, ward. However, for many reasons, the PCFs did not exist for long. Some of these reasons that led to a chain-collapse of the PCFs in 1991-1992 were the weak professionalism, risky capital structure, and a lack of a sufficient risk cushion of equity (Q. H. Vuong, 2004). The massive collapse of PCFs also worsened the public confidence in the financial system after that. Hence, this situation forced the government to revise its plan of reforming the financial sector. As a result, the Law on the State Bank of Vietnam, and Law on Credit Institutions were approved in 1997 to regulate the operation of the banking sector. Also, the government considered the preparatory steps to develop the long-term capital market.

Table 4-1 Number of Banking Institutions in Vietnam in 1991 – 1999

Bank	**1991**	**1993**	**1995**	**1997**	**1999**
State-owned Bank	4	4	4	5	5
Joint Stock Bank	4	41	48	51	48
Joint Venture Bank	1	3	4	4	4
Foreign Bank Branch	0	8	18	24	26
Total	**9**	**56**	**74**	**84**	**83**

Source: State Bank of Vietnam (Dang-Thanh, 2012)

In this period, the private sector expanded through the establishment of new private enterprises and the equitisation process. As a part of the State enterprise reform program, "equitisation" in Vietnam started with a pilot program in 1992 (Webster and Amin, 1998). The Prime Minister launched the State enterprise reform program in mid-1992. This program called for transformation on a "voluntary basis" and focused on a limited number of medium-scale, non-strategic SOEs, that were either viable or potentially viable, into joint-stock companies (JSCs).

In the 1980s-90s, state-owned enterprises (SOEs) were the backbone of Vietnam's economy. They enjoyed enormous privileges but were largely inefficient in performance.

Therefore, restructuring of SOEs to become more efficient and competitive has been an important and urgent issue of Vietnam's economic reform. Also, in the restructuring process, without addressing the ownership issue, the motivation for these SOEs to become transparent, productive and competitive would be significantly constrained.

The terminology "equitisation" is used rather than "privatisation" because, normally, the state retains a large stake in most of the equitised SOEs and only a limited amount of their shares is sold to private investors. However, "equitisation" and "privatisation" are not clearly different in practical terms (Hiep, 2017).

Objectives of this equitised program in this period are:

(i) transformation of non-strategic small and medium-sized State enterprises into JSCs in order to mobilise capital from employees and outside investors for renewing technologies and developing enterprises; and

(ii) creation of conditions for enterprise employees and outside investors to own shares, play the role of real owners, and give new impetus to enhancement of each enterprise's business efficiency.

The equitisation process was to be done through acquisition of shares by enterprise employees based on preferential terms, by domestic private and public investors, and by foreign investors (with the proviso that this latter group's participation had to be approved by the Prime Minister). Finally, the companies so formed would be governed by the Law on Companies.

Year	**Number of Equitised Company**
1992-2000	558
2001-2002	253
2003	622
2004	856
2005	813
2006	359
2007-2010	223
2011	60
2012	13
2013	66
2014	143
2015	213
2016	55
2017	37
Total	**4271**

Source: Enterprise Innovation Unit (2017)

Disappointingly, nearly three years later, at the end of 1995, the total number of equitised SOEs stood at just five (Webster and Amin, 1998).

In the late 1990s, the equitisation process grew stronger with many favourable policies from the government to the equitised enterprises, such as income tax and credit priority. According to the source of the statistics of the Ministry of Finance, only 123 state-owned enterprises were equitised during 1992-1998. Significantly, this figure was more than doubled to 253 companies in 1999 alone. However, Vuong (2004) emphasises that this number looked impressive, but the actual situation was not promising. This is due to the total value of these equitised state-owned enterprises (SOEs) being only 2.93% of the GDP, and the large SOEs being considered as the generative money machines for the state budget which had not been reformed and equitised, such as Vietnam airlines and four SOBs.

4.2.2 The period from the year 2001 to 2015

From 2001-2006

During the 2001- 2006 period, Vietnam continued its integration into the world economy with the signing of a bilateral trade agreement with the US in 2000 and becoming a member of the WTO in late 2006. It experienced an economic boom with expanding financial markets, GDP averaging at 7.5%, low inflation averaging at 4.5%, surging FDI inflows and a faster pace of SOEs privatisation. The economy was ranked at 58th largest in the world in 2006 and was considered to be a little tiger economy in Southeast Asia (GSO, 2011; UNCTAD, 2008).

The stock market was established in July 2000 with a capitalisation of less than 1% of GDP by the end of 2000 and rising to 22.7% by the end of 2006. In 2006 VN-Index rose 150%. The stock market was considered a ‘money machine’ from 2006 to early 2007, and this triggered huge market bubble risks in Vietnam.

However, the heavy reliance on economic growth and on overconsumption of physical assets or/and capital endowments, without the main emphasis on innovation and productivity, deteriorated competitiveness. The incremental capital to output ratio (ICOR) of Vietnam was high, at 7-8 times, compared to other Southeast Asian economies of 3-4. Investment to GDP rose from 4.9% (from 1996 to 2000) to 39.1% (2001-2005) to the staggering 43.5% (2006-2010), showing its propensity to consume more resources while seeking growth.

Vietnam was successful in reducing the poverty rate from 28.9% in 2002 to 18.1% in 2004 and 15.5% in 2006 (GSO, 2011). Inflation was kept under check, with average CPI in the period at 4.5%, a remarkable achievement as inflation has always been a chronic disease of the post-*Doi Moi* period.

The US-Vietnam BTA (Bilateral Trade Agreement), Vietnam entering the WTO in 2006, political and social stability, and prospective economic growth contributed to make Vietnam an attractive destination for FDI. FDI started to recover from the US$3.2 billion registered capital in 2003 to US$12 billion in 2006, generating growth and employment.

Progress in SOEs privatisation was witnessed in the 2002-06 period with 2,813 enterprises privatised, compared to a handful in the 1990s, 60 in 2011, and 16 from 2012 to the first quarter of 2013 (Bao Hai Quan, 2013).

From 2007-2015

After two decades of growth, the economy started to slow down in the late 2000s. The SOE dominance model has shown sizable problems including poor efficiency, corruption and crony capitalism. There are several macroeconomic issues, namely high inflation, budget deficit, a declining foreign exchange reserve, mismanaged fiscal and monetary policies, high unemployment and sluggish commercial activities.

The stock bubble burst in 2009 due to Vietnam's unstable macroeconomic condition, two-digit inflation in 2008 and the overspill effect of the global crisis. The VN-Index went down to less than 250 in February 2009 from the peak of 1170 in March 2007; it has never regained the expected 600-point level that experts, policymakers and investors had desperately looked for, while the downtrend became unavoidable in mid-2008 (Pham and Vuong, 2009). The interconnectedness between the stock market, money market and properties market led to accumulated complexities. Stock investors' realisation of capital gains from skyrocketing stock prices and purchase of properties led to a boom in the real estate market from 2007 to 2010. The subsequent free fall in the real estate price from the first half of 2012, by almost 30% in 2012Q2 and another 30% in 2013Q2 panicked all speculators and developers. It is reported that VND 108 trillion ($5.1 billion) worth of real property become non-tradable in the second quarter of 2013 (Vietnamnet, 2013).

Given half of the bank credit going to the real estate sector, the banking sector immediately suffered from the falling housing price (Hong Suong, 2013a). Non-

performing loan accumulation hindered credit flows to the economy and dragged production, businesses and consumption into a slowdown. The government issued a stimulus package of US$8 billion in 2008 and 2009, which helped temporarily back GDP growth at 6.78% in 2010 before the inflation threat realised in 2011. The growth rate fell to a 13-year-low level of 5.03% in 2012 (Nguyen, Nguyen and Nguyen, 2010). There were 100,000 firms (20% of the enterprise population) pushed out of business from 2011 to 2012 due to the recession (Vuong, 2012). The Consumer price index (CPI) only slowed down in recent years as a result of falling domestic demand.

State-owned enterprises, in their dominant role in Vietnam's economic development, have shown increasing problems of crony capitalism, interest groups and corruption. The state sector only creates 10% employment but consumes 70% of total social investment, 50% of total state investment, 60% of commercial credit, and 70% of ODA (BBC, 2013).

Year	Key activities	Impact
1986	Start the economic reform program call 'doi moi',	Aim to develop the socialist-oriented market economy from the central-planning economy.
1987	Implement a 2-tier banking system	Separate the function of the central bank and the commercial and investment banks.
	Launch Foreign Investment Law	Provide a legal framework and regulate the foreign investment activities
1992	Launch the 'Equitisation' program	Begin to privatise the state-owned enterprises to the joint stock companies.
1995	Join the Association of Southeast Asian Nations (ASEAN) US-Vietnam relation normalisation	Improve the relationship with countries other than the former socialist countries
1997	Launch Bank and Credit Institutions Law	Provide a legal framework on banking system operation
2000	Operate the first stock market in Hochiminh City	Provide the facility and officialise the share trading to public investors
2005	Operate the second stock market in Hochiminh City	Support small and medium-size enterprises to access the public investors
2006	Join the World Trade Organisation US-Vietnam Bilateral Trade Agreement	Expand the economic integration

2006	Launch the Securities and Securities Market Law	Regulate the operation activities on securities and the securities market
2011	Amend the Securities and Securities Market Law	Revise the legal framework in securities and the securities market to adapt to the international standard

4.3. Overview of Financial market development in Vietnam

4.3.1 Banking sector and the Money market

Banking sector

The banking sector in Vietnam, as in other emerging economies, is the most important financing source of the economy. However, the banking sector's intermediation function is inefficient and constrained by its weak balance sheet and under-capitalisation issue. Joint stock commercial banks (JSCBs) had greater importance but were unable to break the dominance of state-owned commercial banks (SOCBs). The market share of SOCBs since 2007 has hovered slightly above 50% as these entities continue to provide directed and often subsidised credit to select industries. These loans often support the immediate cash needs of less productive enterprises while crowding out the legitimate credit needs of the private sector. For example, preferential loans to SOEs accounted for over three-quarters of the Vietnam Development Bank's assets in 2009. Easy terms, limited disclosure requirements, and weak supervision seem to have made financing through the State Capital Investment Corporation (SCIC), Vietnam Development Bank, and other commercial banks more attractive to SOEs than other channels (OECD, 2013).

Compounding this problem is the proliferation of NPLs, which is attributed to several reasons, including: (i) rapid lending growth through the 2008 global financial crisis, followed by a credit squeeze in 2011, (ii) a decline in real estate prices by roughly 60% from their 2009-2010 peak level, (iii) a stagnating economy, and (iv) poor performance by some highly leveraged SOEs (about 53% of NPLs are from state-owned enterprises). Governance weakness of JSCBs has reportedly contributed to this problem, with loans requested by major stockholders to high-risk projects in which they have commercial interests. In turn, NPLs have had a negative impact on bank credit provided in recent years. While most experts believe that NPLs in the banking system is high, there is a great deal of uncertainty whether the actual level is be even higher. Given the banking sector's importance as a backbone of Vietnam's economy, it is vital to enhance the transparency of NPLs and bolster efforts to lower them to a more sustainable level. Liquidity risk is

elevated, along with a large structural maturity mismatch when virtually all of the commercial sector's long-term credit needs are funded through short-term bank deposits. Also, commercial banks in Vietnam are quite small, with the total assets of the ten largest banks averaging only VND 285 trillion (US 13.7 billion dollars) in July 2012, compared with $60 billion in Indonesia and $66 billion in Thailand. Concerns are also raised about the valuation and liquidity of collateral, given sharp declines in real estate prices. These banking sector risks are worsened by a weak regulatory and supervisory framework and deficient infrastructure.

Foreign investment plays a critical role in meeting the banking sector's recapitalisation needs, together with bringing about improved corporate governance, and transfers of skills and technology. Although foreign investment into the domestic banking system has been accelerated, with restrictions being loosened, interest from strategic investors are still discouraged by limits on foreign ownership and other regulations.

In the context of rising banking sector risks, the State Bank of Vietnam (SBV) requested the IMF and the World Bank to conduct a Financial Sector Assessment Program (FSAP) to assess the current situation of the financial sector and put forward recommendations on overcoming financial sector weaknesses. Moreover, the IMF's 2013 Article IV Consultation with Vietnam confirmed that part of the banking system is undercapitalised, under-provisioned and has low profitability. Moreover, the cross-ownership among banks and between banks and enterprises situation warrants attention and efforts to resolve and prevent the contagion risk. A good understanding of the state of the financial system was hindered by data limitation and challenges in the regulatory and supervisory framework. Executive Directors of the IMF encouraged Vietnam following the steps recommended by the FSAP to improve the banking system's health. In particular, measures should be put in place to recapitalise banks, strengthen banking supervision and regulation, and implement the workout scheme for NPLs. Strengthening credit risk analysis, governance and transparency should continue to be prioritised.

Money market.

Vietnam needs to grow its underdeveloped and segmented money market into a deep and well-functioning money market which would enable (i) financial institutions to match short-term assets and liabilities, (ii) security dealers to finance their inventories and to make two-way markets, (iii) corporations to smooth out working capital needs, (iv) the

central bank to implement more effective monetary policy, and (v) the market to price financial instruments based on short-term benchmark rates.

Considerable declines have been observed in interbank lending volumes since the end of 2001, with terms shortened to less than three months. The number of active interbank players also dropped between 2011 and 2013, with banks tending to trade within the same tier group. This contraction and segmentation is a matter of excess liquidity when commercial banks become more cautious about the health of other banks. Traditionally, a large part of interbank transactions takes place on an unsecured basis; larger SOBs, though holding excess liquidity, have limited investment opportunities. Based on the 2013 July money market survey, the repurchase agreement market is growing but is still small and limited to transactions between the SBV and commercial banks, while bank borrowing from SBV has increased exponentially since 2008.

The money market remains volatile and unstable, albeit with high liquidity, as evidenced by quotations in the interbank market which are mostly one-way price or with wide bid-offer spreads. Declining activity seems to have been exacerbated by regulations and a lack of confidence in the policy setting. For instance, in 2012, the SBV introduced risk provisioning requirements on interbank lending. It also required the application of the standardised agreements and prohibited lending to banks having overdue interbank loans. However, these requirements had to be relaxed several months later. While agreeing, in principle, with the need for intervention, market participants suggested that the interbank market would function more efficiently and develop further if these weak banks were left to fail and stronger banks were allowed to operate under a more flexible regulatory framework.

In order to prepare for the money market to fully perform its key functions, several issues may need to be solved. For example, reliable qualitative credit assessments are difficult to obtain, which worsened doubts about the creditworthiness of counterparties. Moreover, the lack of standardised agreements, such as for repurchase agreements, and risk provisioning requirements for interbank loans with terms more than three months provide a disincentive on such transactions due to lower profit margins. There is also a lack of sufficiently detailed statistics, and it is not optimal to use the Vietnam Interbank Offered Rate as a reference rate since it fails to fully reflect market conditions. After the London interbank offered rate scandal broke, many foreign banks exited from the interbank

market, and quotations provided by domestic banks are not regulated. Settlement netting of Treasury bills had not been formally recognised until recently.

4.3.2 Securities Market

4.3.2.1. Bond market

The bond market is showing some encouraging signs. At the end of December 2013, total local currency bond outstanding grew by 15.6% year-on-year to 606 trillion VND (equivalent 28.7 billion USD), marking the first time that the amount has topped the 600 trillion VND. In fact, in the fourth quarter of 2013, Vietnam was the most rapidly growing local currency bond market in emerging East Asia on a quarterly basis, due exclusively to government issuance.

Nevertheless, Vietnam remains one of the smallest markets in the region. The total local currency bond market amounted to 16.9% of GDP in the fourth quarter of 2013, well below the overall emerging East Asia average of 56.6% (Asian Development Bank, 2014). The primary government bond market is regarded by stakeholders as rudimentary and cumbersome. Until recently, issuance adhered to an inflexible reading of government decrees without regard to a wider capital market development agenda. Issue sizes have also been small, which created problems for investors, depositories, regulators, and exchanges.

Moreover, public financial management needs further strengthening. A broad assessment of the country's public financial management systems shows that existing legislation and guidelines provide a comprehensive legal platform. However, there remain weaknesses at various points in the public financial management cycle, particularly budget coverage, internal controls (especially at the subnational level), and legislative oversight of the public financial management. The government has implemented neither a Treasury Single Account (TSA) nor liquidity forecasting, which has led to inefficiencies in the management of cash balances and higher-than-necessary borrowing costs.

Furthermore, a rigid mechanism to manage basic dong-dominated interest rates seems to have driven primary issuance to the area of the yield curve, where the government might have success, rather than focus on a longer-term projection of the government's financing needs or a view of the optimum composition of the government's financing profile. As a result of these limitations, the government debt maturity profile has become highly skewed to the short term, which prevents a long-term yield curve from emerging and

represents an elevated refinancing risk given the region's increasing exposure to capital flight. For instance, by December 2013, 68% of the government's outstanding local currency debt was due within 1-3 years.

Secondary market trading is subdued, with only 40% of listed bond codes being traded in 2010. Despite some tightening of spread[6] in 2013, Vietnam continues to exhibit the widest premium. Bond transactions have been executed through an equity styled trading platform, which relies on brokers active as put through agents for the transaction input. This oligarchic environment for debt trading, built around securities companies who appear to add little directly to bond or money market development, serves as a barrier to entry. Government bond ownership is also concentrated, with the four largest SOBs holding around 65% of total outstanding bonds, usually until maturity.

Although a possible alternative for bank financing, the corporate bond market remains severely under-utilised, with the most recent local currency corporate bond issuance occurring in October 2012. Corporate bonds outstanding declined to $0.7 billion (0.4% of GDP) in December 2013 from $1.1 billion (0.7% of GDP) in December 2012, continuing a trend that began in March 2011. The market remains highly concentrated – with the 15 largest issuers being responsible for all corporate bonds outstanding – and liquid, as illustrated by high bid-ask spreads.

Supply has been limited by the availability of directed credit from SOBs. At the same time, investor appetite remains low due to depressed market conditions, elevated credit risk in the private sector, and the shortage of reliable credit information. Most corporate bonds are unrated as there are no domestic credit rating agencies. Similarly, outstanding municipal bonds, which have a relatively long history in Vietnam, represented only 0.3% of GDP at the end of 2012.

Unit: trillion dongs

[6] The difference of bid-ask price.

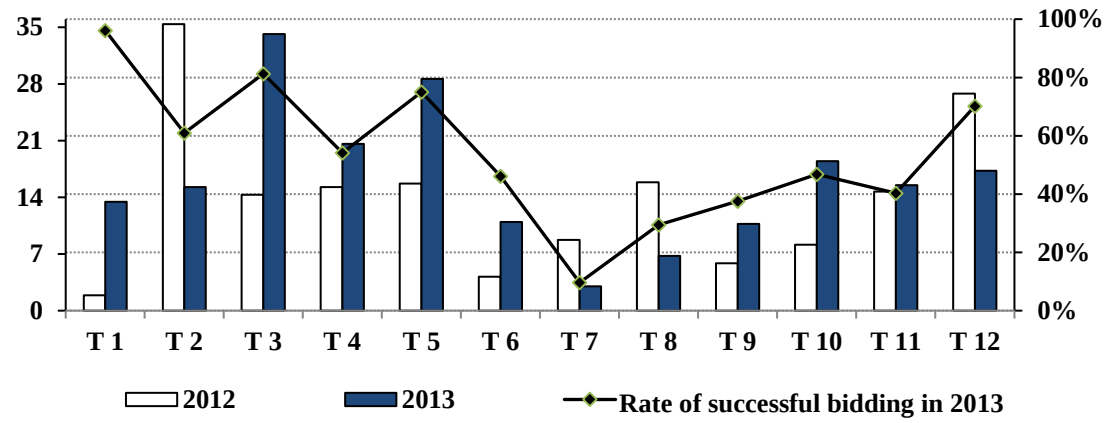

Figure 4-1 Government Bonds: Issuance value and Successful Bidding Rate in 2012-13

Source: HNX

4.3.2.2. Equity market

By reaching 25.2% of GDP in 2007, Vietnam's combined stock market capitalisation far exceeded the government's initial target of 10% by 2010. While most regional equity markets recovered quickly after the global financial crisis, Vietnam has yet to reach this level again. A stock market capitalisation of 21% of GDP in 2012 – 4 percentage points under the 2007 peak and lagging behind regional comparators – underscores its potential to catalyse future economic growth, particularly since newly issued equity can be leveraged.

Regarding market structure, there are two stock exchanges. The Hochiminh Stock Exchange (HSX) began operations in 2000 with just two listed companies. In 12 years, HSX has grown to 308 listed stocks.

Despite the equitisation process that turned many large state-owned enterprises into joint-stock companies with limited liability, many of them have not yet been listed. Although reform led to a significant reduction in the number of SOEs, it neither had any clear impacts on the reallocation of state resources nor created any big change in the state's role in a market economy for the remaining SOEs, many of which are large in size, complex in operation, and weak in performance. Large general corporations (or conglomerates) have mostly converted into holding companies, or, in a few cases, economic groups have only recently begun the transformation process. This has resulted in a stock market that is dominated by a large number of small companies. Annual reports show that the 704 listed companies on the HSX and HNX had a cumulative stock market

capitalisation of D156 trillion ($7.5 billion) in December 2012. While 535 of these listed companies had a stock market capitalisation below 10 million USD, the top 10 accounted for nearly a third of total stock market capitalisation. The number of newly listed companies at HNX has dropped significantly from 104 in 2010 to 14 in 2012. Moreover, when excluding Lam Thao Fertilisers and Chemicals JSC, the average market capitalisation of companies newly listed on HNX was, at 3 million USD, significantly lower than the average of 8.2 million USD in 2009-2011.

4.4. Stock market development and economic growth in Vietnam

4.4.1 Stock market for the demand of economic development

The transition process to the market economy in the late twentieth century has not only facilitated, but also set out, the need to build up and develop the stock market in Vietnam. In the 1990s, the primary target of the 10-year Socio-Economic Development Strategy for the period 1991-2000 was industrialisation and modernisation the country. Thus, the demand for capital resources for the industrialisation and modernisation process was pressingly increased in the whole economy. Also, since moving toward a market-oriented economy, the government no longer subsidised and provided capital for the state-owned enterprises. It forced those enterprises to raise funds by borrowing. The evidence of Biger et al. (2008) on the capital structure of 3,778 companies in Vietnam for a period of 2002-2003 suggests that Vietnamese enterprises rely mostly on short-term bank loans rather than equity since the stock markets were nascent. Besides that, the banking system which dominated the state-owned banks during this period could not meet the increasing credit demand from Vietnamese enterprises, especially the long-term finance. More so, to avoid the scenario of collapse, which happened to the People's Credit Fund system in 1991-1992, banks were more careful in making loans and applied the risk management requirements. Hence, the economy required other forms of financing besides the banking sector.

Furthermore, in the late 1990s, the economy required a market for transferring the enterprises' ownership and facilitating the offerings since the equitisation process became deeper and stronger. Since the first half of the 1990s, Vietnam has started attracting foreign direct investment; there were about seven foreign investment funds with a total capital of approximately $US 500 million. By the end of the 1990s, there was a decline in that figure, partly from the impact of the Asian financial crisis at this time, and partly due to the lack of a market for capital transactions and transfers.

Although facing many difficulties in the economic and social context of development in the 1980s and 1990s, Vietnam had carried out a comprehensive reform program. The transformation from the centrally planned to the socialist-oriented market economy is to meet the target of the social and economic development of the country and realise the industrialisation and modernisation process. However, one of the urgent issues that needs to be addressed is the need to adopt policies to mobilise all domestic financial resources and attract foreign capital in various forms. Thus, the development of the stock market is an indispensable requirement in the context of the country's development.

4.4.2 Launching Stock Markets in Vietnam

Hochiminh Stock Exchange

As a part of financial system reform in the renovation – the *'Doi moi'* program - the Vietnamese government prepared to establish the stock markets in Vietnam. The preparation concentrated on building the key regulatory framework for the existence and functioning of the stock market and establishing the first trading floor in Hochiminh City, which is considered to be the dynamic economic and commercial centre of the country.

Thus, on the 28th July 2000, the first trading session in the Hochiminh Securities Trading Center[7] was operated. In this initial stage of development, there were only two listed companies (Refrigeration Electrical Engineering Joint Stock Corporation (REE) and Saigon Cable and Telecommunication Material Joint Stock Company (SAM) with the market capitalisation approximately 0.28% of GDP in 2000. However, by the end of 2015 there were 307 listed companies on HSX with a market capitalisation of around 1,147 trillion VND (equivalent 50.5 billion USD).

Hanoi Stock Exchange

In March 2005, a second trading floor was officially opened in Hanoi known as the Hanoi Securities Trading Center (HaSTC)[8].

At first, the HaSTC set up and put into operation a stock auction system in March 2005. This auction system is specialised for the stock auction of equitised and foreign-invested enterprises which have transformed to Joint-stock companies. Also, the auction price is

[7] This Trading Center was upgraded to the Stock Exchange in 2007 called Hochiminh Stock Exchange (HSX)
[8] This trading center was also upgraded to the stock exchange called HNX in 2009.

formed under the market mechanism. The stock auctions of equitised companies in the trading centres support the acceleration of the reform of SOEs and ensure that the sale of state-owned capital is carried out publicly. Also, a transparent and fair auction mechanism attracts a large number of investors to participate in the stock market, contributing to promoting market development in the country.

Besides the stock auction system, the secondary trading system of the Hanoi Securities Trading Center has officially been in operation since July 2005 for unlisted companies under the negotiation trading mechanism, it then added the matching mechanism in |November 2005. Also, in 2009, HaSTC launched the Unlisted Public Company Market (UPCoM) board, on which the unlisted public companies can register their shares to be traded publicly.

There were six listed companies on the main board with a registered trading value of more than 1,280 billion VND in the initial period of 2005. By the end of 2012, HaSTC reported that there were 396 listed companies, 448 listed government bonds, 18 listed treasury bills, and 132 registered over-the-counter stocks at the UPCoM. There were 105 securities companies and 47 fund management companies, with 1.3 million active and inactive investor accounts. However, one of the many challenges to address is the overall poor health of securities companies, with 70% of them reporting accumulated losses in the third quarter of 2012 (SSC, 2014).

4.4.3 Stock Market Development in Vietnam

The Vietnamese securities market has become an important capital mobilisation channel for the economy. It has facilitated the Government and enterprises to raise capital for development investment and expansion of production and business and become the main distribution channel for the issuance of government bonds, raising capital for the state budget. Since its establishment, the securities market has mobilised more than VND 2,000 trillion. Notably, only during 2011 to 2016, the mobilised capital via this channel reached VND 1,500 trillion, five times higher than that in the period of 2005-2010 and contributed an average of 21% of the total investment capital, equivalent to 50% of the credit supply by the banking system to the economy (SSC, 2016).

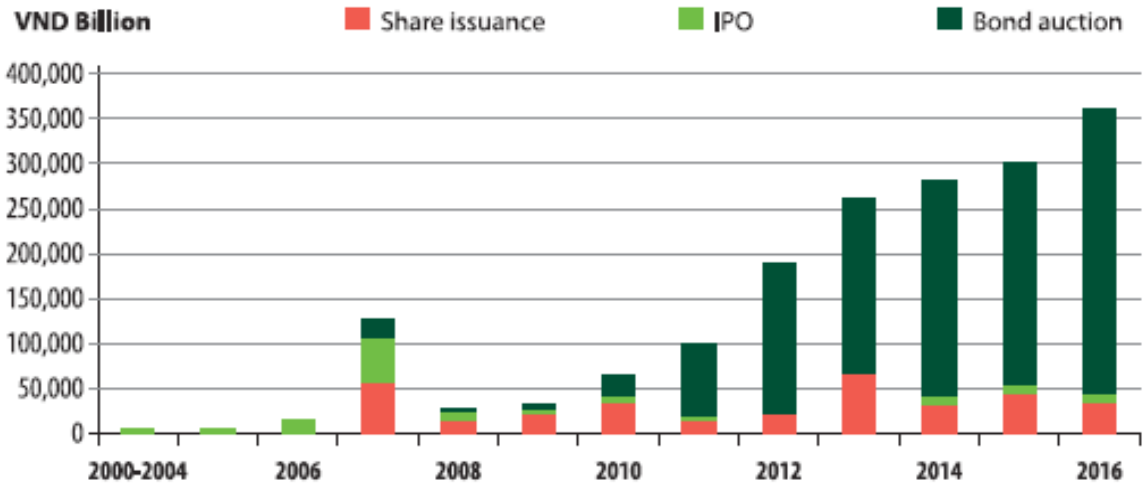

Figure 4-2 Capital Mobilisation through the Vietnam Securities Market

Source: SSC (SSC, 2016)

Together with the increase in the number of listed companies, the market capitalisation has grown tremendously (see Figure 4-3). The Vietnam Securities Market has been attracting more and more companies to list/ register for trading. from just two listed companies in 2000, by the end of 2016 there were 697 companies listed on the two exchanges, and 417 companies registered to be traded on UPCoM. This has contributed to narrow the OTC market, promoting the development of the organised market to increase transparency, professionalism and investor protection.

Also, since its opening with only two listed companies and a market capitalisation of VND 986 billion, equivalent to 0.28% of GDP in 2000, so far, the capital mobilisation through Vietnam securities market has reached nearly VND 1,947 trillion in 2016, increased roughly 2000 times, and 2.7 times compared to 2010. The market capitalisation reached over 43% of GDP in 2016. The average trading value of the whole market has risen to the highest level ever, reaching 6,900 billion VND per session.

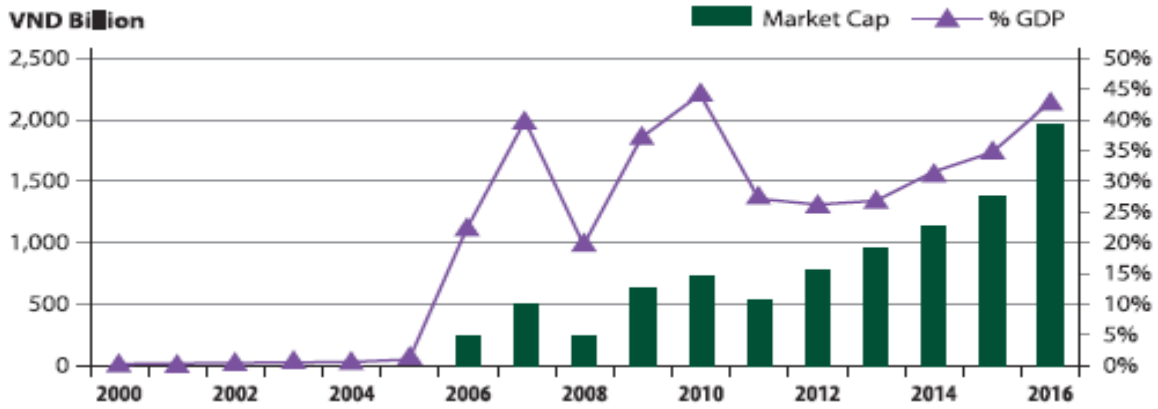

Figure 4-3 Market Capitalisation of the Vietnam Stock Markets

Source: SSC (SSC, 2016)

The market organisation and structure are continuously upgraded and developed. The two stock exchanges and the securities depository centre have carried out the functions of trading, depositing, settling and transferring securities smoothly and safely. Besides that, the securities business organisations have become financial intermediaries between investors and the market and positively contributed consultant services to equitisation, underwriting, merger and acquisition, and corporate restructuring activities. Even though, between 2012 and 2016, the number of securities companies has fallen by 25% (from 105 to 79 companies), the quality of their services have been improved, and the financial assurance standards upon Basel II, principles for corporate governance, risk management and early warning criteria on their performance according to CAMEL standards have been applied.

The Securities Market actively promoted equitisation and SOEs reform, enhancing the public supervision of business operations. In 2016, the total mobilised capital through equitisation has reached nearly 100 trillion VND, thus speeding up the restructuring of SOEs by associating equitisation with listing and trading registration. The securities market also actively supports the process of restructuring the banking system, helping commercial banks raise charter capital and transparency.

The market also builds large investor bases, including domestic and foreign investors. While the foreign investment flow tends to withdraw from many emerging markets, the Vietnam Securities Market remains an attractive destination for foreign investors. Net foreign capital inflow in 2016 was the highest for the past eight years. The number of

investor accounts had increased steadily, from around 3,000 investor accounts when the market was opened in 2000, to 1.7 million accounts at the moment, up 590 times from 2000; the number of foreign investors has also increased by 2.4 times since 2007, mobilising about 17.3 billion USD of indirect investment capital, contributing to the growth in scale of social investment capital and promoting economic growth.

Finally, the regulatory framework for the securities market has been completed. The first and highest legal document, Decree No. 48/1998/ND-CP on Securities and Securities Market, issued by the Government on July 11th 1998, and the Law on Securities, issued in 2006, have contributed to the completion of regulations in the legal system of the Securities Market, creating a big advance in improving the transparency of the market. Up to now, the legal framework has been built comprehensively for the market structure system from the primary market to other advanced ones of the Derivatives Market, contributing to improving the public transparency of the market, improving the effectiveness of management, monitoring and enforcement activities by regulatory authorities; step by step, in accordance with the legal system and international practices, laying the foundation for Vietnam's Securities Market to integrate into international and regional capital markets.

The stock market in Vietnam was established due to the requirement of economic development. Over 15 years of operation, stock markets have realised certain achievements as well as difficulties and limitations that needed to be contained. The stock market development in Vietnam can be divided into three periods: (i) constructing period from 2000 to 2005, (ii) developing from 2006 to 2010, (iii) restructuring period from 2011 to 2015.

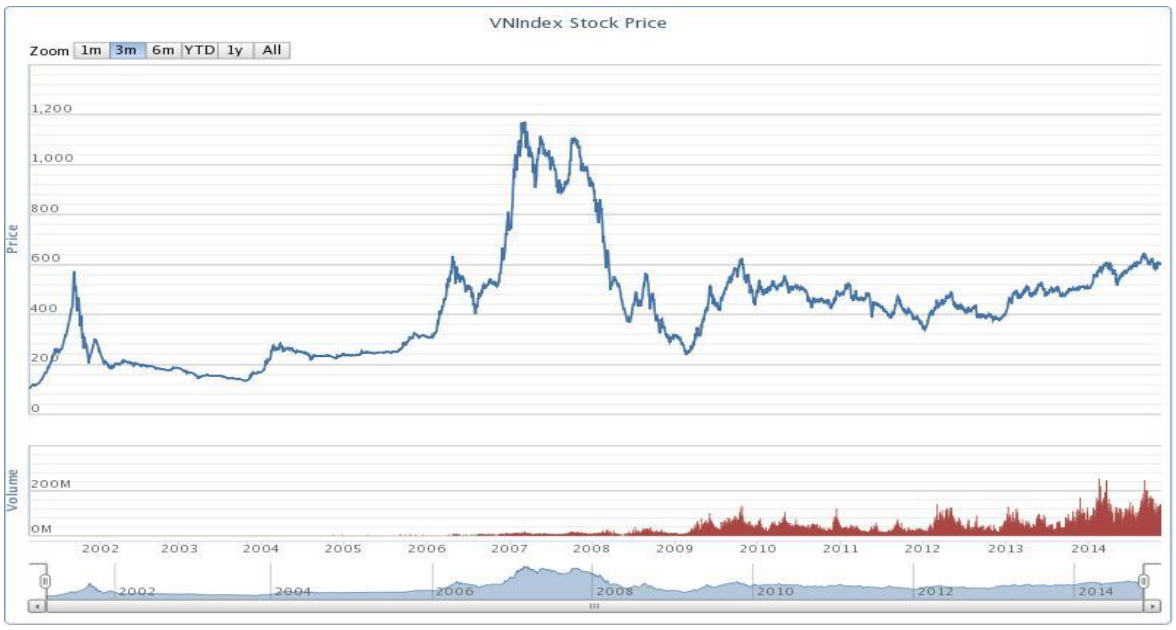

Figure 4-4 Vietnam's Stock Market Index and Trading Volume 2000-2014

(Source: SSC)

(i) Constructing Period of 2000 – 2005

The establishment of Vietnam's stock market marked the formation of a new, long-term capital mobilising channel and accelerated the equitisation process of SOEs. However, in the constructing period 2000-2005, the stock market did not attract public attention for several reasons:

First, the legal framework which regulates the stock market is not synchronised and lacksenforcement.

Also, listed companies have gradually become acquainted with the information disclosure mechanism and followed corporate governance principles in the best practices. This is a prominent feature for enterprises listed on the stock market due to Vietnamese enterprises not having an obligation to perform their auditing or disclose information at this time. In the primary market, in the period 2000 -2003, the initial public offerings were very limited. Also, these offerings had not yet even been regulated by laws or regulations.

(ii) Development Period of 2006 – 2010

Even though bank loans have been a key domestic source of finance for investment, they only represented about 60% of companies' needs. Also, the mismatch in the term of liabilities creates a potential risk when banks provide the medium and long-term loans.

Meanwhile, during the period 2000-2005, government bond issuance has been $4.4 billion, less than 10% of GDP; corporate bonds and municipal bonds were just 1% of GDP ($600 million); and the formal equity market capitalisation stood at about 2% of GDP at the end of 2005 (World Bank, 2006). The economy demands development of the medium and long-term financial market for financing to achieve its economic growth target sustainably in the following years.

The period 2006-2010 sees the blooming of the stock market in Vietnam. In this period, there is a soaring in the number of listed companies, the market liquidity and turnover, and the composite index reached an all-time high record.

(iii) Restructuring Period of 2011 to 2015

In 2011 – 2015, Vietnam's economy faced quite a few difficulties and challenges. However, with a series of efforts and resolutions by the government to stabilise the macroeconomy, support businesses and restructure the financial system, the economy was gradually thriving and gained positive results. The country's average economic growth rate of 2011-2015 was approximately 6% per annum. Exports grew fast, and the trade balance improved. On average, over the whole period, export growth was about 18% per annum with a significant increase in the share of fine processed products in export structure.

Investment in this period was lower than that of the previous period of 2006-2010, but was in a constructive recovery trend. Total social investment in 2011-2015 was estimated at around 31.7% of GDP. The investment growth rate increasingly recovers in all three economic sectors, including the state, non-state economic and foreign direct investment sectors. After the first two difficult years of 2011-2012, FDI attraction rose again from 2013. In this period, the realised FDI capital was estimated at USD 60.5 billion and new and additional capital was estimated at USD 99 billion, exceeding the target set by the government[9] (MOF, 2016).

[9] Target of the 2011-2015 plan for realized realised foreign direct investment was USD 57.3-58 billion, new and additional capital was USD 86 billion.

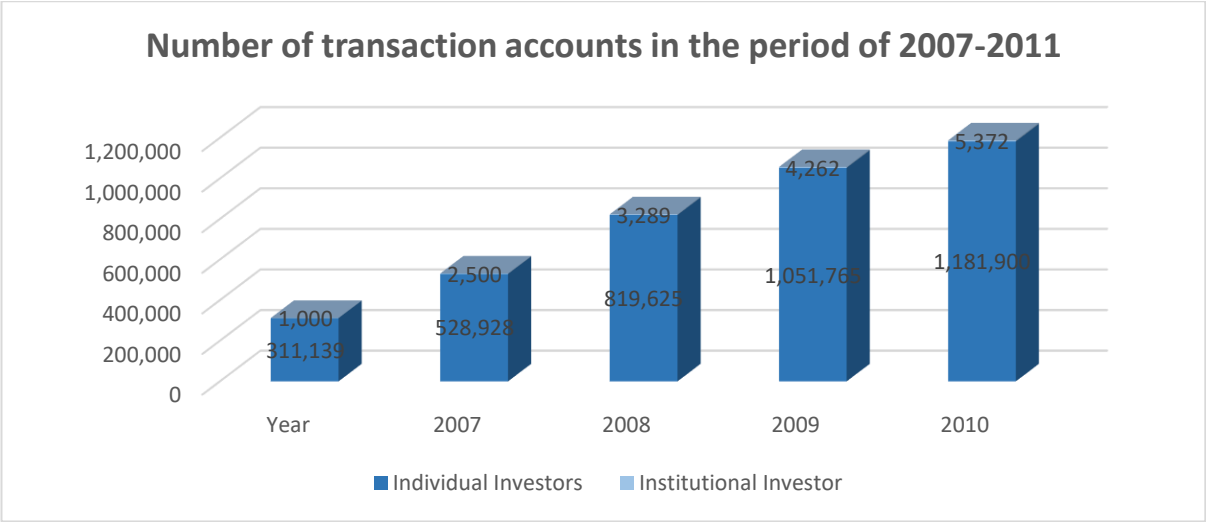

Figure 4-5 Number of transaction account in Vietnam's stock markets in 2007-2011

Source: SSC (SSC, 2012)

Firstly, restructuring financial products: the higher listing criteria were introduced. Together with enhancing the publicity of the market and strengthening corporate governance that gradually approaches international standards, the issuing and listing standards have been improved. For example, increasing the lowest listed charter capital from VND 80 billion to VND 120 billion in HSX, and VND 10 billion to VND 30 billion in HNX; requirement that listed companies have no accumulated losses and return on equity (ROE) target must be at least 5 %, etc. (SSC, 2014).

Secondly, restructuring investor base: to develop the investor base, the SSC has deployed a series of solutions including reducing administrative procedures, reviewing taxes and fees with the aim of attracting foreign and domestic investors. There are nearly 1.3 million trading accounts in comparison with around only 312,000 in 2006. Just in 2013, foreign institutional investors increased by 29% compared to the end of 2012 (SSC, 2014).

Thirdly, Supervising and Restructuring Securities Firms and Fund Management: Aiming to promote voluntary market principles and protect investors' property without negatively impacting the market, the country also focuses on restructuring organised securities businesses.

Introduction of risk management regulated requirements to the securities firms and fund management companies, in which these organisations must: (i) organise the risk

management structure, (ii) issue risk policies, (iii) develop and implement internal processes related to risk management activities.

Secondly, to enhance the ability and efficiency of government management and supervision for securities business organisations following international standards, the SSC issued regulations for supervision under the CAMEL criteria[10]. By the end of 2013, three stock companies were terminated and required to implement procedures to withdraw their establishment and operation licenses; two companies were required to suspend their operations; there are currently 14 securities companies without brokerage activities; also three securities companies have entered dissolution procedures recently. In late 2013, 24 securities companies and six fund management companies were restructured and withdrawn from the market in various forms such as dissolution, suspension, temporary suspension, controlled or gradually withdrawn.

From 105 securities companies in 2012, only 79 companies had brokerage services, and 47/48 fund management companies were still operating in 2016. Of the fund management companies with inefficient operations, their shareholders are gradually transferred to fund management companies under large financial groups, with healthy financial situations and strong management capabilities. Moreover, supervision and inspection activities continue to be strengthened and implemented strictly.

Inspection, supervision and enforcement in the stock market continue to be strengthened, firmly and promptly.

Table 4-2 Securities Sanctioned Cases in 2013

Violations	**Sanctioned cases**
Violation of offering organisations, public companies and listing organisations	44
Insider trading, market manipulation	07
Violations of the reporting regime for large shareholders, insiders and related people	34
Violations of securities companies, fund management companies	23
Total	**108**

[10] The CAMEL criteria include Capital adequacy, Asset quality, Management capability; Earning, and Liquidity requirements.

Source: SSC (SSC, 2014)

Performing inspections and examining securities businesses based on the criteria of maintaining licensing requirements and meeting the financial safety norms. The main violations in recent years have been reporting and disclosure violations, placing orders for customers without money in their accounts, borrowing stock to sell, not fully separating investors' and securities companies' money, transferring more than 10% of the charter capital, etc... Some companies have multiple violations of securities reporting and disclosing duty when having financial and operational difficulties. Fund management company violations include failing to report and disclose duties, loans of the shareholders' related people, storing documents improperly, not issuing all business processes, etc.

The stock market authority has continued to strengthen supervision, handling violations of price manipulation, insider trading, and deploying seven inspection teams on stock price manipulation. Besides monetary sanctions, the SSC has confiscated illegal profits in one case, in which it identified illegal revenues.

Administration and supervision of public companies and listed organisations continue to be strengthened under new regulations. The SSC has directed the regular monitoring and implementation of the issuers' reporting regime and disclosure duties; transaction registering; transactions between shareholders, founding shareholders and internal shareholders; monitoring of published information about companies' management, and; supervision of websites and information published.

Companies' administration is improving and gradually approaching international standards, for listed companies with higher requirements for large public companies.

The evaluation of audit firms and auditors registering is carried out by the regulations. In 2014, 43 audit companies had been approved to audit for the Issuers and the securities business organisations.

Table 4-3 Securities Business Organisations Restructuring in 2013

Company	Securities	Fund Management
Dissolved	3	1

Terminated	3	1
Merged	2	0
Suspended/Paused	2	4
Special controlled	13	1
Monitored	6	0
Operation withdrawn[11]	12	0

Source: State Securities Commission (SSC, 2014)

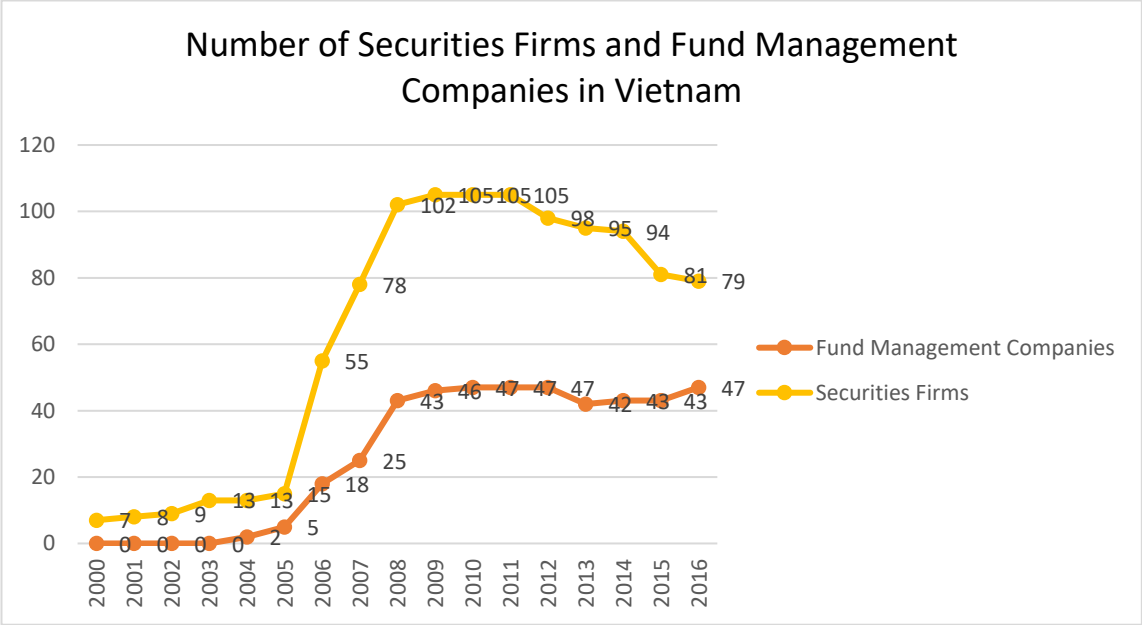

Figure 4-6 Number of Securities Service Intermediaries in Vietnam

(Source: The State Securities Commission of Vietnam – SSC)

The stock market has had positive changes, but the ability to raise capital for businesses as well as the equitisation process and divestment of state enterprises experienced difficulties.

After a series of efforts in restructuring the market, including revising and completing the legal framework for a healthy and transparent market of Vietnam's State Securities Commission, the operation of the system of securities companies has significantly been improved. The financial situation becomes more stable due to the safe asset structure through reduced investment in risky assets, reduced financial leverage and increasing the

[11] Includes six securities companies withdrew their brokerage operations; two companies withdrew self-dealing; four companies withdrew underwriting operations and one withdrew investment advisory business.

ratio of utilisable capital. However, although there are still some small brokers/securities companies with weak risk management, facing risks of being screened and retreating from/getting out of the market, the business performance and efficiency of the intermediaries in the market have been much improved.

4.5. Conclusion

This chapter demonstrates the overview of the macroeconomic situation in Vietnam that required the birth and operation of the stock market, and the country's economic development during the time the stock market has operated and developed since the year 2000. Moreover, the achievements of the stock market operation which have affected the economy over 15 years is also illustrated in periods of the stock market's development. It can be said that, together with the banking sector, the securities market in Vietnam had some significant achievements and contributed to the development of the economy.

Firstly, in the process of building up and improvement, the securities market of Vietnam has adapted and supported the change of the country's economic development over the period. The securities market has positively contributed to the state-owned enterprise equitisation process, thereby enhancing the country's economic restructuring process. Besides, the requirements in market prudence and transparency, human resource and corporate governance, have strengthened the supervision of the public in the operation of enterprises and creating confidence for investors.

Secondly, the securities market plays an important role in mobilising and pooling long-term capital for the economy to promote investment and manufacture. So far, through the stock market channel, the government and enterprises had pooled up to over two million billion Vietnamese dongs in 2016. The government bond market is considered as leading the emerging economies in East Asia as well as the ASEAN + 3 region. In the bond market, over 500 listed bonds with the face value of 24% of GDP in 2016. The bond market size has increased, on average, by 20% per annum in 2011 - 2016. Also, in 2016, with 700 listed companies and the market capitalisation approximately 43% of GDP, the stock market capitalisation is 580 times higher than the first years of operation in 2000 and 2001.

Thirdly, with high liquidity and an increase in market prudence, the stock market has attracted a large number of domestic and foreign investors, mobilised 6 billion USD in indirect investment, improved the circulation ability of domestic capital flows and

mobilised a significant amount of foreign investment capital. In addition, the diversification in investor base and investment knowledge of investors has been improved and contributed to building up a solid foundation for the long-term and sustainable development of the stock market.

Fourth, the stock brokerage system has developed regarding quantity, scale, professionalism in services and technology throughout the nationwide network that strengthens the market liquidity and confidence. This stock brokerage system plays the role of active financial intermediaries bridging investors and the market and investment business, contributing to the development of primary and secondary markets and then, further, to the economic growth.

Fifth, the market organisation system, including stock exchanges, securities depository and clearing centre, etc., are also, through its self-improved process, gradually meeting the international standards in operation to promote the process of global and regional integration.

Finally, the system of legal framework regulating the operation of the stock market has been developed and completed. Also, this regulatory framework has supported to strengthen inspection, supervision and enforcement activities which contribute to maintaining the legal stability and discipline of the market, protecting the rights and legitimate interests of investors. In addition to sanctions for administrative offences, initially, some severe cases of harm to the common interests of the market have been prosecuted and dealt with criminally, contributing to the deterrence and sustainability of the discipline of the law.

However, to have a deeper look at its achievements in promoting the economic development, the following chapters will demonstrate the quantitative analysis on the contribution of the stock market and economic growth and vice versa in Vietnam.

CHAPTER 5 - RESEARCH METHODOLOGY

This chapter discusses the choice of the methodology applied in this study and attempts to address the aims and objectives of this research. It also explains the process of utilising a quantitative time-series approach under the Autoregressive Distributed Lag (ARDL) methods or the bounds testing approach to examine the long-run relationships and short-run dynamics between the stock market development and economic growth in Vietnam and Thailand.

5.1. Introduction

Research is a systematic process by which people investigate the subject concerned to establish the facts or figure out the solutions, thereby increasing their knowledge (Saunders, Lewis, and Thornhill, 2009). Doing research is the process of discovering the answers to questions about knowledge. These answers refer to research paradigms (Guba and Lincoln, 1994) or the answers to the ontological, epistemological and methodological questions. The research paradigm, or the research philosophy, links with the understanding of the nature and development of knowledge. It contains essential assumptions about the worldview of the researchers (Saunders et al., 2009). Creswell (2009) demonstrates that these essential assumptions are ontology, epistemology, methodology, and methods. Within this, the epistemology concerns the question of "what is" or "what should be" regarded as acceptable knowledge in a discipline. A particularly central issue in this context is the question of whether the social world can, and should, be studied according to the same principles, procedures, and ethos as the natural sciences. Meanwhile, the ontology answers the question of what the nature of the reality is. In turn, the question of methodology is about what is the process of the research (Creswell, 2009). However, building questions about knowledge depends on the area and the topic of research (Wilson, 2014). For example, the question of social ontology is concerned with the nature of social entities.

Moreover, the tools to reach the research aims and objectives are methodology and methods. Hence, the choice of research methodology and design is vital to the success of this research. The selection of research paradigm is a set of activities such as determining the research approach, research strategy, and design. For instance, the positivist is likely to view the world with an object, and the world exists independently. Therefore, they

follow the ontology of objectivism and adopt the deductive approach and quantitative strategy. However, the interpretivist, with the subjective perspectives, which is independent of others' minds, is likely to take the inductive approach and qualitative strategy. Meanwhile, the pragmatist tends to adopt a mixed research methodology between the adoption of the interpretivists and positivists. Hence, they form data collection and analysis techniques appropriately.

By doing research independently with the existing phenomena, a quantitative research method from a positivist perspective was employed; the researchers also used the deductive approach in this study. This research established and tested hypotheses on the relationship between variables, which formed the models. Relying on the analysis of the tested results is key to this research's contribution to knowledge. The Ontology orientation of this research is objectivism. This is an ontological position which asserts that social phenomena and their meanings have an existence that is independent of social actors (Bryman and Bell 2011).

Thus, following the quantitative research design, in this research, the study generates hypotheses for testing the existing time-series data independently and, thereby, allows for explanation of the phenomena. The process of making and testing assumptions and discussing the results on the available data from the secondary sources is the principle of deductivism (Creswell, 2009) or quantitative analysis.

In addition, as per the discussion in the literature review chapter, to investigate the relationship between the financial market development and economic growth, the scholars typically use the cross-sectional study in doing cross-country analysis, for instance Beck and Levine (2004), De Gregorio and Guidotti (1995), Fung (2009) and Rousseau and Wachtel (2000). In their studies, they applied the time-series method in the single country analysis or comparison between countries by investigating every single country separately (see Bayar et al., 2014; Hou and Cheng, 2010; Ibrahim, 2011; Marques, Fuinhas, and Marques, 2013; Rousseau and Wachtel, 2000; and Wang and Ajit, 2013). Furthermore, in the comparison study, scholars also employ the panel data method, which combines both cross-sectional and time-series analysis (see Arestis et al., 2001; Caporale and Bank, 2003; Naceur and Ghazouani, 2007; Cooray, 2010; Kar et al., 2011; Rachdi and Mbarek, 2011; Pradhan, Arvin, Samadhan, and Taneja, 2013; and Cavenaile, Gengenbach, and Palm, 2013). However, as previously mentioned, one of the advantages

of the single country analysis is that it can avoid ignorance of the country's specific issues. It also helps to discuss the results of the one-country study more intensively.

Therefore, this research will focus on the single case study analysis by utilising a time-series approach and the Autoregressive Distributed Lag (ARDL) bounds testing technique on the time-series data variables of economic growth and stock market development. Particularly, this study will implement a single country analysis in Thailand and Vietnam to explore, independently, what the nexus of the stock market development and economic growth is in these two nations. The hypotheses of the research are: *(i) the stock market and economic growth have a positive relationship (ii) the relationship between the stock market and economic growth is a causal relation*. Also, the study will implement the comparison analysis and forecast the relationship between stock market development and economic growth in Vietnam based on the results of the single country analysis.

In summary, this chapter aims to answer the question of which models should be used in this study; describing the procedure of how to estimate those models systematically. Thus, this chapter is presented in six sections. The first section introduces briefly the research theory and rational choice of the method applied in this study. The second section proposes the theoretical model. Following that, the third section describes the data sources for analysis and modelling. Next, the application of the time-series method in the ARDL framework and model specification are discussed in sections five and six, respectively. This section also describes the investigating process in detail. Finally, the chapter gives a summary and conclusions.

5.2. The Theoretical Model

As discussed in Chapter 2, the conceptual framework of this study is the endogenous growth model proposed by Pagano (1993), where aggregate output, Y is produced during period t and is a linear function of the aggregate capital stock, K. As pointed out in the literature review chapter, there is generally a high degree of correlation between the stock markets and economic growth in the developed countries. Theoretically, the Tobin's q and wealth effect influence the consumption and investment. Thus, the wealth of the economy and stock market development can mutually affect each other. The liquidity market may affect the money stock in the economy. Also, the stock market and performance of the companies can influence the foreign investment, this leads to the change in capital supply and demand which will further impact on economic growth.

5.3. Data

This study will utilise the quarterly data for all the variable series. Eviews 9.5 and Microfit 4.1 software packages are the analytical tools to simulate tests in this research. Employing two different software programmes helps to cross-check the consistency of the test results.

Table 5-1 Summary of data and proxies in the research

Variables	Proxy	Name
Economic Growth	Ln(real GDP per capita)	GDP
Banking Sector Development	M2/GDP	MON
Foreign Direct Investment	FDI/GDP	FDI
Stock Market Development	Market Capitalisation/GDP	MCAP
Stock Market Liquidity	Ln(Stock Market Index)	VNI (Vietnam)
		SETI (Thailand)

The description of the variables that are used in this study is given in Table 5-1. The quarterly growth rate of real GDP per capita is a proxy for economic growth (GDP). This proxy has been used extensively in numerous works such as Fung (2009) and Nazir et al. (2010). The ratio of stock market capitalisation to real GDP is the proxy for the contribution of the stock market development (MCAP) as used in Carp (2012), Filer et al. (2000), Garcia and Liu (1999). Also, the stock market index is employed as the stock market development proxy as employed in Kajurova and Rozmahel (2016) and Street and Box (2009). Besides that, the debate on the "bank-based" or "market-based" economy leads the study to consider the assessment of other capital contribution from channels besides the stock market. Therefore, the ratios of broad money M2 to real GDP is the proxy of bank development (MON) (Calderón and Liu, 2003; King and Levine, 1993). An increase in real GDP per worker is likely to raise the capital stock. However, the increase in foreign direct investment can increase or decrease domestic capital stock depending on whether the two are complements or substitutes (Anwar and Sun, 2011). Thus, the ratio of foreign direct investment to real GDP is the proxy for the contribution of the foreign direct investment capital to the economic growth (FDI) (see Baharumshah and Thanoon, 2006, Boubakari and Jin, 2010).

In this study, the data was collected from different sources, even for the same series, because of several reasons. First, it helps to avoid the missing data. Second, it guarantees

the accuracy in recalculating and transforming the macroeconomic data from different frequencies, rather than a quarterly basis, by making a comparison of the calculation outcomes. Finally, it supports synchronising data in a series in the same unit of measurement.

The details of data collection are described as follows:

Firstly, the empirical analysis is in Vietnam's case. The time duration of this empirical study on Vietnam is counted from the first quarter of the stock exchange's operation in Vietnam (2000.Q4 – 2015.Q1). The quarterly time series data is collected from the available sources. The economic indicators of Vietnam, such as real GDP series, are obtained from Vietnam's General Statistics Office (GSO); money supply (M2) is from the International Monetary Fund's data source (IFS) (IMF, n.d.); data on population for calculating quarterly GDP per capita is collected from the World Bank's data source (WB, n.d.). Between the two national censuses in 2000-2005, the data on population is calculated on a quarterly average for the whole period. Since 2005, this data has been calculated and adjusted on the quarterly basis of the reported annual population and natural birth rate.

Meanwhile, the data stream on stock market development, such as market capitalisation, trading volume, trading value and a stock index is from the available source of stock markets on the website of the Hochiminh Stock Exchange (HSX, n.d.) and Bloomberg's financial data source. In this research, the analysis focuses on examining data on the Hochiminh Stock Exchange (HSX). This stock exchange has operated since late July of the year 2000 with an approximate 80% of total market capitalisation in Vietnam. It also applies more standardised criteria for the listed companies, especially in terms of information disclosure, in comparison with the Hanoi Stock Exchange (HNX). Additionally, since commencing operation, HSX has dominated not only the stock listing volume but also the stock liquidity in Vietnam's stock exchanges.

Secondly, to carry out further analysis on other developing countries, especially the countries in the South-east Asian area, this study applies the same process of analysis as in Vietnam's case on the data set from selected developing countries in South East Asia. In this region, Indonesia, Malaysia, the Philippines, Singapore, and Thailand have operated stock markets since the 1960s and 1970s. Vietnam's stock market began operation in 2000, followed by Laos' and Cambodia's stock markets in 2011 and 2012,

respectively. Recently, Myanmar's stock exchange opened in 2015. Other countries in this region do not have stock markets yet, or are preparing to establish them. Among the countries in this region, the World Bank classifies Singapore as a developed country. Hence, this study selects a developing country in this region as a sample for further study in the second empirical analysis: Thailand. The data in Thailand is from 1994 to 2014. However, these data series will be broken down into two subsets of the two different time spans for analysis: (i) the recovery period after the financial crisis from 1998Q1 to 2008Q1 and (ii) the stock market development period from 1994Q1 to 2014Q4.

Also, in the case of Thailand, this study will not employ the dummy variables for the breaking structure of the variables' series, due to the occurrence of the global financial crisis in 2008 – 2009. Instead, it will break the data stream into periods to investigate the development of the stock market in Thailand in stages. Chapter 7 will discuss this issue in more detail.

The sources of this data set are from the databases on the websites of the Central Bank of Thailand (BOT, n.d.), the National Economic and Social Development Board of Thailand (NESDB, n.d.), the World Bank (WB, n.d.), the International Monetary Fund (IMF, n.d.), the Thai Stock Exchanges (SET, n.d.), and the Bloomberg financial data source.

Thus, the empirical model will be used in this study to test the relationship between the stock market development and economic growth as follows:

$$\mathrm{GDP_t} = \alpha_0 + \alpha_1 \mathrm{MCAP_t} + \alpha_2 \mathrm{MON_t} + \alpha_3 FDI_t + INDEX_t + \varepsilon_t \qquad (5.1)$$

where α_0 is a constant, $\alpha_1 \ldots \alpha_3$ are the regression coefficients and ε_t is error terms. The following sections will discuss the specified empirical model in this study.

5.4. Methodology

This study applies the ARDL model (bounds test) proposed by Pesaran et al., (2001) to investigate the reaction of the Vietnamese and Thai economies on the relationship between the stock market and economic growth.

In dealing with dynamic economic models, scholars emphasised using time-series econometrics. They find that the Vector Autoregressive (VAR) model is especially useful for describing the dynamic relationships of economic and financial time-series and for

forecasting (Enders, 2010; Tsay, 2010). Also, VAR models are "one of the key empirical tools in modern macroeconomics" (Negro and Schorfheide, 2011).

Although, in analysing multivariate time-series data, VAR models are considered as one of the most successful, flexible and easy to use models, the ARDL approach has its advantages. First, because of the problem of lower power, the ARDL model was preferred in cointegration tests rather than other methods such as the residual-based by Engel and Granger (1987), the maximum likelihood-based by Johansen (1991, 1995) and the Johansen and Juselius (1990). Second, the ARDL model is also considered to be an unrestricted error correction model, regardless of whether the regressors are integrated of the same order or not, as long as they are I(0) and I(1) (integrated of an order not more than one) and it can test on the small size sample (Pesaran et al., 2001). Third, it is simple to implement and easy to interpret because the ARDL model has only a single equation. Fourth, the ARDL model allows for different lag lengths and is able to accommodate more variables than in other models, such as VARs (the ARDL model uses a sufficient number of lags to capture the data-generating process in a general-to-specific modelling framework). Finally, the ARDL model manages both long-run cointegration and short-run dynamics.

Especially, in the empirical study, in the case of Vietnam, there is insufficient data series length. The VARs are a complex system, and every single variable can be both endogenous and exogenous variables in the system. Also, the VARs system is good in forecasting but requires a sufficient length of data series. However, in this study, the ARDL models are better in explaining the economic theory of the relationship between the stock market and economic growth. Each model is an independent relationship.

Thus, this research will apply the time-series method to examine the relationship between stock market development and economic growth. More specifically, this study will use the ARDL approach in implementing the empirical tests on examining the cointegration and Granger-causal relationships of the stock market development and economic growth variables.

The investigation is divided into three stages to review the validity of the assertions of the endogenous growth theory regarding the role of stock market development on economic growth, particularly the positive role of the stock market on economic growth posited by the endogenous growth theory. The first stage is checking the stationary of all

data series. It is the prerequisite condition of the cointegration analysis using the bounds testing approach. The second stage is examining the existence of cointegration relations and analysing the long-run relations among variables if there are existing cointegration relations. The final stage is testing the Granger Causality relationships among the data series and the short-run dynamic adjustment of the relationship between variables.

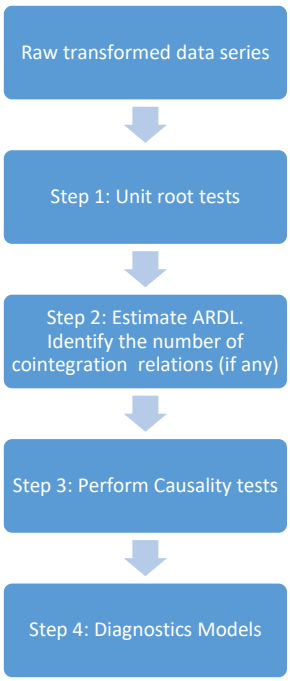

Figure 5-1 Analytical Procedure

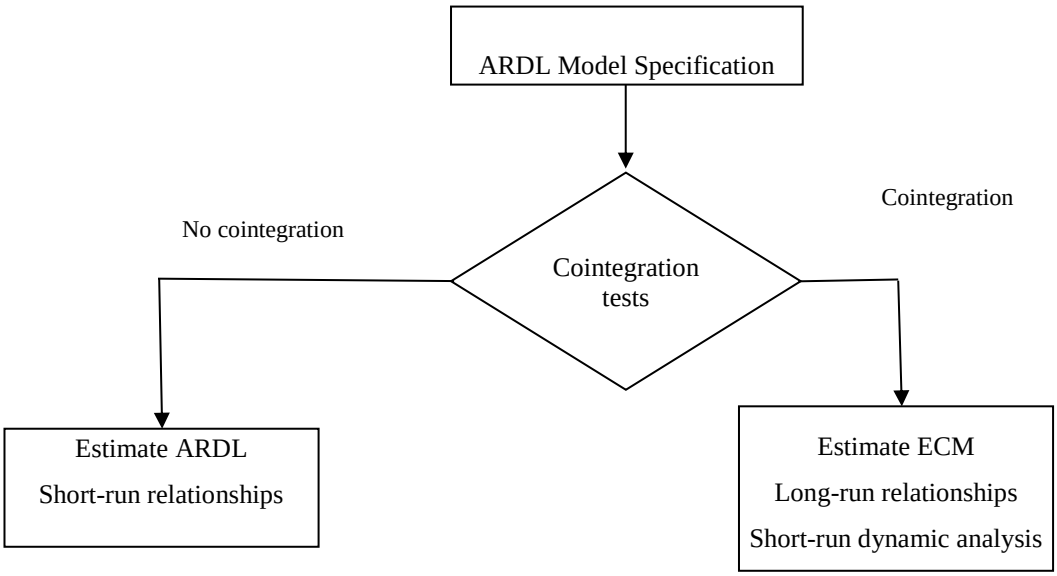

Figure 5-2 ARDL bound tests analysis

5.4.1 Unit root tests

In the data generation process, one should consider the specific features of the economic time series data. These features bring the dynamic stochastic characteristics of the time-series data. Also, figuring out the order of integration of the time-series data is crucial for the analysis to satisfy the pre-condition of the ARDL test, which is no variables integrated of an order not more than one (Pesaran et al., 2001). Therefore, it is necessary to examine the stochastic characteristics of the time-series variables by using the unit root test. This test examines the stability of the time-series data (stationary). The null hypothesis of the test is that there is a unit root against the alternative of stationary data generation process that may have a non-zero mean term, a linear deterministic trend, and perhaps seasonal dummy variables. Testing for unit roots, this study employs the Dickey-Fuller test (Dickey and Fuller, 1979) and Phillips and Perron test (Phillips and Perron, 1988). The discussion for unit root tests is as follows:

Suppose we have a set of K time series variables $y_t = (y_{1t}, y_{2t}, \dots, y_{Kt})'$. Y_t is a random walk series and assumes it has an intercept μ_1 and a trend t as represented in the equation (5.2.

$$Y_t = \mu_1 + \mu_2 t + \sum_{i=1}^{k} A_i Y_{t-i} + \varepsilon_t \qquad \varepsilon_t \sim IN(0, \sigma^2) \tag{5.2}$$

and

$$\Delta Y_t = Y_t - Y_{t-1} = \mu + \gamma t + \delta Y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \varepsilon_t \tag{5.3}$$

where

$$\delta \equiv \left(\sum_{i=1}^{k} A_i \right) - 1 \tag{5.4}$$

$$\Gamma_i = -(A_{i+1} + A_{i+2} + \cdots A_p) \tag{5.5}$$

To examine whether the series data X_t is stationary or not, the test hypothesis is $\sum A_i = 1$ (or equivalently, $\delta = 0$) (Brook, 2008)

Briefly, assume that the Y_t is a random walk and assumes intercept and trend, the test follows as in the Augmented Dickey-Fuller test (ADF) (Dickey and Fuller, 1979)

$$\Delta Y_t = \alpha_1 + \alpha_2 t + \delta Y_{t-1} + \beta_i \sum_{i=1}^{m} \Delta Y_{t-1} + \varepsilon_i \tag{5.6}$$

besides, as in PP-test (Phillips and Perron, 1988)

$$\Delta Y_t = \alpha_1 + \alpha_2 t + \delta Y_{t-1} + \varepsilon_i \tag{5.7}$$

The testing hypothesis is:

H_0: $\delta = 0$ (Variable has a unit root)

H_a: $\delta < 0$ (Variable does not have a unit root)

In case the null hypothesis cannot be rejected, the time series variable has a unit root. Then, the unit root test is applied again and again in the differenced series (at the *d*th order difference) to get the stationary series (Pantula, 1989). For example, the if at the level, we cannot reject the null hypothesis of having a unit root, there could be another test for the first-order difference of the series to test the stationary of this series. Again, if at the first-order difference, the test result still cannot reject the null hypothesis, this test would be applied again on the second-order difference to get the stationary series. This process will repeat until the series is stationary at I(d) (d is the number of differenced order). Also, as per Hamilton (1994), when there is a stationary property in the linear combination of the I(1) series, the series will be cointegrated. However, in the ARDL framework, it is regardless of whether the regressors are integrated of the same order or not as long as they are I(0) and I(1) (Pesaran et al., 2001). Therefore, the unit-roots tests should make sure there are no series integrated at an order higher than one.

5.4.2 ARDL Test for Cointegrations

The cointegration analysis in this study is based on the ARDL bounds testing approach. To determine the existence of the long-run relationship between the investigated variables, the Bound F-statistic is computed to establish the long-run relationship among variables. This bound test is carried out on each of the variables as they stand as endogenous variables while others are assumed as exogenous variables. The testing model ARDL$(\mathrm{p}, q_1, q_2, \ldots, q_k)$ model to cointegration testing:

$$\Delta \mathrm{Y}_t = \delta_{0,i} + \sum_{i=1}^{k} \alpha_i \Delta \mathrm{Y}_{t-1} + \sum_{i=1}^{k} \alpha_2 \Delta \mathrm{X}_{t-i} + \delta_{Y1} Y_{t-1} + \delta_{Y2} Y_{t-1} + \varepsilon_{1t} \quad (5.8)$$

$$\Delta X_t = \delta_{0,i} + \sum_{i=1}^{k} \alpha_i \Delta X_{t-1} + \sum_{i=1}^{k} \alpha_2 \Delta \mathrm{Y}_{t-i} + \delta_{X1} X_{t-1} + \delta_{X2} Y_{t-1} + \varepsilon_{2t} \quad (5.9)$$

where k is the ARDL model maximum lag order and chosen by the user, δ is the long-run coefficient from the cointegrating vector. Then, the specified model can be denoted as:

$$F_Y(Y_1 | \mathrm{X}_1, \ldots., \mathrm{X}_k) \quad (5.10)$$

$$F_X(X_1 | \mathrm{Y}_1, \ldots., \mathrm{Y}_k) \quad (5.11)$$

The null hypothesis that the coefficients of the lagged variables are zero, i.e. the long-run relationship does not exist is tested.

in equation (5.8)		in equation (5.9)
$H_0: \delta_{Y1} = \delta_{Y2} = 0$	and	$H_0: \delta_{X1} = \delta_{X2} = 0$
$H_a: \delta_{Y1} \neq \delta_{Y2} \neq 0$		$H_a: \delta_{X1} \neq \delta_{X2} \neq 0$

The hypothesis is tested using the F-statistic in equation (5.10 and (5.11, respectively. The distribution of this F-statistic is non-standard, irrespective of the order of the integration of variables. The critical values of the F-statistics applied for a different number of variables in the model and whether the ARDL model contains an intercept and/or trend are available in Pesaran and Pesaran (1997) and Pesaran et al. (2001). There are two sets of critical values, called lower bound and upper bound. If the computed F statistics fall outside the critical bounds, a decision can be made regarding cointegration without knowing the order of integration of the regressors. If the estimated F statistic is higher than the upper bound of the critical values, then the null hypothesis of no cointegration relation is rejected. Alternatively, if the estimated F statistic is lower than the lower bound of critical values, we cannot reject the null hypothesis of no cointegration. Meanwhile, if the estimated F statistic falls within the value range of the critical bounds, there is an inconclusive decision about the existence of the cointegration relation between the variables.

If the ARDL test results identify the existence of the cointegration relation, the cointegration vector of the ARDL will be re-parameterised into the Error Correction Model (ECM). Then, the short-run dynamics and long-run relationships of the variable in a single model will be interpreted form the re-parameterised model (Nkoro and Uko, 2016).

Also, at this stage, if the empirical results reveal that cointegration relationships exist among all variables, the marginal impacts of the regressors on the dependent variables will be discussed further.

5.4.3 Granger Causality Test

If the cointegration relation is found based on the bounds test, the Granger causality tests should be carried out. Granger (1969) introduces a causality concept that has become quite popular in the econometrics literature. He defines a time series variable X_t to be causal for a time series variable Y_t if the past values of X_t help to predict the current level

value of Y_t. The original Granger-causality requires the testing of two regression equations as in (5.12*)* and (5.13):

$$Y_t = \beta_{1,0} + \sum_{i=1}^{p} \beta_{1,i} Y_{t-i} + \sum_{i=1}^{p} \beta_{1,p+i} X_{t-i} + \varepsilon_{1t} \quad (5.12)$$

$$X_t = \beta_{2,0} + \sum_{j=1}^{p} \beta_{2,j} Y_{t-j} + \sum_{j=1}^{p} \beta_{2,p+j} X_{t-j} + \varepsilon_{2t} \quad (5.13)$$

In which, p is the number of lags that adequately models the dynamic structure so that the coefficients of further lags of variables are not statistically significant and the error term ε_{1t} is white noise. As in (5.12*)*, the null hypothesis that X_t does not Granger cause Y_t can be rejected if the p parameters $\beta_{1,p+i}$ are jointly significant. Similarly, in (5.13*)*, if the p parameters $\beta_{2,j}$ are jointly significant the null hypothesis, that Y_t does not Granger cause X_t,can be rejected.

However, the original Granger causality method has some limitations. For example, Park Phillips (1989), Stock and Watson (1989) and Sims et al. (1990) show that the Granger causality test on the non-stationary data can produce spurious causality results. The distribution of the test statistic for the Granger causality test in a VAR with non-stationary series is not standard chi-square distribution (Ohanian, 1988; Toda and Phillips, 1993). Therefore, it leads to invalid test results. Thus, before testing the causal effects, it is necessary to examine the features of the series variables involved. If the variables are both stationary at I(0), the test can be implemented under applying the VAR model in level. In case one series is stationary and another one is at I(1), we can use the VAR specified in level for the stationary variable and the first-order difference for the I(1) variable. If all variables are integrated at I(1) but not cointegrated, the test can use VAR level for the first differences of all those variables. However, if those I(1) variables are cointegrated, the VECM can be utilised (a particular case of VAR model). The use of VAR models will be explained in detail in the following sections.

An alternative approach for testing the Granger causality, proposed by Toda and Yamamoto (1995), is a modified Wald test (MWALD) in vector autoregressive equations for linear restrictions on some parameters on an augmented VAR$(m + d_{max})$ in levels. The advantage of employing this approach is that it does not require cointegration. Hence, it does not rely much on the prerequisite feature testing of all variable series. However, it requires the maximum order of integration ($d_{\max}$). Also, this alternative method can solve

the problem of non-standard Chi-square distribution for Wald test which was mentioned in the original Granger causality test (see Ohanian, 1988; Toda and Phillips, 1993) by adding an extra redundant lag in estimating the parameters of the process and testing the relevant null hypotheses (see Toda and Yamamoto, 1995 and Dolado and Lütkepohl, 1996). Therefore, this study will apply the Toda and Yamamoto (1995) procedure to test the Granger causality between the stock market development and economic growth variables.

Thus, in the bivariate case, the model in the Toda-Yamamoto (1995) method is written as:

$$Y_t = \beta_{1,0} + \sum_{i=1}^{m} \beta_{1,i} Y_{t-i} + \sum_{i=m+1}^{m+d_{max}} \beta_{1,i} Y_{t-i} + \sum_{i=1}^{m} \delta_{1i} X_{t-i} + \sum_{i=m+1}^{m+d_{max}} \delta_{1i} X_{t-i} + \upsilon_{1t} \quad (5.14)$$

$$X_t = \beta_{2,0} + \sum_{i=1}^{m} \beta_{2,i} Y_{t-i} + \sum_{i=m+1}^{m+d_{max}} \beta_{2,i} Y_{t-i} + \sum_{i=1}^{m} \gamma_i X_{t-i} + \sum_{i=m+1}^{m+d_{max}} \gamma_i X_{t-i} + \upsilon_{2t} \quad (5.15)$$

As in equation (5.14), the null hypothesis that X_t does not Granger cause Y_t can be rejected if δ_i are jointly significant with $\forall i = 1,2,\dots,m$. Likewise, the null hypothesis that Y_t does not Granger cause X_t can be rejected if γ_i in equation (5.15) are jointly significant, the null hypothesis that Y_t does not Granger cause X_t can be rejected.

Therefore, the ARDL model can be re-parameterised into the error correction model (ECM) if one cointegrating vector is identified. The ARDL can be re-parameterised because it is a dynamic single model equation and of the same form with the ECM. Distributed lag Model merely means the inclusion of unrestricted lag of the regressors in a regression function. The outcome model suggests the short-run dynamics and the long-run relationship of the variables of a single model. (Nkoro and Uko, 2016).

The re-parameterised ARDL model is as follows:

$$\Delta Y_t = \gamma_{0,i} + \sum_{i=1}^{k} \gamma_{1i} \Delta Y_{t-1} + \sum_{i=1}^{k} \gamma_{2i} \Delta X_{t-i} + \varphi_{Y,3} ECT_{Y,t-1} + \nu_{Y,t} \quad (5.16)$$

$$\Delta X_t = \gamma_{0,i} + \sum_{i=1}^{k} \gamma_{1i} \Delta X_{t-1} + \sum_{i=1}^{k} \gamma_{2i} \Delta Y_{t-i} + \varphi_{X,3} ECT_{X,t-1} + \nu_{X,t} \quad (5.17)$$

γ_2 : is the short-run coefficient for this model

φ : is the error correction term coefficient explaining the speed of equilibrium-adjustment.

ECT_{t-1} represents the lagged error correction term that was derived from the long-run cointegrating relationship and $v_{i,t}$ are serially independent random errors with a zero mean and finite covariance matrix. In each case, the dependent variable is regressed against past values of itself and other variables. An ECT_{t-1} distinguished between both the short-run and long-run Granger causality. The statistics of the short-run are tested by using the individual coefficients of the lagged terms. The statistical significance of the coefficient of the ECT_{t-1} indicates the long-run causality. The value of the ECT must be between zero and 1 with a negative sign indicating the convergence of the system back to equilibrium. The joint causation of both long-run and short-run can be tested to check for joint significance.

Furthermore, to check the reliability and validity of the estimation of the ARDL model, several diagnostic and model stability tests are performed. The diagnostic test examines serial correlation, heteroscedasticity and serial correlation. The structural stability of the model can be examined via CUSUM (Cumulative Sum) tests.

To finalise, supposing Y and X present as the economic growth and stock market development variables respectively, there are three possible types of Granger causality relationships. The first one is *Unidirectional Causality*, i.e., $Y \rightarrow X$ but $X \nrightarrow Y$ or vice versa. The second one is *Bidirectional Causality* ($Y \leftrightarrow X$). The last one is *No Causality* ($Y \nrightarrow X \; and \; X \nrightarrow Y$).

5.5. Model Specification

One of the initial steps in the modelling process in quantitative analysis is to decide which variables to include in the study. The selection of these variables should meet a particular research purpose (Lütkepohl, Krätzig, and Phillips, 2004). In this study, a time-series growth regression is used for an empirical evaluation of whether the stock market development is connected to economic growth in Vietnam and Thailand. The general model and variables used are based on the economic theory and proposed by theoretical and empirical studies in the growth model (such as Greenwood and Jovanovic, 1990; Levine, 1999; Arestis, Demetriades and Luintel, 2001; Al-Yousif, 2002; Hou and Cheng, 2010).

In the endogenous growth framework, the capital of the economy contributes to economic growth. This study will employ the model based on the principles of the endogenous theory, and as applied in some earlier studies (see: King and Levine, 1993; Christopoulos and Tsionas, 2004; Choong, Yusop, Law, and Liew, 2005; Cheng, Ho, and Hou, 2012).

As explained in section 5.2, the theoretical model and empirical equations are expressed as below:

Model 1

$$\Delta LnGDP_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta LnGDP_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta MON_{t-i} + \sum_{i=0}^{n} \alpha_{3i}\Delta MC_{t-i} + \sum_{i=0}^{n} \alpha_{4i}\Delta FDI_{t-i} + \sum_{i=0}^{n} \alpha_{5i}\Delta LnIndex_{t-i} + \alpha_6\Delta LNGDP_{t-1} + \alpha_7\Delta MON_{t-1} + \alpha_8\Delta MC_{t-1} + \alpha_9\Delta FDI_{t-1} + \alpha_{10}\Delta LnIndex_{t-1} + \varepsilon_{1t} \quad (5.18)$$

Model 2

$$\Delta MC_t = \gamma_0 + \sum_{i=1}^{n} \gamma_{1i}\Delta MC_{t-i} + \sum_{i=0}^{n} \gamma_{2i}\Delta LnGDP_{t-i} + \sum_{i=0}^{n} \gamma_{3i}\Delta MON_{t-i} + \sum_{i=0}^{n} \gamma_{4i}\Delta FDI_{t-i} + \sum_{i=0}^{n} \gamma_{5i}\Delta LnIndex_{t-i} + \gamma_6\Delta LnGDP_{t-1} + \gamma_7\Delta MON_{t-1} + \gamma_8\Delta MC_{t-1} + \gamma_9\Delta FDI_{t-1} + \gamma_{10i}\Delta LnIndex_{t-1} + \varepsilon_{3t} \quad (5.19)$$

Model 3

$$\Delta MON_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i}\Delta MON_{t-i} + \sum_{i=0}^{n} \beta_{2i}\Delta LnGDP_{t-i} + \sum_{i=0}^{n} \beta_{3i}\Delta MC_{t-i} + \sum_{i=0}^{n} \beta_{4i}\Delta FDI_{t-i} + \sum_{i=0}^{n} \beta_{5i}\Delta LnIndex_{t-i} + \beta_6\Delta LnGDP_{t-1} + \beta_7\Delta MON_{t-1} + \beta_8\Delta MC_{t-1} + \beta_9\Delta FDI_{t-1} + \beta_{10}\Delta LnIndex_{t-1} + \varepsilon_{2t} \quad (5.20)$$

Model 4

$$\Delta FDI_t = \delta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta FDI_{t-i} + \sum_{i=0}^{n} \delta_{2i} \Delta LnGDP_{t-i} + \sum_{i=0}^{n} \delta_{3i} \Delta MON_{t-i} + \sum_{i=0}^{n} \delta_{4i} \Delta MC_{t-i} + \sum_{i=0}^{n} \delta_{5i} \Delta LnIndex_{t-i} + \delta_6 \Delta LnGDP_{t-1} + \delta_7 \Delta MON_{t-1} + \delta_8 \Delta MC_{t-1} + \delta_9 \Delta FDI_{t-1} + \delta_{10} \Delta LnIndex_{t-1} + \varepsilon_{4t} \quad (5.21)$$

Model 5

$$\Delta LnIndex_t = \theta_0 + \sum_{i=1}^{n} \theta_{1i} \Delta LnIndex_{t-i} + \sum_{i=0}^{n} \theta_{2i} \Delta LnGDP_{t-i} + \sum_{i=0}^{n} \theta_{3i} \Delta MON_{t-i} + \sum_{i=0}^{n} \theta_{4i} \Delta MC_{t-i} + \sum_{i=0}^{n} \theta_{5i} \Delta FDI_{t-i} + \theta_6 \Delta LnGDP_{t-1} + \theta_7 \Delta MON_{t-1} + \theta_8 \Delta MC_{t-1} + \theta_9 \Delta FDI_{t-1} + \theta_{10} \Delta LnIndex_{t-1} + \varepsilon_{5t} \quad (5.22)$$

The explanation of the proxies for all the variables in equations (5.18) to (5.22) is as described in Table 5-1. The dependent variable is the real gross domestic product per capita. The other indicators are the independent variables. The analysis exploits the capital supply aspect and the liquidity of the market that assumes the support of economic growth. The primary objectives of this analysis, by using these two models, are to explore the long-run relationship between the stock market development and economic growth. Next, it examines the causal linkage of this relationship. In doing so, the following sections present the estimated procedure and analysis methods:

In equation (5.18, the real GDP per capita is the dependent variable, the null hypothesis of no cointegration amongst the variables is $H_0: \alpha_7 = \alpha_8 = \alpha_9 = \alpha_{10} = 0$ against $H_1: \alpha_7 \neq \alpha_8 \neq \alpha_9 \neq \alpha_{10} \neq 0$.

This model denotes as F(LnGDP|MC, MON, FDI, LnINDEX).

Similarly, in equation (5.20 of F(MC|LnGDP, MON, FDI, LnINDEX); equation (5.19 of F(MON|GDP, MC, FDI, LnINDEX); equation (5.21 of F(FDI|LnGDP, MC, MON, LnINDEX); equation (5.22 of F(LnINDEX|LnGDP, MC, MON, FDI) the dependent variables are the ratios of the broad money to GDP (MON), the market capitalisation to GDP (MC), foreign direct investment to GDP (FDI) and the stock market index (LnINDEX) respectively; the hypotheses for cointegrations are as follow:

$H_0: \beta_7 = \beta_8 = \beta_9 = \beta_{10} = 0$ against $H_1: \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq 0$

$H_0: \gamma_7 = \gamma_8 = \gamma_9 = \gamma_{10} = 0$ against $H_1: \gamma_7 \neq \gamma_8 \neq \gamma_9 \neq \gamma_{10} \neq 0$

$H_0: \delta_7 = \delta_8 = \delta_9 = \delta_{10} = 0$ against $H_1: \delta_7 \neq \delta_8 \neq \delta_9 \neq \delta_{10} \neq 0$

$H_0: \theta_7 = \theta_8 = \theta_9 = \theta_{10} = 0$ against $H_1: \theta_7 \neq \theta_8 \neq \theta_9 \neq \theta_{10} \neq 0$

The re-parameterised ARDL model for Granger Causality Testing:

$$\Delta LnGDP_t = \lambda_0 + \sum_{i=1}^{n} \lambda_{1i} \Delta LnGDP_{t-i} + \sum_{i=1}^{n} \lambda_{2i} \Delta MON_{t-i} + \sum_{i=1}^{n} \lambda_{3i} \Delta MC_{t-i} + \sum_{i=1}^{n} \lambda_{4i} \Delta FDI_{t-i} + \sum_{i=1}^{n} \lambda_{5i} \Delta LnINDEX_{t-i} + \lambda_6 ECT_{t-1} + \nu_{1t} \quad (5.23)$$

$$\Delta MC_t = \varphi_0 + \sum_{i=1}^{n} \varphi_{1i} \Delta LnGDP_{t-i} + \sum_{i=1}^{n} \varphi_{2i} \Delta MON_{t-i} + \sum_{i=1}^{n} \varphi_{3i} \Delta MC_{t-i} + \sum_{i=1}^{n} \varphi_{4i} \Delta FDI_{t-i} + \sum_{i=1}^{n} \varphi_{5i} \Delta LnINDEX_{t-i} + \varphi_6 ECT_{t-1} + \nu_{3t} \quad (5.24)$$

$$\Delta MON_t = \xi_0 + \sum_{i=1}^{n} \xi_{1i} \Delta LnGDP_{t-i} + \sum_{i=1}^{n} \xi_{2i} \Delta MON_{t-i} + \sum_{i=1}^{n} \xi_{3i} \Delta MC_{t-i} + \sum_{i=1}^{n} \xi_{4i} \Delta FDI_{t-i} + \sum_{i=1}^{n} \xi_{5i} \Delta LnINDEX_{t-i} + \xi_6 ECT_{t-1} + \nu_{2t} \quad (5.25)$$

$$\Delta FDI_t = \phi_0 + \sum_{i=1}^{n} \phi_{1i} \Delta LnGDP_{t-i} + \sum_{i=1}^{n} \phi_{2i} \Delta MON_{t-i} + \sum_{i=1}^{n} \phi_{3i} \Delta MC_{t-i} + \sum_{i=1}^{n} \phi_{4i} \Delta FDI_{t-i} + \sum_{i=1}^{n} \phi_{5i} \Delta LnVNI_{t-i} + \phi_6 ECT_{t-1} + \nu_{4t} \quad (5.26)$$

$$\Delta LnINDEX_{\mathrm{t}} = \psi_0 + \sum_{i=1}^{n} \psi_{1i} \Delta LnGDP_{t-i} + \sum_{i=1}^{n} \psi_{2i} \Delta MON_{t-i} + \sum_{i=1}^{n} \psi_{3i} \Delta MC_{t-i} + \sum_{i=1}^{n} \psi_{4i} \Delta FDI_{t-i} + \sum_{i=1}^{n} \psi_{5i} \Delta LnINDEX_{t-i} + \psi_6 ECT_{t-1} + \nu_{5t} \quad (5.27)$$

The null hypothesis is that the stock market development does not cause economic growth and vice versa.

5.6. Summary and Conclusions

In conclusion, research is the process of discovering and exploring a new idea, probing an issue or finding solutions for a problem (Guba and Lincoln, 1994; Creswell, 2009). Also, by doing research, people can understand and contribute to the development of knowledge. However, their views on the development of knowledge or research philosophies influence the way they carry out research and how they interpret the study's results (Bryman and Bell, 2011). Therefore, it is necessary to understand the philosophy of the research.

This chapter provides an overview of the research theory, conceptual framework and theoretical model employed in this study. Besides that, it explains the Autoregressive Distributed Lag (ARDL) bounds testing approach proposed by Pesaran et al. (2001) adopted in this research.

The research focuses on examining the long-run and short-run relationship, the shock and innovation effects between the stock market and economic growth and the causal relation of these nexuses in the cases of Thailand and Vietnam.

To meet the aims of research, the analysis procedures in this study are:

i. Test for the stationary of all stock market development and economic growth variables by using the Augmented Dickey-Fuller test (Dickey and Fuller, 1979) and Phillips-Peron test (Phillips and Perron, 1988) to get the cross-check;
ii. Find the cointegration relations among variables by ARDL approach (Pesaran et al., 2001);
iii. Examine the causal effects of the stock market development and economic growth variables in the models under the unrestricted error correction model proposed by

Toda and Yamamoto (1995) on the reparameterised ARDL model for the Granger causality relations.

The subsequent chapters will describe and discuss the empirical study and the implications of the application of these procedures in the case of Thailand and Vietnam.

CHAPTER 6 - STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH RELATIONSHIP IN VIETNAM: AN EMPIRICAL ANALYSIS

As described in Chapter 4 on the overview of the economic and financial development in Vietnam, Vietnam is a low-middle income country with stable economic growth over the recent decades. Vietnam's stock market has operated since the 28th of July 2000. Since then, the stock market has contributed an important role in channelling and allocating capital resources to Vietnam's economy. However, does the existence of the stock market essentially support the economic growth in Vietnam? This chapter aims to analyse the role of the stock market development in economic growth and vice versa in Vietnam over the period 2000 to 2015 by employing the autoregressive distributed lags bounds testing approach. It covers the report and discussion on the relationship between stock market development and economic growth in Vietnam in the long-run and short-run dynamics. It also clarifies the nexus of stock market development with economic growth in Vietnam in directional and causal linkage. Furthermore, it investigates whether the findings of the chapter's analysis support the theory of a relationship between the stock market and economic growth.

6.1. Introduction

In over 15 years of operation, the stock market in Vietnam has played a significant role in channelling and allocating capital resources for Vietnam's economy. However, as mentioned earlier in Chapters 3 and 4, so far, the quantitative assessment and study of financial development in general, and on the stock market development in relationship with the economic growth, have scarcely been studied in the case of Vietnam. Therefore, the study in this chapter is expected to contribute to the research literature and empirical assessments on the relationship between stock market development and economic growth in Vietnam.

This study will examine the endogenous growth theory in case of constant technology applied, which posits that stock market development causes higher growth through its influence on the level of investment in the economy of Vietnam in 2000 to 2015, or vice versa. To achieve the research aims and objectives, this study seeks to answer the two questions drawn from unresolved issues within the relationship between the stock market

and economic growth and the causal directional of any such relationships. Furthermore, it also re-assesses the nexus between the economic growth and the other capital funding sources, such as the money market and foreign direct investment, to have a broader view of the relationships between the development of the other financing channels and economic growth in the long-run and short-run.

This study applies the ARDL bounds test approach and vector error correction models to examine the long-run relationship, the short-run dynamic, and the directional relationship between the stock market development and economic growth. The investigation is divided into three stages to review the validity of the assertions of the endogenous growth theory regarding the role of stock market development on economic growth In particular, it investigates the positive role for the stock market on economic growth posited by the endogenous growth theory. The first stage is checking the stationary of all data series. It is the prerequisite condition of the cointegration analysis using the bounds testing approach. The second stage is examining the existence of the cointegration relationships and analysing the long-run relations among variables if there are existing cointegration relationships. The final stage is testing the Granger Causality relationships among the data series and the short-run dynamic adjustment of the relationship between variables.

This chapter will be presented in five sections. Section 6.1 gives an introduction to the study. Following that, Section 6.2 describes the data series and the collection sources. In Section 6.3, there will be a description of the research method and the procedure of analysis, including testing for unit roots, cointegration analysis and Granger causality tests by using the ARDL bounds testing approach. Section 6.4 will discuss the empirical results on the relationship between stock market development and economic growth in Vietnam from 2000 to 2015. It includes the examination of the feature of all variable series, the relationships between variables in the analysis. Next, it investigates the causal linkage between the variables in pairs under Granger Causality tests, the error-correction models and the relationship between the variables. Finally, Section 6.5 concludes the chapter discussion.

6.2. Data

The data employed in this empirical study are collected from international and domestic secondary data sources. As mentioned in Chapter 5, the data was collected from different sources, even for the same series, for several reasons. First, it helps to avoid the missing

data. Second, it guarantees the accuracy in recalculating and transforming the macroeconomic data from different frequencies, rather than a quarterly basis, by making a comparison of the calculation outcomes. Finally, it supports the synchronisation of data in a series in the same unit of measurement. The international data sources are the International Financial Statistics (IFS) and the Money Survey database of the International Monetary Fund (IMF), the World Bank (WB), and the Bloomberg's financial market database. The domestic data sources include the State Bank of Vietnam (SBV), the General Statistics Bureau of Vietnam (GSO) and the Hochiminh City Stock Exchange (HSX), All the data series are on a quarterly basis. The unit of the raw data is the US dollar, except the stock market index series, which is in point.

The collected data and sources are, in detail: The real gross domestic product (GDP) in the local currency and the exchange rate, are collected from the SBV, the IMF and the GSO data sources. The country population data is collected from GSO and WB. The broad money (M2) and foreign direct investment series are from the IMF financial statistics database. The stock market capitalisation and stock market index (VNI) are from the HSX and Bloomberg's financial market database. In these, the raw M2 and real GDP data series are smoothed by seasonal adjustment. The real GDP per capita and the market capitalisation data series are also converted into the US currency by using the same period quarterly average exchange rate. Then, these smoothed real GDP per capita data and stock market indices are transformed to the logarithmic form. The difference in the logarithmic real GDP presents economic growth. Meanwhile, the differences in the ratio of the stock market capitalisation to GDP (MC) and the stock market index measure the stock market development. This study also examines the contribution of other capital sources to Vietnam's economy by using the ratios of broad money to GDP (MON), and foreign direct investment to GDP (FDI) in modelling.

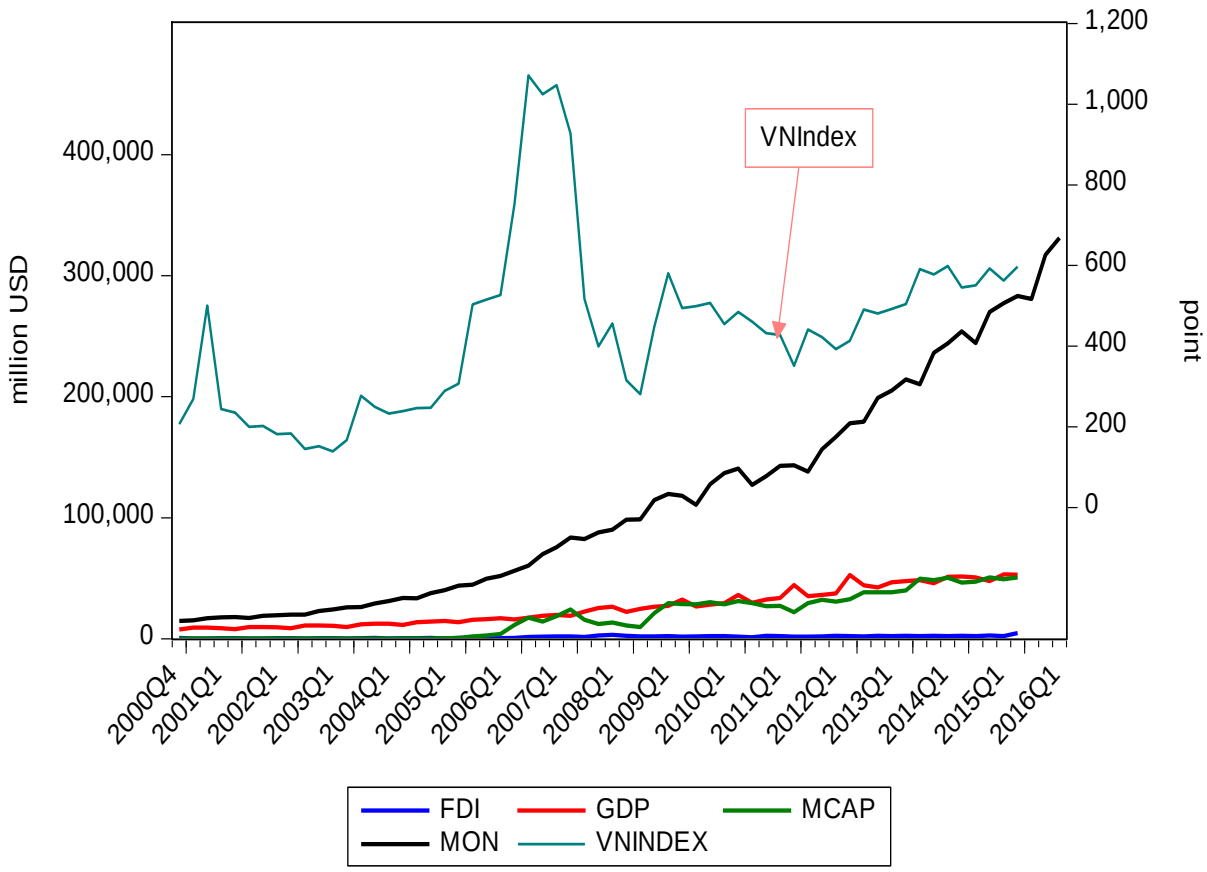

Figure 6-1 Raw data series

Even though there are two operating Stock Exchanges in Vietnam (Hanoi Stock Exchange – HNX and Hochiminh City Stock Exchange – HSX), this research focuses on examining data from the HSX. This stock exchange has operated since late July of the year 2000. Currently, approximately 80% of total market capitalisation in Vietnam is on the HSX. The HSX also applies more standardised criteria for the listed companies, especially in terms of information disclosure, in comparison with the HNX. Additionally, since commencing operation, the HSX has dominated not only the stock listing volume but also the stock liquidity in Vietnam's stock exchanges. Therefore, this study utilises the stock market index and the market capitalisation data of the HSX to represent the stock market development determinants of Vietnam for analysis and discussion.

Figure 6-1 presents the raw data series in use for investigating the relationship between stock market development and economic growth in this chapter, and Figure 6-2 illustrates the transformed data series used in modelling.

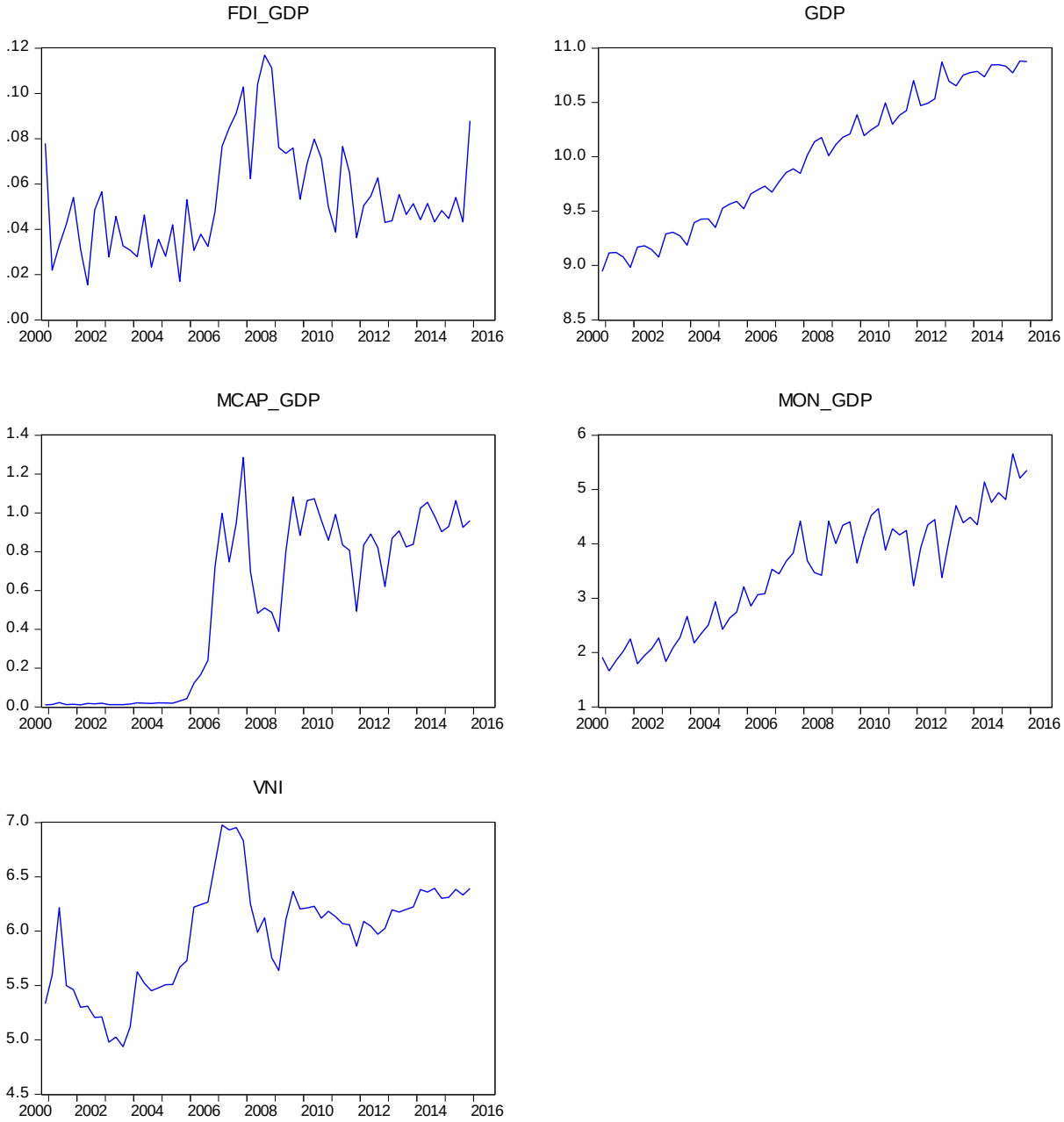

Figure 6-2 Transformed data series

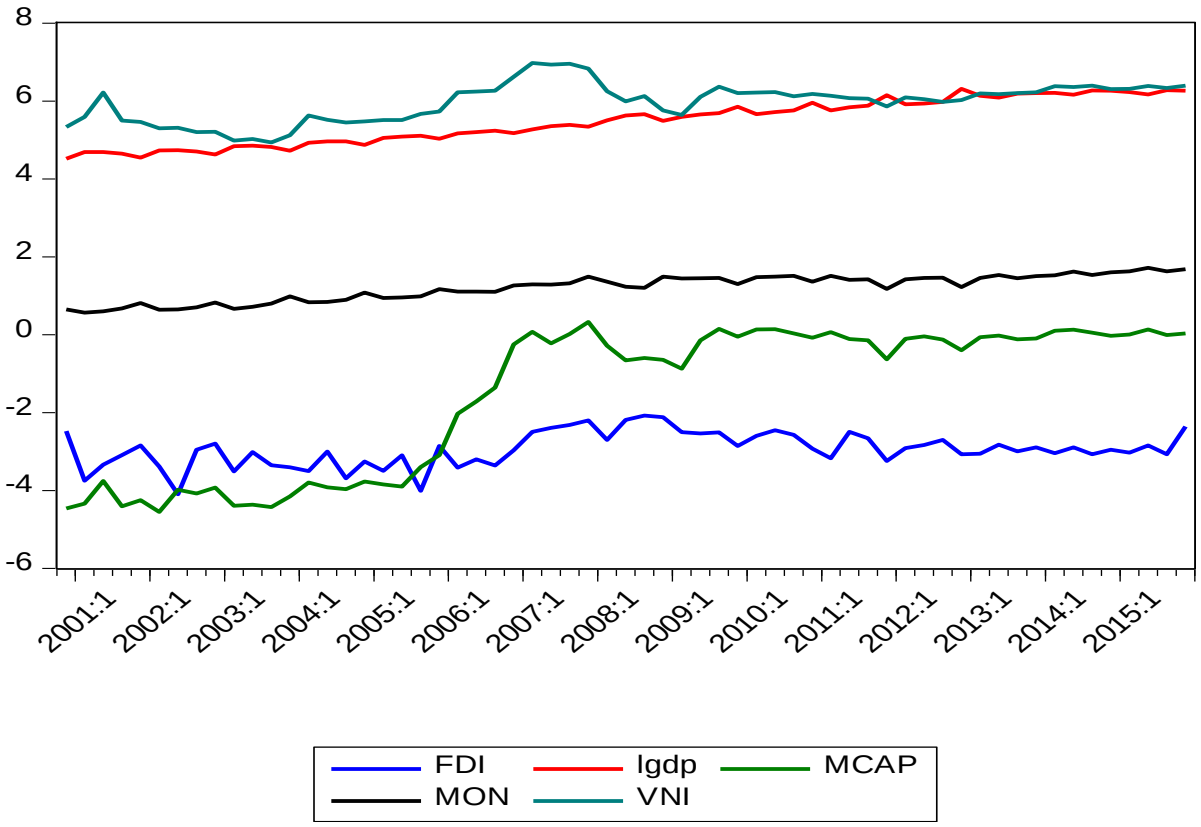

Figure 6-3 Transformed data (seasonally adjusted)

As in Figure 6-3, there was a surge increase in the market capitalisation figure in 2006. Also, there are drops in both market capitalisation and the stock market index in Vietnam in the fourth quarter of 2008 and the first quarter in 2009. It is assumed that these may be the influence of the 2008-2009 financial crisis by the world economic integration in Vietnam. Therefore, in this study, the dummy variable "Break" is added to represent the influence of the afore-mentioned crisis period.

6.3. Methods

6.3.1 Unit Root Tests

To confirm the order of integration is a prerequisite for almost all time-series data analysis. To implement this step, this study applies the Augmented Dickey-Fuller (ADF), and Phillip-Perron (PP) tests for individual series of logarithmic real GDP per capita, the ratio of broad money to GDP, market capitalisation to GDP, foreign direct investment to GDP and the logarithm of the stock market index of Vietnam.

Y_t is a random walk and assumes with intercept and trend (ADF test) (Dickey and Fuller, 1979)

$$\Delta Y_t = \alpha_1 + \alpha_2 t + \delta Y_{t-1} + \beta_i \sum_{i=1}^{m} \Delta Y_{t-1} + \varepsilon_i \quad (6.1)$$

as in PP test (Phillips and Perron, 1988):

$$\Delta Y_t = \alpha_1 + \alpha_2 t + \delta Y_{t-1} + \varepsilon_i \quad (6.2)$$

The null hypothesis that the series does have a unit root ($H_0: \delta = 0$). The alternative hypothesis is that the series is stationary ($H_a: \delta < 0$). The criteria for rejecting the null hypothesis of has a unit root is the test statistic absolute value is greater than the absolute critical value at 1%, 5%, 10% level of statistical significance. Otherwise, the null hypothesis should not be rejected.

6.3.2 The ARDL Bounds Tests for Cointegration

The results from unit root tests confirm there is no integrated order of all variables higher than I(1). These results imply all variables have met the precondition of cointegration testing by applying the ARDL method (see Pesaran et al., 2001). Thus, the second stage will test for the existence of a long-run relationship between real GDP, money supply, market capitalisation, foreign direct investment capital and the stock market index within a multivariate framework. As mentioned before, in Chapter 5, at this stage this study utilises the bounds testing approach to test for the cointegrations. In other words, it employs the ARDL model investigating the existence of the long-run equilibrium.

The orders of the lags in the ARDL models are selected by the Akaike Information Criterion (AIC). The F-test is used to determine if a long-run relationship exists between variables; the F-test indicates which variables should be normalised.

Furthermore, to ascertain the goodness of fit of the ARDL models, this study also conducts the diagnostic tests and the stability tests. The diagnostic tests check for serial correlation, function form, the normality of error term and heteroscedasticity associated with the models. The cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMsq) report the stability check of the ARDL models. As represented in Chapter 5, The ARDL models for cointegration in this study chapter are expressedin equation (5.18 to (5.22.

In equation (5.18), the real GDP per capita is the dependent variable, the null hypothesis of no cointegration amongst the variables is $H_0: \alpha_7 = \alpha_8 = \alpha_9 = \alpha_{10} = 0$ against $H_1: \alpha_7 \neq \alpha_8 \neq \alpha_9 \neq \alpha_{10} \neq 0$.

Model 1 (equation (5.18) denotes as F(LnGDP|MON, MC, FDI, LnVNI).

Similarly, in model 2 (5.19) of F(MC|LnGDP, MON, FDI, LnVNI), model 3 (5.20) of F(MON|GDP, MC, FDI, LnVNI), model 4 (5.21) of F(FDI|LnGDP, MON, MC, LnVNI), and model 5 (5.22) of F(LnVNI|LnGDP, MON, MC, FDI), the dependent variables are the ratios of the broad money to GDP (MON), the market capitalisation to GDP (MC), foreign direct investment to GDP (FDI) and the stock market index (LnVNI) respectively; the hypotheses for cointegrations are as follow:

$H_0: \beta_7 = \beta_8 = \beta_9 = \beta_{10} = 0$ against $H_1: \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq 0$

$H_0: \gamma_7 = \gamma_8 = \gamma_9 = \gamma_{10} = 0$ against $H_1: \gamma_7 \neq \gamma_8 \neq \gamma_9 \neq \gamma_{10} \neq 0$

$H_0: \delta_7 = \delta_8 = \delta_9 = \delta_{10} = 0$ against $H_1: \delta_7 \neq \delta_8 \neq \delta_9 \neq \delta_{10} \neq 0$

$H_0: \theta_7 = \theta_8 = \theta_9 = \theta_{10} = 0$ against $H_1: \theta_7 \neq \theta_8 \neq \theta_9 \neq \theta_{10} \neq 0$

These hypotheses can be examined using the standard F statistic. The F test has non-standard distributions which depend on the variables included in the ARDL model, which are I(1) or I(0).The number of regressors and this ARDL Model contains an intercept and/or a trend.

Pesaran et al. (2001) report two sets of critical values based on 40,000 replications of stochastic simulation, which provide critical value bounds for all classifications of the regressors into purely I(1), purely I(0) or mutually cointegrated for a sample size of 1000 observations. However, with the investigation period from the 2000Q4 to 2015Q4 (64 observations) in this study, the sample size is relatively small. Therefore, the relevant critical values potentially deviate substantially from the critical values reported in Pesaran et al. (2001). Hence, the exact F statistic critical value bounds will be customised to this sample size of T= 59, with four regressors in each model. This study employed a model with unrestricted intercept, and unrestricted trend, which is case V in Pesaran et al.'s (2001) terminology (see Pesaran et al., 2001). If the computed F statistics fall outside the critical bounds, a decision can be made regarding cointegration without knowing the order of integration of the regressors. If the estimated F statistic is higher than the upper bound of the critical values, then the null hypothesis of no cointegration relation is rejected. Alternatively, if the estimated F statistic is lower than the lower bound of critical values, the null hypothesis of no cointegration cannot be rejected. Meanwhile, if the estimated F

statistic falls within the value range of the critical bounds, there is an inconclusive decision about the existence of the cointegration relationship between the variables.

Also, at this stage, if the empirical results reveal that cointegration relationships exist among all variables, the marginal impacts of the regressors on the dependent variables will be discussed further.

6.3.3 Granger Causality Tests

The third stage of the study in this chapter involves constructing a standard Granger Causality test augmented with a lagged error correction term (ECT), where the series are cointegrated. The testing models are presented in equations (5.23) to (5.27), in which, ECT_{t-1}denotes the lagged errore-correction term derived from the long-run cointegrated relationship (this term is not included if the variables are not cointegrated) and ν_{it}, $i = \overline{1,5}$ are serially independent random errors with zero mean and finite covariance matrices. In each case, the dependent variable is regressed against past values of itself and other variables.

If there is an existing cointegration, it suggests that there must be Granger causality in at least one direction, but it does not indicate the direction of temporal causality between the variables. The F statistics on the explanatory variables in each equation show the statistical significance of the short-run causal effects. The coefficient of the ECT should be negative, and its absolute value need not be always less than unity, implying that, at times, overshooting is a possibility.

Also, the error correction mechanism operates to correct for the disequilibrium in the cointegration relationship. The error correction terms within the error correction mode, and its effect and interpretation, contain significant importance about the equilibrium of the system. They capture the short-run dynamics and serve as a way to reconcile the behaviour of an economic variable in the short-run with its performance in the long-run, as in equation (5.23 to (5.27.

6.4. Empirical Results and Discussion

This section will be divided into three sub-sections: Section 6.4.1 examines the time series data by using the Augmented Dickey-Fuller (Dickey and Fuller, 1979) and Phillips and Perron (1988) tests and reports its results. Sub-section 6.4.2 tests the cointegrating relationship between variables by using the ARDL bounds testing approach (Pesaran et al.,

2001) and discusses the long-run equilibriums and the marginal impacts on the dependent variables in the cointegration equations. Finally, investigating the Granger causality in the ARDL framework: estimating the error correction terms together with the discussion on the short-run dynamic analysis in section 6.4.3

6.4.1 Unit Roots Test Analysis

Table 6-1 Unit Roots Estimation at Level

	Augmented Dickey-Fuller test statistic			Phillips-Perron test statistic		
At level	Test critical values:	t-Statistic	Prob.*	Test critical values:	t-Statistic	Prob.*
LGDP	-2.913549	-0.83171	0.8022	-2.91086	-0.94416	0.7673
MCAP	-2.91086	-1.32353	0.6132	-2.91086	-1.33239	0.6090
MON	-2.913549	-1.42479	0.5639	-2.91086	-1.16861	0.6825
FDI	-2.911730	-2.680537	0.0834	-2.910860	-4.549967	0.0005
VNI	-2.910860	-1.913552	0.3241	-2.910860	-2.015954	0.2794

This empirical research employs the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests for individual series. The results of the unit root tests for almost all variables at the level presented in Table 6-1 report the test statistic value at 5% significance level does not exceed the absolute critical values in all variable series. Only FDI is significantly stationary in the PP test but not in the ADF test. This means that, by using the ADF test, at the significance of 5%, all variables in this analysis are non-stationary at the level. PP test estimations gave the result of nonstationary to all variables except FDI. By the test for unit roots at the first differences in both ADF and PP, tests report that all the variables are stationary at a 5% level of significance (all the absolute test statistic values are higher than the critical test values with the probabilities being under 0.05 (see Table 6-2). These results confirm all the series are integrated of the level and first difference order or stationary at I(0) and I(1).

Table 6-2 Unit Roots Estimation at the first differences

		Augmented Dickey-Fuller test statistic			Phillips-Perron test statistic		
At difference	1st Test values:	critical	t-Statistic	Prob.*	Test values:	critical	t-Statistic	Prob.*
LGDP		-2.913549	-14.5308	0.0000		-2.91173	-17.7571	0.0000

MCAP	-2.91173	-7.3879	0.0000	-2.91173	-7.41781	0.0000
MON	-2.913549	-11.7245	0.0000	-2.91173	-15.4649	0.0000
FDI	-2.911730	-13.13739	0.0000			
VNI	-2.911730	-7.492044	0.0000	-2.911730	-7.495272	0.0000

6.4.2 Cointegration and Long-run Equilibrium Analysis

The ARDL Bounds Models test the hypotheses of the existence of the long-run equilibrium relationship between Vietnam's real GDP per capita, stock market capitalisation to GDP, broad money supply to GDP, foreign direct investment to GDP and the stock market index series.

As mentioned in the previous Section 6.3.2, in the case of Vietnam, this study tests the long-run relationships in equations (5.18 to (5.22 with the null hypotheses of no cointegration relation among variables for the quarterly data in 2000Q4 to 2015Q4. The maximum number of lags in the ARDL is no higher than 8. (The process of selecting optimal lag length depends on the model diagnostic, such as the autocorrelation or heteroscedasticity checking in each model).

Table 6-3 Bounds Test Results

	Model	F-Statistic	Significance.	I(0)	I(1)	Cointergration
1	F(LGDP|MCAP, MON,FDI,VNI)	5.026211	10%	2.45	3.52	Cointegrated
2	F(MCAP|LGDP, MON,FDI,VNI)	4.090209	5%	2.86	4.01	Cointegrated
3	F(MON|LGDP,MCAP,FDI,VNI)	4.578205	2.5%	3.25	4.49	Cointegrated
4	F(FDI|LGDP,MCAP, MON,VNI)	15.29277	1%	3.74	5.06	Cointegrated
5	F(VNI|LGDP,MCAP, MON,FDI)	3.905147				Cointegrated*

*Note that * indicates the conclusion at 10% of the significance level.*

With reference to the suggested F-statistic critical values from Narayan (2005) and Pesaran et al. (2001), Table 6-3 represents the F-statistic calculation from the ARDL tests for each model from (5.18 to (5.22. The model 1 with LGDP is the dependent variable,

the F-statistics value is 5.026211. This number is higher than the upper bound of 4.01 at the significant level of 5%, and the upper bound at 10% of the significant level. Therefore, at 5% of significance level, we can reject the null hypothesis of no cointegration (Pesaran and Pesaran, 1997, Pesaran et al., 2001). Similarly, in Models 2, 3 and 4 the F-statistic values are higher than the upper bound at a 5% significance level. Only in Model 5 is the statistic value higher than the upper bound, at 10% of significant level. Therefore, it can be concluded that there are cointegration relationships in Models 1 to 4 at 5% level of significance and in Model 5 at 10% level of significance.

Furthermore, the significance of the error correction terms in each model further confirms the existence of the cointegration relationships between testing variables,

Following the establishment of the existence of cointegration equations (5.18 to (5.22, further analysis can be taken by estimating the coefficients of the long-run relationship by ARDL models. This step is to investigate the marginal influences on the real GDP per capita, ratios of stock market capitalisation to GDP, broad money to GDP, foreign direct investment to GDP ratio and the VNI index from the other variables in these five models.

Estimated results of Long-run Coefficients using the ARDL approach[12]

In the model 1,

LGDP =	**0.557009 MCAP**	**-0.3907 MON**	**+ 0.484459 FDI**	**-1.32514 VNI**	**+ECM$_1$**
Std. Error	***0.208181***	*1.521255*	*1.238047*	*0.910972*	
t-Statistic	***2.675593***	*-0.25682*	*0.391309*	*-1.45464*	
Prob.	***0.0216***	*0.8021*	*0.703*	*0.1737*	

The estimated long-run coefficients of equation suggest there is only one cointegration relationship between LGDP and MCAP. It reveals that there is a positive long-run relationship between the ratio of market capitalisation to GDP and real GDP per capita. If the ratio of the stock market capitalisation to GDP increases by one %, it will lead to an increase of 0.557 % in GDP. In other words, the stock market development in terms of increasing the market capitalisation has a positive contribution to the economic growth in the long-run. In this, the policies such as favourable application taxes for newly listing companies are on the right track. However, the high speed of growth in market capitalisation and transactions in the years 2006 to 2008 seems to make the market was overheated. In this period, the narrow trading bands were applied to reduce the risk of

[12] See Appendix A for more details of the estimated results.

vulnerability in the market. Nevertheless, Farber et al. (2006) criticise this tool as it does not support the natural price adjustment in the stock market.

Model 2

MCAP =	**1.087554 LGDP**	**+ MON**	**0.062764**	**+ FDI**	**1.11109**	**+ VNI**	**2.247024**	**+ECM$_2$**
Std. Error	*0.68329*		*1.40331*		***0.47349***		***0.64216***	
t-Statistic	*1.59164*		*0.04473*		***2.34662***		***3.49919***	
Prob.	*0.121*		*0.9646*		***0.0251***		***0.0014***	

Similarly, there is a significant relationship between foreign direct investment and the stock market index with the market capitalisation size. In the long-run, the foreign direct investment has a positive relationship with market capitalisation. The increase of foreign direct investment by 1% may lead to growth in the market capitalisation of 1.1%. Also, if the stock market index rises 1%, the market capitalisation size may rise by 2.24% in the long-run. The opened market policy is, in effect, attracting more foreign direct investment in 2000 to 2015.

Model 3

MON =	**0.670395 LGDP**	**-0.13126 MCAP**	**+ 0.627131 FDI**	**-0.03429 VNI**	**+ECM$_3$**
Std. Error	***0.242186***	*0.097313*	***0.253325***	*0.207372*	
t-Statistic	***2.7681***	*-1.34883*	***2.475602***	*-0.16537*	
Prob.	***0.0094***	*0.1872*	***0.019***	*0.8697*	

The test results also suggest the existing of a long-run relationship between economic growth and money market and foreign direct investment and money supply in a positive manner.

If the growth rate of the income per capita increase by 1% causes the money supply to GDP ratio increase by 0.67 %. Meanwhile, it will increase by 0.62% if the foreign direct investment to GDP ratio rises by 1%.

Model 4

FDI =	**-1.01795 LGDP**	**+0.28496 MCAP**	**+0.612428 MON**	**+0.107879 VNI**	**+ECM$_4$**
Std. Error	***0.228531***	***0.083731***	*0.511171*	*0.212795*	
t-Statistic	***-4.45432***	***3.403262***	*1.198088*	*0.506962*	
Prob.	***0.0001***	***0.0015***	*0.2374*	*0.6148*	

In

Model 5

VNI =	**-0.55045 LGDP**	**+0.429663 MCAP**	**+ 0.42102MON**	**-0.68008 FDI**	**+ECM$_5$**
Std. Error	***0.219828***	***0.07916***	*0.440174*	***0.194569***	
t-Statistic	***-2.50402***	***5.427775***	*0.956485*	***-3.49533***	
Prob.	***0.0186***	***0.0000***	*0.3473*	***0.0017***	

ECM_{t-1}	Coefficient	Std. Error	t-Statistic	Prob.
Model 1	*-0.120993*	*0.020668*	*-5.854026*	*0.0001*
Model 2	*-0.246496*	*0.051476*	*-4.788524*	*0.0000*
Model 3	*-0.175410*	*0.034504*	*-5.083769*	*0.0000*
Model 4	*-0.971564*	*0.106274*	*-9.142033*	*0.0000*
Model 5	*-0.454597*	*0.096012*	*-4.734811*	*0.0001*

In turn, in Model 1, there is also a significant positive long-run relationship between real GDP per capita and the ratio of market capitalisation to GDP. Meanwhile, the estimation also suggests the significant joint cointegrated relations between FDI and MCAP, and VNI and MCAP in the same direction. However, the estimated results from equation illustrate that there is no cointegration between the variable in the equation. These results consist of the bounds test results in model 1. The long-run cointegration relations are also found in equations (5.19, (5.20, (5.21 and (5.22. There are joint cointegration relations between real GDP per capita and FDI; VNI and FDI; real GDP per capita and VNI; MCAP and VNI, and FDI and VNI.

The findings from the testing equation Model at a significant level of 5% reveal that there is a long-run relationship between the stock market capitalisation to GDP and real GDP per capita. It implies that, in Vietnam, from 2000 to 2015, when the ratio of the stock market capitalisation to GDP increases by 1 unit this will lead to an increase in real GDP per capita by 0.986 %. In the meantime, in equation Model 2, three jointly cointegrated relationships are found. At the same level of significance, the increase of real GDP per capita by 1% could result in the increase in the stock market capitalisation to GDP ratio by 0.419 units. Therefore, these results support the hypothesis that stock market development promotes economic growth in Vietnam and vice versa. The positive long-run relationship between stock market development and economic growth is also found

in numerous studies (see: Singh, 2008; Shan and Jianhong, 2006). Also, the ratio of foreign direct investment to GDP increased by a unit might lead to an increase in the stock market capitalisation to GDP ratio by 7.53 units. The stock market index illustrates its contribution to promoting market capitalisation. If the stock market index (VNI) increases by 1%, the stock market capitalisation to GDP in the Hochiminh Stock Exchange could increase by 0.485 unit.

The bounds test estimated results in Table 6-3 suggest that there are no long-run equilibrium relationships between variables in the ARDL model in equation (5.20. Therefore, the insignificant test results on all the long-run coefficients in this model are consistent with the previous analysis.

Likewise, from the equation (5.21 there are two long-run relationships between the real GDP per capita and the ratio of foreign direct investment to GDP and the ratio of the foreign direct investment to GDP, and between the stock market index and the ratio of the foreign direct investment to GDP. At 5% of the significant level, in 2000-2015, when the real GDP per capita increase by one 1% may lead the fall in the ratio of foreign direct investment to GDP by 1.01 unit. This slight decrease in the FDI ratio might be due to the fact that the growth rate of the GDP is much higher than the growth rate of foreign direct investment inflows to the country. Meanwhile, the increase in the stock market index is a good signal to create a better investment environment and attract more foreign direct investment. The estimation illustrates that when VNIndex increases by 1%, it leads to an increase in the ratio of foreign direct investment to GDP by 1.078 unit.

Also, from equation (5.22 at 5% of the significant level, it is very strange that there have been the negative long-run relationships between the GDP per capita and the stock market index, and the ratio of foreign direct investment to GDP and the VNI index. Ceteris paribus, when the GDP per capita increases by 1%, it will bring a decrease in the VNI index of 1.1769%. Meanwhile, one unit increase in the ratio of foreign investment to GDP increase one unit would lead to a 16,73% decrease in the VNI index. These results suggest that the capital stock raised from the increase in income and foreign direct investment might go to the primary market of the unlisted companies. However, there is positive support for the increase in the stock market index by the stock market capitalisation and broad money. When the ratio of stock market capitalisation to GDP increases one unit, it might result in the VNI index increasing by 1.699%. Moreover, if the ratio of broad money to GDP increases one unit, the VNI index could increase by 0.53%.

Even in 2000-2015, the Vietnam economy's source of financing is mainly from the banking sector, and while the estimation results suggest the positive contribution of the stock market and foreign direct investment inflows, the contribution from the banking system in Vietnam is not supported. This evidence may due to the fact of the banking system's performance during this period. In this economic transition time, the banking sector reveals several problems that influence the banking system development, and, therefore, the economic growth. These problems include the rate of non-performing loans still being high, the collapse of several business groups or big firms (typically the Vinashin Group) which could not repay the loans and the cross-ownership among banking sector and big companies. The cross-ownership may reduce competition since it facilitates collusion among firms. When major investors own shares in multiple firms in the same industry, cross-ownership changes competitive interest and moves the market equilibrium closer to the monopoly situation (Trivieri, 2007). As per the results, in this period, the banking system needs to be restructured, and many banks are merged and acquired.

6.4.3 Granger Causality and Short-run Dynamic Analysis

The ARDL bounds tests results suggest the long-run and short-run Granger causality within the error correction mechanism. The findings reveal that the coefficients on the lagged error correction terms in equations (5.23(5.24(5.25 (5.26) and (5.27) are significant with the expected sign (negative) at 1% of the significant level[13]. Thus, it further confirms the results of the bounds tests for cointegration. The coefficient on the lagged error correction term of all variables to the real GDP per capita -0.12 implies that the deviation from the long-run equilibrium level of the current period is corrected by 12% in the next period to restore equilibrium. Meanwhile, this coefficient in the equation, where the stock market capitalisation ratio is the dependent variable, is -0.24. It suggests that, when once shocked, convergence to equilibrium is rapid. In other words, the deviation from the equilibrium level of stock market capitalisation to GDP during the current quarter will be corrected by 24% in the next quarter. Also, in equation (5.26), the coefficient of the lag error correction term is -0.17, which implies that the deviation from the equilibrium level of foreign direct investment to GDP during the current quarter will be corrected by 17% in the following quarter. Similarly, in Equation (5.27), the correction to the long-run equilibrium from the deviation of the current period to the next period of

[13] See the Appendix for more detail on the Error Correction Model estimations

the stock market index (VNI) will be by 45%. The Granger short-run causality can be briefly presented in the table:

F-Statistic results of Short-run Granger causality tests and t-statistic of ECM

	F-Statistics					
	Error Correction					
Dependent Variable	ΔLnGDP	ΔMCAP	ΔMON	ΔFDI	ΔVNI	ECM_{t-1} [t-statistics]
ΔLGDP	-	6.009130	8.410431	4.220448	5.651510	-5.854026
		[0.0040]	[0.0010]	[0.0153]	[0.0051]	[0.0001]
ΔMCAP	3.863377	-	4.786196	3.766280	0.0122 [0.0000]	-4.788524
	[0.0308]		[0.0036]	[0.0122]		[0.0000]
ΔMON	64.65750	5.459369	-	8.583357[0.0003]	4.207341[0.0078]	-5.083769
	[0.0000]	[0.0006]				[0.0000]
ΔFDI	**2.189745**	25.95947	3.907931	-	4.325778	-9.142033
	[0.1240]	[0.0000]	[0.0274]		[0.0093]	[0.0000]
ΔVNI	3.764580	12.27105	5.075383	11.17150	-	-4.734811
	[0.0075]	[0.0000]	[0.0013]	[0.0000]		[0.0001]

Short-run causality test results from the Wald tests for joint significance of variables and lag error correction models t-statistics in equations (5.23 to (5.27).

Regarding the short-run Granger causality results, the F-statistics on the explanatory variables suggest that there are five bi-directional short-run relationships. They are (i) GDP per capita and the ratio of broad money to GDP; (ii) GDP per capita and stock market capitalisation to GDP ratio; (iii) broad money and stock market capitalisation to GDP ratios; (iv) GDP per capita and stock market index; and (v) foreign direct investment to GDP ratio and stock market index.

The unidirectional short-run relationships are between (i) GDP per capita and the foreign direct investment to GDP ratio; (ii) broad money to GDP ratio and stock market index; (iii) foreign investment and stock market capitalisation to GDP ratios; (iv) stock market index and stock market capitalisation. However, there is no short-run Granger causal relationship between the broad money and the foreign direct investment to GDP ratios.

6.5. Conclusion

Following the basic theoretical framework that links together endogenous growth theory on the functions of financial markets and institutions, this chapter has investigated and

determined the cointegration relationships between the stock market and economic growth in Vietnam from 2000 to 2015 by using the ARDL model framework. Together with the relationship between the stock market development and the economic growth, this empirical chapter has also suggested the relationship between other financial funding sources such as broad money and foreign direct investment and economic growth and the stock market development in the long-run and short-run dynamic in the same period.

As suggested in many studies, within countries at the initial stage of stock market development, the stock markets do not support the economic growth (e.g. Ross Levine, 2002; Lee, 2012). However, the results of cointegration and causality testing suggest that the real GDP per capita and stock market capitalisation are cointegrated when they, in turn, are dependent variables. Also, foreign direct investment and the stock market index are jointly cointegrated with stock market capitalisation, and they have positive long-run relationships. Furthermore, the stock market index and GDP per capita are found to have a cointegrating relationship with foreign direct investment. However, there is a negative long-run relationship between real GDP per capita and the ratio of foreign direct investment to GDP, while the stock market index illustrates positive support to this ratio in the long-run. Other negative long-run cointegrated relationships are also obtained. They are relationships between real GDP per capita and foreign direct investment to GDP ratio with the stock market index.

In the short-run dynamic analysis, the evidence presented the cointegration examination report that supports the view that there is both a short and long-run relationship between stock market development and economic growth in Vietnam. These findings are consistent with the theoretical prediction of both the finance growth and endogenous growth literature. As in statistics and examination, it is found that the size of Vietnam's stock market regarding market capitalisation has historically ranged from between 5% to above 20% of the real GDP for the period from 2000 to 2015. Thus, indicating a reasonable size of GDP infers that the size of the Vietnam stock market provides a reasonable sample size for the Vietnamese economy. The findings also support the discussion on financial sector development in Vietnam in Chapter 4.

Overall, the findings in this chapter have important policy implications for Vietnam and other developing countries with similar economic structures. The evidence indicates that the stock market and economic growth play a significant role in encouraging each other's

development. Thus, the development of the stock market would be beneficial for economic growth in the Vietnamese economy.

Table 6-4 Decision of Causality

Long-run Causality			***Short-run Causality***		
LGDP	⇎	MON	LGDP	⇄	MON
LGDP	⇄	MCAP	LGDP	⇄	MCAP
LGDP	→	FDI	LGDP	→	FDI
LGDP	→	VNI	LGDP	⇄	VNI
MON	⇎	MCAP	MON	⇄	MCAP
MON	⇎	FDI	MON	⇎	FDI
MON	→	VNI	MON	→	VNI
MCAP	←	FDI	MCAP	←	FDI
MCAP	⇄	VNI	MCAP	←	VNI
FDI	⇄	VNI	FDI	⇄	VNI

In conclusion, the results of the empirical analysis of Vietnam suggest that the stock market development does influence economic growth, and vice versa, in the long-run and short-run. In other words, both the demand side of growth and supply side of stock market development have impacts on each other's development. However, to justify the findings, further analysis among other developing countries is necessary, especially those in the same region. In summary, investigating the influence of the financial sector regarding the contribution of the stock market to economic growth in Vietnam should be updated and implemented. The analysis of its relationship with economic growth should also take into consideration the impact of the macroeconomic policy to evaluate the role of the stock market in Vietnam's economy. The research is also in the context of the stock market and economic development of the developing countries in the South-East Asian region. Therefore, the research results may provide the valuable reference evidence for the policymakers in adjustment regulation framework to promote the stock market development and economic growth in Vietnam and other countries with newly established stock markets in this region.

CHAPTER 7 - THAILAND'S STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH NEXUS: ANALYSIS – COMPARATIVE ANALYSIS AND IMPLICATIONS FOR VIETNAM

The previous chapter discussed the relationship between the stock market and economic growth in Vietnam between 2000 and 2015. Then, what is the future of this nexus for Vietnam? If the financial crisis has influenced Vietnam's vulnerable economy, what can it do to maintain the sustainable stock market development and economic growth? By using the time series approach and autoregressive vector framework, this chapter will present and discuss the analysis of the relationship between the stock market and economic growth of Thailand's case for comparison with that of Vietnam. In the region, this country shares the similarity in geography, social and culture with Vietnam. The findings suggest the forecast for the relationship for Vietnam and implications for the future development of the stock market and its economy in the coming time.

7.1. Introduction

As discussed in the previous chapter, Vietnam's stock market development is still in the initial stages. To forecast the potential development in the next steps and how stock market development influences the economic development of Vietnam requires the analysis for comparison to the pioneer countries which sharing the similarities in the South-east Asian region.

Vietnam is the member of the Associate of South-east Asian Nations (ASEAN) in the region. The ASEAN was founded in 1967 with originally of five countries including Indonesia, Malaysia, Philippines, Singapore and Thailand. The aims of this association are through cooperation among the member countries to increase the welfare of the people in the area, both economically and culturally. Vietnam joined this organisation in 1995 to benefit from the integration into the economic, social and cultural environment of this community. Currently, ASEAN includes ten dynamic economies: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. These countries have experienced substantial economic growth in the past 20 years. Moreover, the member countries of the ASEAN have made an effort toward the target of a borderless economic community by 2030 (Asian Development Bank Institute, 2014).

Regarding the capital market development in ASEAN's countries, Singapore and Malaysia have more advanced financial markets and regulatory framework. Originally, the Singapore Stockbrokers' Association founded the stock business in Malaysia. Both Malaysia and Singapore shared a common stock exchange called Stock Exchange of Malaysia and Singapore (SEMS) until 1973. By 1990, Malaysia delisted Singapore incorporated companies in Malaysian stock exchange and vice versa. Different from Thailand, the developing economies of Indonesia, the Philippines, and Vietnam still heavily rely on the banking sector for financing investment. Meanwhile, Cambodia, Laos and Myanmar are developing a sound banking system (Asian Development Bank and Korea Capital Market Institute, 2014), and their stock markets are at the beginning of their life-cycle. Laos' and Cambodia's stock exchanges began operation in 2011 and 2012, respectively. More recently, Myanmar's stock exchange has operated since December 2015 with three listed companies.

In the South-east Asian region, Thailand is the developing country. It has developed a better sound financial system in comparison with the other developing countries in the area. Currently, in Thailand, the average proportions of investment financing for the economy from both the banking sector and equity market are approximately equal. After the Asian financial crisis (1997-1999), the economy not only relies on the banking sector or equity market for investment financing, Thailand has been increasing the reliance on its corporate bond market. By 2013, the outstanding corporate bonds accounted for USD 274 billion in comparison with equity market capitalisation and bank lending of USD 356 billion and USD 376 billion, respectively (Stock Exchange of Thailand, 2014). In an academic study to examine the efficient market hypothesis (EMH) for the stock markets of the ASEAN countries, Guidi and Gupta (2011) suggest only the stock markets in Singapore and Thailand are following the EMH in the weak form – random walk movements in the stock prices. Also, the World Bank classifies Singapore as a developed country regarding income; the other countries in ASEAN are developing ones. Thailand also has experienced severe financial crises, quickly recovered, and maintained its economic growth. Therefore, this chapter selects Thailand's stock market and economic development as the case study for the comparative analysis and forecasting the stock market and economic growth relationship in Vietnam.

In this chapter, the analysis of stock market development and economic growth nexus in Thailand during the time from the first quarter of 1998 to that of 2016 is undertaken. The application of the same approach and methodology in the previous chapter is to examine

the relationship between stock market development and economic growth in Thailand. However, the analysis considers two periods of stock market development in Thailand. The first period is from 1998.Q1 to 2008.Q1; the second one is from 2008.Q1 to 2014.Q4. Although Thailand has been developing the stock market since 1975, it has experienced the ups and downs of economic development, especially its dramatic economic recovery from the financial crises of the Asian financial crisis in 1997 and the global financial crisis in 2007-2009. The reason for breaking data into two periods in the analysis is the interruption of the development process in economic growth due to the happening of financial crises.

This chapter focuses on the issue: (i) what is the relationship between the stock market development and economic growth in Thailand in two periods of development? (ii) What has Thailand done to recover and maintain the development of the stock market after the financial crises? The collected data for this analysis are from the trustable secondary source such as the Stock Exchange of Thailand (SET), the Bank of Thailand (BOT), Thailand's Office of National Economic and Social Development Board (NESDB) sources. The findings of this analysis support the hypothesis that the stock market development caused economic growth in Thailand. The results suggest the stock market and economic growth in Thailand are cointegrated and have short-run Granger causality in both directions from 1998 to 2008. Together with the relationship between the stock market and economic growth in Thailand in this period, the evidence also recommends that the long-run and positive causality between the money market and economic growth. Besides, the results show that foreign direct investment in this period has a positive long-run relationship with economic growth. However, from 1994 to 2014 that included the time the financial crises occurred, the estimated results reveal that the stock market does not make causal the economic growth in the long-run, but the economic growth causes the stock market development. In addition, there is also evidence that the money market has causality relationships with stock market development.

This chapter includes four sections. The first section introduces the overview of the South-east Asian economic and the stock market development; the selection case of Thailand's stock market development in relationship with its economic growth for analysis and discussion. The second section gives the introduction of Thailand's economic development in brief; the analysing Thailand's experience in stock market development that should bring the valuable policy suggestions for the other countries in the region, which have the early stages of the stock markets development such as

Vietnam, Laos, Cambodia, and Myanmar. The third section examines Thailand's stock market development and economic growth nexus. It includes the description of collected data and data sources for the analysis, methodology, the result and discussion. Finally, the conclusion of this chapter is in the fourth section.

7.2. Stock market development and economic growth in Thailand

7.2.1 Overview of Economic Growth in Thailand

Thailand is a country with more than 67 million habitants. Thailand became the upper-middle-income country in 2011 (Asian Development Bank, 2015b). Thailand is also the fourth-largest economy in the ASEAN region regarding income per capita (after Brunei, Singapore, and Malaysia) (World Bank, 2016). The domestic currency of Thailand is the Thai Baht (THB). Currently, one US dollar is approximately equivalent to 34.775 THB. Thailand has an export-oriented economy, which mainly depends on the manufacturing sector. In recent years, despite the domestic political chaos, the economy is relatively stable in Thailand.

From 1985 to 1995, the Thai economy had experienced a boom period. From 1985 to 1997, just before Asian financial crisis, Thailand's economy grew at an average annual rate of approximately 9% (see Figure 7-1. *Source: IMF's World Economic Outlook source*). However, the Asian financial crisis in 1997-1998 severely impacted on the real economic growth of just around –7.6% in 1998.

The overheat development of the Thai economy pre-crisis 1997 was fuelled by the excessive capital inflows also led to the bullish equity market and the bubble price in the real estate market. The causes of this crisis were mainly from the country's financial liberalisation with large capital inflows when the financial system was not soundly developed, lack of prudent monitoring and supervision to the financial institutions and the rigid exchange rate policy (Lauridsen, 1998 and Pholphirul, 2009). Thus, the lesson learned from the 1997 financial crisis made the Thai banks rely more on deposits rather than on foreign borrowing. The Thai authorities also enhanced supervision and risk management in the financial system. Subsequently, the Thai economy had gradually recovered during 2000 – 2004 from the financial crisis, with GDP rising by an average of around 8% per annum. From 2005 – 2011, the growth increased to an average of 6% per annum (Bhaopichitr and Thitisakmongkol, 2014).

Like many other countries, the global financial crisis 2008 – 2009 has influenced the financial stability in Thailand, consequently harmed the economic growth (Asian Development Bank, 2015a). This consequence can be recognised by negative economic growth in Thailand in 2009. Thailand has slower economic recovery from the influence of the global financial crisis than the other countries in the region such as Malaysia (Bhaopichitr and Thitisakmongkol, 2014). However, the impact of this crisis on the Thai economic growth has been small in comparison with that of the Asian financial crisis in 1997 (Chandoevwit, 2010).

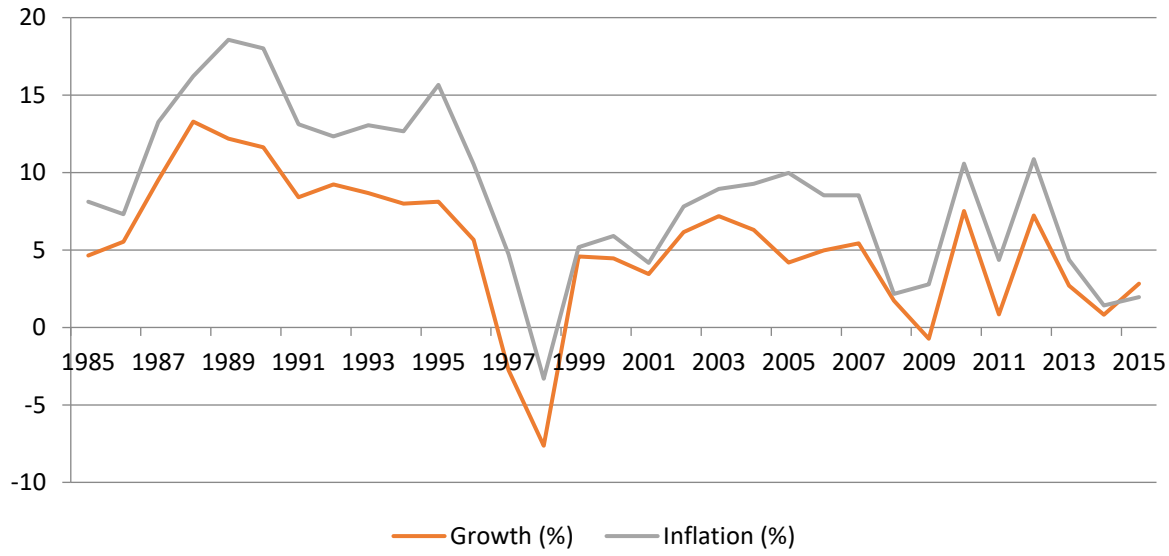

Figure 7-1 Thai GDP growth rate and Inflation in 1985 – 2015 (Source: IMF's World Economic Outlook)

Together with other sectors in the economy, the banking sector in Thailand has contributed much effort to support the stabilisation of the financial system. Thai banking authority removed the fixed exchange rate regime in 1997 and adopted the risk-based supervision and risk management of banks. These contributed to reducing Thailand's vulnerability to the global financial crisis (Bank of Thailand, 2010). Besides, since the banking reforms in 2006, the financial market has witnessed an increase in the market capitalisation, promoting savings and effective fundraising and allocation in Thailand. Especially, strengthening banking transparency provides much support for the sound development of the financial system. In 2015, there were 11 among 17 Thai banks listed on the Stock Exchange of Thailand (Bertelsmann Stiftung, 2016).

Also, to recover from the impacts of the political turmoil began in 2013 on the economy, the Thai government has been imposing various other policies such as increasing the net purchasing power among mid and lower-income people, reducing the cost of living for Thai people, pro-business, pro-investment, planned public infrastructure investment. In summary, the "sound fundamental, quick and forceful policy responses" contributed to the economic recovery (Sangubhan and Wangcharoenrung, 2011) in Thailand recently.

7.2.2 Stock market development in Thailand

The Stock Exchange of Thailand (SET) began trading on April 30, 1975. There were only 21 listed companies in SET in 1975. Since then, the development of the Thai stock market has been much affected by the macroeconomic changes in the country. Evidently, the movement of the stock market index reflects the impacts of macroeconomic behaviour. During 1975 to 1985, the market development is rather dull with the index below and around 200 points. It is partially because Thailand maintained high savings interest rate, on average of 10% per annum in this period. In 1983-1985, Thailand had shut down 50 finance and securities firms. Since 1985, the stock market in Thailand had boomed until before crashing down during the Asian financial crisis in 1997. The stock index was 139.65 points in January 1985 then climbed to the highest point at 1,410.33 points in January 1996 (approximately ten times increasing).

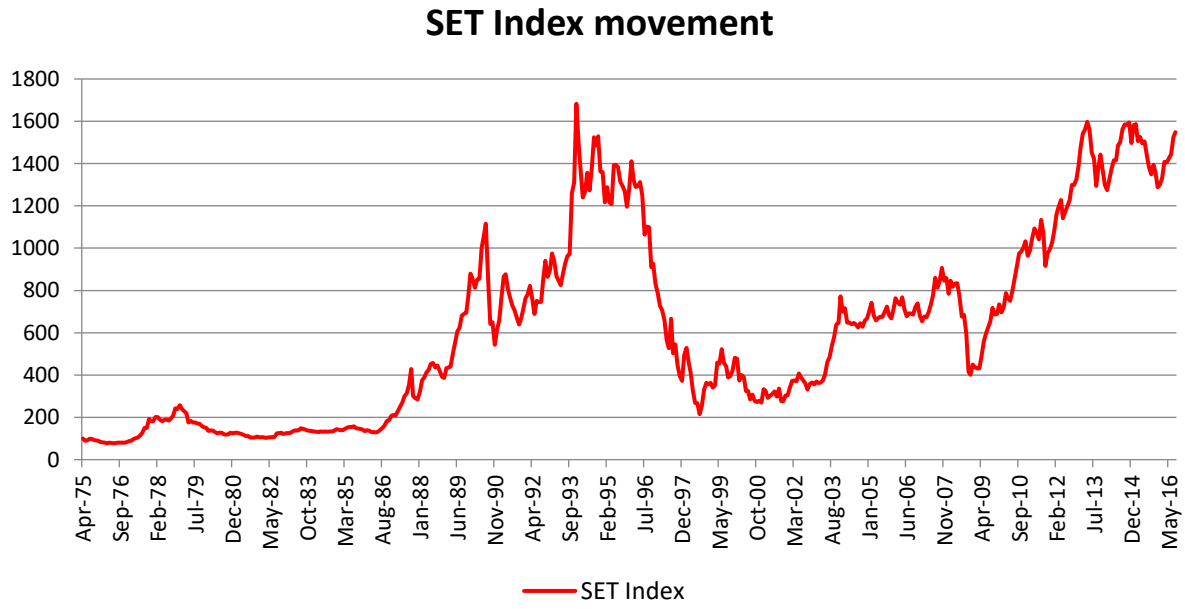

Figure 7-2 The movement of the Thai Stock Market Index – SET Index from April 1975 to August 2016 (Source: The Stock Exchange of Thailand)

Meanwhile, the number of listed companies was also grown very fast in this period. In 1985, this figure was 93 companies, and in 1996, it was 454 companies (*Source: The Stock Exchange of Thailand*).

The occurring of the Asian financial crisis since early 1997 led to the crashing down in the stock market to the lowest point of 214.53 during 1988 – 1999 in August 1998. Moreover, despite the decrease in the relative GDP, the market capitalisation to GDP ratio dropped dramatically from 105% in 1993 to 24% in 1997. The recovery of the market began in 1998 and developed until early 2008 (see Figure 7-2 and Figure 7-3). Although the recovery made progress, the market continued growing until the spread of the global financial crisis in 2008-2009 remarked by the Lehman Brothers bankruptcy in August 2008. Within only four months, the Thai stock market lost nearly 300 points. The SET Index fell from 684.44 points in August to 401.84 points in November 2008. Experience from the Asian financial crisis in 1997, the Thai stock market recovered very fast and kept the steady increase in the stock index and the market capitalisation to GDP ratio from 2008 - 2012 (Figure 7-3).

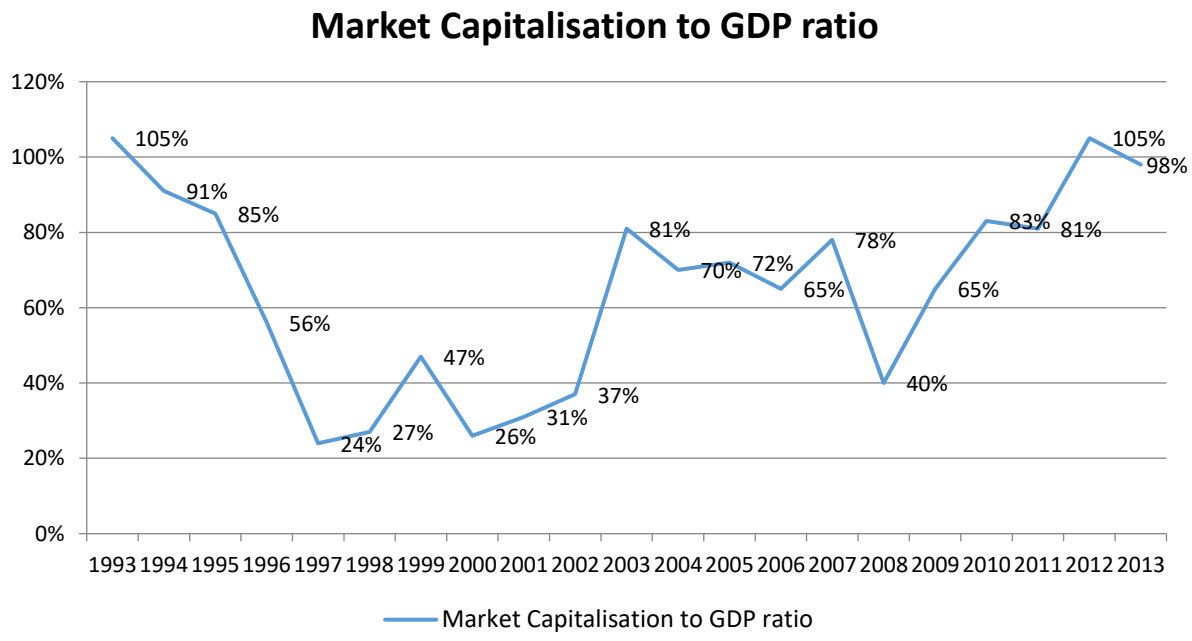

Figure 7-3 The market capitalisation to GDP ratio from 1993 to 2013 (Source: The Stock Exchange of Thailand)

Thai politic turmoil and a military coup that began in 2013 have slowed down economic development. The stock market has reacted to the economic instability and fluctuated between 1,200 points to 1,500 points during 2013-2015. However, the negative impact is much less than expected (Bertelsmann Stiftung, 2016).

Although strongly influenced by the macroeconomic changes, the Thai stock market has played a significant role in facilitating investment, promoting efficient capital resources allocation, consequently promoting the long-term economic growth of the country. The investment financing from bank lending was 87% in 1977. Meanwhile, this ratio from the equity market was only 13%. However, in 2013, the investment finance for the economy accounted for up to 35% from the equity market, from the corporate bond market was 27% and only 38% was from bank lending *(Source: The Stock Exchange of Thailand).*

7.3. Empirical analysis of stock market performance and economic growth nexus in Thailand

7.3.1 Data

Data for the analysis in this chapter are quarterly time series, spanning from the fourth quarter of 1994 to 2015. All the collected data are from the available secondary sources. For instance, the database of the National Economic and Social Development Board (NESDB) (NESDB, n.d.)and the Bank of Thailand (BOT) provide data on real gross domestic products. The broad money (M2) and foreign direct investment data are from the website of the Bank of Thailand (BOT, n.d.) and the International Financial Statistics Database (IMF, n.d.). The stock market data such as market capitalisation, stock market index is from Bloomberg's financial market data source and website of Thailand's Stock Exchange (SET, n.d.). NESDB data source also provides the Thai population data. The data on real GDP, broad money, and market capitalisation series are in million USD.

There are three main groups of Indices created by SET. The first group is the SET Index series. This group includes the SET Index, SET Industry Group Index and SET Sector Index, SET50 Index and SET100 Index, SET High Dividend Index (SETHDI). The second group is Mai Index Series in the Market for Alternative Investment (MAI). It consists of Mai Index and Mai Industry Group Index. The last group is the Total Return Index (TRI). This chapter concentrates on using the data set of SET Index obtained from SET's website and financial data provider Bloomberg for the analysis. SET Index is a

composite index that reflects the movement of securities listing on SET. The base date of this index is April 30, 1975, at 100 points.

Like the previous chapter, in this empirical chapter, the variables of real GDP per capita and SET Index are in the form of the natural logarithm. The other variables are in the form of ratio with GDP. The graphs illustrate the variables at a level in the raw data. Even though the natural logarithm form smoothens variable data series, the group graphs show that the Thai economy was delaying in the economic development during1997-1998 and 2008 – 2009, the time of happening the financial crises (see). The sources funding for the economy: market capitalisation and money supply, foreign direct investment declined sharply contributed to the slow-down of economic development. Regarding the stock market development, the fall in market capitalisation and a drop in the stock market index also happened when the financial crises were lasting. Thus, to analyse the relationship between Thai economic growth and stock market development and compare to the counterpart nexus in Vietnam, all the data streams are broken into two periods: the first period is from 1997Q1 to 2008Q1; the second one is from 1994Q4 to 2014Q4. Dividing the data into periods helps to avoid the structure breaking in all the series data which due to the happening of the global financial crisis in 2008-09. It also makes a comparison with the analysis in Vietnam easier in line with the development level of stock markets in Vietnam.

7.3.2 Method and methodology

There are substantial studies that examine the relationship between the stock market and macroeconomic performance in Thailand. However, these studies discuss different aspects, utilise different proxies and periods. For instance, Ibrahim (2011) examines the causality relationship between the stock market development and the macroeconomic performance in Thailand in 1993 – 2007. He uses a vector error correction model for his analysis on the four-variable framework (GDP, market capitalisation and investment ratio to GDP, and the aggregate price). The market capitalisation is the determinant of the stock market development. Moreover, by applying impulse response functions and variance decompositions techniques on the VAR model, he emphasises the positive and sizeable contributions to the economic growth by the stock market development. He also incorporates the financial crisis in the analysis model as a dummy variable to eliminate the influence of the Asian financial crisis in 1997. Meanwhile, investigating the relationship between economic growth and the stock market in Thailand, Ato Forson and

Janrattanagul (2013) exploit the stock market development in the other aspect. They use the stock market index (SET Index) as the determinant of stock market performance and the economic growth denoted by several selected macroeconomic indicators such as money supply, interest rate, consumer price index and the industrial production index in 20 years (from 1990 to 2009).

Implementing the analysis in Thailand's case, this chapter will use the same proxies applied in Chapter 6 that measures economic growth and stock market development in Vietnam. More concretely, the real gross domestic product per capita (LGDP) denotes for the level of the economic growth; the market capitalisation as a ratio of GDP (MC) presents the level of stock market development. The Thai stock market index (SET) presents the liquidity of the stock market. The broad money supply to GDP ratio (MON) and the net foreign direct investment to GDP (FDI) represent for the other funding channel of the economy.

The investigation also repeats the examining process in the previous chapter. However, all the examination steps are repeated in two consideration periods. The first period is from 1997 to 2008; the time is in between the two financial crises that happened in 1997-1998 and 2008-2009. The second period is counted longer than the first one, which includes both two mentioned financial crises. This study considers the time happened financial crises is the breaking time and construct the dummies variable for these breaks. The time spans from the fourth quarter of 1994 to the end of 2014.

First, it begins with the identification of the integrated order of all data series. The augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979) and the Phillips-Perron (PP) test (Phillips and Perron, 1988) detect the unit root for all the variables in the models in the period of 1997-2008. Meanwhile, for the period from 1994 – 2014, the unit-roots tests employ the ADF test with the break If the time series variables are integrated not higher than one order, the ARDL bounds testing method (Pesaran, Shin, and Smith, 2001) examines the existence of the long-run relationship among variables. Nevertheless, before exploring the long-run and short-run equilibrium among all variables in ARDL framework, this study identifies the optimal lag length in each analysis model by using AIC as the criteria for the optimal lag length selection in each model. Finally, based on the integration and cointegration test results, this analysis proceeds to Granger causality estimations.

This empirical study takes the two analysis periods in consideration for the purposes:

i. Compare the analysis results from the first period in Thailand to that of the previous chapter on Vietnam's case in the time span of the third quarter of 2000 to the end of 2015;
ii. The results from both consideration analysis periods one including the time of the two financial crises, the other one excluding them should give some implications for the development process of the stock market in Vietnam in the coming future.

Therefore, modelling in this empirical chapter is as following:

ARDL bounds tests for Cointegration

$$\begin{aligned}\Delta LnGDP_t = {} & \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta LnGDP_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta MON_{t-i} \\ & + \sum_{i=0}^{n} \alpha_{3i}\Delta MC_{t-i} + \sum_{i=0}^{n} \alpha_{4i}\Delta FDI_{t-i} \\ & + \sum_{i=0}^{n} \alpha_{5i}\Delta LnSETI_{t-i} \\ & + \alpha_6\Delta LNGDP_{t-1} + \alpha_7\Delta MON_{t-1} + \alpha_8\Delta MC_{t-1} \\ & + \alpha_9\Delta FDI_{t-1} + \alpha_{10}\Delta LnSETI_{t-1} + \varepsilon_{1t}\end{aligned} \tag{7.1}$$

$$\begin{aligned}\Delta MON_t = {} & \beta_0 + \sum_{i=1}^{n} \beta_{1i}\Delta MON_{t-i} + \sum_{i=0}^{n} \beta_{2i}\Delta LnGDP_{t-i} + \sum_{i=0}^{n} \beta_{3i}\Delta MC_{t-i} \\ & + \sum_{i=0}^{n} \beta_{4i}\Delta FDI_{t-i} + \sum_{i=0}^{n} \beta_{5i}\Delta LnSET_{t-i} \\ & + \beta_6\Delta MON_{t-1} + \beta_7\Delta LnGDP_{t-1} + \beta_8\Delta MC_{t-1} + \beta_9\Delta FDI_{t-1} \\ & + \beta_{10}\Delta LnSET_{t-1} + \varepsilon_{2t}\end{aligned} \tag{7.2}$$

$$\begin{aligned}\Delta MC_t = {} & \gamma_0 + \sum_{i=1}^{n} \gamma_{1i}\Delta MC_{t-i} + \sum_{i=0}^{n} \gamma_{2i}\Delta LnGDP_{t-i} + \sum_{i=0}^{n} \gamma_{3i}\Delta MON_{t-i} \\ & + \sum_{i=0}^{n} \gamma_{4i}\Delta FDI_{t-i} + \sum_{i=0}^{n} \gamma_{5i}\Delta LnSET_{t-i} \\ & + \gamma_6\Delta MC_{t-1} + \gamma_7\Delta LnGDP_{t-1} + \gamma_8\Delta MON_{t-1} \\ & + \gamma_9\Delta FDI_{t-1} + \gamma_{10}\Delta LnSET_{t-1} + \varepsilon_{3t}\end{aligned} \tag{7.3}$$

$$\begin{aligned}\Delta FDI_t = {} & \delta_0 + \sum_{i=1}^{n} \beta_{1i}\Delta FDI_{t-i} + \sum_{i=0}^{n} \delta_{2i}\Delta LnGDP_{t-i} \\ & + \sum_{i=0}^{n} \delta_{3i}\Delta MON_{t-i} + \sum_{i=0}^{n} \delta_{4i}\Delta MC_{t-i} \\ & + \sum_{i=0}^{n} \delta_{5i}\Delta LnSET_{t-i} \\ & + \delta_6\Delta FDI_{t-1} + \delta_7\Delta LnGDP_{t-1} + \delta_8\Delta MON + \delta_9\Delta MC_{t-1} \\ & + \delta_{10}\Delta LnSET_{t-1} + \varepsilon_{4t}\end{aligned} \tag{7.4}$$

$$\Delta SETI_t = \theta_0 + \sum_{i=1}^{n} \theta_{1i} \Delta SETI_{t-i} + \sum_{i=0}^{n} \theta_{2i} \Delta LGDP_{t-i} + \sum_{i=0}^{n} \theta_{3i} \Delta MON_{t-i} + \sum_{i=0}^{n} \theta_{4i} \Delta MC_{t-i} + \sum_{i=0}^{n} \theta_{5i} \Delta FDI_{t-i} + \theta_6 \Delta SET_{t-1} + \theta_7 \Delta LGDP_{t-1} + \theta_8 \Delta MON_{t-1} + \theta_9 \Delta MC_{t-1} + \theta_{10} \Delta FDI_{t-1} + \varepsilon_{5t} \quad (7.5)$$

Note: when analysing the case of Thailand in the period from 1994 to 2014, the dummy variable called "BREAK" that represented for the financial crises in 1997-1998 and 2008-2009 will be added to the ARDL models as a fixed regressor.

In equation (5.18, the real GDP per capita is the dependent variable, the null hypothesis of no cointegration amongst the variables is. This equation denotes as F(LGDP|MON, MC, FDI, SET). Similarly, in equation (5.19 of F(MON|LGDP, MC, FDI, SET); equation (5.20 of F(MC|GDP, MON, FDI, SET); equation 5.21 of F(FDI|LGDP, MON, MC, SET); equation (5.22 of F(LnSET|LGDP, MON, MC, FDI), the dependent variables are the ratios of the broad money to GDP (MON), the market capitalization to GDP (MC), foreign direct investment to GDP (FDI) and the stock market index (SET) respectively, the hypotheses for cointegrations are as follow:

$H_0: \alpha_7 = \alpha_8 = \alpha_9 = \alpha_{10} = 0$ against $H_1: \alpha_7 \neq \alpha_8 \neq \alpha_9 \neq \alpha_{10} \neq 0$

$H_0: \beta_7 = \beta_8 = \beta_9 = \beta_{10} = 0$ against $H_1: \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq 0$

$H_0: \gamma_7 = \gamma_8 = \gamma_9 = \gamma_{10} = 0$ against $H_1: \gamma_7 \neq \gamma_8 \neq \gamma_9 \neq \gamma_{10} \neq 0$

$H_0: \delta_7 = \delta_8 = \delta_9 = \delta_{10} = 0$ against $H_1: \delta_7 \neq \delta_8 \neq \delta_9 \neq \delta_{10} \neq 0$

$H_0: \theta_7 = \theta_8 = \theta_9 = \theta_{10} = 0$ against $H_1: \theta_7 \neq \theta_8 \neq \theta_9 \neq \theta_{10} \neq 0$

The Granger Causality test

$$\Delta LGDP_t = \lambda_0 + \sum_{i=1}^{n} \lambda_{1i} \Delta LnGDP_{t-i} + \sum_{i=1}^{n} \lambda_{2i} \Delta MON_{t-i} + \sum_{i=1}^{n} \lambda_{3i} \Delta MC_{t-i} + \sum_{i=1}^{n} \lambda_{4i} \Delta FDI_{t-i} + \sum_{i=1}^{n} \lambda_{5i} \Delta SET_{t-i} + \lambda_6 ECT_{t-1} + \nu_{1t} \quad (7.6)$$

Similarly, when examining the period of 1994Q4 to 2014Q4, the dummy variable "BREAK" of financial crises is also included in the Granger causality test as a fixed regressor.

$$\Delta MON_t = \xi_0 + \sum_{i=1}^{n} \xi_{1i} \Delta LnGDP_{t-i} + \sum_{i=1}^{n} \xi_{2i} \Delta MON_{t-i} + \sum_{i=1}^{n} \xi_{3i} \Delta MC_{t-i} + \sum_{i=1}^{n} \xi_{4i} \Delta FDI_{t-i} + \sum_{i=1}^{n} \xi_{5i} \Delta LnSETI_{t-i} + \xi_6 ECT_{t-1} + \nu_{2t} \quad (7.7)$$

$$\Delta MC_t = \varphi_0 + \sum_{i=1}^{n} \varphi_{1i} \Delta LnGDP_{t-i} + \sum_{i=1}^{n} \varphi_{2i} \Delta MON_{t-i} + \sum_{i=1}^{n} \varphi_{3i} \Delta MC_{t-i} + \sum_{i=1}^{n} \varphi_{4i} \Delta FDI_{t-i} + \sum_{i=1}^{n} \varphi_{5i} \Delta SET_{t-i} + \varphi_6 ECT_{t-1} + \nu_{3t} \quad (7.8)$$

$$\Delta FDI_t = \phi_0 + \sum_{i=1}^{n} \phi_{1i} \Delta LGDP_{t-i} + \sum_{i=1}^{n} \phi_2 \Delta MON_{t-i} + \sum_{i=1}^{n} \phi_{3i} \Delta MC_{t-i} + \sum_{i=1}^{n} \phi_4 \Delta FDI_{t-i} + \sum_{i=1}^{n} \phi_{5i} \Delta SET_{t-i} + \phi_6 ECT_{t-1} + \nu_{4t} \quad (7.9)$$

$$\Delta SETI_{\mathrm{t}} = \psi_0 + \sum_{i=1}^{n} \psi_{1i} \Delta LGDP_{t-i} + \sum_{i=1}^{n} \psi_{2i} \Delta MON_{t-i} + \sum_{i=1}^{n} \psi_{3i} \Delta MC_{t-i} + \sum_{i=1}^{n} \psi_{4i} \Delta FDI_{t-i} + \sum_{i=1}^{n} \psi_{5i} \Delta SETI_{t-i} + \psi_6 ECT_{t-1} + \nu_{5t} \quad (7.10)$$

The null hypothesis is the coefficients of all lagged different order of a variable series, in turn, are jointly equal to zero.

7.3.3 Empirical results and discussion

7.3.3.1. Unit root tests

Before proceeding the analysis of almost time series data, it requires the test for unit roots to identify whether the variables are integrated or stationary (Toda and Yamamoto, 1995;

Lütkepohl, 2005). This chapter uses the augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979) and the breaking series technique to detect the unit root for all the variables in the models.

To obtain the order of integration, this chapter takes the first step by applying the Augmented Dickey-Fuller (ADF), and Phillips Perron (PP) tests for unit roots.

The hypothesis is each variable has a unit root. The alternative hypothesis is each variable does not have a unit root. Also, there are intercepts and trend in all variables series. Therefore, the tests for unit root include both intercept and trend expressed as following (Clements and Hendry, 1999):

Y_t is a random walk and assumes with intercept and trend (ADF test) (Dickey and Fuller, 1979)

$$\Delta Y_t = \alpha_1 + \alpha_{2t} + \delta Y_{t-1} + \beta_i \sum_{i=1}^{m} \Delta Y_{t-1} + \varepsilon_i \quad (7.11)$$

as in PP test (Phillips and Perron, 1988):

$$\Delta Y_t = \alpha_1 + \alpha_{2t} + \delta Y_{t-1} + \varepsilon_i \quad (7.12)$$

The hypothesis

H_0: $\delta = 0$ (Variable has a unit root)

H_a: $\delta < 0$ (Variable does not have a unit root)

In the test for unit roots, if the $|t - statistic| < critical\ value$, we cannot reject the null hypothesis of having a unit root. Otherwise, we can accept the alternative hypothesis that the variable series is stationary.

The value of t-statistics and p-value from the ADF and PP tests at level specification in the table suggest that we cannot reject the null hypothesis at the 5% significant level ($|t - statistic| < critical\ value$ at 95% of confident level). It means all the examining variables have unit roots at level or non-stationary. Therefore, it requires the test for unit root at the first difference order.

Similarly, the t-statistic and p-value result in advice this study can reject the null hypothesis of having unit root in all variables at 5% significant level, and all the variables

are stationary at the first difference level. The illustrates all analysis variables are stationary at the first difference. These suggest further tests to examine to identify the existence of the long-run relationship among all the variables (Engle and Granger, 1991).

Table 7-1 Unit roots test results (period 1997Q1 to 2008Q1)

	Augmented Dickey-Fuller test statistic at Level			**Augmented Dickey-Fuller test statistic at the 1st Difference**		
	Test critical values (1%)	***t-Statistic***	***Prob.****	***Test critical values***	***t-Statistic***	***Prob.****
LGDP	-4.127338	-1.213088	0.8981	-4.130526	-7.894751	0.0000
MON	-3.555023	-1.912085	0.3245	-3.555023	-7.737518	0.0000
MCAP	-3.550396	-1.457238	0.5479	-3.552666	-7.199940	0.0000
FDI	-3.552666	-7.200704	0.0000	-	-	-
SET	-3.550396	-1.983058	0.2933	-3.552666	-7.775849	0.0000

The unit root test results are as in Table 7-1 and Table 7-2 for the period of 1997Q1 to 2008Q1 and 1994Q4 to 2014Q4, respectively. The tests for unit roots in the period of 1994Q4 to 2014Q4 employ the structure break. The break time denoted the global financial crisis in 2008-2009. The finding represented in Table 7-1 and Table 7-2 confirm that all the variables are integrated at the first order I(1) except variable series FDI is stationary at I(0). These imply that all the variables are met the pre-condition of the ARDL tests of no series variables are integrated at the order higher than one (Pesaran et al., 2001).

Table 7-2 Breaking Point Unit Root Tests Results (period 1994Q4 to 2014Q4)

	Augmented Dickey-Fuller test statistic at Level			**Augmented Dickey-Fuller test statistic at the 1st Difference**		
	Test critical values (1%)	***t-Statistic***	***Prob.****	***Test critical values***	***t-Statistic***	***Prob.****
LGDP	-4.949133	-2.675720	0.839645	-4.949133	-8.398054	< 0.01
MON	-4.949133	-3.380119	0.454153	-4.949133	-9.670618	< 0.01
MC	-4.949133	-2.523913	0.896199	-4.949133	-9.139088	< 0.01
FDI	-4.949133	-9.504108	< 0.01			
SET	-4.949133	-2.877239	0.749439	-4.949133	-9.645416	< 0.01

7.3.3.2. Cointegration Tests

As discussed in Chapter 5, the cointegration tests under the bounds testing framework employ the F-test with critical values tabulated by Pesaran et al. (2001). The ARDL Bounds Models (from equation (5.18 to (5.22) test the hypotheses of the existence of the

long-run equilibrium relationship between Thai real GDP per capita, stock market capitalisation to GDP ratio, broad money supply to GDP, foreign direct investment to GDP ratios and the stock market index series. These tests based on the null hypotheses of no cointegration relation among variables for the quarterly data in the sub-set from 1997 to 2008 and the period of 1994 to 2014. The maximum number of lags in the ARDL is no higher than 8. (The process of selecting optimal lag length depends on the model diagnostic such as the autocorrelation or heteroskedasticity checking in each model).

Bounds tests in a period of 1997Q1-2008Q1

The bounds tests on the sub-set data are represented in Table 7-3 give the evidence that in equation (5.18(5.19 and (5.22 at 5% significant level, there exist the cointegration between the variable series in the models.

Table 7-3 F-statistics for Cointegration Estimation (period 1997Q1 to 2008Q1)

	Optimal lag length	*F-statistics*	Critical Value Bounds				*Conclusion*
			10% significance		*5% significance*		
			Lower Bound	*Upper Bound*	*Lower Bound*	*Upper Bound*	
F(LGDP|MON,MC, FDI, SET)	5,1,0,1,2	4.558418	2.68	3.53	3.05	3.97	Cointegrated
F(MON|LGDP, MC, FDI, SET)	5,0,1,1,0	6.363025					Cointegrated
F(MC|LGDP, MON, FDI, SET),	1,0,0,0,1	3.934490					Cointegrated*
F(FDI|LGDP, MON, MC, SET),	2,3,1,1,0	2.293139					Not Cointegrated
F(SET|LGDP, MON, MC, FDI)	3,4,1,1,2	5.536099					Cointegrated

*Note that * indicate the conclusion at 10% of the significance level.*

Referenced to the suggested F-statistic critical values from Narayan (2005) and Pesaran et al. (2001), Table 7-3 represents the F-statistic calculation from the ARDL tests for each model from (5.18 to (5.22. For equation (5.18 (the model with LGDP is the dependent variable), the F-statistics is 4.558418. This number is higher than the upper bound of 3.97 at a significant level of 5%. Therefore, at 5% of significance level, we can reject the null hypothesis of no cointegration. Similarly, in equation (5.20, the broad money to GDP ratio (MON) is the dependent variable, the F-statistic of.6.363025 is also above the upper bound critical value at 5% of the significant levels. That result confirms the existence of cointegration relation. In the equation (5.19, where the ratio of market

capitalisation to GDP is the dependent variable, the test statistic value of 3.93449 is slightly less than the critical value upper bound at 5% of significant level but higher than the upper bound of 10% level of significance. Therefore, in this case, we can reject the hypothesis of no cointegration relation at 10% significant level. However, in equation (5.21, the ratio of foreign direct investment to GDP, we cannot reject the null hypothesis of no cointegration when the test statistic value (2.293139) falls below the critical statistic lower bound at 10% significant level. In the equation of the Thai stock market index as the dependent variable, the statistic value of 5.536 is higher than the critical value upper bound at both 10% and 5% level of significance. Hence, the null hypothesis is rejected, and there is a cointegrating relation in this equation. These results are consistent with the findings of Ibrahim (2011) at the same time span of the study.

Table 7-4 F-statistics for Cointegration Estimation (period 1994Q4 to 2014Q4)

	Optimal lag length	*F-statistics*	Critical Value Bounds				*Conclusion*
			10% significance		*5% significance*		
			Lower Bound	*Upper Bound*	*Lower Bound*	*Upper Bound*	
F(LGDP|MON, MC, FDI, SET)	3,1,0,2,2	2.388064	2.68	3.53	3.05	3.97	Not Cointegrated
F(MON|LGDP, MC, FDI, SET)	5,0,6,6,1	0.532303					Not Cointegrated
F(MC|LGDP, MON, FDI, SET),	8,0,0,8,1	4.511729					Cointegrated
F(FDI|LGDP, MON, MC, SET),	2,5,8,8,8	8.312542					Cointegrated
F(SET|LGDP, MON, MC, FDI)	3,4,6,1,8	5.616522					Cointegrated

Bounds tests in a period of 1994Q4 to 2014Q4

However, the bounds test results applied in the period of 1994Q4-2014Q4, at 5% of significant level, only equation (5.20(5.21and (5.22 reveals the evidence of cointegration relationship.

Table 7-4 represents the F-statistic calculation from the ARDL tests for each model from (5.18 to (5.22. For equation (5.18 (the model with LGDP is the dependent variable), the F-statistics is 2.388064. This number is below the lower bound of 2.68 at the significant level of 10%. Therefore, at 10% of significance level, we cannot reject the null hypothesis of no cointegration. Similarly, in equation (5.20, the broad money to GDP ratio (MON)

is the dependent variable, the F-statistics shows that no cointegration relation in this model. In the equations (5.19(5.21 and 5.22, the test results recommend the existence of the cointegration relations

Follow the establishment of the existence of cointegration equations; further analysis can be taken by estimating the coefficients of the long-run relationship by ARDL models. This step is to investigate the marginal influences on the real GDP per capita, ratios of stock market capitalisation and broad money to GDP, ratio of foreign direct investment to GDP and the SET index from the other variables in these models.

Table 7-5 Long-run Coefficients Estimation (period 1997Q1 to 2008Q1)

Estimated Long Run Coefficients using the ARDL Approach
ARDL(5,1,0,1,2) selected based on Akaike Information Criterion

Dependent variable is LGDP
45 observations used for estimation from 1997Q1 to 2008Q1

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
MON	**.36792**	**.13523**	**2.7208[.011]**
MC	-.27954	.12070	-2.3159[.028]
FDI	-4.3413	1.7906	-2.4245[.022]
SET	1.5050	.38973	3.8616[.001]
C	-1.4498	3.0196	-.48012[.635]
T	.013341	.0057642	2.3145[.028]

Estimated Long Run Coefficients using the ARDL Approach
ARDL(5,0,1,1,0) selected based on Akaike Information Criterion

Dependent variable is MON
45 observations used for estimation from 1997Q1 to 2008Q1

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LGDP	.58430	.52453	1.1139[.274]
MC	.63190	.21567	2.9299[.006]
FDI	6.5898	2.9074	2.2665[.030]
SET	-2.7805	.63078	-4.4081[.000]
C	17.0710	4.4958	3.7971[.001]
T	-.0089443	.013306	-.67220[.506]

Estimated Long Run Coefficients using the ARDL Approach
ARDL(1,0,0,0,1) selected based on Akaike Information Criterion

Dependent variable is MC
45 observations used for estimation from 1997Q1 to 2008Q1

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LGDP	-.89877	.38075	-2.3605[.024]
MON	.50291	.11508	4.3701[.000]
FDI	1.5315	1.4898	1.0280[.311]
SET	3.3493	.24480	13.6818[.000]
C	-13.8256	3.2337	-4.2755[.000]
T	.042231	.0053000	7.9682[.000]

Estimated Long Run Coefficients using the ARDL Approach
ARDL(3,4,1,1,2) selected based on Akaike Information Criterion

Dependent variable is SET
45 observations used for estimation from 1997Q1 to 2008Q1

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LGDP	.44740	.12015	3.7239[.001]
MON	-.24832	.048591	-5.1104[.000]
MC	.21329	.030244	7.0523[.000]
FDI	2.0799	.89452	2.3252[.028]
C	3.0509	1.2630	2.4155[.022]

T	-.0066115	.0025075	-2.6366[.014]

Table 7-5 represents the estimated long-run coefficient using the ARDL Approach in the period of 1997Q1 to 2008Q1. The results show that in the model in equation (5.18, the money supply, stock market capitalisation, foreign direct investment and SET stock market index are jointly cointegrated and have long-run relationships with the real GDP per capita at 5% significant level. The results reveal that the ratio of the money supply to GDP increases by one unit will lead to 0.36% increase in GDP per capita. Meanwhile, the change in a unit of MCAP and FDI have the negative impact of the stock market capitalisation to GDP ratio on GDP that makes GDP per capita falls by 0.27%, and FDI contributes to the decrease of 4.34%. These results might due to the speed of increase in the Thai GDP is much higher than that of the stock market capitalisation and foreign direct investment.

In model 2 (equation (5.19, the stock market capitalisation to GDP ratio is the dependent variable. The estimated results reveal that the GDP per capita, money supply and SET stock market index are jointly cointegrated with a stock market capitalisation in the long-run. However, in this period, economic growth has a negative impact on the share of market capitalisation. A per cent increase in GDP per capita will result in a decrease in this ratio by 0.899 unit. At the same time the increase by 1 unit in the money supply to GDP ratio, and 1 % increase in the SET stock market index, in turn, results in the increase in the stock market capitalisation to GDP ratio 0.5 unit and 3.34 unit, respectively.

Model 3 (equation (5.20, the estimated results suggest that the stock market capitalisation, foreign direct investment and SET stock market index are jointly cointegrated with the money supply. The long-run equilibrium indicates that the ratio of stock market capitalisation increases one unit results in an increase in money supply ratio to GDP by 0.63 unit. Meanwhile, one unit increase in foreign direct investment to GDP ratio will lead to an increase in the money supply to GDP ratio 6.58 unit. However, the 1% increase of the stock market will lead to the fall the money supply to GDP ratio by 2.7 unit.

In model 5, the SET stock market index is the dependent variable (equation (5.22). The results show that all the regressors are significant and jointly cointegrated. However, there is only money supply to GDP ratio that has a negative relationship with the SET stock market index. If the money supply to GDP ratio increase by one unite will result in a decrease in the stock market index by 0.248%. However, in the long-run, a per cent

increase in GDP per capita will lead to an increase in the SET stock market index by 0.44 %. The stock market capitalisation and foreign direct investment to GDP ratio in turn increase by one unit will lead to an increase in the stock market index by 0.21% and 2.07%, respectively.

Table 7-6 Long-run coefficients Estimation (period 1994Q4 to 2014Q4)

Estimated Long Run Coefficients using the ARDL Approach
ARDL(8,0,0,8,1) selected based on Akaike Information Criterion
Dependent variable is MC
73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LGDP	**-3.7201**	**.72346**	**-5.1421[.000]**
MON	**.46516**	**.068573**	**6.7835[.000]**
FDI	5.2495	4.3528	1.2060[.234]
SET	**5.1054**	**.42045**	**12.1427[.000]**
C	3.8504	5.2398	.73484[.466]
T	.037358	.0089273	4.1847[.000]
BREAK	**-.72239**	**.27155**	**-2.6602[.011]**

Estimated Long Run Coefficients using the ARDL Approach
ARDL(2,5,8,8,8) selected based on Akaike Information Criterion
Dependent variable is FDI
73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LGDP	**-.40503**	**.13683**	**-2.9601[.005]**
MON	**.055125**	**.021466**	**2.5680[.015]**
MC	**-.15388**	**.049076**	**-3.1355[.003]**
SET	**.64676**	**.20416**	**3.1680[.003]**
C	-.079671	.59405	-.13411[.894]
T	.0074033	.0022652	3.2683[.002]
BREAK	**.077456**	**.027308**	**2.8363[.008]**

Estimated Long Run Coefficients using the ARDL Approach
ARDL(3,4,6,1,8) selected based on Akaike Information Criterion
Dependent variable is SET
73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LGDP	**.53250**	**.14049**	**3.7903[.000]**
MON	**-.090188**	**.019500**	**-4.6250[.000]**
MC	**.20039**	**.018113**	**11.0636[.000]**
FDI	-1.3907	.91600	-1.5182[.136]
C	1.1299	1.4183	.79665[.430]
T	-.0047359	.0020987	-2.2566[.029]
BREAK	.035963	.065315	.55061[.585]

As the results of ARDL test for in cointegration in Table 7-4, there is cointegration in equations (5.19, (5.21 and (5.22, Table 7-6 represents the estimated long-run coefficient using the ARDL Approach in the period of 1997Q1 to 2008Q1 of these equations.

The results show that in the model (5.19, the stock market capitalisation to GDP ratio is the dependent variable, the GDP per capita, money supply and SET stock market index are jointly cointegrated with a stock market capitalisation in the long-run. However, similar to the analysis period, economic growth still has a negative impact on the share of market capitalisation with stronger influences. A per cent increase in GDP per capita will result in a decrease in this ratio by up to 3.72 unit. This result may due to the two

financial crises occurred during the analysing period. At the same time the increase by 1 unit in the money supply to GDP ratio, and 1 % increase in the SET stock market index, in turn, results in the increase in the stock market capitalisation to GDP ratio 0.46 unit and 5.1 unit, respectively.

There is no cointegrated relation in equation (5.20 in the sub-period of 1997-2008. In model 4, the FDI is the dependent variable. The results show that all the regressors are significant and jointly cointegrated. However, both GDP per capita and the stock market capitalisation to GDP ratio demonstrate the negative impact in the long-run on the foreign direct investment. It is consistent with the fact that there was a massive outflow of foreign investment during the financial crises of 1997-1998 and 2008-2009. Sector relationship with the SET stock market index. If the money supply to GDP ratio increase by one unite will result in an increase in foreign direct investment to GDP ratio in 0.05 unit. Also, the SET index increases by one per cent could lead to an increase by 0.64 unit in the foreign direct investment to GDP ratio. However, in the long-run, a % increase in GDP per capita will lead to the falling in FDI share to GDP by 0.4 unit. Besides, the stock market capitalisation to GDP ratio increase by one unit will lead to the decrease in the foreign direct investment to GDP ratio by 0.64 unit.

In model 5, the SET stock market index is the dependent variable. The results show that GDP per capita, money supply and the stock market capitalisation are significant and jointly cointegrated. However, the same as the previous period of study, the results show that is only money supply to GDP ratio that has a negative relationship with the SET stock market index. If the money supply to GDP ratio increases by one unite will result in a decrease in the stock market index by 0.09%. In the long-run, a per cent increase in GDP per capita will lead to an increase in the SET stock market index by 0.52%. The stock market capitalisation to GDP ratio increases by one unit will lead to an increase in the stock market index by 0.2%.

To analyse the short-run adjustment to equilibrium, the following section will discuss the findings.

7.3.3.3. Granger Causality Analysis

Period 1997Q1 to 2008Q1, the ARDL bounds tests results suggest the long-run and short-run Granger causality within the error correction mechanism. The findings reveal that the coefficients on the lagged error correction terms in equations(7.6, (7.7, (7.8, (7.9 and (7.10

are significant with the expected sign (negative) at 1% of the significant level (see Table 7-8. Thus, it further confirms the results of the bounds tests for cointegration. In equation (7.6, the coefficient on the lagged error correction term of all variables to the real GDP per capita -0.48 implies that the deviation from long-run equilibrium level of the current period is corrected by 48% in the next period to bring back equilibrium. Meanwhile, this coefficient in equation (7.8 where the stock market capitalisation ratio is the dependent variable, is -0.658. It suggests that when once shocked convergence to equilibrium is rapid. In other words, the deviation from the equilibrium level of stock market capitalisation to GDP during the current quarter will be corrected by 65.8% in the next quarter. Also, in equation (7.10, the correction to the long-run equilibrium from the deviation of the current period to the next period of the stock market index will be by 79.44%.

Period 1994Q4 to 2014Q4, the ARDL bounds tests results suggest the long-run and short-run Granger causality within the error correction mechanism. The findings reveal that the coefficients on the lagged error correction terms in equations (7.8, and (7.10 are significant with the expected sign (negative) at 1% significant level, but the coefficient and test statistic in significant in equation (7.9 (see Table 7-7). The findings suggest this coefficient in equation (7.8 where the stock market capitalisation ratio is the dependent variable, is -0.488. It suggests that when once shocked convergence to equilibrium is rapid. In other words, the deviation from the equilibrium level of stock market capitalisation to GDP during the current quarter will be corrected by 48.8% in the next quarter. Also, in equation (7.10, the correction to the long-run equilibrium from the deviation of the current period to the next period of the stock market index will be by 56.37%.

Table 7-7 F-statistics for Granger Causality Analysis (period 1994Q4 to 2014Q4)

	F-Statistics Error Correction					
Dependent Variable	ΔLGDP	ΔMON	ΔMC	ΔFDI	ΔSET	ECMt-1 [t-statistics][Pr]
ΔLGDP	-	5.0365[0.025]**	8.5131[0.004]***	4.4091[0.110]	17.7539[0.000]***	-
ΔMON	0.084139[0.772]	-	35.9121[0.000]***	12.4478[0.053]*	7.3505[0.007]***	-
ΔMC	33.9059[0.000]***	36.3558[0.000]***	-	39.4156[0.000]***	233.4028[0.000]***	-0.48835 -6.9372[0.000]***
ΔFDI	15.5562[0.008]***	30.6815[0.000]***	25.1267[0.001]***	-	22.1827[0.005]***	-1.1503 -6.7311[0.000]***
ΔSET	44.0569[0.000]***	29.8836[.000]***	241.3195[.000]***	21.6288[.006]***	-	-0.56278 -4.9868[.000]***

Table 7-8 F-statistics for Granger Causality Analysis (period 1997Q1 to 2008Q1)

Dependent Variable	F-Statistics Error Correction ΔLGDP	ΔMON	ΔMC	ΔFDI	ΔSET	ECMt-1 [t-statistics][Pr]
ΔLGDP	-	0.12319[0.726]	5.1117[0.024]**	5.8551[0.016]**	18.8181[0.000]***	-0.48645*** -4.0144[0.000]
ΔMON	1.2558[0.262]	-	10.4187[0.001]***	1.2722[0.259]	13.8967[0.000]***	-.64603*** -6.9936[0.000]
ΔMC	6.1283[0.013]**	19.9494[0.000]***	-	1.1292[0.288]	288.1572[0.000]***	-.65887*** -6.5203[0.000]
ΔFDI	9.0860[0.028]**	2.0801[0.149]	2.6451[0.104]	-	0.84153[0.359]	-
ΔSET	23.3980[0.000]***	10.5075[0.001]***	155.5125[0.000]***	6.0671[0.048]**	-	-0.79445*** -4.8577[0.000]

7.3.3.4. Discussion and Policy Implication

The findings of the empirical study on the case of Thailand can be represented briefly in Table 7-9 and Table 7-10.

Table 7-9 Long-run causal relationships

1997Q1 to 2008Q1 Sub-sample		Cointegrated Equation	1994Q4 to 2014Q4 Full-size sample	
MON	→	GDP	↛	MON
MC	→		↛	MC
FDI	→		↛	FDI
SET	→		↛	SET
GDP		MON	↛	GDP
MCAP	→		↛	MCAP
FDI	→		↛	FDI
SET	→		↛	SET
GDP	→	MCAP	←	GDP
MON	→		←	MON
FDI	→		↛	FDI
SET	→		←	SET
GDP		FDI	←	GDP
MON			←	MON
MCAP			←	MCAP
SET			←	SET
GDP	→	SET	←	GDP
MON	→		←	MON
MCAP	→		←	MCAP
FDI	→		↛	FDI

The findings show that in the sub-period that before the financial crisis of 2008-2009 occurred, there are cointegrated relationships existing in almost models except for the FDI model. Meanwhile, in the full-size sample examination, there are three cointegrating relations between the model of market capitalisation, foreign direct investment and the stock market index. Besides that, the estimated long-run coefficients have a stronger negative impact in the whole study period than in the sub-sample time. It implies the

strong evidence that the financial crises worsen the economic environment. The remarkable point is that the banking system dominates the capital supply to the economy in the pre-crisis period. These results are consistent with the findings of Ato Forson and Janrattanagul, (2014) and Ibrahim (2011) in the pre-crisis period. In the full period, the results show the highest impact comes from the foreign direct investment sector. Moreover, as a reference to the analysis in Vietnam in 2000-2015, the pre-crisis subsample proposes almost similar causality relations between variable.

Table 7-10 Short-run Granger Causality

Sub-sample 1997Q1 to 2008Q1		Cointegrated Equation	1994Q4 to 2014Q4 Full size sample	
MON	↛		←	MON
MC	→	GDP	←	MC
FDI	→		↚	FDI
SET	→		←	SET
GDP			↚	GDP
MCAP	→	MON	←	MCAP
FDI			↚	FDI
SET	→		←	SET
GDP	→		←	GDP
MON	→		←	MON
FDI	↛	MCAP	←	FDI
SET	→		↚	SET
GDP	→		←	GDP
MON	↛		←	MON
MCAP	↛	FDI	←	MCAP
SET	↛		↚	SET
GDP	→		←	GDP
MON	→		←	MON
MCAP	→	SET	←	MCAP
FDI	→		←	FDI

In the short-run Granger causality analysis, the examination results reveal the bi-directional causal relationship between the stock market development indicators and economic growth.

Experienced the global financial crises impacts on the economy, the demand for export of the country decreased in the Thai economy. Thailand economy suffered a significant downturn from dependence on its export sector as the engine of growth. Also, the slowdown in exports following a collapse of demand in the advanced economies, especially from the US market, that results in a negative economic growth rate in the time of the Asian financial crisis 1997-1998 and the global financial crisis in 2008. Moreover, domestic demand was also weakened by depressed consumers' purchasing power due to the lower-income and rising unemployment. Moreover, squeezing financial conditions leading to a greater vulnerability in the financial sector with high volatility in capital flows. The financial market experienced high instability, and the stock market crashed as global risk aversion, and liquidity needs went up globally.

Therefore, to overcome not favour economic situation, regarding the stock market, the authority and policymakers should: First, to improve securities businesses operational quality, financial capacity, company management and risk management and gradually reduce the number of operations. Secondly, the restructuring has been prudent, providing certainty, without hindering the stock market operation and ensuring transparency and the right to protect customers' assets. Thirdly, the securities businesses have restructured themselves by legal provisions under the management and supervision of the state management agencies. Fourth, strengthen international cooperation in supervision in the financial market field. Finally, introduce an early warning system that employs vulnerability conditions or the economic indicators as a way of detecting the risk of economic instability at the early stage and to build up a suitable policy to mitigate this risk, therefore prevents the potential impacts externally and internally on the future financial market development.

7.4. Conclusion

Research in the direction of the causality between financial development and economic growth is important because it has essential policy implications on the best economic strategy for enhancing growth. The recommended policy from the policymakers should be customised to adapt to changes in the economic conditions. Also, financial

development in Thailand seems to stimulate the economic growth of the country to some extent. Moreover, the study can conclude that a better-developed stock market leads to higher economic growth. This occurs because the development of stock markets can imply risk diversification and better resource allocation.

In examining the impact of the 2008 financial crisis on the financial sector and the economic growth in Thailand, the results show that GDP causal links in Thailand, this study compared the results of the research performed for the full sample (covering the period 1994Q4–2014Q4) and the pre-crisis subsample (1997Q1–2008Q1). This comparison provided a basis for claiming that during the 2008 financial crisis, the stock market had a much more significant impact on economic growth than before the crisis. On the other hand, the causal impacts of the performance of the banking sector, stock market and foreign direct investment on economic growth in Thailand were significant mostly in the pre-crisis subsample. The fact that the positive causality running from was significant only before the crisis means that during the crisis this causal impact could be significantly negative. This important conclusion arises from the fact that the positive impact (reported for the pre-crisis period) was most likely cancelled out or weakened by negative shocks (observed in the crisis period), which in consequence led to a lack of significant causalities in the full period.

This study, however, might have inherent limitations. For example, the empirical tests could suffer from the omission of some variables. Nevertheless, these probable drawbacks are likely to exist in most, if not all, time-series analyses of this kind. The reason for this is the lack of a sufficient dataset.

In overall, the findings in this chapter have important policy implications for Vietnam and other developing countries with similar economic structures. The evidence indicates that the stock market and economic growth play a significant role in encouraging each other’s development. Thus, the development of the stock market would be beneficial for economic growth in Vietnam.

CHAPTER 8 - CONCLUSION

8.1. Introduction

It has been argued that an improved financial market is a necessary condition to foster economic development. For a country to achieve economic growth, thereby improving the standard of living of citizens, requires increasing capital resources and an optimal allocation of these funds to productive and efficient uses. It could be said there is no better alternative than the financial markets to channel savings to the investments, but this also depends on an established legal framework and public policy structure to regulate and provide oversight to have a strong financial system.

There is a need of a performance evaluation of the Vietnamese stock market because it has existed for over 15 years. This thesis examines the causal relationship between the stock market and economic growth in Vietnam between the period of 2000 and 2015. The results of the study on Vietnam bring the empirical quantitative evaluation of the performance of the stock market in the development process of the Vietnamese economy. Moreover, to strengthen the public policy system, a comparative analysis of the case of Thailand, a country that experienced a severe impact from the international financial crisis before a quick economic recovery, has been undertaken.

This thesis focuses on the channels that drive financial resources into the economy leading to economic growth. These mobilising channels relate to the stock market, banking sector and foreign direct investment.

Furthermore, this study provides a basis for further quantitative time series investigation of the historical and contemporary role of banking and the stock market in the economic development of Vietnam.

In In the case of Thailand, the findings in the pre-crisis period (1997-2008) suggest the same bi-directional relationship between the stock market and economic growth. However, the characteristics of some impacts are different when the analysis takes into account the sample including the time of the financial crisis.

This chapter is organised as follows: Section 8.1 gives the introduction of the chapter. Section 8.2 presents a summary of the findings from this research. Section 8.3 suggests the policy implications to develop the Vietnamese stock market. Section 8.4 presents the limitations of this research and high-lights areas for further empirical investigation.

8.2. Findings

The research is basically based on the theoretical framework that links together endogenous growth theory and the function of financial markets and institutions. This study has investigated and determined the co-integrated relationship between the stock market and economic growth in Vietnam between 2000 to 2015 by using the ARDL framework. Together with the relationship between stock market development and economic growth; in addition, the empirical chapter has suggested the relationship between other funding sources such as broad money supply and foreign direct investment and economic growth and the stock market development in the long-run and short-run dynamic in the same period.

As suggested in many studies, economic growth (e.g. Ross Levine, 2002; Lee, 2012) is not supported by stock markets in the early stages of development. However, the results of the study in the causal linkage between stock market development and economic growth in Vietnam between 2000 to 2015 significantly confirm the relationships between stock market development and economic growth are bi-directional in nature both in the long and short-run. The findings suggest the real GDP per capita and stock market capitalisation are cointegrated when they, in turn, are dependent variables. Also, foreign direct investment and the stock market index are jointly cointegrated with stock market capitalisation, and they have positive long-run relationships. Besides, the stock market index and GDP per capita are found to have a cointegrating relationship with foreign direct investment. However, there is a negative long-run relationship between real GDP per capita and the ratio of foreign direct investment to GDP, while the stock market index illustrates the positive support to this ratio in the long-run. Other negative long-run cointegrated relationships are also obtained, they are relationships between real GDP per capita and foreign direct investment to GDP ratio with a stock market index.

In the case of the dynamic analysis in the short-run, the evidence presented the cointegration examination that supports the view there is both short and long-run relationships between stock market development and economic growth in Vietnam. These findings are consistent with the theoretical prediction of both the financial growth and endogenous growth literature as in statistics and examining. It is found that the size of Vietnam stock market regarding market capitalisation has historically ranged from between 5 to above 20% of the real GDP for the period from 2000 to 2015. Thus, indicating a reasonable size about the GDP inferring the size of the Vietnam stock market

provides a reasonable sample size for the Vietnamese economy. The findings also support the discussion on financial sector development in Vietnam in chapter 4.

Overall, the findings in this chapter have important policy implications for Vietnam and other developing countries with similar economic structures. The evidence indicates that the stock market and economic growth play a significant role in encouraging each other's development. Thus, the development of the stock market would be beneficial for economic growth in the Vietnam.

Table 8-1 Decision of Causality between financial development and economic growth in Vietnam

Long-run Causality			***Short-run Causality***		
LGDP	⇎	MON	LGDP	⇄	MON
LGDP	⇄	MCAP	LGDP	⇄	MCAP
LGDP	→	FDI	LGDP	→	FDI
LGDP	→	VNI	LGDP	⇄	VNI
MON	⇎	MCAP	MON	⇄	MCAP
MON	⇎	FDI	MON	⇎	FDI
MON	→	VNI	MON	→	VNI
MCAP	←	FDI	MCAP	←	FDI
MCAP	⇄	VNI	MCAP	←	VNI
FDI	⇄	VNI	FDI	⇄	VNI

In summary, the results of the empirical analysis on Vietnam case suggest that the stock market development does influence economic growth in the long-run and short-run. In other words, this empirical research satisfies both the demand side of growth and supply-side hypotheses of stock market development and economic growth. However, to justify the findings, further analysis among other developing countries is necessary, especially those in the same region. Moreover, investigating the influence of financial sector regarding the contribution of the stock market to economic growth in Vietnam should be updated and implemented. The analysis of its relationship with economic growth also should take into consideration the impact of the macroeconomic policy to evaluate the role of the stock market in Vietnam's economy. The research is also in the context of the stock market and economic development of the developing countries in the South-East Asian region. Therefore, the research results may devote the valuable reference evidence for the policymakers in adjustment regulation framework to promote the stock market development and economic growth in Vietnam and other countries with newly established stock markets in this region.

In the case of Thailand from 1994 to 2014, this analysis considers two periods of study. The first is the period before the financial crisis 2009, the second one takes in to account the whole sample that includes the time the mentioned crisis occurred. These results confirm the theoretical expectation, as the country in the time between the two financial crises, the results confirm that in the sub-period that before the financial crisis of 2008-2009 occurred, there are cointegrated relationships in almost model except for the FDI model. Meanwhile, in the full-size sample examination, there are three cointegrating relations. Besides that, the estimated long-run coefficients have a stronger negative impact on the whole study period than in the sub-sample time. It implies the strong evidence that the financial crises worsen the economic environment. The remarkable point is that the banking system dominates the capital supply to the economy in the pre-crisis period. These results are consistent with the findings of Ato Forson and Janrattanagul, (2014) and Ibrahim (2011) in the pre-crisis period. In the full period, the results show the highest impact comes from the foreign direct investment sector.

8.3. Policy implications

Stable and positive economic growth is the target of most country. To findings of causal linkages between the stock market and economic growth support the policymakers' in drafting and making policy recommendations and decisions aimed at economic growth. For the effect of financial sector development, our findings show similar results, in that financial development in Thailand (banking sector development, capital market development) results in less dependence of firms' investment in their internal finance as they have more opportunity to obtain external funding sources. Banking sector development (both size and activities measure) leads to an increase in bank size, a higher degree of financial intermediation and a rise in the activities of financial intermediation provided to customers. This condition will increase the opportunity for firms to obtain bank loans and lower their external funding costs. This will reduce the dependence of their investment on internal funds (cash flow) and also lower the external funding cost and agency cost, thus raising their debt finance for investment (leverage).

The capital market development also leads to lower external funding cost and agency cost for firms, thus increasing the opportunity for them to increase debt for investment. The greater development of the equity and bond markets will result in less dependence on firms' investment in their internal finance. The develop the sound stock market, the authority and policymakers must ensure to maintain the stability and sustainability of the

stock market. The following recommendations of this research are to achieve that mentioned aims.

Firstly, regarding the funding sources for the economy, the policy to support and promote the equitisations of SOEs process, particularly focus on equitisations associated with listing or registered for trading on UpCom's system. Also, to improve the quality of listed shares, the quality of corporate governance and risk management and further enhance the transparency and information disclosure.

The prudence and transparancy in corporate finance is very important. Therefore, it is necessary for Vietnam to continue collaboration to overcome the flaws in the review and audit of financial statements; research to issue accounting standards on financial instruments, fair value approach to financial reporting standards and the IFRS international roadmap. At first it may focus on applying the standards for intermediary financial institutions operating in the stock market, then evaluate and expand as applicable to other organisations.

Secondly, raising the foreign capital inflows, raising the ownership percentage of foreign investors in Vietnam enterprises should be in consideration, particularly for the industry sector in which the dominates the financial market such as banking. The experience of relying on foreign investment in Thailand is the good evidence.

Thirdly, financial sector reform. Together with economic and financial system liberalisation, financial reform is also the task the country should implement to achieve the sustainable development of the economy (Calderón and Liu, 2003). Thus, regarding the stock market reform, Vietnam should promote the restructure of the organisational system of the securities business by decreasing the number and improving quality of the securities businesses. Besides, the policymakers should carry out researches on putting additional provisions to tighten the operation of the securities business organisations, such as in financial management (raising and using capital), ensuring financial transparency and safety (financial management mechanism, receivable/payable account), jointly issuing accounting regime for securities companies under the fair value for healthy and transparent financial activities of the organisations, eliminating the potential risks in the financial system. In case of necessity, the authority should continue to consider additional regulations on financial security to shorten the process of restructuring the system of organised securities trading, remove the obstacles in administrative procedures,

encouraging the incorporation of the securities business organisations, promulgate the standards and accounting regulations under fair value, that applied firstly to securities businesses.

Fourthly, improving the facility for the effective operation of the stock market. Vietnam should restructure and modernise the securities market organisation to facilitate the funding movement. Besides, the coordination mechanisms in restructuring financial institutions in both the banking sector and stock market field should be proposed.

Fifthly, enhancing managing, monitoring and violation handling. The authority should enhance reviewing, evaluating and classifying of securities business organisations and implement an operational test for securities businesses and strictly handle violations. Besides, it is needed to continue to strengthening coordination with press agencies to inform public opinion on the operation of the stock market, coordinating with associations, market participants, financial institutions, international organisations to hold conferences to promote to foreign investors.

Sixthly, increasing the volume and quality of the investor base and the market participants (securities trading organizations, listed organizations, public companies, auditors, investment funds, etc..) continue to actively restructure themselves in order to improve efficiency; boosting corporate governance, risk management, enhancing operations, increases awareness of law compliance of market participants themselves, reporting and discipline disclosure; liability for investors; raising awareness of legal compliance with reporting obligations, market participants' disclosure in trading activity, professional ethics, and continuing to promoting the associations' role in the development of the stock market; supporting market supervision and improving the level of professional ethics.

Finally, risk management should be considered to achieve financial stability and reduce the risk of external shocks.

Sufficient capital to cover the risk should be put in place and controlled in line with the minimum capital requirement following the Basel II Accord. Policymakers should also consider the introduction of the capital requirement based on the new Basel III Accord to prevent the possibility of systematic risk in the future, largely caused by international financial risk.

Also, policymakers should encourage international cooperation in the financial market and institutional sectors, such as cross-listing, cross inspection and supervisory coordination to support the effectiveness of macro-prudential policy and to reduce regulatory arbitrage, and the spillover of the financial market and institutional risks.

Thus, the main aims of improving the risk management system and supporting the financial infrastructure should be achieved in line with other developments in this plan to reduce the possible risk of financial fragility in the future. Policymakers should also use the monetary policy to maintain stable economic and financial conditions in the country. As a result, this can prevent systematic risk, financial market risk, and the risk from external shocks that can affect the economy during the implementation of the financial development plan in the future. Policymakers should introduce an early warning system as a way of detecting the risk of economic instability at an early stage and to introduce a suitable policy to mitigate this risk.

In summary, the direction of causality between financial development and economic growth is crucial because it has different implications for development policies. Especially for developing countries, Calderón and Liu (2003) demonstrate two important policy implications. First, it is necessary to undertake further financial reform to gain sustainable economic growth. Second, to take advantage of the positive interaction between financial and economic development, the country should liberalise the economy while liberalising the financial sector. However, the developing economy has the newly commencing stock market, the financial sector liberalisation process also needs to consider and control the foreign direct and indirect capital inflows. Thereby, it could achieve the sustainable development and monitor the vulnerable financial system and the economy avoiding risk of the financial crisis not as the case of Thailand in 1997-1998.

8.4. Limitations and suggestions for further study

There are some limitations in this thesis about empirical research, which raises suggestions for further study:

(1) On analysing the contribution of the primary market, this study only exploits the stock market data stream on the HSX. The study of the stock market capitalisation of the other stock exchange - HNX has not yet taken in this study. Even the listed shares on the HSX dominate over 80% of the official listing share in both stock exchange, however, on the shares registered on the UpCoM are increasing rapidly because there are not constraint by the listing criteria. [14]

(2) As demonstrated by Demirgüç-Kunt and Levine (2008) about the important influence of the market liquidity on the secondary market, research on the impact of the liquidity of the market to the economic growth should be exploited more in the future research.

(3) Besides, the research should take into account the influences of policies and regulatory framework on the performance of the financial system and stock market. For example, the interest rate policy, such as the change in the spread of the price limitations, the limitation in the ownership of foreign investors in firms, risk management criteria etc. The applied methodology can either be carried out in quantitative or qualitative methods or both of them.

(4) The firms play in producing wealth for the economy and the performance of the stock market. Therefore, incorporation the contributions of the manufacture and business sector to the stock market development and economic should be considered in research in the microeconomic view.

(5) There is also a data limitation in the comparative study that narrows the research. It does not allow to take a further study on some relevant countries, especially the country has a similar transition process to the market economy like China.

(6) Data is unavailable in our consideration period for the investigation of other channels of monetary policy transmission (asset price and exchange rate channels). Therefore, this thesis has mainly focused on fund mobilised capacity of the financial sector.

[14] The UpCoM is the kind of over-the-counter market where the SOEs after equitization can register their shares for public trading. This market is located in the Hanoi Stock Exchange of Vietnam.

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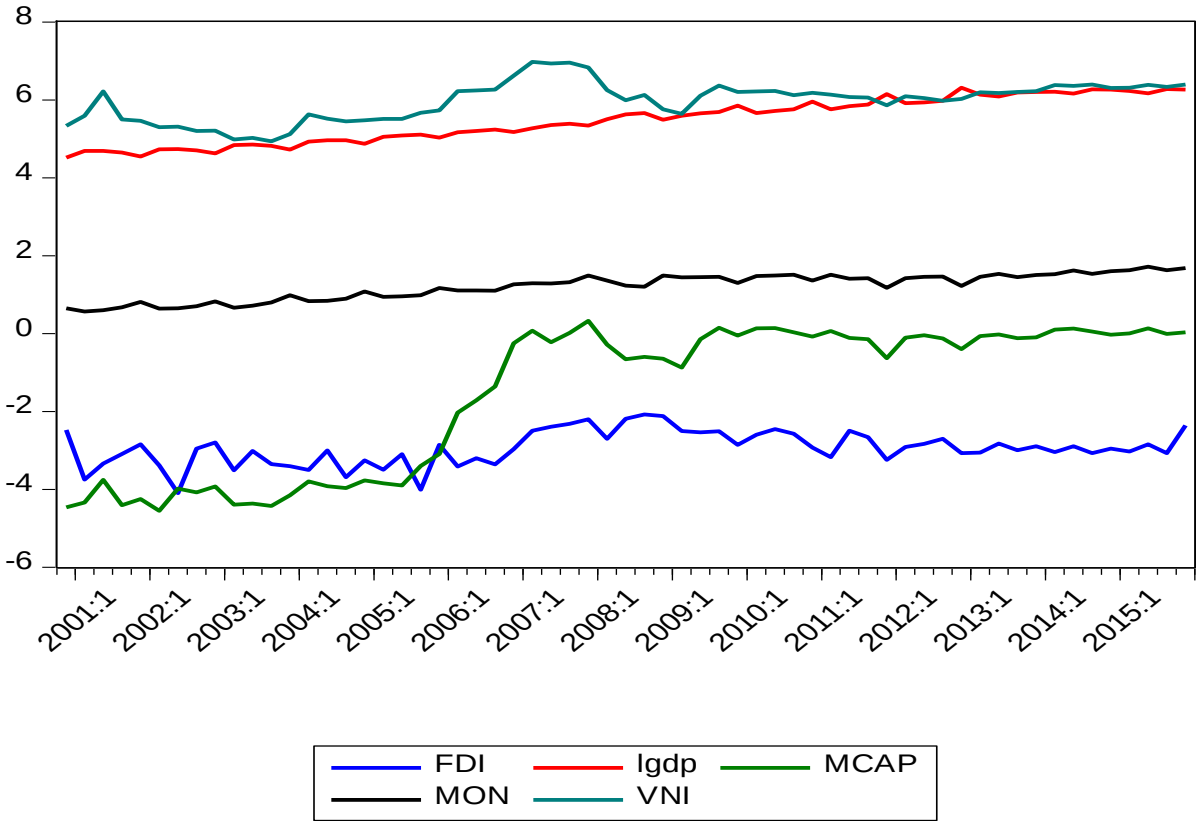
APPENDIX A: TEST RESULTS IN CHAPTER 6



Unit roots tests

LGDP

Null Hypothesis: LGDP has a unit root

Exogenous: Constant

Lag Length: 3 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.831706	0.8022
Test critical values:	1% level	-3.550396	
	5% level	-2.913549	
	10% level	-2.594521	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LGDP)

Method: Least Squares

Date: 04/26/18 Time: 21:36

Sample (adjusted): 2001Q4 2015Q4

Included observations: 57 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(-1)	-0.014352	0.017256	-0.831706	0.4094
D(LGDP(-1))	-0.745618	0.092600	-8.052067	0.0000
D(LGDP(-2))	-0.697267	0.097464	-7.154116	0.0000
D(LGDP(-3))	-0.739060	0.091435	-8.082932	0.0000
C	0.168440	0.095055	1.772028	0.0822

R-squared	0.664367	Mean dependent var	0.028385
Adjusted R-squared	0.638549	S.D. dependent var	0.116323
S.E. of regression	0.069934	Akaike info criterion	-2.398886
Sum squared resid	0.254323	Schwarz criterion	-2.219671
Log likelihood	73.36826	Hannan-Quinn criter.	-2.329237
F-statistic	25.73276	Durbin-Watson stat	1.716305
Prob(F-statistic)	0.000000		

Null Hypothesis: D(LGDP) has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-14.53077	0.0000
Test critical values:	1% level	-3.550396	

5% level	-2.913549	
10% level	-2.594521	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LGDP,2)

Method: Least Squares

Date: 04/26/198 Time: 21:42

Sample (adjusted): 2001Q4 2015Q4

Included observations: 57 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGDP(-1))	-3.196897	0.220009	-14.53077	0.0000
D(LGDP(-1),2)	1.442218	0.160775	8.970393	0.0000
D(LGDP(-2),2)	0.740169	0.091159	8.119564	0.0000
C	0.089925	0.011090	8.108867	0.0000

R-squared	0.876142	Mean dependent var	0.000498
Adjusted R-squared	0.869131	S.D. dependent var	0.192755
S.E. of regression	0.069731	Akaike info criterion	-2.420759
Sum squared resid	0.257706	Schwarz criterion	-2.277387
Log likelihood	72.99164	Hannan-Quinn criter.	-2.365040
F-statistic	124.9699	Durbin-Watson stat	1.703695
Prob(F-statistic)	0.000000		

Null Hypothesis: LGDP has a unit root

Exogenous: Constant

Bandwidth: 13 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-0.944162	0.7673
Test critical values:	1% level	-3.544063	
	5% level	-2.910860	
	10% level	-2.593090	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.012799
HAC corrected variance (Bartlett kernel)	0.003248

Phillips-Perron Test Equation

Dependent Variable: D(LGDP)

Method: Least Squares

Date: 04/26/18 Time: 21:43

Sample (adjusted): 2001Q1 2015Q4

Included observations: 60 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(-1)	-0.028081	0.026512	-1.059179	0.2939
C	0.182264	0.145408	1.253472	0.2151

R-squared	0.018975	Mean dependent var	0.029058
Adjusted R-squared	0.002061	S.D. dependent var	0.115184
S.E. of regression	0.115065	Akaike info criterion	-1.453867
Sum squared resid	0.767923	Schwarz criterion	-1.384055
Log likelihood	45.61600	Hannan-Quinn criter.	-1.426560
F-statistic	1.121860	Durbin-Watson stat	2.670175
Prob(F-statistic)	0.293910		

Null Hypothesis: D(LGDP) has a unit root

Exogenous: Constant

Bandwidth: 13 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-17.75710	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.011207
HAC corrected variance (Bartlett kernel)	0.002529

Phillips-Perron Test Equation

Dependent Variable: D(LGDP,2)

Method: Least Squares

Date: 04/26/18 Time: 21:43

Sample (adjusted): 2001Q2 2015Q4

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGDP(-1))	-1.361865	0.121892	-11.17273	0.0000
C	0.037509	0.014485	2.589478	0.0122

R-squared	0.686520	Mean dependent var	-0.003089
Adjusted R-squared	0.681020	S.D. dependent var	0.190702
S.E. of regression	0.107705	Akaike info criterion	-1.585532
Sum squared resid	0.661220	Schwarz criterion	-1.515107
Log likelihood	48.77318	Hannan-Quinn criter.	-1.558041
F-statistic	124.8298	Durbin-Watson stat	2.263385

Prob(F-statistic)	0.000000

MCAP

Null Hypothesis: MCAP has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.323525	0.6132
Test critical values:	1% level	-3.544063	
	5% level	-2.910860	
	10% level	-2.593090	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(MCAP)

Method: Least Squares

Date: 04/26/18 Time: 21:50

Sample (adjusted): 2001Q1 2015Q4

Included observations: 60 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCAP(-1)	-0.030956	0.023389	-1.323525	0.1909
C	0.026239	0.057058	0.459871	0.6473

R-squared	0.029317	Mean dependent var	0.074883
Adjusted R-squared	0.012581	S.D. dependent var	0.340212
S.E. of regression	0.338065	Akaike info criterion	0.701608
Sum squared resid	6.628698	Schwarz criterion	0.771419
Log likelihood	-19.04823	Hannan-Quinn criter.	0.728915

F-statistic	1.751719	Durbin-Watson stat	1.953789
Prob(F-statistic)	0.190854		

Null Hypothesis: MCAP has a unit root

Exogenous: Constant

Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.332394	0.6090
Test critical values:	1% level	-3.544063	
	5% level	-2.910860	
	10% level	-2.593090	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.110478
HAC corrected variance (Bartlett kernel)	0.129851

Phillips-Perron Test Equation

Dependent Variable: D(MCAP)

Method: Least Squares

Date: 04/26/18 Time: 21:52

Sample (adjusted): 2001Q1 2015Q4

Included observations: 60 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCAP(-1)	-0.030956	0.023389	-1.323525	0.1909
C	0.026239	0.057058	0.459871	0.6473

R-squared	0.029317	Mean dependent var	0.074883

Adjusted R-squared	0.012581	S.D. dependent var	0.340212
S.E. of regression	0.338065	Akaike info criterion	0.701608
Sum squared resid	6.628698	Schwarz criterion	0.771419
Log likelihood	-19.04823	Hannan-Quinn criter.	0.728915
F-statistic	1.751719	Durbin-Watson stat	1.953789
Prob(F-statistic)	0.190854		

Null Hypothesis: D(MCAP) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.387897	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(MCAP,2)

Method: Least Squares

Date: 04/26/18 Time: 21:54

Sample (adjusted): 2001Q2 2015Q4

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MCAP(-1))	-0.978274	0.132416	-7.387897	0.0000
C	0.072515	0.046141	1.571607	0.1216

R-squared	0.489160	Mean dependent var	-0.001318

Adjusted R-squared	0.480198	S.D. dependent var	0.479907
S.E. of regression	0.346000	Akaike info criterion	0.748553
Sum squared resid	6.823800	Schwarz criterion	0.818978
Log likelihood	-20.08231	Hannan-Quinn criter.	0.776044
F-statistic	54.58102	Durbin-Watson stat	1.971225
Prob(F-statistic)	0.000000		

Null Hypothesis: D(MCAP) has a unit root

Exogenous: Constant

Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.417811	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.115658
HAC corrected variance (Bartlett kernel)	0.130096

Phillips-Perron Test Equation

Dependent Variable: D(MCAP,2)

Method: Least Squares

Date: 04/26/18 Time: 21:55

Sample (adjusted): 2001Q2 2015Q4

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(MCAP(-1))	-0.978274	0.132416	-7.387897	0.0000
C	0.072515	0.046141	1.571607	0.1216

R-squared	0.489160	Mean dependent var	-0.001318
Adjusted R-squared	0.480198	S.D. dependent var	0.479907
S.E. of regression	0.346000	Akaike info criterion	0.748553
Sum squared resid	6.823800	Schwarz criterion	0.818978
Log likelihood	-20.08231	Hannan-Quinn criter.	0.776044
F-statistic	54.58102	Durbin-Watson stat	1.971225
Prob(F-statistic)	0.000000		

MON

Null Hypothesis: MON has a unit root

Exogenous: Constant

Lag Length: 3 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.424790	0.5639
Test critical values:	1% level	-3.550396	
	5% level	-2.913549	
	10% level	-2.594521	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(MON)

Method: Least Squares

Date: 04/26/198 Time: 21:59

Sample (adjusted): 2001Q4 2015Q4

Included observations: 57 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MON(-1)	-0.052701	0.036989	-1.424790	0.1602
D(MON(-1))	-0.639279	0.105388	-6.065938	0.0000
D(MON(-2))	-0.588053	0.110789	-5.307863	0.0000
D(MON(-3))	-0.638988	0.104138	-6.135950	0.0000
C	0.116755	0.046505	2.510576	0.0152

R-squared	0.554878	Mean dependent var	0.017605
Adjusted R-squared	0.520638	S.D. dependent var	0.121072
S.E. of regression	0.083825	Akaike info criterion	-2.036537
Sum squared resid	0.365386	Schwarz criterion	-1.857322
Log likelihood	63.04129	Hannan-Quinn criter.	-1.966888
F-statistic	16.20549	Durbin-Watson stat	1.684909
Prob(F-statistic)	0.000000		

Null Hypothesis: MON has a unit root

Exogenous: Constant

Bandwidth: 15 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.168608	0.6825
Test critical values:	1% level	-3.544063	
	5% level	-2.910860	
	10% level	-2.593090	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.013367
HAC corrected variance (Bartlett kernel)	0.005677

Phillips-Perron Test Equation

Dependent Variable: D(MON)

Method: Least Squares

Date: 04/26/18 Time: 21:57

Sample (adjusted): 2001Q1 2015Q4

Included observations: 60 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MON(-1)	-0.072044	0.046474	-1.550192	0.1265
C	0.103564	0.057763	1.792912	0.0782

R-squared	0.039784	Mean dependent var	0.017168
Adjusted R-squared	0.023229	S.D. dependent var	0.118981
S.E. of regression	0.117591	Akaike info criterion	-1.410437
Sum squared resid	0.802008	Schwarz criterion	-1.340626
Log likelihood	44.31312	Hannan-Quinn criter.	-1.383130
F-statistic	2.403096	Durbin-Watson stat	2.605104
Prob(F-statistic)	0.126535		

Null Hypothesis: D(MON) has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.72448	0.0000
Test critical values:	1% level	-3.550396	
	5% level	-2.913549	
	10% level	-2.594521	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(MON,2)

Method: Least Squares

Date: 04/26/18 Time: 22:00

Sample (adjusted): 2001Q4 2015Q4

Included observations: 57 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MON(-1))	-2.911190	0.248300	-11.72448	0.0000
D(MON(-1),2)	1.246928	0.183240	6.804884	0.0000
D(MON(-2),2)	0.644946	0.105061	6.138804	0.0000
C	0.052739	0.012118	4.352239	0.0001

R-squared	0.829802	Mean dependent var	-0.000332
Adjusted R-squared	0.820168	S.D. dependent var	0.199582
S.E. of regression	0.084636	Akaike info criterion	-2.033328
Sum squared resid	0.379650	Schwarz criterion	-1.889956
Log likelihood	61.94985	Hannan-Quinn criter.	-1.977609
F-statistic	86.13416	Durbin-Watson stat	1.673985
Prob(F-statistic)	0.000000		

Null Hypothesis: D(MON) has a unit root

Exogenous: Constant

Bandwidth: 14 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-15.46492	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	

	10% level	-2.593551

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.012214
HAC corrected variance (Bartlett kernel)	0.003684

Phillips-Perron Test Equation

Dependent Variable: D(MON,2)

Method: Least Squares

Date: 04/26/18 Time: 22:02

Sample (adjusted): 2001Q2 2015Q4

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MON(-1))	-1.353033	0.123146	-10.98722	0.0000
C	0.024733	0.014778	1.673621	0.0997

R-squared	0.679269	Mean dependent var	0.002413
Adjusted R-squared	0.673642	S.D. dependent var	0.196817
S.E. of regression	0.112437	Akaike info criterion	-1.499534
Sum squared resid	0.720601	Schwarz criterion	-1.429109
Log likelihood	46.23624	Hannan-Quinn criter.	-1.472043
F-statistic	120.7189	Durbin-Watson stat	2.223292
Prob(F-statistic)	0.000000		

FDI

Null Hypothesis: FDI has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.680537	0.0834
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(FDI)

Method: Least Squares

Date: 04/26/18 Time: 22:11

Sample (adjusted): 2001Q2 2015Q4

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.328194	0.122436	-2.680537	0.0096
D(FDI(-1))	-0.291142	0.120956	-2.407006	0.0194
C	-0.950919	0.364788	-2.606772	0.0117

R-squared	0.314849	Mean dependent var	0.023577
Adjusted R-squared	0.290379	S.D. dependent var	0.421104
S.E. of regression	0.354734	Akaike info criterion	0.814613
Sum squared resid	7.046831	Schwarz criterion	0.920250
Log likelihood	-21.03107	Hannan-Quinn criter.	0.855849
F-statistic	12.86690	Durbin-Watson stat	2.143707
Prob(F-statistic)	0.000025		

Null Hypothesis: FDI has a unit root

Exogenous: Constant

Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.549967	0.0005
Test critical values:	1% level	-3.544063	
	5% level	-2.910860	
	10% level	-2.593090	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.147811
HAC corrected variance (Bartlett kernel)	0.157168

Phillips-Perron Test Equation

Dependent Variable: D(FDI)

Method: Least Squares

Date: 04/26/18 Time: 22:14

Sample (adjusted): 2001Q1 2015Q4

Included observations: 60 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.518960	0.115962	-4.475252	0.0000
C	-1.530123	0.346059	-4.421560	0.0000

R-squared	0.256676	Mean dependent var	0.002014
Adjusted R-squared	0.243860	S.D. dependent var	0.449691
S.E. of regression	0.391035	Akaike info criterion	0.992726
Sum squared resid	8.868684	Schwarz criterion	1.062537
Log likelihood	-27.78177	Hannan-Quinn criter.	1.020033
F-statistic	20.02788	Durbin-Watson stat	2.022943

Prob(F-statistic)	0.000036

Null Hypothesis: D(FDI) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-13.13739	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(FDI,2)

Method: Least Squares

Date: 04/26/18 Time: 22:15

Sample (adjusted): 2001Q2 2015Q4

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-1.452156	0.110536	-13.13739	0.0000
C	0.019037	0.048636	0.391408	0.6970

R-squared	0.751732	Mean dependent var	0.033619
Adjusted R-squared	0.747377	S.D. dependent var	0.743082
S.E. of regression	0.373485	Akaike info criterion	0.901434
Sum squared resid	7.951000	Schwarz criterion	0.971859
Log likelihood	-24.59230	Hannan-Quinn criter.	0.928925
F-statistic	172.5910	Durbin-Watson stat	2.295210

Prob(F-statistic)	0.000000

VNI

Null Hypothesis: VNI has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.913552	0.3241
Test critical values:	1% level	-3.544063	
	5% level	-2.910860	
	10% level	-2.593090	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(VNI)

Method: Least Squares

Date: 04/26/18 Time: 22:17

Sample (adjusted): 2001Q1 2015Q4

Included observations: 60 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VNI(-1)	-0.110618	0.057808	-1.913552	0.0606
C	0.676617	0.345530	1.958198	0.0550

R-squared	0.059383	Mean dependent var	0.017668
Adjusted R-squared	0.043166	S.D. dependent var	0.225109
S.E. of regression	0.220197	Akaike info criterion	-0.155825
Sum squared resid	2.812223	Schwarz criterion	-0.086014
Log likelihood	6.674762	Hannan-Quinn criter.	-0.128518

F-statistic	3.661683	Durbin-Watson stat	1.848034
Prob(F-statistic)	0.060617		

Null Hypothesis: VNI has a unit root

Exogenous: Constant

Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.015954	0.2794
Test critical values:	1% level	-3.544063	
	5% level	-2.910860	
	10% level	-2.593090	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.046870
HAC corrected variance (Bartlett kernel)	0.053444

Phillips-Perron Test Equation

Dependent Variable: D(VNI)

Method: Least Squares

Date: 04/26/18 Time: 22:18

Sample (adjusted): 2001Q1 2015Q4

Included observations: 60 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VNI(-1)	-0.110618	0.057808	-1.913552	0.0606
C	0.676617	0.345530	1.958198	0.0550

R-squared	0.059383	Mean dependent var	0.017668

Adjusted R-squared	0.043166	S.D. dependent var	0.225109
S.E. of regression	0.220197	Akaike info criterion	-0.155825
Sum squared resid	2.812223	Schwarz criterion	-0.086014
Log likelihood	6.674762	Hannan-Quinn criter.	-0.128518
F-statistic	3.661683	Durbin-Watson stat	1.848034
Prob(F-statistic)	0.060617		

Null Hypothesis: D(VNI) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.492044	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(VNI,2)

Method: Least Squares

Date: 04/26/18 Time: 22:19

Sample (adjusted): 2001Q2 2015Q4

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(VNI(-1))	-0.982188	0.131097	-7.492044	0.0000
C	0.013192	0.029586	0.445877	0.6574

R-squared	0.496158	Mean dependent var	-0.003468

Adjusted R-squared	0.487319	S.D. dependent var	0.316491
S.E. of regression	0.226613	Akaike info criterion	-0.097836
Sum squared resid	2.927146	Schwarz criterion	-0.027411
Log likelihood	4.886161	Hannan-Quinn criter.	-0.070345
F-statistic	56.13072	Durbin-Watson stat	1.975099
Prob(F-statistic)	0.000000		

Null Hypothesis: D(VNI) has a unit root

Exogenous: Constant

Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.495272	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.049613
HAC corrected variance (Bartlett kernel)	0.045107

Phillips-Perron Test Equation

Dependent Variable: D(VNI,2)

Method: Least Squares

Date: 04/26/18 Time: 22:21

Sample (adjusted): 2001Q2 2015Q4

Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(VNI(-1))	-0.982188	0.131097	-7.492044	0.0000
C	0.013192	0.029586	0.445877	0.6574

R-squared	0.496158	Mean dependent var	-0.003468
Adjusted R-squared	0.487319	S.D. dependent var	0.316491
S.E. of regression	0.226613	Akaike info criterion	-0.097836
Sum squared resid	2.927146	Schwarz criterion	-0.027411
Log likelihood	4.886161	Hannan-Quinn criter.	-0.070345
F-statistic	56.13072	Durbin-Watson stat	1.975099
Prob(F-statistic)	0.000000		

Equation 1 (LGDP)

Model 1

Dependent Variable: LGDP

Method: ARDL

Date: 04/27/18 Time: 17:50

Sample (adjusted): 2002Q4 2015Q4

Included observations: 53 after adjustments

Maximum dependent lags: 4 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (8 lags, automatic): MCAP MON FDI VNI

Fixed regressors: BREAK C

Number of models evalulated: 26244

Selected Model: ARDL(4, 8, 8, 8, 8)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGDP(-1)	1.226894	0.192160	6.384742	0.0001
LGDP(-2)	-0.924930	0.277367	-3.334682	0.0067
LGDP(-3)	0.787521	0.270514	2.911207	0.0142

LGDP(-4)	-0.210478	0.199837	-1.053249	0.3148
MCAP	-0.000396	0.036524	-0.010843	0.9915
MCAP(-1)	0.031198	0.067528	0.461999	0.6531
MCAP(-2)	0.004573	0.059354	0.077048	0.9400
MCAP(-3)	-0.156840	0.055154	-2.843656	0.0160
MCAP(-4)	0.220435	0.053060	4.154471	0.0016
MCAP(-5)	-0.202858	0.062103	-3.266495	0.0075
MCAP(-6)	0.188217	0.064857	2.902038	0.0144
MCAP(-7)	-0.284544	0.067112	-4.239848	0.0014
MCAP(-8)	0.267610	0.060034	4.457644	0.0010
MON	-0.859595	0.122146	-7.037429	0.0000
MON(-1)	1.163677	0.218397	5.328275	0.0002
MON(-2)	-0.910640	0.288859	-3.152548	0.0092
MON(-3)	0.994161	0.298429	3.331311	0.0067
MON(-4)	-0.478665	0.202645	-2.362082	0.0377
MON(-5)	0.288571	0.102856	2.805598	0.0171
MON(-6)	-0.313846	0.106575	-2.944853	0.0133
MON(-7)	0.429181	0.096089	4.466474	0.0010
MON(-8)	-0.360116	0.125596	-2.867265	0.0153
FDI	0.055945	0.023676	2.362925	0.0376
FDI(-1)	0.100106	0.031209	3.207560	0.0083
FDI(-2)	0.081777	0.028969	2.822918	0.0166
FDI(-3)	-0.005785	0.032860	-0.176041	0.8635
FDI(-4)	0.036787	0.029213	1.259290	0.2340
FDI(-5)	-0.100722	0.039819	-2.529518	0.0280
FDI(-6)	0.016476	0.026636	0.618547	0.5488
FDI(-7)	-0.110806	0.032470	-3.412527	0.0058
FDI(-8)	-0.015163	0.015797	-0.959853	0.3578
VNI	0.139815	0.066313	2.108403	0.0587
VNI(-1)	-0.195725	0.125576	-1.558619	0.1474
VNI(-2)	0.023611	0.104151	0.226700	0.8248
VNI(-3)	0.160399	0.092579	1.732565	0.1111

VNI(-4)	-0.299553	0.076517	-3.914874	0.0024
VNI(-5)	0.263616	0.086008	3.065025	0.0108
VNI(-6)	-0.293921	0.076181	-3.858194	0.0027
VNI(-7)	0.352963	0.083946	4.204643	0.0015
VNI(-8)	-0.311537	0.066402	-4.691693	0.0007
BREAK	-0.100597	0.049721	-2.023226	0.0680
C	2.012657	1.161441	1.732896	0.1110

R-squared	0.999737	Mean dependent var	5.591726
Adjusted R-squared	0.998756	S.D. dependent var	0.506673
S.E. of regression	0.017869	Akaike info criterion	-5.198981
Sum squared resid	0.003512	Schwarz criterion	-3.637618
Log likelihood	179.7730	Hannan-Quinn criter.	-4.598556
F-statistic	1019.429	Durbin-Watson stat	2.229221
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Long-run relationships

ARDL Long Run Form and Bounds Test

Dependent Variable: D(LGDP)

Selected Model: ARDL(4, 8, 8, 8, 8)

Case 3: Unrestricted Constant and No Trend

Date: 04/27/19 Time: 17:52

Sample: 2000Q4 2015Q4

Included observations: 53

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.012657	1.161441	1.732896	0.1110
LGDP(-1)*	-0.120993	0.130401	-0.927852	0.3734
MCAP(-1)	0.067394	0.061800	1.090526	0.2988

MON(-1)	-0.047271	0.146360	-0.322980	0.7528
FDI(-1)	0.058616	0.089217	0.657003	0.5247
VNI(-1)	-0.160333	0.133801	-1.198296	0.2560
D(LGDP(-1))	0.347887	0.251493	1.383285	0.1940
D(LGDP(-2))	-0.577043	0.218226	-2.644241	0.0228
D(LGDP(-3))	0.210478	0.199837	1.053249	0.3148
D(MCAP)	-0.000396	0.036524	-0.010843	0.9915
D(MCAP(-1))	-0.036592	0.044423	-0.823725	0.4276
D(MCAP(-2))	-0.032019	0.057303	-0.558775	0.5875
D(MCAP(-3))	-0.188860	0.051867	-3.641198	0.0039
D(MCAP(-4))	0.031576	0.045484	0.694218	0.5019
D(MCAP(-5))	-0.171282	0.062442	-2.743050	0.0191
D(MCAP(-6))	0.016934	0.051015	0.331949	0.7462
D(MCAP(-7))	-0.267610	0.060034	-4.457644	0.0010
D(MON)	-0.859595	0.122146	-7.037429	0.0000
D(MON(-1))	0.351354	0.216641	1.621827	0.1331
D(MON(-2))	-0.559287	0.214002	-2.613459	0.0241
D(MON(-3))	0.434874	0.272783	1.594215	0.1392
D(MON(-4))	-0.043791	0.160623	-0.272630	0.7902
D(MON(-5))	0.244781	0.171970	1.423395	0.1824
D(MON(-6))	-0.069065	0.122553	-0.563557	0.5844
D(MON(-7))	0.360116	0.125596	2.867265	0.0153
D(FDI)	0.055945	0.023676	2.362925	0.0376
D(FDI(-1))	0.097435	0.098327	0.990926	0.3430
D(FDI(-2))	0.179212	0.094315	1.900143	0.0839
D(FDI(-3))	0.173428	0.084093	2.062323	0.0636
D(FDI(-4))	0.210215	0.074254	2.831014	0.0163
D(FDI(-5))	0.109493	0.050038	2.188187	0.0511
D(FDI(-6))	0.125969	0.040798	3.087628	0.0103
D(FDI(-7))	0.015163	0.015797	0.959853	0.3578
D(VNI)	0.139815	0.066313	2.108403	0.0587
D(VNI(-1))	0.104422	0.076328	1.368066	0.1986

D(VNI(-2))	0.128033	0.094373	1.356678	0.2021
D(VNI(-3))	0.288432	0.057516	5.014804	0.0004
D(VNI(-4))	-0.011121	0.061633	-0.180432	0.8601
D(VNI(-5))	0.252495	0.064612	3.907847	0.0024
D(VNI(-6))	-0.041426	0.058110	-0.712876	0.4908
D(VNI(-7))	0.311537	0.066402	4.691693	0.0007
BREAK	-0.100597	0.049721	-2.023226	0.0680

* p-value incompatible with t-Bounds distribution.

Levels Equation

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCAP	0.557009	0.208181	2.675593	0.0216
MON	-0.390695	1.521255	-0.256824	0.8021
FDI	0.484459	1.238047	0.391309	0.7030
VNI	-1.325140	0.910972	-1.454644	0.1737

EC = LGDP - (0.5570*MCAP -0.3907*MON + 0.4845*FDI -1.3251*VNI)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.026211	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
			Finite Sample:	
Actual Sample Size	53		n=55	

	10%	2.578	3.71
	5%	3.068	4.334
	1%	4.244	5.726
	Finite Sample: n=50		
	10%	2.614	3.746
	5%	3.136	4.416
	1%	4.306	5.874

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-0.927852	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6

ECM

ARDL Error Correction Regression

Dependent Variable: D(LGDP)

Selected Model: ARDL(4, 8, 8, 8, 8)

Case 3: Unrestricted Constant and No Trend

Date: 04/27/18 Time: 17:52

Sample: 2000Q4 2015Q4

Included observations: 53

ECM Regression

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.012657	0.338523	5.945412	0.0001
D(LGDP(-1))	0.347887	0.143828	2.418763	0.0341

D(LGDP(-2))	-0.577043	0.133194	-4.332336	0.0012
D(LGDP(-3))	0.210478	0.141706	1.485313	0.1655
D(MCAP)	-0.000396	0.024977	-0.015856	0.9876
D(MCAP(-1))	-0.036592	0.030400	-1.203700	0.2540
D(MCAP(-2))	-0.032019	0.027717	-1.155233	0.2725
D(MCAP(-3))	-0.188860	0.029839	-6.329272	0.0001
D(MCAP(-4))	0.031576	0.034564	0.913541	0.3805
D(MCAP(-5))	-0.171282	0.038658	-4.430709	0.0010
D(MCAP(-6))	0.016934	0.037384	0.452994	0.6594
D(MCAP(-7))	-0.267610	0.037736	-7.091643	0.0000
D(MON)	-0.859595	0.064928	-13.23918	0.0000
D(MON(-1))	0.351354	0.146653	2.395819	0.0355
D(MON(-2))	-0.559287	0.145091	-3.854742	0.0027
D(MON(-3))	0.434874	0.145755	2.983590	0.0124
D(MON(-4))	-0.043791	0.074451	-0.588182	0.5683
D(MON(-5))	0.244781	0.075536	3.240577	0.0079
D(MON(-6))	-0.069065	0.061663	-1.120037	0.2866
D(MON(-7))	0.360116	0.063029	5.713466	0.0001
D(FDI)	0.055945	0.015212	3.677588	0.0036
D(FDI(-1))	0.097435	0.020670	4.713776	0.0006
D(FDI(-2))	0.179212	0.032288	5.550482	0.0002
D(FDI(-3))	0.173428	0.040670	4.264230	0.0013
D(FDI(-4))	0.210215	0.040812	5.150753	0.0003
D(FDI(-5))	0.109493	0.031634	3.461208	0.0053
D(FDI(-6))	0.125969	0.023159	5.439249	0.0002
D(FDI(-7))	0.015163	0.011059	1.371091	0.1977
D(VNI)	0.139815	0.045580	3.067467	0.0107
D(VNI(-1))	0.104422	0.053019	1.969531	0.0746
D(VNI(-2))	0.128033	0.053739	2.382507	0.0363
D(VNI(-3))	0.288432	0.042112	6.849222	0.0000
D(VNI(-4))	-0.011121	0.049121	-0.226390	0.8250
D(VNI(-5))	0.252495	0.047007	5.371469	0.0002

D(VNI(-6))	-0.041426	0.046005	-0.900458	0.3872
D(VNI(-7))	0.311537	0.046472	6.703755	0.0000
BREAK	-0.100597	0.033802	-2.976060	0.0126
CointEq(-1)*	-0.120993	0.020668	-5.854026	0.0001

R-squared	0.995069	Mean dependent var	0.029470
Adjusted R-squared	0.982904	S.D. dependent var	0.117033
S.E. of regression	0.015302	Akaike info criterion	-5.349925
Sum squared resid	0.003512	Schwarz criterion	-3.937262
Log likelihood	179.7730	Hannan-Quinn criter.	-4.806683
F-statistic	81.80243	Durbin-Watson stat	2.229221
Prob(F-statistic)	0.000000		

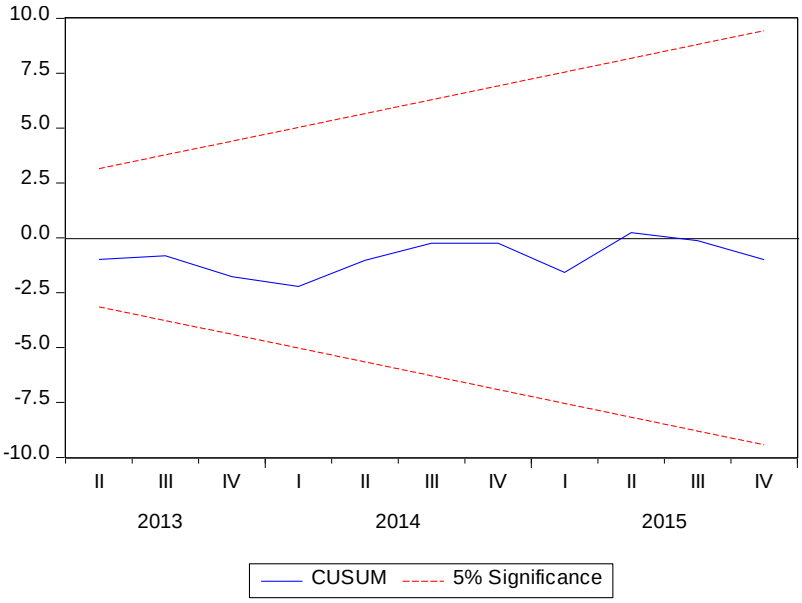
* p-value incompatible with t-Bounds distribution.

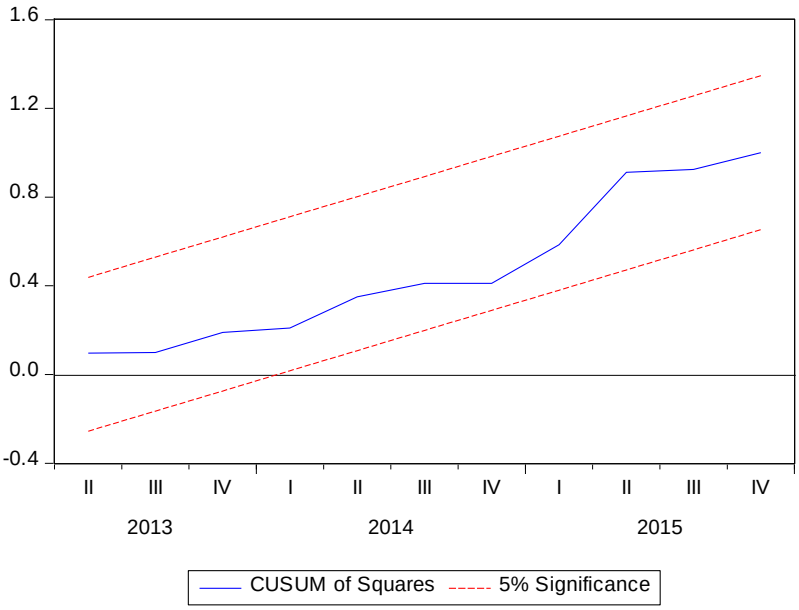
F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.026211	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-5.854026	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6





Wald tests

Delta MCAP

Wald Test:

Equation: EQ01_LGDP

Test Statistic	Value	df	Probability
F-statistic	6.009130	(8, 11)	0.0040
Chi-square	48.07304	8	0.0000

Null Hypothesis: C(6)=C(7)=C(8)=C(9)=C(10)=C(11)=C(12)
=C(13)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(6)	0.031198	0.067528
C(7)	0.004573	0.059354
C(8)	-0.156840	0.055154
C(9)	0.220435	0.053060
C(10)	-0.202858	0.062103
C(11)	0.188217	0.064857
C(12)	-0.284544	0.067112
C(13)	0.267610	0.060034

Restrictions are linear in coefficients.

Reject H_0

Delta Mon

Wald Test:

Equation: EQ01_LGDP

Test Statistic	Value	df	Probability
F-statistic	8.410431	(8, 11)	0.0010
Chi-square	67.28345	8	0.0000

Null Hypothesis: C(15)=C(16)=C(17)=C(18)=C(19)=C(20)=
C(21)=C(22)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.

C(15)	1.163677	0.218397
C(16)	-0.910640	0.288859
C(17)	0.994161	0.298429
C(18)	-0.478665	0.202645
C(19)	0.288571	0.102856
C(20)	-0.313846	0.106575
C(21)	0.429181	0.096089
C(22)	-0.360116	0.125596

Restrictions are linear in coefficients.

Delta FDI

Wald Test:

Equation: EQ01_LGDP

Test Statistic	Value	df	Probability
F-statistic	4.220448	(8, 11)	0.0153
Chi-square	33.76358	8	0.0000

Null Hypothesis: C(24)=C(25)=C(26)=C(27)=C(28)=C(29)=
C(30)=C(31)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(24)	0.100106	0.031209
C(25)	0.081777	0.028969
C(26)	-0.005785	0.032860
C(27)	0.036787	0.029213
C(28)	-0.100722	0.039819
C(29)	0.016476	0.026636
C(30)	-0.110806	0.032470

C(31)	-0.015163	0.015797

Restrictions are linear in coefficients.

Delta VNI

Wald Test:

Equation: EQ01_LGDP

Test Statistic	Value	df	Probability
F-statistic	5.651510	(8, 11)	0.0051
Chi-square	45.21208	8	0.0000

Null Hypothesis: C(33)=C(34)=C(35)=C(36)=C(37)=C(38)=
C(39)=C(40)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(33)	-0.195725	0.125576
C(34)	0.023611	0.104151
C(35)	0.160399	0.092579
C(36)	-0.299553	0.076517
C(37)	0.263616	0.086008
C(38)	-0.293921	0.076181
C(39)	0.352963	0.083946
C(40)	-0.311537	0.066402

Restrictions are linear in coefficients.

Equation 2 (MCAP)
Model 2

Dependent Variable: MCAP

Method: ARDL

Date: 04/27/18 Time: 16:50

Sample (adjusted): 2001Q4 2015Q4

Included observations: 57 after adjustments

Maximum dependent lags: 4 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (4 lags, automatic): LGDP MON FDI VNI

Fixed regressors: BREAK C

Number of models evalulated: 2500

Selected Model: ARDL(4, 2, 4, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
MCAP(-1)	1.159624	0.149798	7.741264	0.0000
MCAP(-2)	-0.317611	0.230773	-1.376294	0.1780
MCAP(-3)	0.255498	0.232347	1.099636	0.2794
MCAP(-4)	-0.344006	0.168404	-2.042740	0.0491
LGDP	1.035467	0.702037	1.474947	0.1497
LGDP(-1)	-2.421352	0.997465	-2.427506	0.0208
LGDP(-2)	1.653963	0.681913	2.425476	0.0209
MON	1.893435	0.666535	2.840713	0.0077
MON(-1)	-3.734468	1.000823	-3.731397	0.0007
MON(-2)	1.940056	0.755035	2.569492	0.0149
MON(-3)	-0.790651	0.409470	-1.930915	0.0621
MON(-4)	0.707099	0.329172	2.148112	0.0391
FDI	-0.324288	0.074819	-4.334320	0.0001
FDI(-1)	0.142997	0.088790	1.610508	0.1168
FDI(-2)	0.069473	0.089514	0.776116	0.4432
FDI(-3)	0.309562	0.098045	3.157352	0.0034

FDI(-4)	0.076134	0.068774	1.107025	0.2763
VNI	1.321710	0.141860	9.316990	0.0000
VNI(-1)	-1.272183	0.248238	-5.124846	0.0000
VNI(-2)	0.474288	0.298726	1.587702	0.1219
VNI(-3)	-0.382614	0.295107	-1.296524	0.2038
VNI(-4)	0.412680	0.190986	2.160786	0.0381
BREAK	-0.102981	0.182887	-0.563083	0.5772
C	-4.302218	1.389274	-3.096737	0.0040

R-squared	0.997271	Mean dependent var	-1.355885
Adjusted R-squared	0.995368	S.D. dependent var	1.792926
S.E. of regression	0.122022	Akaike info criterion	-1.073675
Sum squared resid	0.491346	Schwarz criterion	-0.213443
Log likelihood	54.59974	Hannan-Quinn criter.	-0.739360
F-statistic	524.2328	Durbin-Watson stat	1.851797
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Long-run relationships

ARDL Long Run Form and Bounds Test

Dependent Variable: D(MCAP)

Selected Model: ARDL(4, 2, 4, 4, 4)

Case 3: Unrestricted Constant and No Trend

Date: 04/27/18 Time: 16:51

Sample: 2000Q4 2015Q4

Included observations: 57

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.302218	1.389274	-3.096737	0.0040

MCAP(-1)*	-0.246496	0.087085	-2.830512	0.0079
LGDP(-1)	0.268078	0.230151	1.164790	0.2525
MON(-1)	0.015471	0.345655	0.044759	0.9646
FDI(-1)	0.273879	0.184463	1.484741	0.1471
VNI(-1)	0.553882	0.140861	3.932123	0.0004
D(MCAP(-1))	0.406120	0.164319	2.471531	0.0188
D(MCAP(-2))	0.088508	0.151863	0.582816	0.5640
D(MCAP(-3))	0.344006	0.168404	2.042740	0.0491
D(LGDP)	1.035467	0.702037	1.474947	0.1497
D(LGDP(-1))	-1.653963	0.681913	-2.425476	0.0209
D(MON)	1.893435	0.666535	2.840713	0.0077
D(MON(-1))	-1.856504	0.665785	-2.788443	0.0087
D(MON(-2))	0.083552	0.355573	0.234978	0.8157
D(MON(-3))	-0.707099	0.329172	-2.148112	0.0391
D(FDI)	-0.324288	0.074819	-4.334320	0.0001
D(FDI(-1))	-0.455170	0.141132	-3.225131	0.0028
D(FDI(-2))	-0.385697	0.120320	-3.205589	0.0030
D(FDI(-3))	-0.076134	0.068774	-1.107025	0.2763
D(VNI)	1.321710	0.141860	9.316990	0.0000
D(VNI(-1))	-0.504355	0.193014	-2.613047	0.0134
D(VNI(-2))	-0.030067	0.190175	-0.158099	0.8753
D(VNI(-3))	-0.412680	0.190986	-2.160786	0.0381
BREAK	-0.102981	0.182887	-0.563083	0.5772

* p-value incompatible with t-Bounds distribution.

Levels Equation

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP	1.087554	0.683290	1.591643	0.1210
MON	0.062764	1.403310	0.044726	0.9646

FDI	1.111090	0.473486	2.346616	0.0251
VNI	2.247024	0.642156	3.499189	0.0014

EC = MCAP - (1.0876*LGDP + 0.0628*MON + 1.1111*FDI + 2.2470*VNI)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.090209	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
			Finite Sample: n=60	
Actual Sample Size	57			
		10%	2.568	3.712
		5%	3.062	4.314
		1%	4.176	5.676
			Finite Sample: n=55	
		10%	2.578	3.71
		5%	3.068	4.334
		1%	4.244	5.726

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-2.830512	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26

1%	-3.43	-4.6

ECM

ARDL Error Correction Regression

Dependent Variable: D(MCAP)

Selected Model: ARDL(4, 2, 4, 4, 4)

Case 3: Unrestricted Constant and No Trend

Date: 04/27/18 Time: 16:52

Sample: 2000Q4 2015Q4

Included observations: 57

ECM Regression

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.302218	0.900946	-4.775222	0.0000
D(MCAP(-1))	0.406120	0.122147	3.324852	0.0022
D(MCAP(-2))	0.088508	0.132318	0.668909	0.5082
D(MCAP(-3))	0.344006	0.135160	2.545181	0.0158
D(LGDP)	1.035467	0.635362	1.629729	0.1127
D(LGDP(-1))	-1.653963	0.618564	-2.673873	0.0116
D(MON)	1.893435	0.598343	3.164467	0.0033
D(MON(-1))	-1.856504	0.615620	-3.015666	0.0049
D(MON(-2))	0.083552	0.307784	0.271464	0.7877
D(MON(-3))	-0.707099	0.290999	-2.429906	0.0207
D(FDI)	-0.324288	0.061814	-5.246230	0.0000
D(FDI(-1))	-0.455170	0.101592	-4.480371	0.0001
D(FDI(-2))	-0.385697	0.103589	-3.723353	0.0007
D(FDI(-3))	-0.076134	0.061850	-1.230945	0.2270
D(VNI)	1.321710	0.120009	11.01346	0.0000
D(VNI(-1))	-0.504355	0.166701	-3.025502	0.0048
D(VNI(-2))	-0.030067	0.174573	-0.172230	0.8643

D(VNI(-3))	-0.412680	0.165520	-2.493232	0.0178
BREAK	-0.102981	0.147180	-0.699691	0.4890
CointEq(-1)*	-0.246496	0.051476	-4.788524	0.0000

R-squared	0.918577	Mean dependent var	0.077895
Adjusted R-squared	0.876765	S.D. dependent var	0.328266
S.E. of regression	0.115237	Akaike info criterion	-1.214026
Sum squared resid	0.491346	Schwarz criterion	-0.497166
Log likelihood	54.59974	Hannan-Quinn criter.	-0.935430
F-statistic	21.96923	Durbin-Watson stat	1.851797
Prob(F-statistic)	0.000000		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.090209	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-4.788524	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6

Wald tests

Delta LGDP

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	3.863377	(2, 34)	0.0308
Chi-square	7.726753	2	0.0210

Null Hypothesis: C(6)=C(7)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(6)	-2.520632	0.971849
C(7)	1.698330	0.670508

Restrictions are linear in coefficients.

Delta MON

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	4.786196	(4, 34)	0.0036
Chi-square	19.14478	4	0.0007

Null Hypothesis: C(9)=C(10)=C(11)=C(12)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.

C(9)	-3.832881	0.975497
C(10)	1.990749	0.742081
C(11)	-0.743266	0.396684
C(12)	0.665308	0.317459

Restrictions are linear in coefficients.

Delta FDI

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	3.766280	(4, 34)	0.0122
Chi-square	15.06512	4	0.0046

Null Hypothesis: C(14)=C(15)=C(16)=C(17)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(14)	0.126638	0.083055
C(15)	0.056859	0.085791
C(16)	0.297233	0.094604
C(17)	0.087858	0.064885

Restrictions are linear in coefficients.

Delta VNI

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability

F-statistic	13.53561	(4, 34)	0.0000
Chi-square	54.14243	4	0.0000

Null Hypothesis: C(19)=C(20)=C(21)=C(22)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(19)	-1.230700	0.234662
C(20)	0.417065	0.278074
C(21)	-0.334954	0.279855
C(22)	0.386228	0.183250

Restrictions are linear in coefficients.

Equation 3 (MON)

Model 3

Dependent Variable: MON

Method: ARDL

Date: 04/27/18 Time: 17:02

Sample (adjusted): 2002Q2 2015Q4

Included observations: 55 after adjustments

Maximum dependent lags: 2 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (8 lags, automatic): LGDP MCAP FDI VNI

Fixed regressors: BREAK C

Number of models evalulated: 13122

Selected Model: ARDL(1, 4, 6, 3, 4)

Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
MON(-1)	0.824590	0.069940	11.78992	0.0000
LGDP	-0.853607	0.065880	-12.95691	0.0000
LGDP(-1)	0.806383	0.073602	10.95597	0.0000

LGDP(-2)	0.112625	0.065204	1.727274	0.0941
LGDP(-3)	-0.088752	0.071367	-1.243603	0.2230
LGDP(-4)	0.140946	0.059395	2.373030	0.0240
MCAP	0.063767	0.027690	2.302888	0.0282
MCAP(-1)	-0.065763	0.040899	-1.607930	0.1180
MCAP(-2)	0.002572	0.040546	0.063422	0.9498
MCAP(-3)	-0.105610	0.039839	-2.650923	0.0125
MCAP(-4)	0.126359	0.030282	4.172785	0.0002
MCAP(-5)	-0.010866	0.015360	-0.707463	0.4846
MCAP(-6)	-0.033481	0.013160	-2.544229	0.0162
FDI	0.063304	0.014545	4.352413	0.0001
FDI(-1)	0.047538	0.016255	2.924538	0.0064
FDI(-2)	0.047466	0.016388	2.896341	0.0069
FDI(-3)	-0.048303	0.017974	-2.687302	0.0115
VNI	0.008109	0.046836	0.173129	0.8637
VNI(-1)	0.015080	0.063324	0.238145	0.8133
VNI(-2)	-0.054204	0.064347	-0.842374	0.4060
VNI(-3)	0.176320	0.058476	3.015240	0.0051
VNI(-4)	-0.151320	0.036987	-4.091193	0.0003
BREAK	0.033778	0.033078	1.021164	0.3151
C	-0.061546	0.276804	-0.222344	0.8255

R-squared	0.996500	Mean dependent var	1.267033
Adjusted R-squared	0.993904	S.D. dependent var	0.291394
S.E. of regression	0.022752	Akaike info criterion	-4.428958
Sum squared resid	0.016047	Schwarz criterion	-3.553031
Log likelihood	145.7964	Hannan-Quinn criter.	-4.090230
F-statistic	383.7709	Durbin-Watson stat	1.984138
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Long-run relationships

ARDL Long Run Form and Bounds Test

Dependent Variable: D(MON)

Selected Model: ARDL(1, 4, 6, 3, 4)

Case 3: Unrestricted Constant and No Trend

Date: 04/27/18 Time: 17:07

Sample: 2000Q4 2015Q4

Included observations: 55

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.061546	0.276804	-0.222344	0.8255
MON(-1)*	-0.175410	0.069940	-2.508004	0.0176
LGDP(-1)	0.117594	0.046690	2.518612	0.0172
MCAP(-1)	-0.023024	0.016334	-1.409607	0.1686
FDI(-1)	0.110005	0.036831	2.986742	0.0055
VNI(-1)	-0.006015	0.034901	-0.172357	0.8643
D(LGDP)	-0.853607	0.065880	-12.95691	0.0000
D(LGDP(-1))	-0.164819	0.085637	-1.924632	0.0635
D(LGDP(-2))	-0.052193	0.067506	-0.773165	0.4453
D(LGDP(-3))	-0.140946	0.059395	-2.373030	0.0240
D(MCAP)	0.063767	0.027690	2.302888	0.0282
D(MCAP(-1))	0.021027	0.030967	0.679026	0.5022
D(MCAP(-2))	0.023599	0.028570	0.826016	0.4151
D(MCAP(-3))	-0.082012	0.031045	-2.641735	0.0128
D(MCAP(-4))	0.044347	0.014494	3.059729	0.0045
D(MCAP(-5))	0.033481	0.013160	2.544229	0.0162
D(FDI)	0.063304	0.014545	4.352413	0.0001
D(FDI(-1))	0.000837	0.026344	0.031770	0.9749
D(FDI(-2))	0.048303	0.017974	2.687302	0.0115

D(VNI)	0.008109	0.046836	0.173129	0.8637
D(VNI(-1))	0.029204	0.041685	0.700606	0.4888
D(VNI(-2))	-0.025000	0.039565	-0.631859	0.5321
D(VNI(-3))	0.151320	0.036987	4.091193	0.0003
BREAK	0.033778	0.033078	1.021164	0.3151

* p-value incompatible with t-Bounds distribution.

Levels Equation

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP	0.670395	0.242186	2.768100	0.0094
MCAP	-0.131258	0.097313	-1.348827	0.1872
FDI	0.627131	0.253325	2.475602	0.0190
VNI	-0.034294	0.207372	-0.165372	0.8697

EC = MON - (0.6704*LGDP -0.1313*MCAP + 0.6271*FDI -0.0343*VNI)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.578205	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
			Finite Sample: n=55	
Actual Sample Size	55			
		10%	2.578	3.71
		5%	3.068	4.334

		1%	4.244	5.726

t-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-2.508004	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6

ECM

ARDL Error Correction Regression

Dependent Variable: D(MON)

Selected Model: ARDL(1, 4, 6, 3, 4)

Case 3: Unrestricted Constant and No Trend

Date: 04/27/18 Time: 17:10

Sample: 2000Q4 2015Q4

Included observations: 55

ECM Regression

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.061546	0.020793	-2.959908	0.0059
D(LGDP)	-0.853607	0.056272	-15.16934	0.0000
D(LGDP(-1))	-0.164819	0.066385	-2.482788	0.0187
D(LGDP(-2))	-0.052193	0.058921	-0.885822	0.3825
D(LGDP(-3))	-0.140946	0.052836	-2.667598	0.0120
D(MCAP)	0.063767	0.021848	2.918605	0.0065
D(MCAP(-1))	0.021027	0.024760	0.849267	0.4022
D(MCAP(-2))	0.023599	0.023840	0.989909	0.3299

D(MCAP(-3))	-0.082012	0.024613	-3.332022	0.0022
D(MCAP(-4))	0.044347	0.010131	4.377545	0.0001
D(MCAP(-5))	0.033481	0.010525	3.181167	0.0033
D(FDI)	0.063304	0.012316	5.140028	0.0000
D(FDI(-1))	0.000837	0.017812	0.046989	0.9628
D(FDI(-2))	0.048303	0.014380	3.358965	0.0021
D(VNI)	0.008109	0.035125	0.230852	0.8189
D(VNI(-1))	0.029204	0.037260	0.783811	0.4391
D(VNI(-2))	-0.025000	0.035211	-0.709985	0.4830
D(VNI(-3))	0.151320	0.032755	4.619821	0.0001
BREAK	0.033778	0.027473	1.229500	0.2281
CointEq(-1)*	-0.175410	0.034504	-5.083769	0.0000

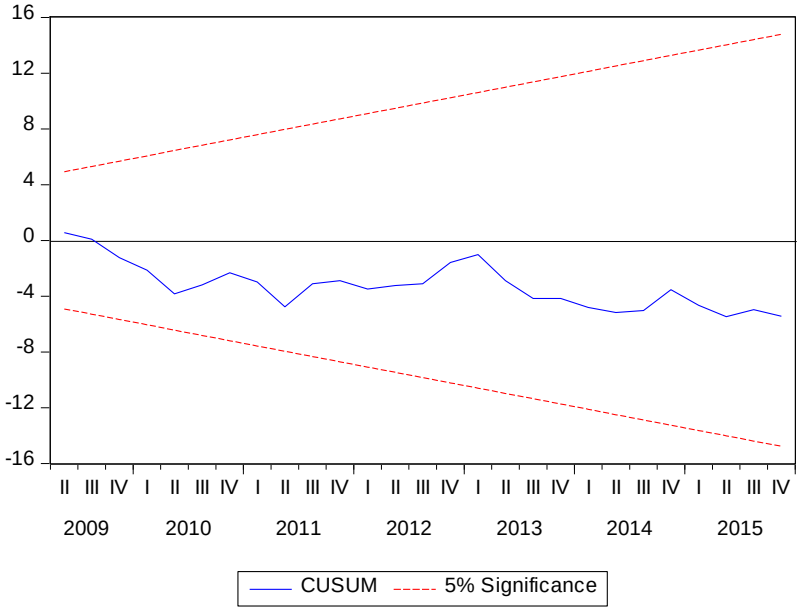
R-squared	0.979166	Mean dependent var	0.018921
Adjusted R-squared	0.967857	S.D. dependent var	0.119432
S.E. of regression	0.021412	Akaike info criterion	-4.574413
Sum squared resid	0.016047	Schwarz criterion	-3.844474
Log likelihood	145.7964	Hannan-Quinn criter.	-4.292139
F-statistic	86.57818	Durbin-Watson stat	1.984138
Prob(F-statistic)	0.000000		

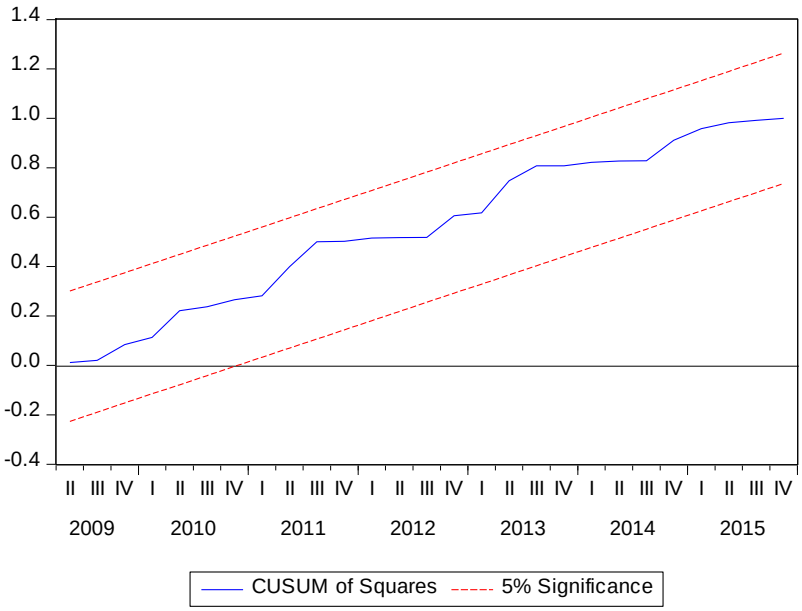
* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.578205	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

t-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-5.083769	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6





Wald tests

Delta LGDP

Wald Test:

Equation: EQ03_MON

Test Statistic	Value	df	Probability
F-statistic	64.65750	(4, 31)	0.0000
Chi-square	258.6300	4	0.0000

Null Hypothesis: C(3)=C(4)=C(5)=C(6)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(3)	0.806383	0.073602
C(4)	0.112625	0.065204
C(5)	-0.088752	0.071367
C(6)	0.140946	0.059395

Restrictions are linear in coefficients.

Delta MCAP

Wald Test:

Equation: EQ03_MON

Test Statistic	Value	df	Probability
F-statistic	5.459369	(6, 31)	0.0006
Chi-square	32.75622	6	0.0000

Null Hypothesis: C(8)=C(9)=C(10)=C(11)=C(12)=C(13)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(8)	-0.065763	0.040899
C(9)	0.002572	0.040546
C(10)	-0.105610	0.039839
C(11)	0.126359	0.030282
C(12)	-0.010866	0.015360
C(13)	-0.033481	0.013160

Restrictions are linear in coefficients.

Delta FDI

Wald Test:

Equation: EQ03_MON

Test Statistic	Value	df	Probability
F-statistic	8.583357	(3, 31)	0.0003
Chi-square	25.75007	3	0.0000

Null Hypothesis: C(15)=C(16)=C(17)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(15)	0.047538	0.016255
C(16)	0.047466	0.016388
C(17)	-0.048303	0.017974

Restrictions are linear in coefficients.

Delta VNI

Wald Test:

Equation: EQ03_MON

Test Statistic	Value	df	Probability
F-statistic	4.207341	(4, 31)	0.0078
Chi-square	16.82937	4	0.0021

Null Hypothesis: C(19)=C(20)=C(21)=C(22)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(19)	0.015080	0.063324
C(20)	-0.054204	0.064347
C(21)	0.176320	0.058476
C(22)	-0.151320	0.036987

Restrictions are linear in coefficients.

Equation 4 (FDI)

Model 4

Dependent Variable: FDI

Method: ARDL

Date: 04/27/18 Time: 17:17

Sample (adjusted): 2001Q3 2015Q4

Included observations: 58 after adjustments

Maximum dependent lags: 2 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (4 lags, automatic): LGDP MCAP MON VNI

Fixed regressors: BREAK C

Number of models evalulated: 1250

Selected Model: ARDL(1, 2, 1, 2, 3)

Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FDI(-1)	0.028436	0.124313	0.228747	0.8201
LGDP	0.687410	1.153917	0.595719	0.5545
LGDP(-1)	-3.868302	1.746053	-2.215456	0.0321
LGDP(-2)	2.191891	1.165775	1.880201	0.0669
MCAP	-0.896063	0.234790	-3.816439	0.0004
MCAP(-1)	1.172920	0.231084	5.075726	0.0000
MON	2.956269	1.070665	2.761152	0.0084
MON(-1)	-5.046615	1.728704	-2.919305	0.0056
MON(-2)	2.685359	1.223431	2.194941	0.0336
VNI	1.017074	0.383983	2.648750	0.0113
VNI(-1)	-1.136156	0.357262	-3.180178	0.0027
VNI(-2)	-0.004521	0.214135	-0.021112	0.9833
VNI(-3)	0.228414	0.161894	1.410887	0.1655
BREAK	0.266446	0.303334	0.878392	0.3846
C	1.728404	1.873289	0.922657	0.3613

R-squared	0.761053	Mean dependent var	-2.929826
Adjusted R-squared	0.683257	S.D. dependent var	0.433000
S.E. of regression	0.243692	Akaike info criterion	0.232176
Sum squared resid	2.553591	Schwarz criterion	0.765049
Log likelihood	8.266891	Hannan-Quinn criter.	0.439741
F-statistic	9.782611	Durbin-Watson stat	1.851231
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Long-run relationships

ARDL Long Run Form and Bounds Test

Dependent Variable: D(FDI)

Selected Model: ARDL(1, 2, 1, 2, 3)

Case 3: Unrestricted Constant and No Trend

Date: 04/27/18 Time: 17:20

Sample: 2000Q4 2015Q4

Included observations: 58

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.728404	1.873289	0.922657	0.3613
FDI(-1)*	-0.971564	0.124313	-7.815442	0.0000
LGDP(-1)	-0.989001	0.229056	-4.317728	0.0001
MCAP(-1)	0.276857	0.091249	3.034069	0.0041
MON(-1)	0.595013	0.496391	1.198679	0.2372
VNI(-1)	0.104811	0.203550	0.514917	0.6092
D(LGDP)	0.687410	1.153917	0.595719	0.5545
D(LGDP(-1))	-2.191891	1.165775	-1.880201	0.0669
D(MCAP)	-0.896063	0.234790	-3.816439	0.0004
D(MON)	2.956269	1.070665	2.761152	0.0084
D(MON(-1))	-2.685359	1.223431	-2.194941	0.0336
D(VNI)	1.017074	0.383983	2.648750	0.0113
D(VNI(-1))	-0.223893	0.170549	-1.312779	0.1962
D(VNI(-2))	-0.228414	0.161894	-1.410887	0.1655
BREAK	0.266446	0.303334	0.878392	0.3846

* p-value incompatible with t-Bounds distribution.

Levels Equation

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP	-1.017948	0.228531	-4.454319	0.0001

MCAP	0.284960	0.083731	3.403262	0.0015
MON	0.612428	0.511171	1.198088	0.2374
VNI	0.107879	0.212795	0.506962	0.6148

EC = FDI - (-1.0179*LGDP + 0.2850*MCAP + 0.6124*MON + 0.1079*VNI)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	15.29277	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
			Finite Sample: n=60	
Actual Sample Size	58			
		10%	2.568	3.712
		5%	3.062	4.314
		1%	4.176	5.676
			Finite Sample: n=55	
		10%	2.578	3.71
		5%	3.068	4.334
		1%	4.244	5.726

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-7.815442	10%	-2.57	-3.66
		5%	-2.86	-3.99

	2.5%	-3.13	-4.26
	1%	-3.43	-4.6

ECM

ARDL Error Correction Regression

Dependent Variable: D(FDI)

Selected Model: ARDL(1, 2, 1, 2, 3)

Case 3: Unrestricted Constant and No Trend

Date: 04/27/18 Time: 17:21

Sample: 2000Q4 2015Q4

Included observations: 58

ECM Regression

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.728404	0.187759	9.205456	0.0000
D(LGDP)	0.687410	1.043302	0.658879	0.5135
D(LGDP(-1))	-2.191891	1.039670	-2.108257	0.0409
D(MCAP)	-0.896063	0.197134	-4.545464	0.0000
D(MON)	2.956269	0.993989	2.974145	0.0048
D(MON(-1))	-2.685359	1.069581	-2.510664	0.0159
D(VNI)	1.017074	0.285109	3.567318	0.0009
D(VNI(-1))	-0.223893	0.156286	-1.432587	0.1592
D(VNI(-2))	-0.228414	0.144278	-1.583152	0.1207
BREAK	0.266446	0.271428	0.981643	0.3318
CointEq(-1)*	-0.971564	0.106274	-9.142033	0.0000

R-squared	0.748030	Mean dependent var	0.016944
Adjusted R-squared	0.694419	S.D. dependent var	0.421661
S.E. of regression	0.233092	Akaike info criterion	0.094245
Sum squared resid	2.553591	Schwarz criterion	0.485019

Log likelihood	8.266891	Hannan-Quinn criter.	0.246459
F-statistic	13.95300	Durbin-Watson stat	1.851231
Prob(F-statistic)	0.000000		

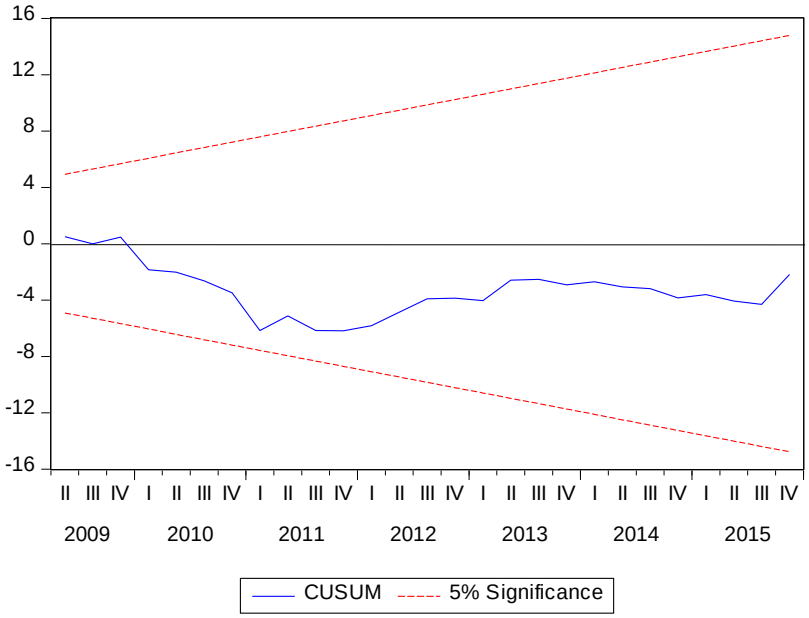
* p-value incompatible with t-Bounds distribution.

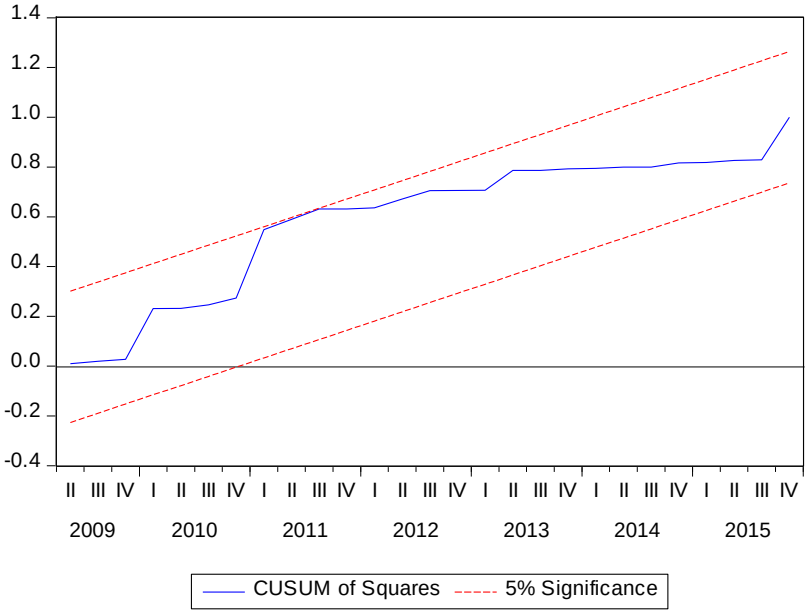
F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	15.29277	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-9.142033	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6





Wald tests

Delta LGDP

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	2.189745	(2, 44)	0.1240
Chi-square	4.379490	2	0.1119

Null Hypothesis: C(3)=C(4)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(3)	-3.547458	1.702982
C(4)	1.879912	1.107468

Restrictions are linear in coefficients.

Delta MCAP

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	5.095044	44	0.0000
F-statistic	25.95947	(1, 44)	0.0000
Chi-square	25.95947	1	0.0000

Null Hypothesis: C(6)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(6)	1.174297	0.230478

Restrictions are linear in coefficients.

Delta MON

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability

F-statistic	3.907931	(2, 44)	0.0274
Chi-square	7.815861	2	0.0201

Null Hypothesis: C(8)=C(9)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(8)	-4.652474	1.665116
C(9)	2.324821	1.149529

Restrictions are linear in coefficients.

Delta VNI

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	4.325778	(3, 44)	0.0093
Chi-square	12.97733	3	0.0047

Null Hypothesis: C(11)=C(12)=C(13)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(11)	-1.162903	0.355036
C(12)	0.041479	0.207093
C(13)	0.205354	0.159336

Restrictions are linear in coefficients.

Equation 5 (VNI)
Model 5

Dependent Variable: VNI

Method: ARDL

Date: 04/27/18 Time: 17:30

Sample (adjusted): 2002Q2 2015Q4

Included observations: 55 after adjustments

Maximum dependent lags: 4 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (6 lags, automatic): LGDP MCAP MON FDI

Fixed regressors: BREAK C

Number of models evalulated: 9604

Selected Model: ARDL(2, 6, 3, 6, 5)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
VNI(-1)	0.916686	0.149111	6.147661	0.0000
VNI(-2)	-0.371283	0.117386	-3.162928	0.0038
LGDP	0.957467	0.475292	2.014482	0.0540
LGDP(-1)	-0.723285	0.670098	-1.079371	0.2900
LGDP(-2)	0.059911	0.619425	0.096720	0.9237
LGDP(-3)	0.048543	0.616178	0.078780	0.9378
LGDP(-4)	-1.710557	0.699203	-2.446439	0.0212
LGDP(-5)	2.220002	0.720314	3.081992	0.0047
LGDP(-6)	-1.102314	0.411814	-2.676732	0.0125
MCAP	0.498509	0.043321	11.50743	0.0000
MCAP(-1)	-0.567855	0.105087	-5.403655	0.0000
MCAP(-2)	0.158527	0.096498	1.642803	0.1120
MCAP(-3)	0.106142	0.057045	1.860658	0.0737
MON	0.626689	0.442025	1.417767	0.1677
MON(-1)	0.313215	0.656161	0.477344	0.6370
MON(-2)	0.182186	0.670175	0.271848	0.7878

MON(-3)	0.172564	0.655178	0.263385	0.7943
MON(-4)	-1.734822	0.656786	-2.641380	0.0136
MON(-5)	1.826517	0.687231	2.657791	0.0131
MON(-6)	-1.194954	0.413420	-2.890414	0.0075
FDI	0.113308	0.045969	2.464858	0.0204
FDI(-1)	-0.188066	0.052644	-3.572421	0.0014
FDI(-2)	-0.149696	0.052962	-2.826500	0.0088
FDI(-3)	-0.104718	0.041995	-2.493583	0.0191
FDI(-4)	-0.077525	0.047712	-1.624864	0.1158
FDI(-5)	0.097535	0.046415	2.101340	0.0451
BREAK	0.064034	0.096072	0.666519	0.5107
C	3.073635	0.905274	3.395252	0.0021

R-squared	0.992067	Mean dependent var	6.007429
Adjusted R-squared	0.984133	S.D. dependent var	0.492210
S.E. of regression	0.062000	Akaike info criterion	-2.416664
Sum squared resid	0.103790	Schwarz criterion	-1.394749
Log likelihood	94.45827	Hannan-Quinn criter.	-2.021482
F-statistic	125.0495	Durbin-Watson stat	2.189779
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Long-run relationships

ARDL Long Run Form and Bounds Test

Dependent Variable: D(VNI)

Selected Model: ARDL(2, 6, 3, 6, 5)

Case 3: Unrestricted Constant and No Trend

Date: 04/27/18 Time: 17:31

Sample: 2000Q4 2015Q4

Included observations: 55

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.073635	0.905274	3.395252	0.0021
VNI(-1)*	-0.454597	0.121774	-3.733135	0.0009
LGDP(-1)	-0.250235	0.120726	-2.072743	0.0479
MCAP(-1)	0.195324	0.051949	3.759905	0.0008
MON(-1)	0.191395	0.217395	0.880399	0.3864
FDI(-1)	-0.309164	0.103200	-2.995775	0.0058
D(VNI(-1))	0.371283	0.117386	3.162928	0.0038
D(LGDP)	0.957467	0.475292	2.014482	0.0540
D(LGDP(-1))	0.484416	0.423851	1.142894	0.2631
D(LGDP(-2))	0.544327	0.405719	1.341636	0.1909
D(LGDP(-3))	0.592870	0.410180	1.445389	0.1599
D(LGDP(-4))	-1.117687	0.465452	-2.401294	0.0235
D(LGDP(-5))	1.102314	0.411814	2.676732	0.0125
D(MCAP)	0.498509	0.043321	11.50743	0.0000
D(MCAP(-1))	-0.264669	0.084601	-3.128429	0.0042
D(MCAP(-2))	-0.106142	0.057045	-1.860658	0.0737
D(MON)	0.626689	0.442025	1.417767	0.1677
D(MON(-1))	0.748509	0.424630	1.762732	0.0893
D(MON(-2))	0.930695	0.452796	2.055438	0.0496
D(MON(-3))	1.103259	0.398574	2.768013	0.0101
D(MON(-4))	-0.631563	0.457342	-1.380942	0.1786
D(MON(-5))	1.194954	0.413420	2.890414	0.0075
D(FDI)	0.113308	0.045969	2.464858	0.0204
D(FDI(-1))	0.234405	0.093566	2.505253	0.0186
D(FDI(-2))	0.084709	0.089160	0.950082	0.3505
D(FDI(-3))	-0.020009	0.073263	-0.273114	0.7868
D(FDI(-4))	-0.097535	0.046415	-2.101340	0.0451
BREAK	0.064034	0.096072	0.666519	0.5107

* p-value incompatible with t-Bounds distribution.

Levels Equation

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP	-0.550453	0.219828	-2.504017	0.0186
MCAP	0.429663	0.079160	5.427775	0.0000
MON	0.421020	0.440174	0.956485	0.3473
FDI	-0.680083	0.194569	-3.495332	0.0017

EC = VNI - (-0.5505*LGDP + 0.4297*MCAP + 0.4210*MON -0.6801*FDI)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	3.905147	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
			Finite Sample: n=55	
Actual Sample Size	55			
		10%	2.578	3.71
		5%	3.068	4.334
		1%	4.244	5.726

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)

t-statistic	-3.733135	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6

ECM

ARDL Error Correction Regression

Dependent Variable: D(VNI)

Selected Model: ARDL(2, 6, 3, 6, 5)

Case 3: Unrestricted Constant and No Trend

Date: 04/27/18 Time: 17:31

Sample: 2000Q4 2015Q4

Included observations: 55

ECM Regression

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.073635	0.659204	4.662642	0.0001
D(VNI(-1))	0.371283	0.103787	3.577371	0.0013
D(LGDP)	0.957467	0.403296	2.374106	0.0250
D(LGDP(-1))	0.484416	0.385401	1.256916	0.2195
D(LGDP(-2))	0.544327	0.362289	1.502467	0.1446
D(LGDP(-3))	0.592870	0.360093	1.646434	0.1113
D(LGDP(-4))	-1.117687	0.416474	-2.683690	0.0123
D(LGDP(-5))	1.102314	0.377345	2.921236	0.0070
D(MCAP)	0.498509	0.037052	13.45443	0.0000
D(MCAP(-1))	-0.264669	0.067568	-3.917052	0.0006
D(MCAP(-2))	-0.106142	0.040075	-2.648600	0.0133
D(MON)	0.626689	0.373554	1.677641	0.1050
D(MON(-1))	0.748509	0.367701	2.035644	0.0517
D(MON(-2))	0.930695	0.394857	2.357045	0.0259

D(MON(-3))	1.103259	0.355824	3.100571	0.0045
D(MON(-4))	-0.631563	0.402918	-1.567474	0.1287
D(MON(-5))	1.194954	0.372107	3.211317	0.0034
D(FDI)	0.113308	0.032683	3.466826	0.0018
D(FDI(-1))	0.234405	0.076136	3.078752	0.0047
D(FDI(-2))	0.084709	0.068569	1.235381	0.2273
D(FDI(-3))	-0.020009	0.054963	-0.364043	0.7187
D(FDI(-4))	-0.097535	0.035792	-2.725071	0.0111
BREAK	0.064034	0.076470	0.837371	0.4097
CointEq(-1)*	-0.454597	0.096012	-4.734811	0.0001

R-squared	0.947922	Mean dependent var	0.019871
Adjusted R-squared	0.909284	S.D. dependent var	0.192112
S.E. of regression	0.057862	Akaike info criterion	-2.562119
Sum squared resid	0.103790	Schwarz criterion	-1.686192
Log likelihood	94.45827	Hannan-Quinn criter.	-2.223391
F-statistic	24.53319	Durbin-Watson stat	2.189779
Prob(F-statistic)	0.000000		

* p-value incompatible with t-Bounds distribution.

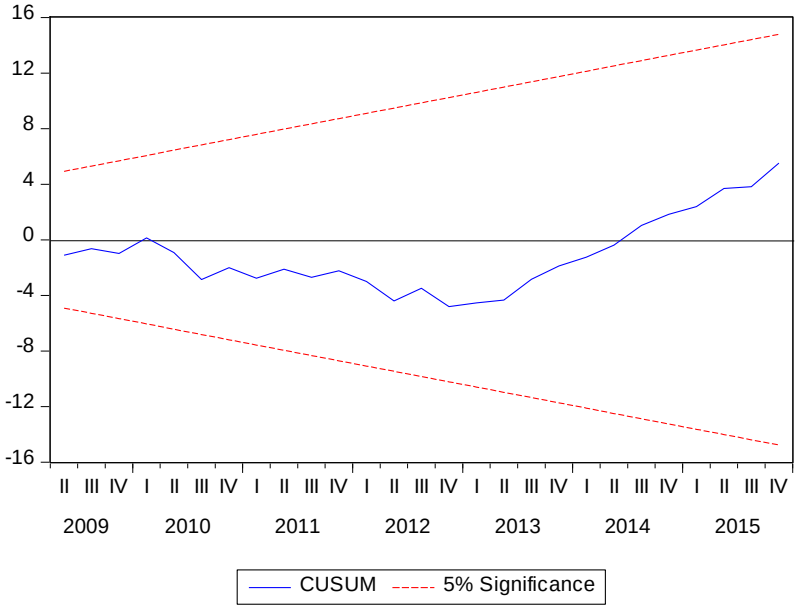
F-Bounds Test — Null Hypothesis: No levels relationship

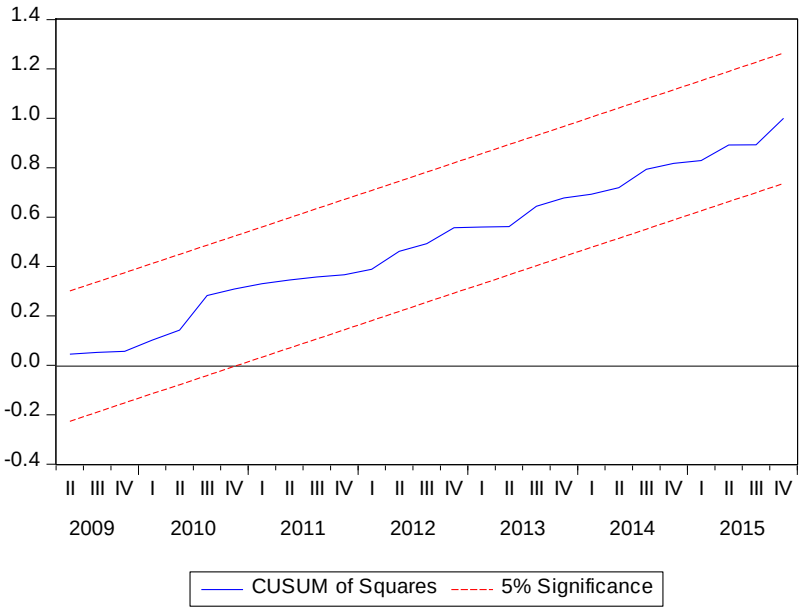
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	3.905147	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)

t-statistic	-4.734811	10%	-2.57	-3.66
		5%	-2.86	-3.99
		2.5%	-3.13	-4.26
		1%	-3.43	-4.6





Wald test

Delta LGDP

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	3.764580	(6, 27)	0.0075
Chi-square	22.58748	6	0.0009

Null Hypothesis: C(4)=C(5)=C(6)=C(7)=C(8)=C(9)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(4)	-0.723285	0.670098
C(5)	0.059911	0.619425
C(6)	0.048543	0.616178
C(7)	-1.710557	0.699203
C(8)	2.220002	0.720314
C(9)	-1.102314	0.411814

Restrictions are linear in coefficients.

Delta MCAP

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	12.27105	(3, 27)	0.0000
Chi-square	36.81316	3	0.0000

Null Hypothesis: C(11)=C(12)=C(13)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(11)	-0.567855	0.105087
C(12)	0.158527	0.096498
C(13)	0.106142	0.057045

Restrictions are linear in coefficients.

Delta MON

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	5.075383	(6, 27)	0.0013
Chi-square	30.45230	6	0.0000

Null Hypothesis: C(15)=C(16)=C(17)=C(18)=C(19)=C(20)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(15)	0.313215	0.656161
C(16)	0.182186	0.670175
C(17)	0.172564	0.655178
C(18)	-1.734822	0.656786
C(19)	1.826517	0.687231
C(20)	-1.194954	0.413420

Restrictions are linear in coefficients.

Delta FDI

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability

F-statistic	11.17150	(5, 27)	0.0000
Chi-square	55.85750	5	0.0000

Null Hypothesis: C(21)=C(22)=C(23)=C(24)=C(25)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(21)	0.113308	0.045969
C(22)	-0.188066	0.052644
C(23)	-0.149696	0.052962
C(24)	-0.104718	0.041995
C(25)	-0.077525	0.047712

Restrictions are linear in coefficients.

Test results

At level	Test critical values:	t-Statistic	Prob.*	Test critical values:	t-Statistic	Prob.*
LGDP	-2.913549	-0.83171	0.8022	-2.91086	-0.94416	0.7673
MCAP	-2.91086	-1.32353	0.6132	-2.91086	-1.33239	0.6090
MON	-2.913549	-1.42479	0.5639	-2.91086	-1.16861	0.6825
FDI	-2.911730	-2.680537	0.0834	-2.910860	-4.549967	0.0005
VNI	-2.910860	-1.913552	0.3241	-2.910860	-2.015954	0.2794

At 1st difference	Test critical values:	t-Statistic	Prob.*	Test critical values:	t-Statistic	Prob.*
LGDP	-2.913549	-14.5308	0.0000	-2.91173	-17.7571	0.0000
MCAP	-2.91173	-7.3879	0.0000	-2.91173	-7.41781	0.0000

MON	-2.913549	-11.7245	0.0000	-2.91173	-15.4649	0.0000
FDI	-2.911730	-13.13739	0.0000			
VNI	-2.911730	-7.492044	0.0000	-2.911730	-7.495272	0.0000

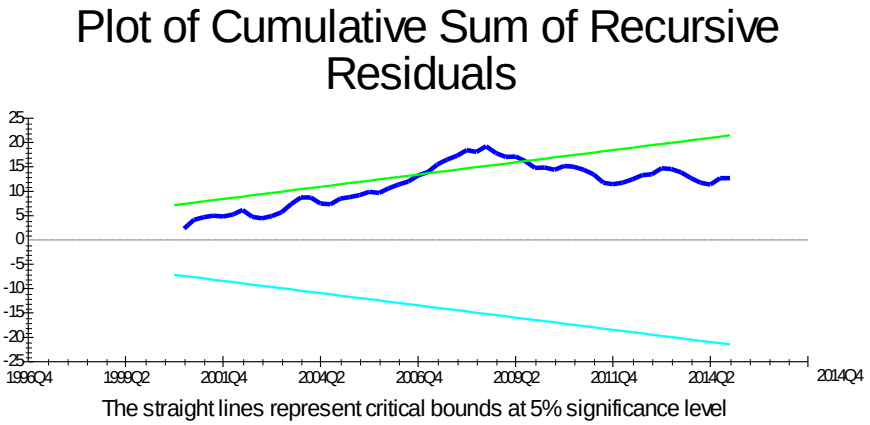
APPENDIX B: TEST RESULTS IN CHAPTER 7

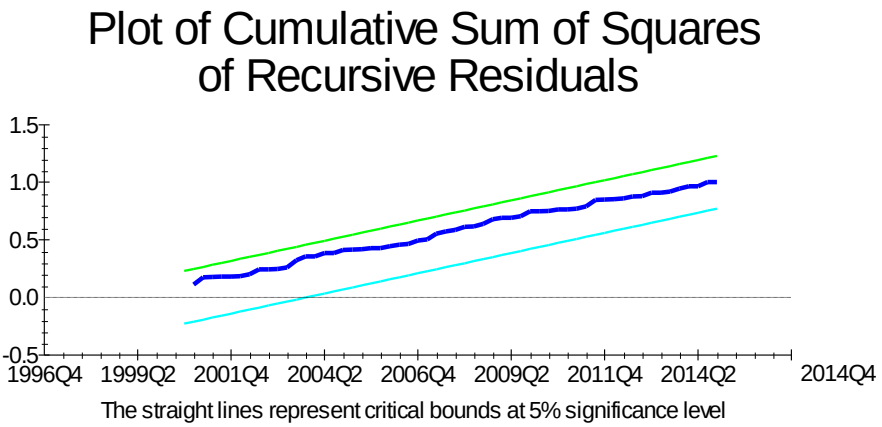
Breaks in the crises of 1997 and 2008

GDP

ARDL

```
                Autoregressive Distributed Lag Estimates
        ARDL(3,1,0,2,2) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LNGDP
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LNGDP(-1)                  .76786            .10789             7.1174[.000]
 LNGDP(-2)                 -.27093            .12990            -2.0856[.041]
 LNGDP(-3)                  .20048            .11389             1.7603[.084]
 MON                       -.047302           .021078           -2.2442[.029]
 MON(-1)                    .057547           .021249            2.7083[.009]
 MC                        -.059451           .020376           -2.9177[.005]
 FDI                        .13148            .15814             .83141[.409]
 FDI(-1)                   -.11816            .15574            -.75868[.451]
 FDI(-2)                    .29720            .14884             1.9967[.051]
 LNSETI                     .31157            .084118            3.7039[.000]
 LNSETI(-1)                -.12252            .063226           -1.9378[.058]
 LNSETI(-2)                 .11467            .052131            2.1997[.032]
 C                          1.1083             .64986            1.7054[.093]
 T                         .0045622          .0011161            4.0877[.000]
 BREAK                     -.067060           .036121           -1.8565[.068]
*******************************************************************************
 R-Squared                      .97286   R-Bar-Squared                  .96631
 S.E. of Regression            .057071   F-stat.    F( 14,  58)  148.5050[.000]
 Mean of Dependent Variable    10.1827   S.D. of Dependent Variable      .31093
 Residual Sum of Squares        .18891   Equation Log-likelihood       113.8452
 Akaike Info. Criterion        98.8452   Schwarz Bayesian Criterion     81.6668
 DW-statistic                   2.0719
*******************************************************************************


                             Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   4)=   6.2940[.178]*F(   4,  54)=   1.2738[.292]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)=   .21265[.645]*F(   1,  57)=   .16652[.685]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)= 147.9779[.000]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=  .026864[.870]*F(   1,  71)=  .026138[.872]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values

Stability tests
```





Estimated Long Run Coefficients using the ARDL Approach
ARDL(3,1,0,2,2) selected based on Akaike Information Criterion

Dependent variable is LNGDP
73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
MON	.033858	.036845	.91893[.362]
MC	-.19648	.065207	-3.0131[.004]
FDI	1.0262	.95903	1.0701[.289]
LNSETI	1.0038	.22193	4.5228[.000]
C	3.6627	1.4025	2.6116[.011]
T	.015077	.0039943	3.7748[.000]
BREAK	-.22162	.16875	-1.3133[.194]

ECM

Error Correction Representation for the Selected ARDL Model
ARDL(3,1,0,2,2) selected based on Akaike Information Criterion

Dependent variable is dLNGDP
73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dLNGDP1	.070441	.11282	.62439[.535]
dLNGDP2	-.20048	.11389	-1.7603[.083]
dMON	-.047302	.021078	-2.2442[.028]
dMC	-.059451	.020376	-2.9177[.005]
dFDI	.13148	.15814	.83141[.409]
dFDI1	-.29720	.14884	-1.9967[.050]
dLNSETI	.31157	.084118	3.7039[.000]

```
 dLNSETI1                  -.11467            .052131            -2.1997[.032]
 dC                         1.1083             .64986             1.7054[.093]
 dT                        .0045622           .0011161            4.0877[.000]
 dBREAK                   -.067060            .036121            -1.8565[.068]
 ecm(-1)                   -.30258             .10057            -3.0086[.004]
*******************************************************************************
 List of additional temporary variables created:
 dLNGDP = LNGDP-LNGDP(-1)
 dLNGDP1 = LNGDP(-1)-LNGDP(-2)
 dLNGDP2 = LNGDP(-2)-LNGDP(-3)
 dMON = MON-MON(-1)
 dMC = MC-MC(-1)
 dFDI = FDI-FDI(-1)
 dFDI1 = FDI(-1)-FDI(-2)
 dLNSETI = LNSETI-LNSETI(-1)
 dLNSETI1 = LNSETI(-1)-LNSETI(-2)
 dC = C-C(-1)
 dT = T-T(-1)
 dBREAK = BREAK-BREAK(-1)
 ecm = LNGDP  -.033858*MON +   .19648*MC   -1.0262*FDI   -1.0038*LNSETI   -3.6
627*C  -.015077*T +   .22162*BREAK
*******************************************************************************
 R-Squared                        .64259   R-Bar-Squared                  .55631
 S.E. of Regression              .057071   F-stat.    F( 11,  61)    9.4797[.000]
 Mean of Dependent Variable     .0037710   S.D. of Dependent Variable     .085680
 Residual Sum of Squares         .18891   Equation Log-likelihood       113.8452
 Akaike Info. Criterion         98.8452   Schwarz Bayesian Criterion     81.6668
 DW-statistic                    2.0719
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLNGDP and in cases where the error correction model is highly
 restricted, these measures could become negative.

F-test statistics

ARDL regression of dLNGDP on:
 dLNGDP1          dLNGDP2          dMON             dMC              dFDI
 dFDI1            dLNSETI          dLNSETI1         dC               dT
 dBREAK           ecm(-1)

Mon


               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNGDP on:
 dLNGDP1          dLNGDP2          dMON             dMC              dFDI
 dFDI1            dLNSETI          dLNSETI1         dC               dT
 dBREAK           ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Coefficients A1 to A12 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A3=0.
*******************************************************************************
 Wald Statistic                 CHSQ( 1)=   5.0365[.025]
*******************************************************************************


MC



               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNGDP on:
 dLNGDP1          dLNGDP2          dMON             dMC              dFDI
 dFDI1            dLNSETI          dLNSETI1         dC               dT
 dBREAK           ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Coefficients A1 to A12 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A4=0.
*******************************************************************************
 Wald Statistic                 CHSQ( 1)=   8.5131[.004]
*******************************************************************************
```

FDI

```
               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNGDP on:
 dLNGDP1          dLNGDP2          dMON             dMC              dFDI
 dFDI1            dLNSETI          dLNSETI1         dC               dT
 dBREAK           ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Coefficients A1 to A12 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A5=0; A6=0.
*******************************************************************************
 Wald Statistic                 CHSQ( 2)=   4.4091[.110]
*******************************************************************************
```

SETI

```
               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNGDP on:
 dLNGDP1          dLNGDP2          dMON             dMC              dFDI
 dFDI1            dLNSETI          dLNSETI1         dC               dT
 dBREAK           ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Coefficients A1 to A12 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A7=0; A8=0.
*******************************************************************************
 Wald Statistic                 CHSQ( 2)=  17.7539[.000]
*******************************************************************************
```

Break

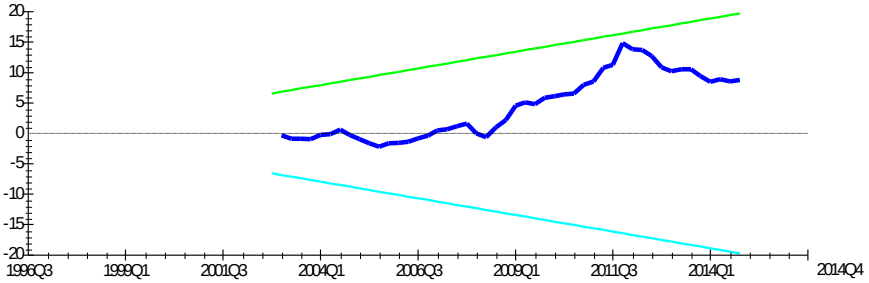
```
               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNGDP on:
 dLNGDP1          dLNGDP2          dMON             dMC              dFDI
 dFDI1            dLNSETI          dLNSETI1         dC               dT
 dBREAK           ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Coefficients A1 to A12 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A11=0.
*******************************************************************************
 Wald Statistic                 CHSQ( 1)=   3.4468[.063]
*******************************************************************************
```

2) MON

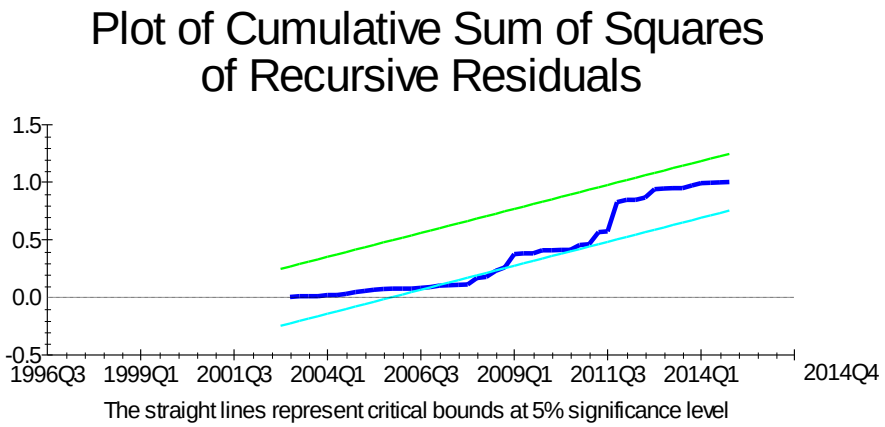
```
                  Autoregressive Distributed Lag Estimates
        ARDL(5,0,6,6,1) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is MON
 74 observations used for estimation from 1996Q3 to 2014Q4
*******************************************************************************
 Regressor             Coefficient       Standard Error         T-Ratio[Prob]
 MON(-1)                    1.0250             .10944            9.3661[.000]
 MON(-2)                   -.24067             .16815           -1.4312[.159]
 MON(-3)                    .16395             .17331            .94600[.349]
 MON(-4)                    .37368             .16427            2.2748[.027]
 MON(-5)                   -.35459             .12638           -2.8057[.007]
```

```
LNGDP                      -.13003            .44826           -.29007[.773]
MC                          .36195            .14336            2.5247[.015]
MC(-1)                     -.56808            .13869           -4.0960[.000]
MC(-2)                      .28621           .089551            3.1960[.002]
MC(-3)                     -.10440           .091417           -1.1420[.259]
MC(-4)                    .037499           .089008            .42130[.675]
MC(-5)                      .20333           .091590            2.2200[.031]
MC(-6)                     -.23446           .070830           -3.3102[.002]
FDI                        -.92757            .82319           -1.1268[.265]
FDI(-1)                     2.0957            .79823            2.6254[.012]
FDI(-2)                    -.57550            .86224           -.66745[.508]
FDI(-3)                    -.30077            .86007           -.34970[.728]
FDI(-4)                     1.8885            .83672            2.2570[.029]
FDI(-5)                    -.76405            .91543           -.83464[.408]
FDI(-6)                    -1.8911            .90834           -2.0819[.043]
LNSETI                     -1.5028            .55432           -2.7112[.009]
LNSETI(-1)                  1.4478            .48133            3.0078[.004]
C                           1.6870            3.3236            .50760[.614]
T                          .0085227          .0068940            1.2362[.222]
BREAK                       .39742            .16941            2.3459[.023]
*******************************************************************************
R-Squared                      .98429   R-Bar-Squared                   .97659
S.E. of Regression             .27288   F-stat.    F( 24,  49)  127.8869[.000]
Mean of Dependent Variable    9.0463   S.D. of Dependent Variable      1.7835
Residual Sum of Squares       3.6487   Equation Log-likelihood         6.3569
Akaike Info. Criterion      -18.6431   Schwarz Bayesian Criterion    -47.4439
DW-statistic                   1.8807
*******************************************************************************

                            Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   4)=   5.0108[.286]*F(   4,  45)=   .81710[.521]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)=   4.9224[.027]*F(   1,  48)=   3.4204[.071]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)=   .50149[.778]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=   .76250[.383]*F(   1,  72)=   .74962[.389]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level



Estimated Long Run Coefficients using the ARDL Approach
ARDL(5,0,6,6,1) selected based on Akaike Information Criterion

Dependent variable is MON
74 observations used for estimation from 1996Q3 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LNGDP	-3.9850	19.1196	-.20843[.836]
MC	-.55050	5.5754	-.098737[.922]
FDI	-14.5516	69.2788	-.21004[.835]
LNSETI	-1.6884	15.0237	-.11238[.911]
C	51.7041	113.8282	.45423[.652]
T	.26120	.73943	.35325[.725]
BREAK	12.1801	29.9921	.40611[.686]

ECM

Error Correction Representation for the Selected ARDL Model
ARDL(5,0,6,6,1) selected based on Akaike Information Criterion

Dependent variable is dMON
74 observations used for estimation from 1996Q3 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dMON1	.057625	.12781	.45087[.654]
dMON2	-.18304	.13389	-1.3671[.177]
dMON3	-.019092	.12948	-.14745[.883]
dMON4	.35459	.12638	2.8057[.007]
dLNGDP	-.13003	.44826	-.29007[.773]
dMC	.36195	.14336	2.5247[.015]
dMC1	-.18817	.068161	-2.7607[.008]
dMC2	.098033	.075578	1.2971[.200]
dMC3	-.0063689	.075586	-.084260[.933]
dMC4	.031130	.070523	.44142[.661]
dMC5	.23446	.070830	3.3102[.002]
dFDI	-.92757	.82319	-1.1268[.265]
dFDI1	1.6429	1.7566	.93527[.354]
dFDI2	1.0674	1.5799	.67562[.502]
dFDI3	.76662	1.3150	.58298[.562]
dFDI4	2.6551	1.2105	2.1934[.033]
dFDI5	1.8911	.90834	2.0819[.042]
dLNSETI	-1.5028	.55432	-2.7112[.009]
dC	1.6870	3.3236	.50760[.614]
dT	.0085227	.0068940	1.2362[.222]
dBREAK	.39742	.16941	2.3459[.023]
ecm(-1)	-.032629	.082032	-.39776[.692]

List of additional temporary variables created:
dMON = MON-MON(-1)
dMON1 = MON(-1)-MON(-2)
dMON2 = MON(-2)-MON(-3)
dMON3 = MON(-3)-MON(-4)
dMON4 = MON(-4)-MON(-5)

```
 dLNGDP = LNGDP-LNGDP(-1)
 dMC = MC-MC(-1)
 dMC1 = MC(-1)-MC(-2)
 dMC2 = MC(-2)-MC(-3)
 dMC3 = MC(-3)-MC(-4)
 dMC4 = MC(-4)-MC(-5)
 dMC5 = MC(-5)-MC(-6)
 dFDI = FDI-FDI(-1)
 dFDI1 = FDI(-1)-FDI(-2)
 dFDI2 = FDI(-2)-FDI(-3)
 dFDI3 = FDI(-3)-FDI(-4)
 dFDI4 = FDI(-4)-FDI(-5)
 dFDI5 = FDI(-5)-FDI(-6)
 dLNSETI = LNSETI-LNSETI(-1)
 dC = C-C(-1)
 dT = T-T(-1)
 dBREAK = BREAK-BREAK(-1)
 ecm = MON +   3.9850*LNGDP +   .55050*MC +  14.5516*FDI +   1.6884*LNSETI  -5
1.7041*C   -.26120*T  -12.1801*BREAK
*******************************************************************************
 R-Squared                        .72651   R-Bar-Squared                  .59255
 S.E. of Regression               .27288   F-stat.    F( 21,  52)    6.1982[.000]
 Mean of Dependent Variable       .086730  S.D. of Dependent Variable     .42750
 Residual Sum of Squares         3.6487    Equation Log-likelihood        6.3569
 Akaike Info. Criterion        -18.6431    Schwarz Bayesian Criterion   -47.4439
 DW-statistic                     1.8807
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dMON and in cases where the error correction model is highly
 restricted, these measures could become negative.

F tests
ARDL regression of dMON on:
 dMON1           dMON2           dMON3           dMON4           dLNGDP
 dMC             dMC1            dMC2            dMC3            dMC4
 dMC5            dFDI            dFDI1           dFDI2           dFDI3
 dFDI4           dFDI5           dLNSETI         dC              dT

LnGDP


               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dMON on:
 dMON1           dMON2           dMON3           dMON4           dLNGDP
 dMC             dMC1            dMC2            dMC3            dMC4
 dMC5            dFDI            dFDI1           dFDI2           dFDI3
 dFDI4           dFDI5           dLNSETI         dC              dT
 dBREAK          ecm(-1)
 74 observations used for estimation from 1996Q3 to 2014Q4
*******************************************************************************
 Coefficients A1 to A22 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A5=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=  .084139[.772]
*******************************************************************************

MC


               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dMON on:
 dMON1           dMON2           dMON3           dMON4           dLNGDP
 dMC             dMC1            dMC2            dMC3            dMC4
 dMC5            dFDI            dFDI1           dFDI2           dFDI3
 dFDI4           dFDI5           dLNSETI         dC              dT
 dBREAK          ecm(-1)
 74 observations used for estimation from 1996Q3 to 2014Q4
*******************************************************************************
 Coefficients A1 to A22 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A6=0; A7=0; A8=0; A9=0; A10=0; A11=0.
*******************************************************************************
 Wald Statistic                CHSQ( 6)=  35.9121[.000]
```

```
********************************************************************************

FDI


             Wald test of restriction(s) imposed on parameters
********************************************************************************
 Based on ARDL regression of dMON on:
 dMON1           dMON2           dMON3           dMON4           dLNGDP
 dMC             dMC1            dMC2            dMC3            dMC4
 dMC5            dFDI            dFDI1           dFDI2           dFDI3
 dFDI4           dFDI5           dLNSETI         dC              dT
 dBREAK          ecm(-1)
 74 observations used for estimation from 1996Q3 to 2014Q4
********************************************************************************
 Coefficients A1 to A22 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A12=0; A13=0; A14=0; A15=0; A16=0; A17=0.
********************************************************************************
 Wald Statistic                CHSQ( 6)=  12.4478[.053]
********************************************************************************

SET


             Wald test of restriction(s) imposed on parameters
********************************************************************************
 Based on ARDL regression of dMON on:
 dMON1           dMON2           dMON3           dMON4           dLNGDP
 dMC             dMC1            dMC2            dMC3            dMC4
 dMC5            dFDI            dFDI1           dFDI2           dFDI3
 dFDI4           dFDI5           dLNSETI         dC              dT
 dBREAK          ecm(-1)
 74 observations used for estimation from 1996Q3 to 2014Q4
********************************************************************************
 Coefficients A1 to A22 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A18=0.
********************************************************************************
 Wald Statistic                CHSQ( 1)=   7.3505[.007]
********************************************************************************
```

3) MC

Autoregressive Distributed Lag Estimates
ARDL(8,0,0,8,1) selected based on Akaike Information Criterion

Dependent variable is MC
73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
MC(-1)	.38575	.089711	4.2999[.000]
MC(-2)	-.028974	.073613	-.39360[.696]
MC(-3)	.031422	.070923	.44304[.660]
MC(-4)	.067633	.069766	.96944[.337]
MC(-5)	.098770	.072942	1.3541[.182]
MC(-6)	-.18196	.068774	-2.6457[.011]
MC(-7)	.055768	.070699	.78881[.434]
MC(-8)	.083243	.055442	1.5014[.140]
LNGDP	-1.8167	.31199	-5.8229[.000]
MON	.22716	.037674	6.0296[.000]
FDI	.38971	.67561	.57683[.567]
FDI(-1)	-.031002	.63732	-.048645[.961]
FDI(-2)	.070445	.60919	.11564[.908]
FDI(-3)	.74054	.61057	1.2129[.231]
FDI(-4)	-.22874	.63737	-.35887[.721]
FDI(-5)	-1.9595	.64283	-3.0482[.004]
FDI(-6)	-.19165	.67962	-.28199[.779]
FDI(-7)	.83659	.68818	1.2157[.230]
FDI(-8)	2.9372	.68473	4.2896[.000]
LNSETI	3.3569	.21973	15.2775[.000]
LNSETI(-1)	-.86369	.32725	-2.6392[.011]
C	1.8803	2.4625	.76359[.449]
T	.018244	.0050713	3.5974[.001]
BREAK	-.35278	.13749	-2.5658[.013]

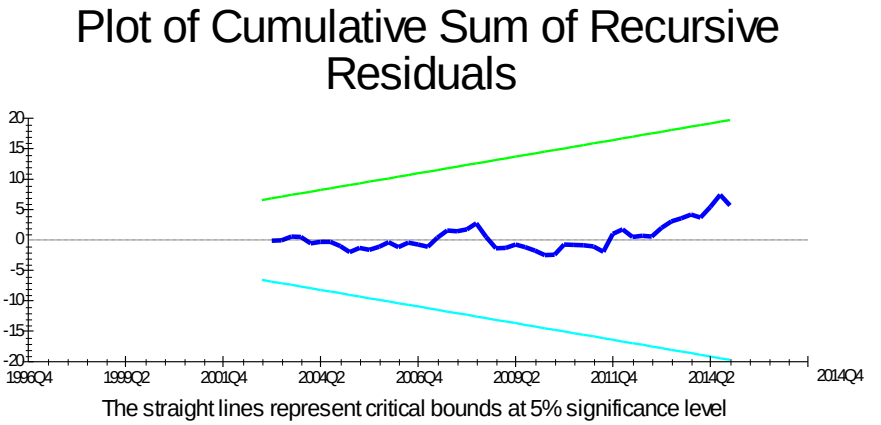
R-Squared	.99540	R-Bar-Squared	.99324
S.E. of Regression	.22445	F-stat. F(23, 49)	460.9826[.000]
Mean of Dependent Variable	4.8940	S.D. of Dependent Variable	2.7300
Residual Sum of Squares	2.4686	Equation Log-likelihood	20.0360
Akaike Info. Criterion	-3.9640	Schwarz Bayesian Criterion	-31.4495
DW-statistic	1.9309		

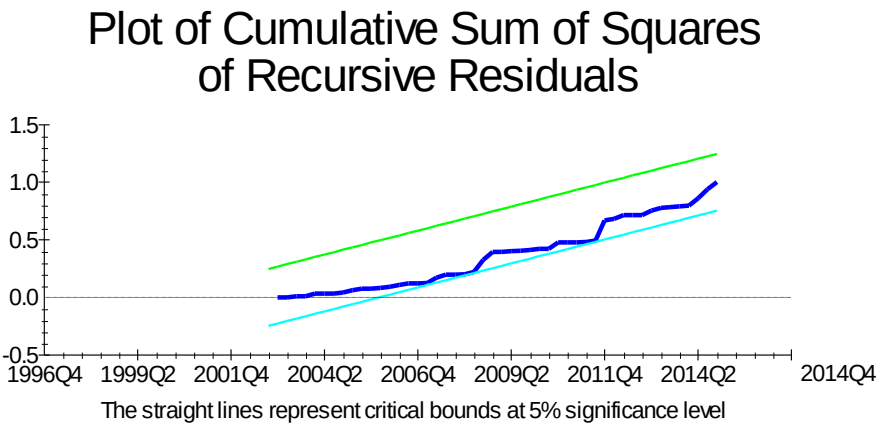
Diagnostic Tests

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(4)= 6.3684[.173]	F(4, 45)= 1.0752[.380]
B:Functional Form	CHSQ(1)= 24.4943[.000]	F(1, 48)= 24.2389[.000]
C:Normality	CHSQ(2)= .41181[.814]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .45826[.498]	F(1, 71)= .44852[.505]

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Stability tests





Estimated Long Run Coefficients using the ARDL Approach
ARDL(8,0,0,8,1) selected based on Akaike Information Criterion

Dependent variable is MC
73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LNGDP	-3.7201	.72346	-5.1421[.000]
MON	.46516	.068573	6.7835[.000]
FDI	5.2495	4.3528	1.2060[.234]
LNSETI	5.1054	.42045	12.1427[.000]
C	3.8504	5.2398	.73484[.466]
T	.037358	.0089273	4.1847[.000]
BREAK	-.72239	.27155	-2.6602[.011]

ECM

Error Correction Representation for the Selected ARDL Model
ARDL(8,0,0,8,1) selected based on Akaike Information Criterion

Dependent variable is dMC
73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dMC1	-.12591	.063445	-1.9845[.053]
dMC2	-.15488	.055729	-2.7792[.008]
dMC3	-.12346	.057380	-2.1516[.036]
dMC4	-.055825	.055799	-1.0005[.322]
dMC5	.042945	.051096	.84047[.405]
dMC6	-.13901	.052350	-2.6554[.011]

```
 dMC7                      -.083243            .055442            -1.5014[.139]
 dLNGDP                     -1.8167             .31199            -5.8229[.000]
 dMON                        .22716            .037674             6.0296[.000]
 dFDI                        .38971             .67561             .57683[.567]
 dFDI1                      -2.2049             1.7634            -1.2504[.217]
 dFDI2                      -2.1344             1.6293            -1.3100[.196]
 dFDI3                      -1.3939             1.4200            -.98158[.331]
 dFDI4                      -1.6226             1.2647            -1.2830[.205]
 dFDI5                      -3.5821             1.0714            -3.3434[.002]
 dFDI6                      -3.7738             .91609            -4.1194[.000]
 dFDI7                      -2.9372             .68473            -4.2896[.000]
 dLNSETI                     3.3569             .21973            15.2775[.000]
 dC                          1.8803             2.4625             .76359[.449]
 dT                         .018244           .0050713             3.5974[.001]
 dBREAK                     -.35278             .13749            -2.5658[.013]
 ecm(-1)                    -.48835            .070395            -6.9372[.000]
*******************************************************************************
 List of additional temporary variables created:
 dMC = MC-MC(-1)
 dMC1 = MC(-1)-MC(-2)
 dMC2 = MC(-2)-MC(-3)
 dMC3 = MC(-3)-MC(-4)
 dMC4 = MC(-4)-MC(-5)
 dMC5 = MC(-5)-MC(-6)
 dMC6 = MC(-6)-MC(-7)
 dMC7 = MC(-7)-MC(-8)
 dLNGDP = LNGDP-LNGDP(-1)
 dMON = MON-MON(-1)
 dFDI = FDI-FDI(-1)
 dFDI1 = FDI(-1)-FDI(-2)
 dFDI2 = FDI(-2)-FDI(-3)
 dFDI3 = FDI(-3)-FDI(-4)
 dFDI4 = FDI(-4)-FDI(-5)
 dFDI5 = FDI(-5)-FDI(-6)
 dFDI6 = FDI(-6)-FDI(-7)
 dFDI7 = FDI(-7)-FDI(-8)
 dLNSETI = LNSETI-LNSETI(-1)
 dC = C-C(-1)
 dT = T-T(-1)
 dBREAK = BREAK-BREAK(-1)
 ecm = MC +   3.7201*LNGDP   -.46516*MON   -5.2495*FDI   -5.1054*LNSETI   -3.8
504*C  -.037358*T +   .72239*BREAK
*******************************************************************************
 R-Squared                      .91929   R-Bar-Squared                    .88141
 S.E. of Regression             .22445   F-stat.    F( 21,  51)   26.5781[.000]
 Mean of Dependent Variable    .086491   S.D. of Dependent Variable       .65179
 Residual Sum of Squares        2.4686   Equation Log-likelihood         20.0360
 Akaike Info. Criterion        -3.9640   Schwarz Bayesian Criterion     -31.4495
 DW-statistic                   1.9309
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dMC and in cases where the error correction model is highly
 restricted, these measures could become negative.

F tests
ARDL regression of dMC on:
 dMC1            dMC2            dMC3            dMC4            dMC5
 dMC6            dMC7            dLNGDP          dMON            dFDI
 dFDI1           dFDI2           dFDI3           dFDI4           dFDI5
 dFDI6           dFDI7           dLNSETI         dC              dT

GDP


              Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dMC on:
 dMC1            dMC2            dMC3            dMC4            dMC5
 dMC6            dMC7            dLNGDP          dMON            dFDI
 dFDI1           dFDI2           dFDI3           dFDI4           dFDI5
 dFDI6           dFDI7           dLNSETI         dC              dT
 dBREAK          ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Coefficients A1 to A22 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A8=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=  33.9059[.000]
```

```
********************************************************************************

Mon

             Wald test of restriction(s) imposed on parameters
********************************************************************************
 Based on ARDL regression of dMC on:
 dMC1            dMC2            dMC3            dMC4            dMC5
 dMC6            dMC7            dLNGDP          dMON            dFDI
 dFDI1           dFDI2           dFDI3           dFDI4           dFDI5
 dFDI6           dFDI7           dLNSETI         dC              dT
 dBREAK          ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
********************************************************************************
 Coefficients A1 to A22 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A9=0.
********************************************************************************
 Wald Statistic                CHSQ( 1)=  36.3558[.000]
********************************************************************************

FDI

             Wald test of restriction(s) imposed on parameters
********************************************************************************
 Based on ARDL regression of dMC on:
 dMC1            dMC2            dMC3            dMC4            dMC5
 dMC6            dMC7            dLNGDP          dMON            dFDI
 dFDI1           dFDI2           dFDI3           dFDI4           dFDI5
 dFDI6           dFDI7           dLNSETI         dC              dT
 dBREAK          ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
********************************************************************************
 Coefficients A1 to A22 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A10=0; A11=0; A12=0; A13=0; A14=0; A15=0; A16=0; A17=0.
********************************************************************************
 Wald Statistic                CHSQ( 8)=  39.4156[.000]
********************************************************************************

SETI

             Wald test of restriction(s) imposed on parameters
********************************************************************************
 Based on ARDL regression of dMC on:
 dMC1            dMC2            dMC3            dMC4            dMC5
 dMC6            dMC7            dLNGDP          dMON            dFDI
 dFDI1           dFDI2           dFDI3           dFDI4           dFDI5
 dFDI6           dFDI7           dLNSETI         dC              dT
 dBREAK          ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
********************************************************************************
 Coefficients A1 to A22 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A18=0.
********************************************************************************
 Wald Statistic                CHSQ( 1)= 233.4028[.000]
********************************************************************************

4) FDI

                Autoregressive Distributed Lag Estimates
       ARDL(2,5,8,8,8) selected based on Akaike Information Criterion
********************************************************************************
 Dependent variable is FDI
 73 observations used for estimation from 1996Q4 to 2014Q4
********************************************************************************
 Regressor             Coefficient       Standard Error         T-Ratio[Prob]
 FDI(-1)                    .19775             .13557             1.4586[.154]
```

FDI(-2)	-.34805	.12513	-2.7816[.009]
LNGDP	.097234	.098900	.98315[.332]
LNGDP(-1)	-.11042	.12335	-.89515[.377]
LNGDP(-2)	.0018069	.13024	.013873[.989]
LNGDP(-3)	-.43568	.16657	-2.6156[.013]
LNGDP(-4)	.17258	.17379	.99306[.327]
LNGDP(-5)	-.19144	.13371	-1.4318[.161]
MON	-.062182	.021452	-2.8986[.006]
MON(-1)	.062363	.027400	2.2760[.029]
MON(-2)	-.069487	.028797	-2.4130[.021]
MON(-3)	.033105	.027639	1.1977[.239]
MON(-4)	.8664E-3	.027113	.031957[.975]
MON(-5)	.030317	.027162	1.1161[.272]
MON(-6)	-.020644	.026648	-.77470[.444]
MON(-7)	.053611	.026004	2.0616[.047]
MON(-8)	.035462	.023251	1.5252[.136]
MC	-.038008	.023315	-1.6302[.112]
MC(-1)	.025448	.029785	.85440[.399]
MC(-2)	-.041917	.030307	-1.3831[.175]
MC(-3)	-.013573	.028993	-.46815[.643]
MC(-4)	.022337	.027006	.82714[.414]
MC(-5)	-.034426	.028583	-1.2044[.237]
MC(-6)	-.033541	.029858	-1.1233[.269]
MC(-7)	-.0043854	.029564	-.14833[.883]
MC(-8)	-.058941	.028816	-2.0454[.048]
LNSETI	.15218	.099092	1.5358[.134]
LNSETI(-1)	-.14311	.12571	-1.1385[.263]
LNSETI(-2)	.20228	.12485	1.6202[.114]
LNSETI(-3)	.072378	.11307	.64011[.526]
LNSETI(-4)	-.10681	.10861	-.98348[.332]
LNSETI(-5)	.12333	.10478	1.1770[.247]
LNSETI(-6)	.10995	.093399	1.1772[.247]
LNSETI(-7)	.14165	.095557	1.4823[.147]
LNSETI(-8)	.19212	.10131	1.8963[.066]
C	-.091645	.68261	-.13426[.894]
T	.0085161	.0026451	3.2196[.003]
BREAK	.089097	.027493	3.2407[.003]

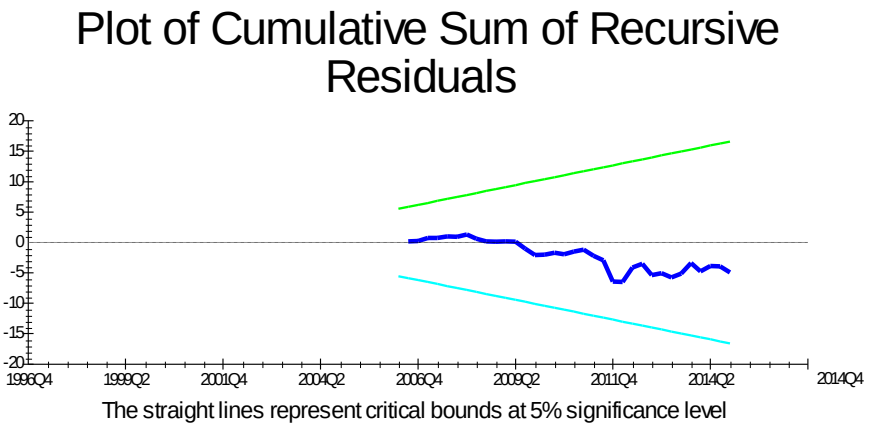
R-Squared	.68957	R-Bar-Squared	.36139
S.E. of Regression	.038297	F-stat. F(37, 35)	2.1012[.015]
Mean of Dependent Variable	.066241	S.D. of Dependent Variable	.047923
Residual Sum of Squares	.051333	Equation Log-likelihood	161.4033
Akaike Info. Criterion	123.4033	Schwarz Bayesian Criterion	79.8846
DW-statistic	2.1971		

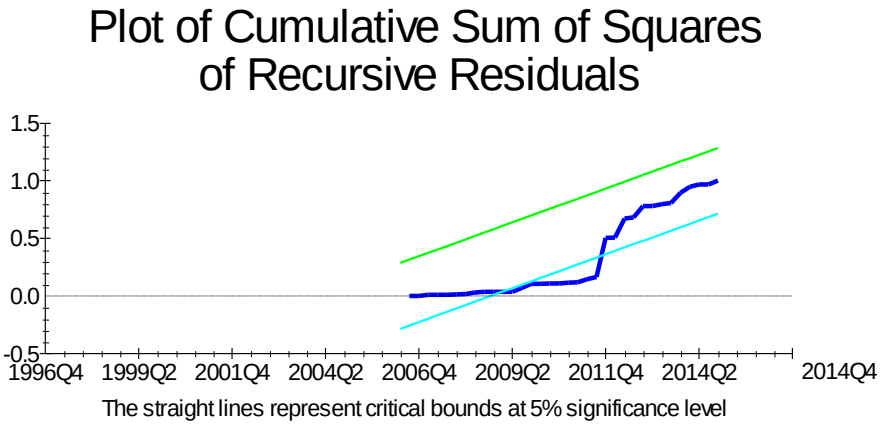
Diagnostic Tests

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(4)= 7.7429[.101]	F(4, 31)= .91955[.465]
B:Functional Form	CHSQ(1)= 17.2297[.000]	F(1, 34)= 10.5040[.003]
C:Normality	CHSQ(2)= 5.2061[.074]	Not applicable
D:Heteroscedasticity	CHSQ(1)= 2.8510[.091]	F(1, 71)= 2.8856[.094]

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Stability





Estimated Long Run Coefficients using the ARDL Approach
ARDL(2,5,8,8,8) selected based on Akaike Information Criterion

Dependent variable is FDI
73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LNGDP	-.40503	.13683	-2.9601[.005]
MON	.055125	.021466	2.5680[.015]
MC	-.15388	.049076	-3.1355[.003]
LNSETI	.64676	.20416	3.1680[.003]
C	-.079671	.59405	-.13411[.894]
T	.0074033	.0022652	3.2683[.002]
BREAK	.077456	.027308	2.8363[.008]

Error Correction Representation for the Selected ARDL Model
ARDL(2,5,8,8,8) selected based on Akaike Information Criterion

Dependent variable is dFDI
73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dFDI1	.34805	.12513	2.7816[.008]
dLNGDP	.097234	.098900	.98315[.332]
dLNGDP1	.45272	.15895	2.8482[.007]
dLNGDP2	.45453	.15130	3.0042[.005]
dLNGDP3	.018853	.14312	.13172[.896]

```
 dLNGDP4                    .19144             .13371            1.4318[.160]
 dMON                     -.062182           .021452           -2.8986[.006]
 dMON1                    -.063230           .034273           -1.8449[.073]
 dMON2                     -.13272           .034520           -3.8447[.000]
 dMON3                    -.099612           .033907           -2.9378[.006]
 dMON4                    -.098746           .031936           -3.0920[.004]
 dMON5                    -.068429           .032015           -2.1374[.039]
 dMON6                    -.089073           .025342           -3.5148[.001]
 dMON7                    -.035462           .023251           -1.5252[.135]
 dMC                      -.038008           .023315           -1.6302[.111]
 dMC1                       .16445           .045982            3.5763[.001]
 dMC2                       .12253           .037798            3.2417[.002]
 dMC3                       .10895           .030733            3.5452[.001]
 dMC4                       .13129           .029061            4.5179[.000]
 dMC5                      .096867           .032563            2.9747[.005]
 dMC6                      .063326           .028241            2.2424[.031]
 dMC7                      .058941           .028816            2.0454[.048]
 dLNSETI                    .15218           .099092            1.5358[.133]
 dLNSETI1                  -.73489            .21596           -3.4030[.002]
 dLNSETI2                  -.53261            .16683           -3.1926[.003]
 dLNSETI3                  -.46023            .14368           -3.2032[.003]
 dLNSETI4                  -.56705            .13499           -4.2008[.000]
 dLNSETI5                  -.44372            .12448           -3.5645[.001]
 dLNSETI6                  -.33377            .11483           -2.9067[.006]
 dLNSETI7                  -.19212            .10131           -1.8963[.065]
 dC                       -.091645            .68261           -.13426[.894]
 dT                      .0085161          .0026451            3.2196[.003]
 dBREAK                    .089097           .027493            3.2407[.002]
 ecm(-1)                   -1.1503            .17089           -6.7311[.000]
*******************************************************************************
 List of additional temporary variables created:
 dFDI = FDI-FDI(-1)
 dFDI1 = FDI(-1)-FDI(-2)
 dLNGDP = LNGDP-LNGDP(-1)
 dLNGDP1 = LNGDP(-1)-LNGDP(-2)
 dLNGDP2 = LNGDP(-2)-LNGDP(-3)
 dLNGDP3 = LNGDP(-3)-LNGDP(-4)
 dLNGDP4 = LNGDP(-4)-LNGDP(-5)
 dMON = MON-MON(-1)
 dMON1 = MON(-1)-MON(-2)
 dMON2 = MON(-2)-MON(-3)
 dMON3 = MON(-3)-MON(-4)
 dMON4 = MON(-4)-MON(-5)
 dMON5 = MON(-5)-MON(-6)
 dMON6 = MON(-6)-MON(-7)
 dMON7 = MON(-7)-MON(-8)
 dMC = MC-MC(-1)
 dMC1 = MC(-1)-MC(-2)
 dMC2 = MC(-2)-MC(-3)
 dMC3 = MC(-3)-MC(-4)
 dMC4 = MC(-4)-MC(-5)
 dMC5 = MC(-5)-MC(-6)
 dMC6 = MC(-6)-MC(-7)
 dMC7 = MC(-7)-MC(-8)
 dLNSETI = LNSETI-LNSETI(-1)
 dLNSETI1 = LNSETI(-1)-LNSETI(-2)
 dLNSETI2 = LNSETI(-2)-LNSETI(-3)
 dLNSETI3 = LNSETI(-3)-LNSETI(-4)
 dLNSETI4 = LNSETI(-4)-LNSETI(-5)
 dLNSETI5 = LNSETI(-5)-LNSETI(-6)
 dLNSETI6 = LNSETI(-6)-LNSETI(-7)
 dLNSETI7 = LNSETI(-7)-LNSETI(-8)
 dC = C-C(-1)
 dT = T-T(-1)
 dBREAK = BREAK-BREAK(-1)
 ecm = FDI +   .40503*LNGDP  -.055125*MON +   .15388*MC   -.64676*LNSETI +  .0
79671*C -.0074033*T  -.077456*BREAK
*******************************************************************************
 R-Squared                     .83422   R-Bar-Squared                    .65897
 S.E. of Regression           .038297   F-stat.    F( 33,  39)    5.3372[.000]
 Mean of Dependent Variable  .4568E-3   S.D. of Dependent Variable     .065580
 Residual Sum of Squares      .051333   Equation Log-likelihood       161.4033
 Akaike Info. Criterion      123.4033   Schwarz Bayesian Criterion     79.8846
 DW-statistic                  2.1971
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dFDI and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

F tests

ARDL regression of dFDI on:

dFDI1	dLNGDP	dLNGDP1	dLNGDP2	dLNGDP3
dLNGDP4	dMON	dMON1	dMON2	dMON3
dMON4	dMON5	dMON6	dMON7	dMC
dMC1	dMC2	dMC3	dMC4	dMC5
dMC6	dMC7	dLNSETI	dLNSETI1	dLNSETI2
dLNSETI3	dLNSETI4	dLNSETI5	dLNSETI6	dLNSETI7
dC	dT	dBREAK	ecm(-1)	

GDP

Wald test of restriction(s) imposed on parameters

Based on ARDL regression of dFDI on:

dFDI1	dLNGDP	dLNGDP1	dLNGDP2	dLNGDP3
dLNGDP4	dMON	dMON1	dMON2	dMON3
dMON4	dMON5	dMON6	dMON7	dMC
dMC1	dMC2	dMC3	dMC4	dMC5
dMC6	dMC7	dLNSETI	dLNSETI1	dLNSETI2
dLNSETI3	dLNSETI4	dLNSETI5	dLNSETI6	dLNSETI7
dC	dT	dBREAK	ecm(-1)	

73 observations used for estimation from 1996Q4 to 2014Q4

Coefficients A1 to A34 are assigned to the above regressors respectively.
List of restriction(s) for the Wald test:
A2=0; A3=0; A4=0; A5=0; A6=0.

Wald Statistic CHSQ(5)= 15.5562[.008]

Mon

Wald test of restriction(s) imposed on parameters

Based on ARDL regression of dFDI on:

dFDI1	dLNGDP	dLNGDP1	dLNGDP2	dLNGDP3
dLNGDP4	dMON	dMON1	dMON2	dMON3
dMON4	dMON5	dMON6	dMON7	dMC
dMC1	dMC2	dMC3	dMC4	dMC5
dMC6	dMC7	dLNSETI	dLNSETI1	dLNSETI2
dLNSETI3	dLNSETI4	dLNSETI5	dLNSETI6	dLNSETI7
dC	dT	dBREAK	ecm(-1)	

73 observations used for estimation from 1996Q4 to 2014Q4

Coefficients A1 to A34 are assigned to the above regressors respectively.
List of restriction(s) for the Wald test:
A7=0; A8=0; A9=0; A10=0; A11=0; A12=0; A13=0; A14=0.

Wald Statistic CHSQ(8)= 30.6815[.000]

MC

Wald test of restriction(s) imposed on parameters

Based on ARDL regression of dFDI on:

dFDI1	dLNGDP	dLNGDP1	dLNGDP2	dLNGDP3
dLNGDP4	dMON	dMON1	dMON2	dMON3
dMON4	dMON5	dMON6	dMON7	dMC
dMC1	dMC2	dMC3	dMC4	dMC5
dMC6	dMC7	dLNSETI	dLNSETI1	dLNSETI2
dLNSETI3	dLNSETI4	dLNSETI5	dLNSETI6	dLNSETI7
dC	dT	dBREAK	ecm(-1)	

73 observations used for estimation from 1996Q4 to 2014Q4

Coefficients A1 to A34 are assigned to the above regressors respectively.
List of restriction(s) for the Wald test:
A15=0; A16=0; A17=0; A18=0; A19=0; A20=0; A21=0; A22=0.

Wald Statistic CHSQ(8)= 25.1267[.001]

SETI

Wald test of restriction(s) imposed on parameters

Based on ARDL regression of dFDI on:

dFDI1	dLNGDP	dLNGDP1	dLNGDP2	dLNGDP3
dLNGDP4	dMON	dMON1	dMON2	dMON3
dMON4	dMON5	dMON6	dMON7	dMC
dMC1	dMC2	dMC3	dMC4	dMC5
dMC6	dMC7	dLNSETI	dLNSETI1	dLNSETI2
dLNSETI3	dLNSETI4	dLNSETI5	dLNSETI6	dLNSETI7
dC	dT	dBREAK	ecm(-1)	

73 observations used for estimation from 1996Q4 to 2014Q4

Coefficients A1 to A34 are assigned to the above regressors respectively.

List of restriction(s) for the Wald test:

A23=0; A24=0; A25=0; A26=0; A27=0; A28=0; A29=0; A30=0.

Wald Statistic CHSQ(8)= 22.1827[.005]

5) SETI

Autoregressive Distributed Lag Estimates

ARDL(3,4,6,1,8) selected based on Akaike Information Criterion

Dependent variable is LNSETI

73 observations used for estimation from 1996Q4 to 2014Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LNSETI(-1)	.47373	.10032	4.7223[.000]
LNSETI(-2)	.14046	.069090	2.0329[.048]
LNSETI(-3)	-.17697	.055800	-3.1714[.003]
LNGDP	.37294	.11773	3.1677[.003]
LNGDP(-1)	.025499	.16161	.15778[.875]
LNGDP(-2)	-.27634	.15280	-1.8085[.077]
LNGDP(-3)	.65321	.15909	4.1060[.000]
LNGDP(-4)	-.47563	.11517	-4.1297[.000]
MON	-.038917	.024252	-1.6047[.116]
MON(-1)	.0035244	.032454	.10859[.914]
MON(-2)	.037203	.032762	1.1356[.262]
MON(-3)	.0045102	.032948	.13689[.892]
MON(-4)	.0034763	.033866	.10265[.919]
MON(-5)	-.10256	.029890	-3.4312[.001]
MON(-6)	.042006	.021182	1.9830[.054]
MC	.21197	.013645	15.5345[.000]
MC(-1)	-.099192	.026262	-3.7770[.000]
FDI	.15845	.16446	.96350[.341]
FDI(-1)	-.24401	.16706	-1.4607[.151]
FDI(-2)	.16990	.16953	1.0022[.322]
FDI(-3)	-.46846	.16909	-2.7705[.008]
FDI(-4)	.11962	.18765	.63747[.527]
FDI(-5)	.010214	.18808	.054303[.957]
FDI(-6)	.11404	.18578	.61381[.542]
FDI(-7)	-.060378	.17156	-.35193[.727]
FDI(-8)	-.58205	.17438	-3.3379[.002]
C	.63588	.77627	.81915[.417]
T	-.0026653	.0014658	-1.8184[.076]
BREAK	.020239	.036418	.55576[.581]

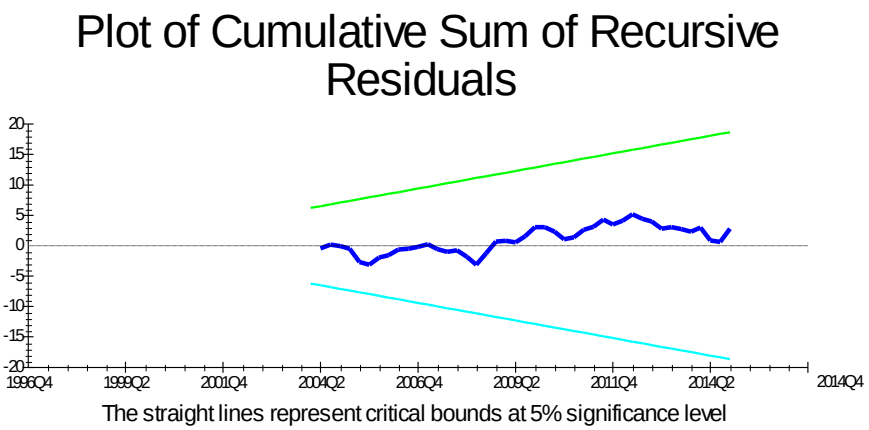
R-Squared	.99366	R-Bar-Squared	.98962
S.E. of Regression	.051794	F-stat. F(28, 44)	246.1574[.000]
Mean of Dependent Variable	6.4591	S.D. of Dependent Variable	.50838
Residual Sum of Squares	.11804	Equation Log-likelihood	131.0108
Akaike Info. Criterion	102.0108	Schwarz Bayesian Criterion	68.7991
DW-statistic	1.8760		

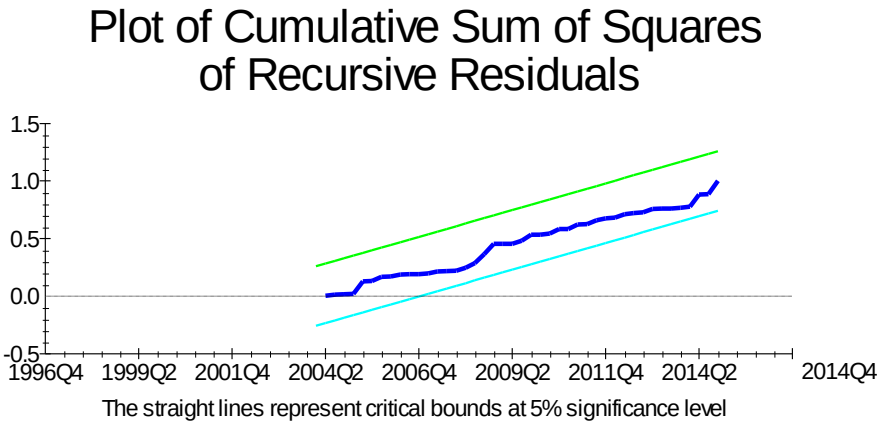
Diagnostic Tests

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(4)= 6.0200[.198]	F(4, 40)= .89877[.474]
B:Functional Form	CHSQ(1)= 45.2129[.000]	F(1, 43)= 69.9659[.000]

```
* C:Normality         *CHSQ(   2)=   1.2050[.547]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=   2.5540[.110]*F(   1,  71)=   2.5741[.113]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

Stability





Long run

```
          Estimated Long Run Coefficients using the ARDL Approach
        ARDL(3,4,6,1,8) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LNSETI
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LNGDP                      .53250            .14049             3.7903[.000]
 MON                      -.090188           .019500            -4.6250[.000]
 MC                         .20039           .018113            11.0636[.000]
 FDI                       -1.3907            .91600            -1.5182[.136]
 C                          1.1299            1.4183             .79665[.430]
 T                        -.0047359          .0020987            -2.2566[.029]
 BREAK                      .035963           .065315             .55061[.585]
*******************************************************************************
```

```
         Error Correction Representation for the Selected ARDL Model
        ARDL(3,4,6,1,8) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLNSETI
```

```
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLNSETI1                  .036511            .060473            .60375[.549]
 dLNSETI2                  .17697             .055800            3.1714[.003]
 dLNGDP                    .37294             .11773             3.1677[.003]
 dLNGDP1                   .098757            .12614             .78293[.438]
 dLNGDP2                   -.17758            .12444            -1.4271[.160]
 dLNGDP3                   .47563             .11517             4.1297[.000]
 dMON                     -.038917            .024252           -1.6047[.115]
 dMON1                     .015363            .025032            .61374[.542]
 dMON2                     .052566            .025867            2.0322[.048]
 dMON3                     .057077            .027436            2.0803[.043]
 dMON4                     .060553            .021557            2.8089[.007]
 dMON5                    -.042006            .021182           -1.9830[.053]
 dMC                       .21197             .013645           15.5345[.000]
 dFDI                      .15845             .16446             .96350[.340]
 dFDI1                     .69710             .41898             1.6638[.103]
 dFDI2                     .86701             .38217             2.2687[.028]
 dFDI3                     .39855             .33402             1.1932[.239]
 dFDI4                     .51817             .30728             1.6863[.098]
 dFDI5                     .52839             .25974             2.0343[.047]
 dFDI6                     .64242             .22938             2.8006[.007]
 dFDI7                     .58205             .17438             3.3379[.002]
 dC                        .63588             .77627             .81915[.417]
 dT                    -.0026653           .0014658           -1.8184[.075]
 dBREAK                    .020239            .036418            .55576[.581]
 ecm(-1)                   -.56278            .11285            -4.9868[.000]
*******************************************************************************
 List of additional temporary variables created:
 dLNSETI = LNSETI-LNSETI(-1)
 dLNSETI1 = LNSETI(-1)-LNSETI(-2)
 dLNSETI2 = LNSETI(-2)-LNSETI(-3)
 dLNGDP = LNGDP-LNGDP(-1)
 dLNGDP1 = LNGDP(-1)-LNGDP(-2)
 dLNGDP2 = LNGDP(-2)-LNGDP(-3)
 dLNGDP3 = LNGDP(-3)-LNGDP(-4)
 dMON = MON-MON(-1)
 dMON1 = MON(-1)-MON(-2)
 dMON2 = MON(-2)-MON(-3)
 dMON3 = MON(-3)-MON(-4)
 dMON4 = MON(-4)-MON(-5)
 dMON5 = MON(-5)-MON(-6)
 dMC = MC-MC(-1)
 dFDI = FDI-FDI(-1)
 dFDI1 = FDI(-1)-FDI(-2)
 dFDI2 = FDI(-2)-FDI(-3)
 dFDI3 = FDI(-3)-FDI(-4)
 dFDI4 = FDI(-4)-FDI(-5)
 dFDI5 = FDI(-5)-FDI(-6)
 dFDI6 = FDI(-6)-FDI(-7)
 dFDI7 = FDI(-7)-FDI(-8)
 dC = C-C(-1)
 dT = T-T(-1)
 dBREAK = BREAK-BREAK(-1)
 ecm = LNSETI   -.53250*LNGDP +  .090188*MON   -.20039*MC +   1.3907*FDI   -1.
1299*C + .0047359*T  -.035963*BREAK
*******************************************************************************
 R-Squared                      .94091   R-Bar-Squared                   .90331
 S.E. of Regression            .051794   F-stat.    F( 24,  48)   29.1929[.000]
 Mean of Dependent Variable   .0042448   S.D. of Dependent Variable      .16657
 Residual Sum of Squares        .11804   Equation Log-likelihood       131.0108
 Akaike Info. Criterion       102.0108   Schwarz Bayesian Criterion     68.7991
 DW-statistic                   1.8760
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLNSETI and in cases where the error correction model is highly
 restricted, these measures could become negative.

F tests

ARDL regression of dLNSETI on:
 dLNSETI1        dLNSETI2        dLNGDP          dLNGDP1         dLNGDP2
 dLNGDP3         dMON            dMON1           dMON2           dMON3
 dMON4           dMON5           dMC             dFDI            dFDI1
 dFDI2           dFDI3           dFDI4           dFDI5           dFDI6
 dFDI7           dC              dT              dBREAK          ecm(-1)

GDP
```

```
              Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNSETI on:
 dLNSETI1        dLNSETI2        dLNGDP          dLNGDP1         dLNGDP2
 dLNGDP3         dMON            dMON1           dMON2           dMON3
 dMON4           dMON5           dMC             dFDI            dFDI1
 dFDI2           dFDI3           dFDI4           dFDI5           dFDI6
 dFDI7           dC              dT              dBREAK          ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Coefficients A1 to A25 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A3=0; A4=0; A5=0; A6=0.
*******************************************************************************
 Wald Statistic                CHSQ( 4)=  44.0569[.000]
*******************************************************************************
```

MON

```
              Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNSETI on:
 dLNSETI1        dLNSETI2        dLNGDP          dLNGDP1         dLNGDP2
 dLNGDP3         dMON            dMON1           dMON2           dMON3
 dMON4           dMON5           dMC             dFDI            dFDI1
 dFDI2           dFDI3           dFDI4           dFDI5           dFDI6
 dFDI7           dC              dT              dBREAK          ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Coefficients A1 to A25 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A7=0; A8=0; A9=0; A10=0; A11=0; A12=0.
*******************************************************************************
 Wald Statistic                CHSQ( 6)=  29.8836[.000]
*******************************************************************************
```

MC

```
              Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNSETI on:
 dLNSETI1        dLNSETI2        dLNGDP          dLNGDP1         dLNGDP2
 dLNGDP3         dMON            dMON1           dMON2           dMON3
 dMON4           dMON5           dMC             dFDI            dFDI1
 dFDI2           dFDI3           dFDI4           dFDI5           dFDI6
 dFDI7           dC              dT              dBREAK          ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Coefficients A1 to A25 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A13=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)= 241.3195[.000]
*******************************************************************************
```

FDI

```
             Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNSETI on:
 dLNSETI1        dLNSETI2        dLNGDP          dLNGDP1         dLNGDP2
 dLNGDP3         dMON            dMON1           dMON2           dMON3
 dMON4           dMON5           dMC             dFDI            dFDI1
 dFDI2           dFDI3           dFDI4           dFDI5           dFDI6
 dFDI7           dC              dT              dBREAK          ecm(-1)
 73 observations used for estimation from 1996Q4 to 2014Q4
*******************************************************************************
 Coefficients A1 to A25 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A14=0; A15=0; A16=0; A17=0; A18=0; A19=0; A20=0; A21=0.
*******************************************************************************
 Wald Statistic                CHSQ( 8)=  21.6288[.006]
*******************************************************************************
```

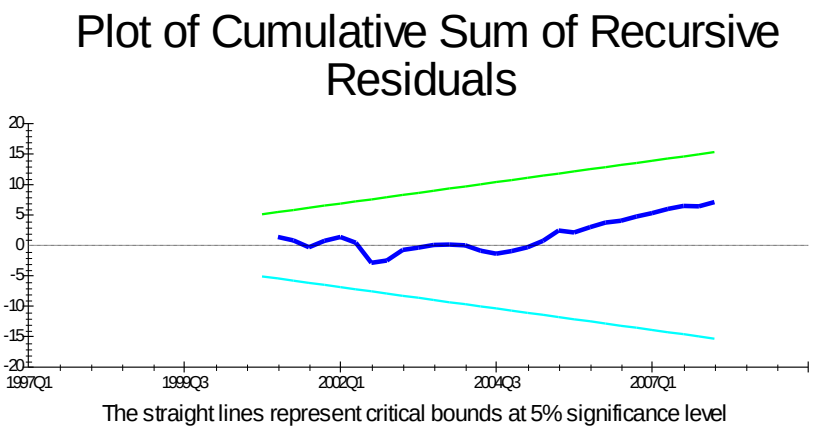
1997Q1 to 2008Q1

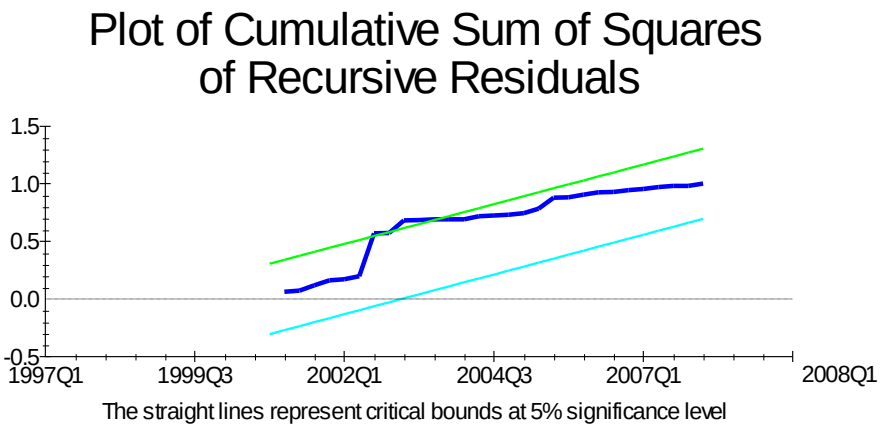
1) GDP

```
                 Autoregressive Distributed Lag Estimates
       ARDL(5,1,0,1,2) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LNGDP
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LNGDP(-1)                .51080            .15691              3.2553[.003]
 LNGDP(-2)               -.32632            .16788             -1.9437[.061]
 LNGDP(-3)               -.10621            .17166             -.61873[.541]
 LNGDP(-4)                .22352            .18021              1.2403[.224]
 LNGDP(-5)                .21175            .14993              1.4123[.168]
 MON                     .016357           .046602              .35099[.728]
 MON(-1)                  .16262           .039282              4.1397[.000]
 MC                      -.13598           .060145             -2.2609[.031]
 FDI                     -1.1997            .49579             -2.4197[.022]
 FDI(-1)                 -.91214            .53048             -1.7195[.096]
 LNSETI                   .63668            .17380              3.6633[.001]
 LNSETI(-1)              -.055966           .091760             -.60992[.547]
 LNSETI(-2)               .15138           .067348              2.2478[.032]
 C                       -.70524            1.3924             -.50650[.616]
 T                      .0064898          .0029239              2.2196[.034]
*******************************************************************************
 R-Squared                    .94940   R-Bar-Squared                   .92579
 S.E. of Regression          .059030   F-stat.    F( 14,  30)   40.2100[.000]
 Mean of Dependent Variable   9.9853   S.D. of Dependent Variable      .21669
 Residual Sum of Squares      .10453   Equation Log-likelihood        72.6080
 Akaike Info. Criterion      57.6080   Schwarz Bayesian Criterion     44.0580
 DW-statistic                 2.2488
*******************************************************************************
```

```
                              Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   4)=  10.9051[.028]*F(   4,  26)=   2.0790[.113]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)=   2.4603[.117]*F(   1,  29)=   1.6772[.206]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)=  69.8011[.000]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=   1.0916[.296]*F(   1,  43)=   1.0690[.307]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

Stability





Long-run

Estimated Long Run Coefficients using the ARDL Approach
ARDL(5,1,0,1,2) selected based on Akaike Information Criterion

Dependent variable is LNGDP
45 observations used for estimation from 1997Q1 to 2008Q1

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
MON	.36792	.13523	2.7208[.011]
MC	-.27954	.12070	-2.3159[.028]
FDI	-4.3413	1.7906	-2.4245[.022]
LNSETI	1.5050	.38973	3.8616[.001]
C	-1.4498	3.0196	-.48012[.635]
T	.013341	.0057642	2.3145[.028]

ECM

Error Correction Representation for the Selected ARDL Model
ARDL(5,1,0,1,2) selected based on Akaike Information Criterion

Dependent variable is dLNGDP
45 observations used for estimation from 1997Q1 to 2008Q1

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dLNGDP1	-.0027467	.14226	-.019307[.985]
dLNGDP2	-.32906	.13327	-2.4690[.019]
dLNGDP3	-.43527	.15927	-2.7330[.010]
dLNGDP4	-.21175	.14993	-1.4123[.167]

```
 dMON                      .016357           .046602            .35099[.728]
 dMC                       -.13598           .060145           -2.2609[.030]
 dFDI                      -1.1997            .49579           -2.4197[.021]
 dLNSETI                    .63668            .17380            3.6633[.001]
 dLNSETI1                  -.15138           .067348           -2.2478[.031]
 dC                        -.70524            1.3924           -.50650[.616]
 dT                       .0064898          .0029239            2.2196[.033]
 ecm(-1)                   -.48645            .12118           -4.0144[.000]
*******************************************************************************
 List of additional temporary variables created:
 dLNGDP = LNGDP-LNGDP(-1)
 dLNGDP1 = LNGDP(-1)-LNGDP(-2)
 dLNGDP2 = LNGDP(-2)-LNGDP(-3)
 dLNGDP3 = LNGDP(-3)-LNGDP(-4)
 dLNGDP4 = LNGDP(-4)-LNGDP(-5)
 dMON = MON-MON(-1)
 dMC = MC-MC(-1)
 dFDI = FDI-FDI(-1)
 dLNSETI = LNSETI-LNSETI(-1)
 dLNSETI1 = LNSETI(-1)-LNSETI(-2)
 dC = C-C(-1)
 dT = T-T(-1)
 ecm = LNGDP   -.36792*MON +   .27954*MC +   4.3413*FDI   -1.5050*LNSETI +   1
.4498*C  -.013341*T
*******************************************************************************
 R-Squared                      .75168   R-Bar-Squared                   .63579
 S.E. of Regression            .059030   F-stat.    F( 11,  33)    8.2555[.000]
 Mean of Dependent Variable   .0032363   S.D. of Dependent Variable     .097813
 Residual Sum of Squares        .10453   Equation Log-likelihood        72.6080
 Akaike Info. Criterion        57.6080   Schwarz Bayesian Criterion     44.0580
 DW-statistic                   2.2488
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLNGDP and in cases where the error correction model is highly
 restricted, these measures could become negative.

F tests

ARDL regression of dLNGDP on:
 dLNGDP1          dLNGDP2          dLNGDP3          dLNGDP4          dMON
 dMC              dFDI             dLNSETI          dLNSETI1         dC
 dT               ecm(-1)

MON


               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNGDP on:
 dLNGDP1          dLNGDP2          dLNGDP3          dLNGDP4          dMON
 dMC              dFDI             dLNSETI          dLNSETI1         dC
 dT               ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A12 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A5=0.
*******************************************************************************
 Wald Statistic                 CHSQ( 1)=   .12319[.726]
*******************************************************************************


MC


               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNGDP on:
 dLNGDP1          dLNGDP2          dLNGDP3          dLNGDP4          dMON
 dMC              dFDI             dLNSETI          dLNSETI1         dC
 dT               ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A12 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A6=0.
*******************************************************************************
 Wald Statistic                 CHSQ( 1)=   5.1117[.024]
*******************************************************************************
```

FDI

```
               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNGDP on:
 dLNGDP1         dLNGDP2         dLNGDP3         dLNGDP4         dMON
 dMC             dFDI            dLNSETI         dLNSETI1        dC
 dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A12 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A7=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=   5.8551[.016]
*******************************************************************************
```

SETI

```
               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNGDP on:
 dLNGDP1         dLNGDP2         dLNGDP3         dLNGDP4         dMON
 dMC             dFDI            dLNSETI         dLNSETI1        dC
 dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A12 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A8=0; A9=0.
*******************************************************************************
 Wald Statistic                CHSQ( 2)=  18.8181[.000]
*******************************************************************************
```

2) MON

MON

Dependent Variable: MON
Method: ARDL
Date: 05/08/17 Time: 17:42
Sample: 1997Q1 2008Q1
Included observations: 45
Maximum dependent lags: 5 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (5 lags, automatic): LNGDP MC FDI LNSETI
Fixed regressors: C @TREND
Number of models evalulated: 6480
Selected Model: ARDL(5, 0, 1, 1, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
MON(-1)	0.458445	0.132746	3.453538	0.0016
MON(-2)	-0.253275	0.149815	-1.690580	0.1006
MON(-3)	0.056507	0.155266	0.363935	0.7183
MON(-4)	0.505580	0.150945	3.349423	0.0021
MON(-5)	-0.413288	0.105704	-3.909858	0.0005
LNGDP	0.377474	0.336836	1.120647	0.2708
MC	0.536082	0.166083	3.227797	0.0029
MC(-1)	-0.127852	0.064017	-1.997145	0.0544
FDI	1.345631	1.193032	1.127909	0.2677
FDI(-1)	2.911560	1.271255	2.290304	0.0287
LNSETI	-1.796312	0.481865	-3.727828	0.0007
C	11.02262	3.488483	3.159716	0.0034
@TREND	-0.005778	0.008547	-0.676097	0.5038

R-squared	0.910586	Mean dependent var	8.022690
Adjusted R-squared	0.877056	S.D. dependent var	0.484252
S.E. of regression	0.169795	Akaike info criterion	-0.471595
Sum squared resid	0.922575	Schwarz criterion	0.050330
Log likelihood	23.61088	Hannan-Quinn criter.	-0.277026
F-statistic	27.15710	Durbin-Watson stat	2.071078
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

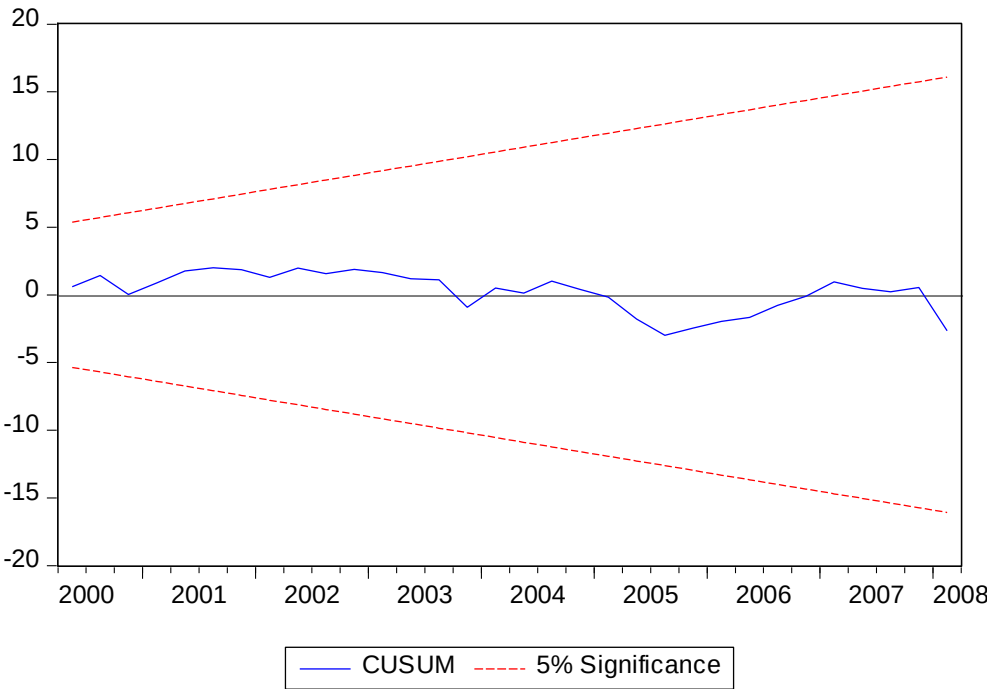
Breusch-Godfrey Serial Correlation LM Test:

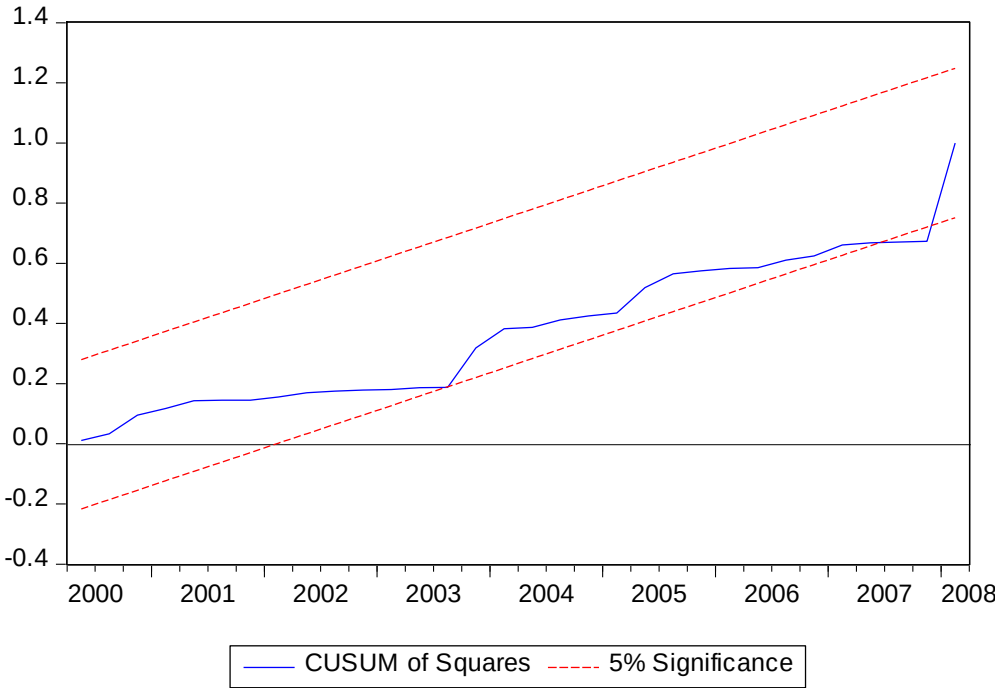
F-statistic	1.248545	Prob. F(2,30)	0.3014
Obs*R-squared	3.457819	Prob. Chi-Square(2)	0.1775

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 05/08/17 Time: 17:43
Sample: 1997Q1 2008Q1
Included observations: 45
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MON(-1)	0.135244	0.157183	0.860422	0.3964
MON(-2)	-0.172671	0.194460	-0.887955	0.3816
MON(-3)	0.131609	0.193841	0.678957	0.5024
MON(-4)	-0.067565	0.170272	-0.396806	0.6943
MON(-5)	0.008538	0.113189	0.075436	0.9404
LNGDP	0.173996	0.373380	0.466002	0.6446
MC	0.013136	0.170712	0.076950	0.9392
MC(-1)	-0.002994	0.064267	-0.046591	0.9631
FDI	-0.157715	1.230045	-0.128219	0.8988
FDI(-1)	-0.220809	1.293570	-0.170698	0.8656
LNSETI	-0.074459	0.498074	-0.149494	0.8822
C	-1.528238	3.634602	-0.420469	0.6771
@TREND	-0.001212	0.008694	-0.139452	0.8900
RESID(-1)	-0.419170	0.291099	-1.439957	0.1602
RESID(-2)	0.082455	0.285193	0.289119	0.7745

R-squared	0.076840	Mean dependent var	2.22E-15
Adjusted R-squared	-0.353967	S.D. dependent var	0.144802
S.E. of regression	0.168492	Akaike info criterion	-0.462659
Sum squared resid	0.851683	Schwarz criterion	0.139562
Log likelihood	25.40983	Hannan-Quinn criter.	-0.238157
F-statistic	0.178364	Durbin-Watson stat	1.699722
Prob(F-statistic)	0.999300		




1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
2000
2001
2002
2003
2004
2005
2006
2007
2008
CUSUM of Squares
5% Significance

ARDL Bounds Test
Date: 05/08/17 Time: 17:43
Sample: 1997Q1 2008Q1
Included observations: 45
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	6.363025	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.68	3.53
5%	3.05	3.97
2.5%	3.4	4.36
1%	3.81	4.92

Test Equation:
Dependent Variable: D(MON)
Method: Least Squares
Date: 05/08/17 Time: 17:43
Sample: 1997Q1 2008Q1
Included observations: 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MON(-1))	0.122024	0.135641	0.899608	0.3750
D(MON(-2))	-0.254048	0.133100	-1.908695	0.0653
D(MON(-3))	-0.139036	0.130503	-1.065383	0.2947
D(MON(-4))	0.386769	0.134200	2.882026	0.0070
D(MC)	-0.037731	0.073887	-0.510662	0.6131
D(FDI)	2.380464	1.377876	1.727633	0.0937
C	5.780283	4.415243	1.309165	0.1998
@TREND	0.010161	0.011125	0.913377	0.3679
LNGDP(-1)	0.066319	0.421500	0.157341	0.8760
MC(-1)	0.008328	0.199590	0.041724	0.9670
FDI(-1)	6.182534	1.928889	3.205231	0.0031
LNSETI(-1)	-0.483785	0.642585	-0.752873	0.4570
MON(-1)	-0.524082	0.131432	-3.987462	0.0004

R-squared	0.769484	Mean dependent var	0.027770
Adjusted R-squa...	0.683041	S.D. dependent var	0.359294
S.E. of regression	0.202279	Akaike info criterion	-0.121483
Sum squared re...	1.309341	Schwarz criterion	0.400441
Log likelihood	15.73338	Hannan-Quinn criter.	0.073085
F-statistic	8.901592	Durbin-Watson stat	1.948290
Prob(F-statistic)	0.000000		

ARDL Cointegrating And Long Run Form
Original dep. variable: MON
Selected Model: ARDL(5, 0, 1, 1, 0)
Date: 05/08/17 Time: 17:44
Sample: 1997Q1 2008Q1
Included observations: 45

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MON(-1))	0.099283	0.089790	1.105721	0.2771
D(MON(-2))	-0.147249	0.093878	-1.568516	0.1266
D(MON(-3))	-0.092958	0.094730	-0.981295	0.3338
D(MON(-4))	0.425599	0.095727	4.445966	0.0001
D(LNGDP)	0.538523	0.360713	1.492943	0.1452
D(MC)	0.563688	0.127562	4.418924	0.0001
D(FDI)	1.384868	0.825049	1.678528	0.1030
D(LNSETI)	-1.915843	0.393096	-4.873727	0.0000
C	11.009277	1.615719	6.813854	0.0000
CointEq(-1)	-0.645740	0.094562	-6.828778	0.0000

Cointeq = MON - (0.5843*LNGDP + 0.6319*MC + 6.5898*FDI -2.7805 *LNSETI -0.0089*@TREND)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP	0.584297	0.524535	1.113934	0.2736
MC	0.631904	0.215674	2.929900	0.0062
FDI	6.589757	2.907431	2.266522	0.0303
LNSETI	-2.780532	0.630778	-4.408096	0.0001
@TREND	-0.008944	0.013306	-0.672202	0.5063

Autoregressive Distributed Lag Estimates
ARDL(5,0,1,1,0) selected based on Akaike Information Criterion

Dependent variable is MON
45 observations used for estimation from 1997Q1 to 2008Q1

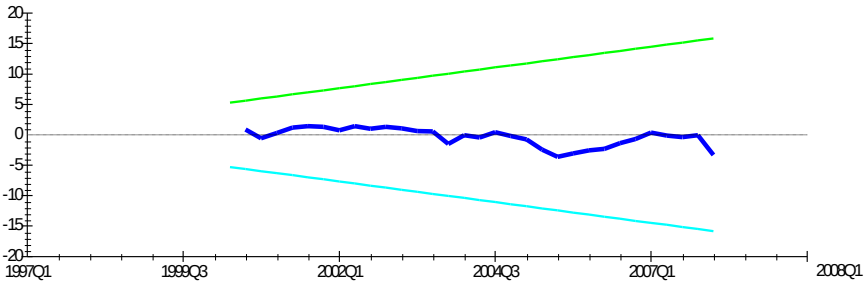
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
MON(-1)	.45844	.13275	3.4535[.002]
MON(-2)	-.25327	.14982	-1.6906[.101]
MON(-3)	.056507	.15527	.36393[.718]
MON(-4)	.50558	.15095	3.3494[.002]
MON(-5)	-.41329	.10570	-3.9099[.000]
LNGDP	.37747	.33684	1.1206[.271]
MC	.53608	.16608	3.2278[.003]
MC(-1)	-.12785	.064017	-1.9971[.054]
FDI	1.3456	1.1930	1.1279[.268]
FDI(-1)	2.9116	1.2713	2.2903[.029]
LNSETI	-1.7963	.48187	-3.7278[.001]
C	11.0284	3.4902	3.1599[.003]
T	-.0057783	.0085466	-.67610[.504]

R-Squared	.91059	R-Bar-Squared	.87706
S.E. of Regression	.16980	F-stat. F(12, 32)	27.1571[.000]
Mean of Dependent Variable	8.0227	S.D. of Dependent Variable	.48425
Residual Sum of Squares	.92257	Equation Log-likelihood	23.6109
Akaike Info. Criterion	10.6109	Schwarz Bayesian Criterion	-1.1324
DW-statistic	2.0711		

Diagnostic Tests

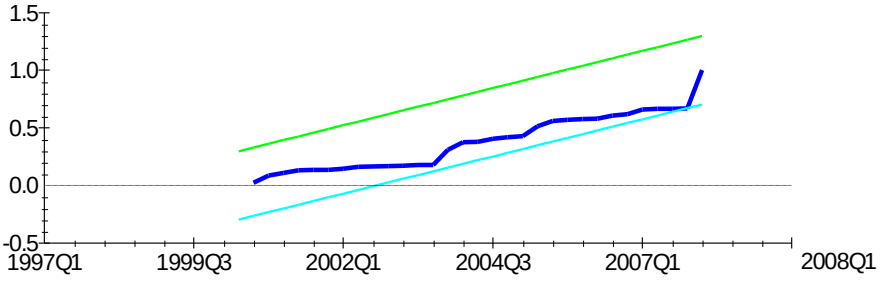
```
*    Test Statistics  *        LM Version        *         F Version          *
*************************************************************************
*                     *                          *                         *
* A:Serial Correlation*CHSQ(   4)=   8.5832[.072]*F(   4,  28)=   1.6499[.190]*
*                     *                          *                         *
* B:Functional Form   *CHSQ(   1)= .0077140[.930]*F(   1,  31)= .0053150[.942]*
*                     *                          *                         *
* C:Normality         *CHSQ(   2)=   5.9255[.052]*       Not applicable      *
*                     *                          *                         *
* D:Heteroscedasticity*CHSQ(   1)=   .13585[.712]*F(   1,  43)=   .13020[.720]*
*************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Estimated Long Run Coefficients using the ARDL Approach
ARDL(5,0,1,1,0) selected based on Akaike Information Criterion

```
*************************************************************************
 Dependent variable is MON
 45 observations used for estimation from 1997Q1 to 2008Q1
*************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LNGDP                      .58430            .52453            1.1139[.274]
 MC                         .63190            .21567            2.9299[.006]
 FDI                       6.5898            2.9074            2.2665[.030]
 LNSETI                   -2.7805            .63078           -4.4081[.000]
 C                         17.0710            4.4958            3.7971[.001]
 T                        -.0089443           .013306           -.67220[.506]
*************************************************************************
```

```
         Error Correction Representation for the Selected ARDL Model
        ARDL(5,0,1,1,0) selected based on Akaike Information Criterion
********************************************************************************
 Dependent variable is dMON
 45 observations used for estimation from 1997Q1 to 2008Q1
********************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dMON1                      .10448             .11392           .91706[.366]
 dMON2                     -.14880             .11651          -1.2771[.210]
 dMON3                    -.092292             .11279          -.81829[.419]
 dMON4                      .41329             .10570           3.9099[.000]
 dLNGDP                     .37747             .33684           1.1206[.270]
 dMC                        .53608             .16608           3.2278[.003]
 dFDI                       1.3456             1.1930           1.1279[.267]
 dLNSETI                   -1.7963             .48187          -3.7278[.001]
 dC                         11.0284             3.4902           3.1599[.003]
 dT                       -.0057783           .0085466          -.67610[.504]
 ecm(-1)                    -.64603            .092375          -6.9936[.000]
********************************************************************************
 List of additional temporary variables created:
 dMON = MON-MON(-1)
 dMON1 = MON(-1)-MON(-2)
 dMON2 = MON(-2)-MON(-3)
 dMON3 = MON(-3)-MON(-4)
 dMON4 = MON(-4)-MON(-5)
 dLNGDP = LNGDP-LNGDP(-1)
 dMC = MC-MC(-1)
 dFDI = FDI-FDI(-1)
 dLNSETI = LNSETI-LNSETI(-1)
 dC = C-C(-1)
 dT = T-T(-1)
 ecm = MON   -.58430*LNGDP   -.63190*MC   -6.5898*FDI +   2.7805*LNSETI  -17.0
710*C + .0089443*T
********************************************************************************
 R-Squared                        .83758   R-Bar-Squared                  .77667
 S.E. of Regression               .16980   F-stat.    F( 10,  34)   16.5016[.000]
 Mean of Dependent Variable      .027770   S.D. of Dependent Variable      .35929
 Residual Sum of Squares          .92257   Equation Log-likelihood        23.6109
 Akaike Info. Criterion          10.6109   Schwarz Bayesian Criterion     -1.1324
 DW-statistic                     2.0711
********************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dMON and in cases where the error correction model is highly
 restricted, these measures could become negative.

F test

ARDL regression of dMON on:
 dMON1           dMON2           dMON3           dMON4           dLNGDP
 dMC             dFDI            dLNSETI         dC              dT
 ecm(-1)

GDP



              Wald test of restriction(s) imposed on parameters
********************************************************************************
 Based on ARDL regression of dMON on:
 dMON1           dMON2           dMON3           dMON4           dLNGDP
 dMC             dFDI            dLNSETI         dC              dT
 ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
********************************************************************************
 Coefficients A1 to A11 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A5=0.
********************************************************************************
 Wald Statistic                CHSQ( 1)=   1.2558[.262]
********************************************************************************
```

MC

```
              Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dMON on:
 dMON1           dMON2           dMON3           dMON4           dLNGDP
 dMC             dFDI            dLNSETI         dC              dT
 ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A11 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A6=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=  10.4187[.001]
*******************************************************************************
```

FDI

```
              Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dMON on:
 dMON1           dMON2           dMON3           dMON4           dLNGDP
 dMC             dFDI            dLNSETI         dC              dT
 ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A11 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A7=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=   1.2722[.259]
*******************************************************************************
```

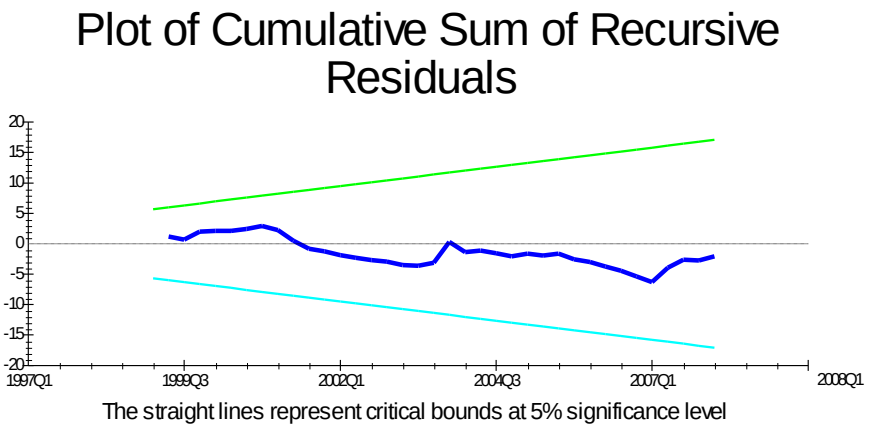
SETI

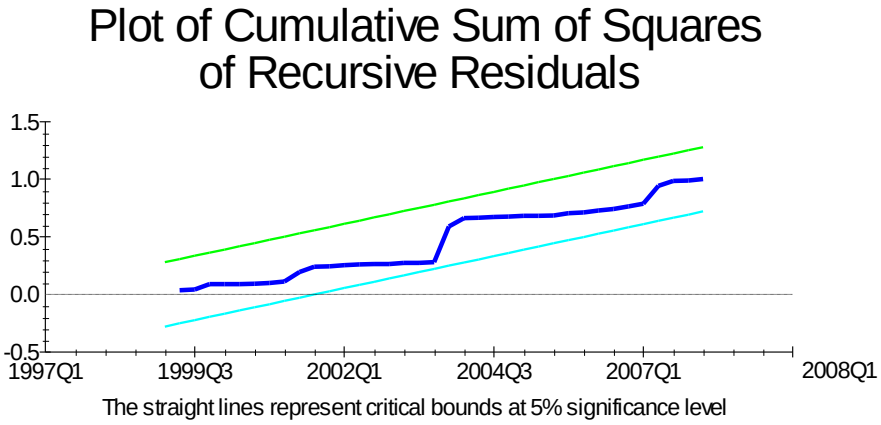
```
              Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dMON on:
 dMON1           dMON2           dMON3           dMON4           dLNGDP
 dMC             dFDI            dLNSETI         dC              dT
 ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A11 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A8=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=  13.8967[.000]
*******************************************************************************
```

3) MC 5 lags

```
                 Autoregressive Distributed Lag Estimates
       ARDL(1,0,0,0,1) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is MC
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 MC(-1)                     .34113            .10105             3.3758[.002]
 LNGDP                     -.59218            .23921            -2.4755[.018]
 MON                        .33135           .074187             4.4665[.000]
 FDI                        1.0090            .94958             1.0626[.295]
 LNSETI                     2.7953            .16467            16.9752[.000]
 LNSETI(-1)                -.58852            .29781            -1.9761[.056]
 C                         -9.1093            2.6126            -3.4867[.001]
 T                         .027825          .0063388             4.3896[.000]
*******************************************************************************
 R-Squared                    .99201   R-Bar-Squared                  .99050
```

```
 S.E. of Regression            .15037   F-stat.    F(  7,  37)  656.1550[.000]
 Mean of Dependent Variable    3.3834   S.D. of Dependent Variable      1.5425
 Residual Sum of Squares       .83656   Equation Log-likelihood        25.8130
 Akaike Info. Criterion       17.8130   Schwarz Bayesian Criterion     10.5864
 DW-statistic                  1.9712   Durbin's h-statistic      .13127[.896]
*******************************************************************************

                              Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   4)=   1.5571[.816]*F(   4,  33)=   .29571[.879]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)=  11.4037[.001]*F(   1,  36)=  12.2196[.001]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)=  11.4896[.003]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=   1.0592[.303]*F(   1,  43)=   1.0365[.314]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values

Stability
```






```
Long run

          Estimated Long Run Coefficients using the ARDL Approach
        ARDL(1,0,0,0,1) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is MC
 45 observations used for estimation from 1997Q1 to 2008Q1
```

```
*****************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LNGDP                     -.89877             .38075            -2.3605[.024]
 MON                        .50291             .11508             4.3701[.000]
 FDI                        1.5315             1.4898             1.0280[.311]
 LNSETI                     3.3493             .24480            13.6818[.000]
 C                         -13.8256            3.2337            -4.2755[.000]
 T                          .042231           .0053000            7.9682[.000]
*****************************************************************************
```

Ecm

```
          Error Correction Representation for the Selected ARDL Model
        ARDL(1,0,0,0,1) selected based on Akaike Information Criterion
*****************************************************************************
 Dependent variable is dMC
 45 observations used for estimation from 1997Q1 to 2008Q1
*****************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLNGDP                    -.59218             .23921            -2.4755[.018]
 dMON                       .33135            .074187             4.4665[.000]
 dFDI                       1.0090             .94958             1.0626[.295]
 dLNSETI                    2.7953             .16467            16.9752[.000]
 dC                        -9.1093            2.6126            -3.4867[.001]
 dT                         .027825           .0063388            4.3896[.000]
 ecm(-1)                   -.65887             .10105            -6.5203[.000]
*****************************************************************************
 List of additional temporary variables created:
 dMC = MC-MC(-1)
 dLNGDP = LNGDP-LNGDP(-1)
 dMON = MON-MON(-1)
 dFDI = FDI-FDI(-1)
 dLNSETI = LNSETI-LNSETI(-1)
 dC = C-C(-1)
 dT = T-T(-1)
 ecm = MC +   .89877*LNGDP   -.50291*MON   -1.5315*FDI   -3.3493*LNSETI +  13.
8256*C  -.042231*T
*****************************************************************************
 R-Squared                        .92891   R-Bar-Squared                  .91546
 S.E. of Regression               .15037   F-stat.    F(  6,  38)    80.5777[.000]
 Mean of Dependent Variable       .056273  S.D. of Dependent Variable      .51715
 Residual Sum of Squares          .83656   Equation Log-likelihood        25.8130
 Akaike Info. Criterion          17.8130   Schwarz Bayesian Criterion     10.5864
 DW-statistic                     1.9712
*****************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dMC and in cases where the error correction model is highly
 restricted, these measures could become negative.
```

F test

```
ARDL regression of dMC on:
 dLNGDP          dMON            dFDI            dLNSETI         dC
 dT              ecm(-1)
```

GDP

```
               Wald test of restriction(s) imposed on parameters
*****************************************************************************
 Based on ARDL regression of dMC on:
 dLNGDP          dMON            dFDI            dLNSETI         dC
 dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*****************************************************************************
 Coefficients A1 to A7 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A1=0.
*****************************************************************************
 Wald Statistic                 CHSQ( 1)=   6.1283[.013]
*****************************************************************************
```

MON

```
               Wald test of restriction(s) imposed on parameters
*****************************************************************************
 Based on ARDL regression of dMC on:
 dLNGDP          dMON            dFDI            dLNSETI         dC
```

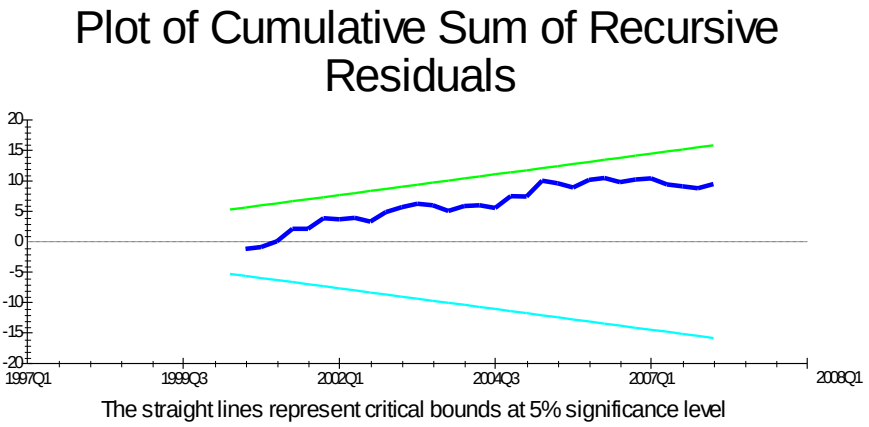
```
 dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A7 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A2=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=  19.9494[.000]
*******************************************************************************

FDI


              Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dMC on:
 dLNGDP          dMON            dFDI            dLNSETI         dC
 dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A7 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A3=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=   1.1292[.288]
*******************************************************************************

SET


              Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dMC on:
 dLNGDP          dMON            dFDI            dLNSETI         dC
 dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A7 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A4=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)= 288.1572[.000]
*******************************************************************************


FDI


                 Autoregressive Distributed Lag Estimates
        ARDL(2,3,1,1,0) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is FDI
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Regressor             Coefficient       Standard Error         T-Ratio[Prob]
 FDI(-1)                  .034653            .16200             .21391[.832]
 FDI(-2)                   .34950            .15412             2.2678[.030]
 LNGDP                   -.068105           .054808            -1.2426[.223]
 LNGDP(-1)                .037584           .060515             .62107[.539]
 LNGDP(-2)                -.10569           .056193            -1.8809[.069]
 LNGDP(-3)                 .12655           .043336             2.9203[.006]
 MON                       .023409          .016231             1.4422[.159]
 MON(-1)                  -.028672          .013287            -2.1579[.039]
 MC                        .038858          .023893             1.6264[.114]
 MC(-1)                   -.012622          .0090089            -1.4011[.171]
 LNSETI                   -.065181           .071054            -.91735[.366]
 C                         .51953            .49576             1.0479[.303]
 T                      -.7650E-3          .0010962            -.69783[.490]
*******************************************************************************
 R-Squared                    .51700   R-Bar-Squared                  .33587
 S.E. of Regression           .022338  F-stat.    F( 12,  32)    2.8544[.009]
 Mean of Dependent Variable   .069056  S.D. of Dependent Variable     .027411
 Residual Sum of Squares      .015968  Equation Log-likelihood       114.8839
 Akaike Info. Criterion      101.8839  Schwarz Bayesian Criterion     90.1406
 DW-statistic                 2.1912
*******************************************************************************
```

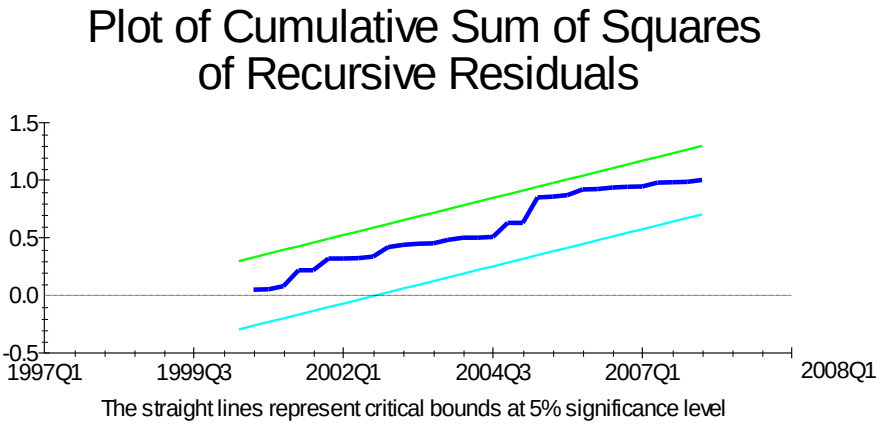
Diagnostic Tests

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(4)= 8.7041[.069]	F(4, 28)= 1.6787[.183]
B:Functional Form	CHSQ(1)= 4.7249[.030]	F(1, 31)= 3.6367[.066]
C:Normality	CHSQ(2)= 2.1996[.333]	Not applicable
D:Heteroscedasticity	CHSQ(1)= 3.7396[.053]	F(1, 43)= 3.8973[.055]

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Stability





Bounds test

ARDL Bounds Test
Date: 05/08/17 Time: 18:32
Sample: 1997Q1 2008Q1
Included observations: 45
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	2.293139	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.68	3.53
5%	3.05	3.97
2.5%	3.4	4.36
1%	3.81	4.92

Test Equation:
Dependent Variable: D(FDI)
Method: Least Squares
Date: 05/08/17 Time: 18:32
Sample: 1997Q1 2008Q1
Included observations: 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-0.347328	0.155608	-2.232064	0.0327
D(LNGDP)	-0.084666	0.051128	-1.655965	0.1075
D(LNGDP(-1))	-0.021828	0.039051	-0.558959	0.5801
D(LNGDP(-2))	-0.123606	0.043615	-2.834012	0.0079
D(MON)	0.030153	0.014454	2.086146	0.0450
D(MC)	0.017043	0.008258	2.063896	0.0472
C	0.108771	0.492263	0.220962	0.8265
@TREND	0.000525	0.001213	0.432782	0.6681
LNGDP(-1)	-0.041206	0.041993	-0.981241	0.3338
MON(-1)	0.010097	0.016280	0.620215	0.5395
MC(-1)	-0.005201	0.022441	-0.231785	0.8182
LNSETI(-1)	0.042846	0.068382	0.626565	0.5354
FDI(-1)	-0.623491	0.212037	-2.940487	0.0060

R-squared	0.651297	Mean dependent var	0.001000
Adjusted R-squa...	0.520533	S.D. dependent var	0.032483
S.E. of regression	0.022493	Akaike info criterion	-4.514408
Sum squared re...	0.016189	Schwarz criterion	-3.992484
Log likelihood	114.5742	Hannan-Quinn criter.	-4.319840
F-statistic	4.980710	Durbin-Watson stat	2.213032
Prob(F-statistic)	0.000134		

Long run

Estimated Long Run Coefficients using the ARDL Approach
ARDL(2,3,1,1,0) selected based on Akaike Information Criterion

Dependent variable is FDI
45 observations used for estimation from 1997Q1 to 2008Q1

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LNGDP	-.015688	.069443	-.22591[.823]
MON	-.0085458	.031032	-.27539[.785]
MC	.042601	.036538	1.1659[.252]
LNSETI	-.10584	.12370	-.85559[.399]

```
C                          .84360             .86274             .97781[.336]
T                        -.0012421           .0017325            -.71693[.479]
*******************************************************************************


         Error Correction Representation for the Selected ARDL Model
        ARDL(2,3,1,1,0) selected based on Akaike Information Criterion
*******************************************************************************
Dependent variable is dFDI
45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
Regressor              Coefficient       Standard Error         T-Ratio[Prob]
dFDI1                     -.34950             .15412            -2.2678[.030]
dLNGDP                   -.068105            .054808            -1.2426[.222]
dLNGDP1                  -.020859            .038804            -.53756[.594]
dLNGDP2                   -.12655            .043336            -2.9203[.006]
dMON                      .023409            .016231             1.4422[.158]
dMC                       .038858            .023893             1.6264[.113]
dLNSETI                  -.065181            .071054            -.91735[.365]
dC                        .51953              .49576             1.0479[.302]
dT                      -.7650E-3           .0010962            -.69783[.490]
ecm(-1)                   -.61585             .21089            -2.9202[.006]
*******************************************************************************
List of additional temporary variables created:
dFDI = FDI-FDI(-1)
dFDI1 = FDI(-1)-FDI(-2)
dLNGDP = LNGDP-LNGDP(-1)
dLNGDP1 = LNGDP(-1)-LNGDP(-2)
dLNGDP2 = LNGDP(-2)-LNGDP(-3)
dMON = MON-MON(-1)
dMC = MC-MC(-1)
dLNSETI = LNSETI-LNSETI(-1)
dC = C-C(-1)
dT = T-T(-1)
ecm = FDI +  .015688*LNGDP + .0085458*MON  -.042601*MC +   .10584*LNSETI   -.
84360*C + .0012421*T
*******************************************************************************
R-Squared                      .65606   R-Bar-Squared                    .52709
S.E. of Regression           .022338   F-stat.    F(  9,  35)    6.7823[.000]
Mean of Dependent Variable  .9997E-3   S.D. of Dependent Variable     .032483
Residual Sum of Squares      .015968   Equation Log-likelihood       114.8839
Akaike Info. Criterion      101.8839   Schwarz Bayesian Criterion     90.1406
DW-statistic                 2.1912
*******************************************************************************
R-Squared and R-Bar-Squared measures refer to the dependent variable
dFDI and in cases where the error correction model is highly
restricted, these measures could become negative.

F test
ARDL regression of dFDI on:
dFDI1           dLNGDP          dLNGDP1         dLNGDP2         dMON
dMC             dLNSETI         dC              dT              ecm(-1)


GDP


              Wald test of restriction(s) imposed on parameters
*******************************************************************************
Based on ARDL regression of dFDI on:
dFDI1           dLNGDP          dLNGDP1         dLNGDP2         dMON
dMC             dLNSETI         dC              dT              ecm(-1)
45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
Coefficients A1 to A10 are assigned to the above regressors respectively.
List of restriction(s) for the Wald test:
A2=0; A3=0; A4=0.
*******************************************************************************
Wald Statistic                CHSQ( 3)=   9.0860[.028]
*******************************************************************************


MON


              Wald test of restriction(s) imposed on parameters
*******************************************************************************
Based on ARDL regression of dFDI on:
```

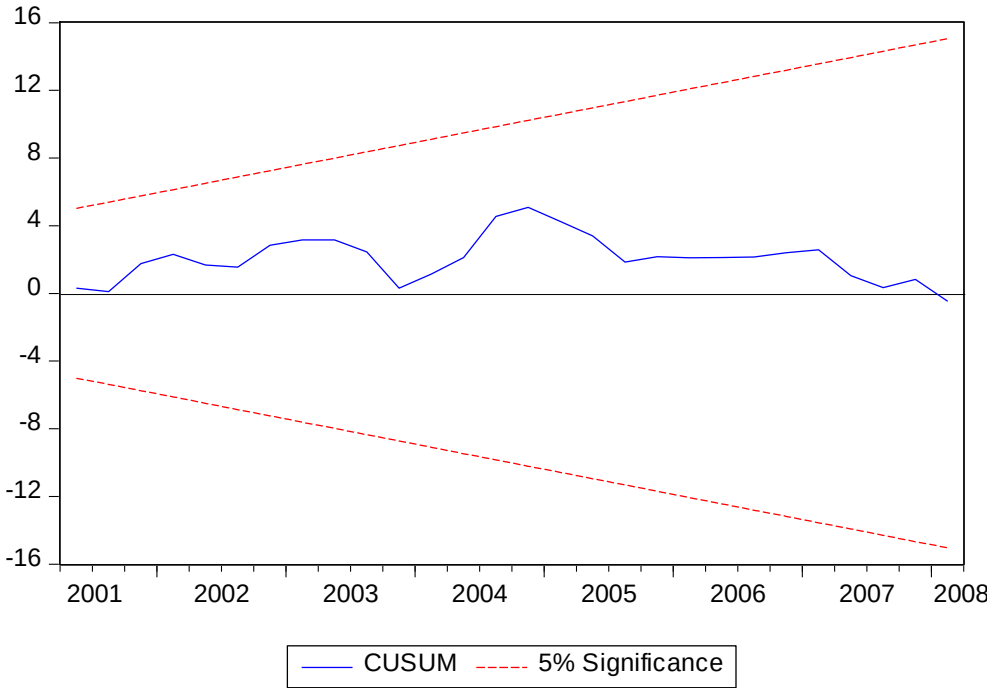
```
 dFDI1           dLNGDP          dLNGDP1         dLNGDP2         dMON
 dMC             dLNSETI         dC              dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A10 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A5=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=   2.0801[.149]
*******************************************************************************

MC


               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dFDI on:
 dFDI1           dLNGDP          dLNGDP1         dLNGDP2         dMON
 dMC             dLNSETI         dC              dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A10 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A6=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=   2.6451[.104]
*******************************************************************************


SETI



               Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dFDI on:
 dFDI1           dLNGDP          dLNGDP1         dLNGDP2         dMON
 dMC             dLNSETI         dC              dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A10 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A7=0.
*******************************************************************************
 Wald Statistic                CHSQ( 1)=   .84153[.359]
*******************************************************************************
```

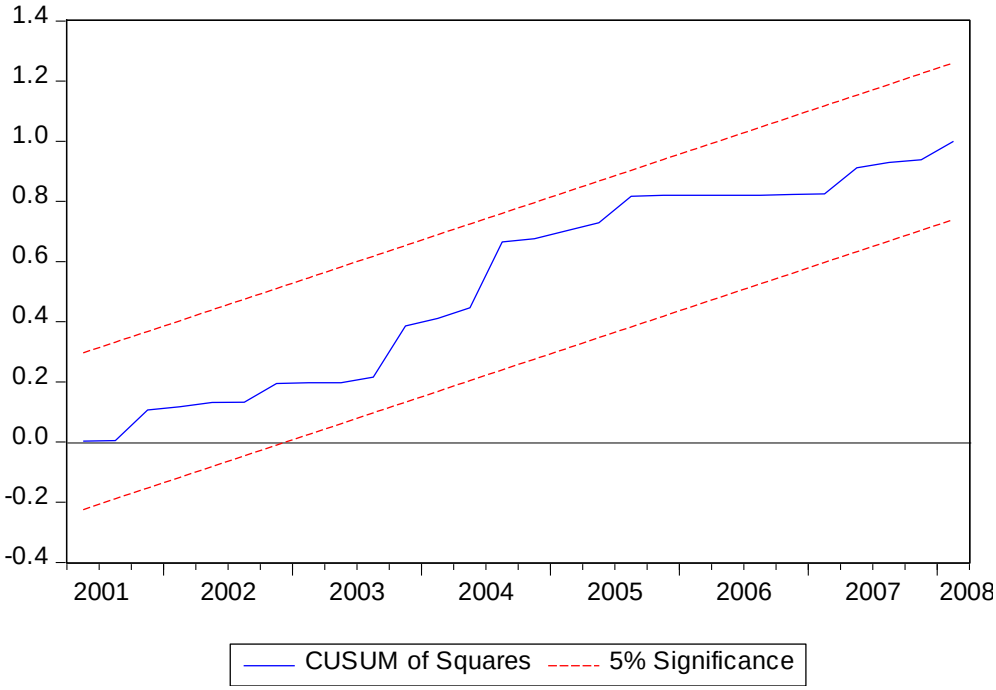
Dependent Variable: LNSETI
Method: ARDL
Date: 05/08/17 Time: 18:38
Sample: 1997Q1 2008Q1
Included observations: 45
Maximum dependent lags: 5 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (5 lags, automatic): LNGDP MON MC FDI
Fixed regressors: C @TREND
Number of models evalulated: 6480
Selected Model: ARDL(3, 4, 1, 1, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNSETI(-1)	0.287159	0.141202	2.033673	0.0516
LNSETI(-2)	0.002641	0.068722	0.038435	0.9696
LNSETI(-3)	-0.084252	0.057410	-1.467548	0.1534
LNGDP	0.384529	0.117964	3.259716	0.0029
LNGDP(-1)	0.072716	0.151877	0.478782	0.6358
LNGDP(-2)	-0.143944	0.145955	-0.986224	0.3325
LNGDP(-3)	0.465640	0.152899	3.045412	0.0050
LNGDP(-4)	-0.423499	0.120129	-3.525374	0.0015
MON	-0.101679	0.031368	-3.241522	0.0031
MON(-1)	-0.095601	0.038172	-2.504476	0.0184
MC	0.272998	0.021892	12.47047	0.0000
MC(-1)	-0.103548	0.046967	-2.204720	0.0359
FDI	0.277564	0.413349	0.671501	0.5074
FDI(-1)	0.606467	0.373109	1.625440	0.1153
FDI(-2)	0.768382	0.350713	2.190915	0.0369
C	2.418508	1.051520	2.300011	0.0291
@TREND	-0.005252	0.002667	-1.969522	0.0589

R-squared	0.990813	Mean dependent var	6.186518
Adjusted R-squared	0.985563	S.D. dependent var	0.379011
S.E. of regression	0.045539	Akaike info criterion	-3.059395
Sum squared resid	0.058067	Schwarz criterion	-2.376879
Log likelihood	85.83640	Hannan-Quinn criter.	-2.804960
F-statistic	188.7386	Durbin-Watson stat	2.010252
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.


16
12
8
4
0
-4
-8
-12
-16
2001
2002
2003
2004
2005
2006
2007
2008
CUSUM
5% Significance


1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
2001
2002
2003
2004
2005
2006
2007
2008
CUSUM of Squares
5% Significance

ARDL Bounds Test
Date: 05/08/17 Time: 18:40
Sample: 1997Q1 2008Q1
Included observations: 45
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	5.536099	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.68	3.53
5%	3.05	3.97
2.5%	3.4	4.36
1%	3.81	4.92

Test Equation:
Dependent Variable: D(LNSETI)
Method: Least Squares
Date: 05/08/17 Time: 18:40
Sample: 1997Q1 2008Q1
Included observations: 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNSETI(-1))	0.081611	0.063356	1.288125	0.2082
D(LNSETI(-2))	0.084252	0.057410	1.467548	0.1534
D(LNGDP)	0.384529	0.117964	3.259716	0.0029
D(LNGDP(-1))	0.101803	0.110093	0.924701	0.3630
D(LNGDP(-2))	-0.042141	0.115566	-0.364650	0.7181
D(LNGDP(-3))	0.423499	0.120129	3.525374	0.0015
D(MON)	-0.101679	0.031368	-3.241522	0.0031
D(MC)	0.272998	0.021892	12.47047	0.0000
D(FDI)	0.277564	0.413349	0.671501	0.5074
D(FDI(-1))	-0.768382	0.350713	-2.190915	0.0369
C	2.418508	1.051520	2.300011	0.0291
@TREND	-0.005252	0.002667	-1.969522	0.0589
LNGDP(-1)	0.355441	0.121222	2.932140	0.0066
MON(-1)	-0.197279	0.039873	-4.947707	0.0000
MC(-1)	0.169450	0.049405	3.429790	0.0019
FDI(-1)	1.652413	0.659306	2.506292	0.0183
LNSETI(-1)	-0.794452	0.163544	-4.857713	0.0000

R-squared	0.960242	Mean dependent var	0.000381
Adjusted R-squa...	0.937523	S.D. dependent var	0.182189
S.E. of regression	0.045539	Akaike info criterion	-3.059395
Sum squared re...	0.058067	Schwarz criterion	-2.376879
Log likelihood	85.83640	Hannan-Quinn criter.	-2.804960
F-statistic	42.26593	Durbin-Watson stat	2.010252
Prob(F-statistic)	0.000000		

ARDL Cointegrating And Long Run Form
Original dep. variable: LNSETI
Selected Model: ARDL(3, 4, 1, 1, 2)
Date: 05/08/17 Time: 18:42
Sample: 1997Q1 2008Q1
Included observations: 45

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNSETI(-1))	0.081611	0.051080	1.597699	0.1213
D(LNSETI(-2))	0.084252	0.046261	1.821225	0.0793
D(LNGDP)	0.384529	0.093451	4.114756	0.0003
D(LNGDP(-1))	0.101803	0.083718	1.216027	0.2341
D(LNGDP(-2))	-0.042141	0.090927	-0.463460	0.6466
D(LNGDP(-3))	0.423499	0.084872	4.989865	0.0000
D(MON)	-0.101679	0.024823	-4.096076	0.0003
D(MC)	0.272998	0.015345	17.790278	0.0000
D(FDI)	0.277564	0.300568	0.923465	0.3637
D(FDI(-1))	-0.768382	0.288050	-2.667531	0.0126
C	2.413256	0.388289	6.215102	0.0000
CointEq(-1)	-0.794452	0.126973	-6.256847	0.0000

Cointeq = LNSETI - (0.4474*LNGDP -0.2483*MON + 0.2133*MC + 2.0799 *FDI -0.0066*@TREND)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP	0.447405	0.120145	3.723862	0.0009
MON	-0.248321	0.048591	-5.110410	0.0000
MC	0.213291	0.030244	7.052255	0.0000
FDI	2.079942	0.894516	2.325214	0.0275
@TREND	-0.006611	0.002508	-2.636620	0.0135

Autoregressive Distributed Lag Estimates
ARDL(3,4,1,1,2) selected based on Akaike Information Criterion

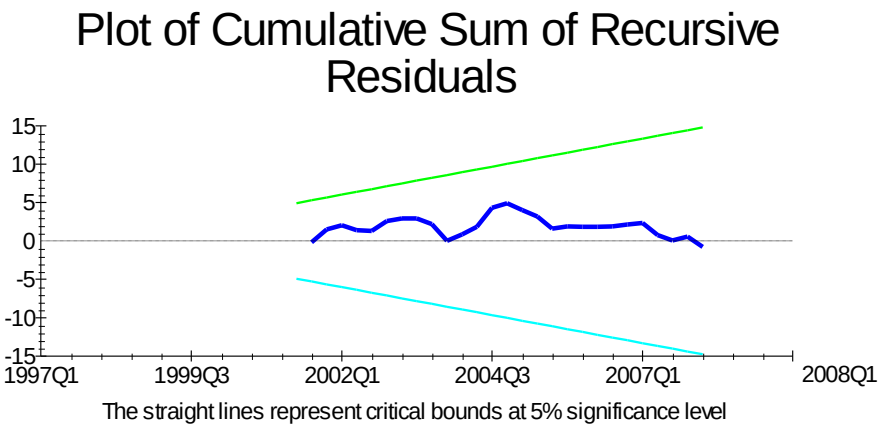
Dependent variable is LNSETI
45 observations used for estimation from 1997Q1 to 2008Q1

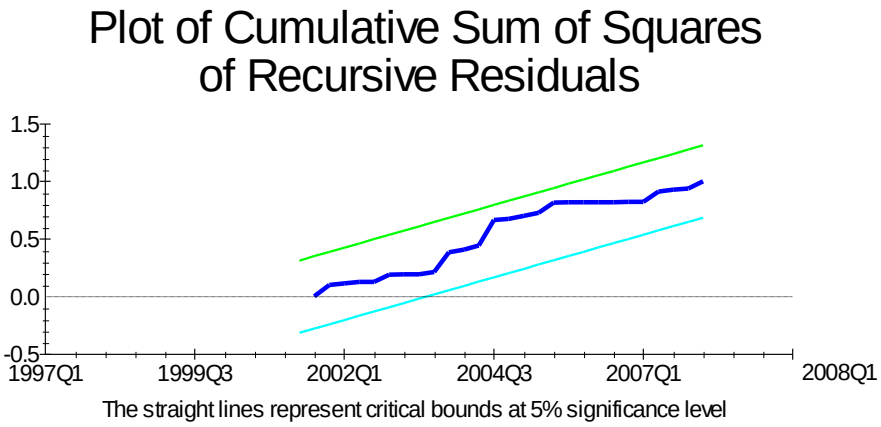
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LNSETI(-1)	.28716	.14120	2.0337[.052]
LNSETI(-2)	.0026413	.068722	.038435[.970]
LNSETI(-3)	-.084252	.057410	-1.4675[.153]
LNGDP	.38453	.11796	3.2597[.003]
LNGDP(-1)	.072716	.15188	.47878[.636]
LNGDP(-2)	-.14394	.14595	-.98622[.332]
LNGDP(-3)	.46564	.15290	3.0454[.005]
LNGDP(-4)	-.42350	.12013	-3.5254[.001]
MON	-.10168	.031368	-3.2415[.003]
MON(-1)	-.095601	.038172	-2.5045[.018]
MC	.27300	.021892	12.4705[.000]
MC(-1)	-.10355	.046967	-2.2047[.036]
FDI	.27756	.41335	.67150[.507]
FDI(-1)	.60647	.37311	1.6254[.115]
FDI(-2)	.76838	.35071	2.1909[.037]
C	2.4238	1.0524	2.3032[.029]
T	-.0052525	.0026669	-1.9695[.059]

R-Squared	.99081	R-Bar-Squared	.98556
S.E. of Regression	.045539	F-stat. F(16, 28)	188.7386[.000]
Mean of Dependent Variable	6.1865	S.D. of Dependent Variable	.37901
Residual Sum of Squares	.058067	Equation Log-likelihood	85.8364

```
 Akaike Info. Criterion       68.8364   Schwarz Bayesian Criterion     53.4798
 DW-statistic                  2.0103
*******************************************************************************
```

```
                              Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   4)=   5.0118[.286]*F(   4,  24)=   .75199[.566]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)=  25.3914[.000]*F(   1,  27)=  34.9626[.000]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)=   .11886[.942]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=   .87424[.350]*F(   1,  43)=   .85194[.361]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```






```
        Estimated Long Run Coefficients using the ARDL Approach
       ARDL(3,4,1,1,2) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is LNSETI
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Regressor             Coefficient       Standard Error         T-Ratio[Prob]
 LNGDP                     .44740            .12015             3.7239[.001]
 MON                      -.24832            .048591           -5.1104[.000]
 MC                        .21329            .030244            7.0523[.000]
```

```
 FDI                          2.0799             .89452             2.3252[.028]
 C                            3.0509             1.2630             2.4155[.022]
 T                          -.0066115           .0025075           -2.6366[.014]
*******************************************************************************


         Error Correction Representation for the Selected ARDL Model
        ARDL(3,4,1,1,2) selected based on Akaike Information Criterion
*******************************************************************************
 Dependent variable is dLNSETI
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 dLNSETI1                  .081611            .063356            1.2881[.207]
 dLNSETI2                  .084252            .057410            1.4675[.152]
 dLNGDP                     .38453             .11796            3.2597[.003]
 dLNGDP1                    .10180             .11009             .92470[.362]
 dLNGDP2                  -.042141             .11557           -.36465[.718]
 dLNGDP3                    .42350             .12013            3.5254[.001]
 dMON                     -.10168            .031368           -3.2415[.003]
 dMC                        .27300            .021892           12.4705[.000]
 dFDI                       .27756             .41335             .67150[.507]
 dFDI1                    -.76838             .35071           -2.1909[.036]
 dC                         2.4238             1.0524            2.3032[.028]
 dT                       -.0052525           .0026669           -1.9695[.058]
 ecm(-1)                    -.79445             .16354           -4.8577[.000]
*******************************************************************************
 List of additional temporary variables created:
 dLNSETI = LNSETI-LNSETI(-1)
 dLNSETI1 = LNSETI(-1)-LNSETI(-2)
 dLNSETI2 = LNSETI(-2)-LNSETI(-3)
 dLNGDP = LNGDP-LNGDP(-1)
 dLNGDP1 = LNGDP(-1)-LNGDP(-2)
 dLNGDP2 = LNGDP(-2)-LNGDP(-3)
 dLNGDP3 = LNGDP(-3)-LNGDP(-4)
 dMON = MON-MON(-1)
 dMC = MC-MC(-1)
 dFDI = FDI-FDI(-1)
 dFDI1 = FDI(-1)-FDI(-2)
 dC = C-C(-1)
 dT = T-T(-1)
 ecm = LNSETI   -.44740*LNGDP +   .24832*MON   -.21329*MC   -2.0799*FDI   -3.0
509*C + .0066115*T
*******************************************************************************
 R-Squared                      .96024   R-Bar-Squared                   .93752
 S.E. of Regression           .045539   F-stat.    F( 12,  32)   56.3546[.000]
 Mean of Dependent Variable  .3813E-3   S.D. of Dependent Variable      .18219
 Residual Sum of Squares      .058067   Equation Log-likelihood        85.8364
 Akaike Info. Criterion       68.8364   Schwarz Bayesian Criterion     53.4798
 DW-statistic                  2.0103
*******************************************************************************
 R-Squared and R-Bar-Squared measures refer to the dependent variable
 dLNSETI and in cases where the error correction model is highly
 restricted, these measures could become negative.


F test

ARDL regression of dLNSETI on:
 dLNSETI1        dLNSETI2        dLNGDP          dLNGDP1         dLNGDP2
 dLNGDP3         dMON            dMC             dFDI            dFDI1
 dC              dT              ecm(-1)

GDP


              Wald test of restriction(s) imposed on parameters
*******************************************************************************
 Based on ARDL regression of dLNSETI on:
 dLNSETI1        dLNSETI2        dLNGDP          dLNGDP1         dLNGDP2
 dLNGDP3         dMON            dMC             dFDI            dFDI1
 dC              dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
*******************************************************************************
 Coefficients A1 to A13 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A3=0; A4=0; A5=0; A6=0.
*******************************************************************************
```

```
 Wald Statistic                 CHSQ( 4)=  23.3980[.000]
********************************************************************************

MON


               Wald test of restriction(s) imposed on parameters
********************************************************************************
 Based on ARDL regression of dLNSETI on:
 dLNSETI1        dLNSETI2        dLNGDP          dLNGDP1         dLNGDP2
 dLNGDP3         dMON            dMC             dFDI            dFDI1
 dC              dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
********************************************************************************
 Coefficients A1 to A13 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A7=0.
********************************************************************************
 Wald Statistic                 CHSQ( 1)=  10.5075[.001]
********************************************************************************

MC


               Wald test of restriction(s) imposed on parameters
********************************************************************************
 Based on ARDL regression of dLNSETI on:
 dLNSETI1        dLNSETI2        dLNGDP          dLNGDP1         dLNGDP2
 dLNGDP3         dMON            dMC             dFDI            dFDI1
 dC              dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
********************************************************************************
 Coefficients A1 to A13 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A8=0.
********************************************************************************
 Wald Statistic                 CHSQ( 1)= 155.5125[.000]
********************************************************************************

FDI


               Wald test of restriction(s) imposed on parameters
********************************************************************************
 Based on ARDL regression of dLNSETI on:
 dLNSETI1        dLNSETI2        dLNGDP          dLNGDP1         dLNGDP2
 dLNGDP3         dMON            dMC             dFDI            dFDI1
 dC              dT              ecm(-1)
 45 observations used for estimation from 1997Q1 to 2008Q1
********************************************************************************
 Coefficients A1 to A13 are assigned to the above regressors respectively.
 List of restriction(s) for the Wald test:
 A9=0; A10=0.
********************************************************************************
 Wald Statistic                 CHSQ( 2)=   6.0671[.048]
********************************************************************************
```